Social Integration During Midlife and Beyond:
An Examination of How Social Roles and Work Affect Sleep

By

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Dissertation

Submitted to the Faculty of the

Graduate School of Vanderbilt University

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

in

Sociology

May 14, 2021

Nashville, Tennessee

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To the memory of those that lost I along the way

and

To those that remain who love and care for me continually

ACKNOWLEDGEMENTS

There were times when I did not think I could continue on this journey. However, I give All Praise to The Most High for His grace and mercy in carrying me through. Thank You.

The completion of this dissertation reflects the love, support, and guidance I received from family, friends, and other wonderful people over the years. Although I do not name you all here, know that I love and appreciate each of you from the bottom of my heart.

I am especially grateful to my dissertation committee. First, I thank my primary mentor C. André Christie-Mizell for sharing his knowledge and friendship over the years. Not only did he care about my academic performance, but also my well-being outside academia. I truly appreciate his unwavering support over the past five years and his presence through the peaks and valleys of life. I look forward to continuing our friendship in the years to come. Second, I thank Lijun Song who also provided informational, emotional, and appraisal support. I appreciate her encouragement to always think about what my research means with regards to the contributions that I want to make to the field. Third, attending the HRS workshop during my first year at Vanderbilt was truly a blessing in disguise; there I met Christy L. Erving, who became instrumental to my development as a scholar as well as a Black woman in the academy. I am truly thankful to have her support and friendship. Finally, I thank Tyson Brown for his willingness to serve on my committee. My interest in working with him has come full circle. I look forward to his guidance and our collaborative endeavors in the future.

I am truly grateful for Brittany Hearne who provided support and encouragement inside and outside the classroom. The first year of graduate school was tough. I will never forget her patience, sincerity, and willingness to help. I also appreciate her being there through some of the most challenging times. I thank Ryan Talbert and Ashleigh Hope for their advice and support.

I truly enjoyed my time at Vanderbilt. From the start of this endeavor, I felt welcomed by, learned from, and engaged in influential conversations with numerous faculty and staff in the sociology department and across campus. I want to especially thank Richard Pitt, Dan Cornfield, Evelyn Patterson, Bianca Manago, George Becker, Holly McCammon, Shaul Kelner, Joshua Murry, David Hess, Pamela Tichenor, Sandy Cherry, La Tisha Moore, Pamela Morgan, and the late Anne Wall. I also want to thank Yvonne Chen, Monisola Vaughan, Lacee Satcher, Megan Jordan, and Megan Robinson for their support over the years.

Last, but certainly not least, I thank my husband Tony. Words cannot express how blessed I am to have your love, support, and devotion. The journey toward getting this Ph.D. was not easy for either of us. However, through The Most High's grace and mercy we persevered! You have always been my strongest advocate, who looked beyond my faults, doubts, and insecurities. You always encourage and inspire me to reach my highest potential. I am forever grateful to have you in my life and I continue to find peaceful refuge in your love.

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CHAPTER I

INTRODUCTION

"Sociology is concerned with only 2/3 of the lives of its human subjects and has systematically ignored 1/3 of them either as sources of data or as occasions for theorizing." (Taylor 1993:463)

Humans spend a third of their lives in slumber. Sleep is restorative for individual health and provides renewed energy for physical and social activities. Despite the importance of sleep in daily life, the sociological study of sleep is relatively neglected. Speculation surrounding this lacuna posits that sociologists are concerned with the active ways in which people interact with society and with questions of structure and agency (Taylor 1993; Williams 2008). Thus, within this framework, sleep is viewed as a non-event or a radical withdrawal from society (Williams 2008). In fact, even the language used to describe sleep (e.g., falling asleep, dropping off, and dead to the world) emphasizes inactivity and lack of social control (Taylor 1993). However, as Williams (2005) points out: "Questions such as how we sleep, when we sleep, where we sleep, what meanings we attribute to sleep, and with whom we sleep are indicators of social status, privilege, and prevailing power relations that are embedded in the social world" (75).

Some of the earliest sociological theorizing about sleep comes from Schwartz (1970), who posits that sleep is an important part of life and must be protected by social organizations. His largest contribution is the focus on the role of the sleeper, as well as the rituals used to transition in and out of sleep. Next, Taylor's (1993) work introduces the notion of 'doing sleep', which refers to the meanings, methods, motives, and management of sleep. Furthermore, he proposes that claims about the amount and quality of sleep carry subtle messages about social status and social meanings (Taylor 1993). For example, individuals of a higher socioeconomic status (SES) may view sleep as a leisurely activity; the working classes see sleep as respite from

hard labor; and athletes view sleep as preparation for a good performance (Taylor 1993). Williams (2001, 2005, 2007a, 2007b) advanced sociological insight about sleep with his work on the social etiquette of sleep, embodiment, and the relationship between sleep vulnerability and human rights. Additional scholarship about sleep emphasizes five areas in sociology. First, there is focus on the increasing medicalization of sleep (i.e., the extent to which sleep is defined as a medical problem that needs treatment) (Hislop and Arber 2003a). Second, the effects of poor sleep on marriage and family relationship quality are examined (Ailshire and Burgard 2012; Chen, Waite, and Lauderdale 2015; Meadows and Arber 2015). Third, sociological research reveals gender differences in sleep quality and sleep disruptions (Burgard and Ailshire 2013; Hislop and Arber 2003b). Fourth, sociologists study the association between disrupted sleep and job stress (Burgard and Ailshire 2009; Maume, Sebastian, and Bardo 2010). Finally, there is examination of how neighborhood factors affect sleep. Overall, these theoretical explorations and studies show that sleep is woven into the fabric of life; it is socially managed, scheduled, and institutionalized in various ways (Williams 2008).

Despite this burgeoning sociological examination of sleep, knowledge about sleep in the broader society focuses primarily on physiological and medical aspects. The National Sleep Foundation (Ojile 2017) recommends that adults aged 18 and older get a minimum of 7-8 hours of sleep per night. However, research shows that 37% of Americans get less than 7 hours of sleep and 50 to 70 million adults have a chronic sleep disorder that contributes to diminished sleep (Luyster et al. 2012; Sheehan et al. 2019). Poor sleep is reflected in the high prevalence of sleep disorders such as sleep apnea, narcolepsy, and restless leg syndrome (Luyster et al. 2012). One common sleep disorder, insomnia, is characterized by symptoms such as trouble falling asleep, frequent waking during the night, waking and trouble falling back to sleep, and feeling

unrested upon waking. Forty percent of American adults report this disorder (Henry et al. 2008). Studies also show that poor sleep health is associated with diminished cardiovascular health, increased mortality, diabetes, obesity, asthma, and lower self-rated health (Buxton and Marcelli 2010; Calhoun and Harding 2010; Grandner et al. 2010; Hale et al. 2013; Jackson et al. 2015; Liu et al. 2013). Mental health outcomes associated with poor sleep include anxiety and depressed mood (Hale et al. 2005; Leggett et al. 2016; Leggett et al. 2018). The concept of "sleep health" is a more holistic view of sleep that includes multiple domains, such as regularity, alertness, timing, efficiency, and satisfaction, rather than individual symptoms and disorders (Buysse 2014). Viewing sleep health as a multidimensional concept recognizes that sleep occurs both at the individual level and in a larger social context (Hale, Troxel, and Buysse 2020). As such, sleep health is indicative of overall health and equity. Moreover, this multidimensional conceptualization provides an opportunity for different levels of intervention (Hale et al. 2020).

Even with an emphasis on biological factors, close examination of existing research reveals a social patterning of sleep by gender, race/ethnicity, and class. For example, both sleep disruptions and sleep duration produce differential impacts on health by gender. Women in midlife are at greater risk for hypertension, dyslipidemia, cardiovascular disease (CVD), and weight-related issues because they are more likely than men to experience sleep disruptions (Hislop and Arber 2003b; Medic et al. 2017). Men report shorter sleep duration than women, which increases risk for immune dysfunctions, alcohol abuse, and fatal accidents (Hale et al. 2003; Luyster et al. 2012).

There are also racial/ethnic differences in sleep. Numerous studies show that African Americans report more difficulty maintaining sleep and shorter (< 6 hours of sleep) and longer (> 8 hours of sleep) sleep duration compared to Whites (Petrov et al. 2016; Sheehan et al. 2019;

Williams et al. 2016). Both shorter and longer sleep are associated with increased risk for mortality, obesity, and CVD (Liu et al. 2013). There is also evidence that compared to Whites, Hispanics report short sleep duration and more snoring (Carnethon 2016). Class differences also influence the relationship between sleep and health. Individuals with less education, low income, and employment instability are more likely to experience sleep problems (Hale, Peppard, and Young 2007). For instance, chronic instability in employment is related to a 40% higher probability of sleep problems, which translate into a higher risk for obesity, mood disorders, hypertension, and substance abuse (Antillón et al. 2014; Maeda et al. 2019). Gender, race/ethnicity, and socioeconomic differences in sleep disorders provide evidence that sleep is a structured dimension of inequality and it may be an important explanatory factor for health disparities (Adenekan et al. 2013; Williams 2005).

The relationship between sleep and health is complicated because causality is likely reciprocal (Hale et al. 2007). On the one hand, poor-quality sleep can lead to poor health and on the other hand, poor health can interfere with one's ability to sleep. Nevertheless, the current increase in sleep disorders and poor sleep health reflect social, economic, and technological changes over the past century (Luyster et al. 2002). Factors that contribute to sleep loss and disruption include extended work hours, longer commute times, shift work, cell phone usage, increased carbohydrate consumption, ambient noise, artificial light, and a 'you snooze you lose' mindset (Adenekan 2013; Luyster et al. 2012).

DISSERTATION OVERVIEW

Although limited, previous sociological theory and research demonstrate that sleep is an important endeavor for sociologists. As such, this dissertation adds to the growing sociological

study of sleep by applying Durkheim's ([1897] 1951) conceptualization of social integration. Specifically, I examine how the degree of social integration, primarily through social roles and work, affects sleep and well-being during midlife and beyond. In general, I ask: "Is social integration protective or harmful for sleep health?" This dissertation consists of three independent, but interrelated papers.

Paper 1: Social Roles, Sleep Duration, and Insomnia: Variation at the Intersections of Race and Gender

Individuals are integrated in society through the various roles they occupy. The types and number of social roles individuals possess may represent chronic stressors, which can have negative effects on mental and physical health (Christie-Mizell et al. 2019; Jackson and Erving 2020; Menaghan 1989). The first paper of the dissertation extends this research to the study of sleep. I examine whether different configurations of social roles (e.g., married parent, employed spouse) and/or the total number of roles affect sleep duration and insomnia. Previous research reveals racial/ethnic and gender differences in social roles, sleep duration, and insomnia. As such, this paper utilizes intersectionality theory, which provides an opportunity to demonstrate how social roles and sleep are both gendered and racialized. For example, women are more likely to experience sleep disruptions in general (Hislop and Arber 2003b), but it is unclear whether Black and Hispanic women may be more vulnerable to poor sleep when considering the mutually reinforcing nature of their lower status as women and racial/ethnic minorities. Moreover, the effect of various role combinations may differ between Black and White women since research shows that the former has more flexible gender roles (Jones, Buque, and Miville 2018).

Paper 2: The Effects of Shift Work and Sleep on Depressive Symptoms and Self-rated Health

The institution of work plays an important role in determining the degree to which one is integrated in society, as well as when people sleep. Studies show that shift work and sleep have independent effects on mental and physical health outcomes (Costa 2010; Goyal, Gay, and Lee 2007; Liu et al. 2013; Park, Shuh, and Lee 2019; Puttonen et al. 2010). While these effects are examined separately in the literature, this study investigates the relationship between shift work, sleep, and health outcomes simultaneously. The guiding theoretical framework for this study is the stress process. The stress process model allows for the examination of the direct effect of stressors, as well as mediating and/or moderating factors. In this paper, sleep duration and sleep quality (e.g., insomnia) are analyzed as potential mediators of the relationship between shift work and depressive symptoms and shift work and self-rated health.

Paper 3: Disintegration: Labor Force Status, Retirement Transitions, and Sleep Quality in Older Adults

Research indicates that as people age, many of the ways in which they are integrated in society decrease due to a loss of network members and important social roles. One important life course transition that the occurs in late life is the transition from full-time work to retirement. Retirement is generally looked upon as a positive change in the life course due to the possibility of increased leisure time and new opportunities. Due to a lack of a work schedule, many retirees experience increased sleep duration, go to bed later, and rise later in the morning (Zantinge et al. 2014). While retirement does offer more individual agency with regards to sleep, this transition is also a time of uncertainty as older adults adapt to a new social status. Increased worry during retirement can give rise to poor sleep health. Consequently, this study examines whether diminishing integration through exiting full-time work and transitions to retirement affect insomnia among older adults. In addition, I investigate whether this association vary by race-gender group status.

THEORETICAL FRAMEWORK

Social Integration

One of Durkheim's lasting contribution to the field of sociology is his explanation of individual pathology as a function of social dynamics (Berkman and Glass 2000). His examination of suicide introduces an important concept for the sociological analysis of health: social integration. Social integration is a concept that has been used to understand both individual behavior and social structure. Although Durkheim ([1897]1951) proposes that integration is a fundamental characteristic of all social institutions, he never provides a specific definition (Abrutyn and Mueller 2016; Mestrovic and Glassner 1983). As such, there is lack of consensus in its conceptualization. On the one hand, social integration is defined as participation in a broad range of social relationships that includes measures of network size, frequency of contact with network members, the number of interpersonal ties, and social support (Berkman and Glass 2000; Lin 2002; Pillemer et al. 2000; Song, Frazier, and Petits 2018; Voydanoff 2005). On the other hand, social integration refers to attachment to society through formal participation in voluntary and civil organizations and it encompasses individuals' connection to social institutions (Berkman and Glass 2000; Durkheim [1897]1951; Turner 1981; Voydanoff 2005). In accordance with the latter definition and throughout this dissertation, social integration refers to the ways in which individuals are attached to society through shared rituals, institutions, social roles, and mutually reinforcing gestures (Turner 1981).

In addition, individual actions are regulated by cultural symbols, norms, and political structures (Turner 1981). Conversely, disintegration refers to a lack of regulation and social isolation from society (Ross 2017). The concept of social integration reflects Durkheim's ([1897]1951) visualization of social reality at both macro and micro levels (Maimon and Kuhl

2008; Turner 1990). Specifically, Durkheim ([1897] 1951) posited that social structure is based on integration in familial, religious, and occupational organizations and people are bonded to society by upholding the values, beliefs, and norms of these institutions (Berkman and Glass 2000). Macro-level structures set the parameters for micro-level processes through selective pressures associated with differentiation, patterns of structural coordination, and symbolic generalization (Turner 1990).

Durkheim ([1914] 2005) recognized the importance of the individual in the study of society. Therefore, in order to show how social integration involves the interplay of individualism and societal forces in this analysis of sleep, I utilize a key principle from Durkheim's work that is broadly absent from current social integration research: homo duplex. Durkheim's ([1914] 2005) concept of homo duplex refers to the dualistic nature of humans; there is a part that wants to fulfill the desires of the individual and another part that seeks to fulfill the demands of society (Durkheim [18971]1951; Durkheim [1914] 2005; Mestrovic and Glassner 1983). Thus, homo duplex involves the constitutive relationship between individuals and society (Paoletti 2012). Figure 1 displays a conceptual representation of the relationship between social integration, homo duplex, social roles, and sleep.

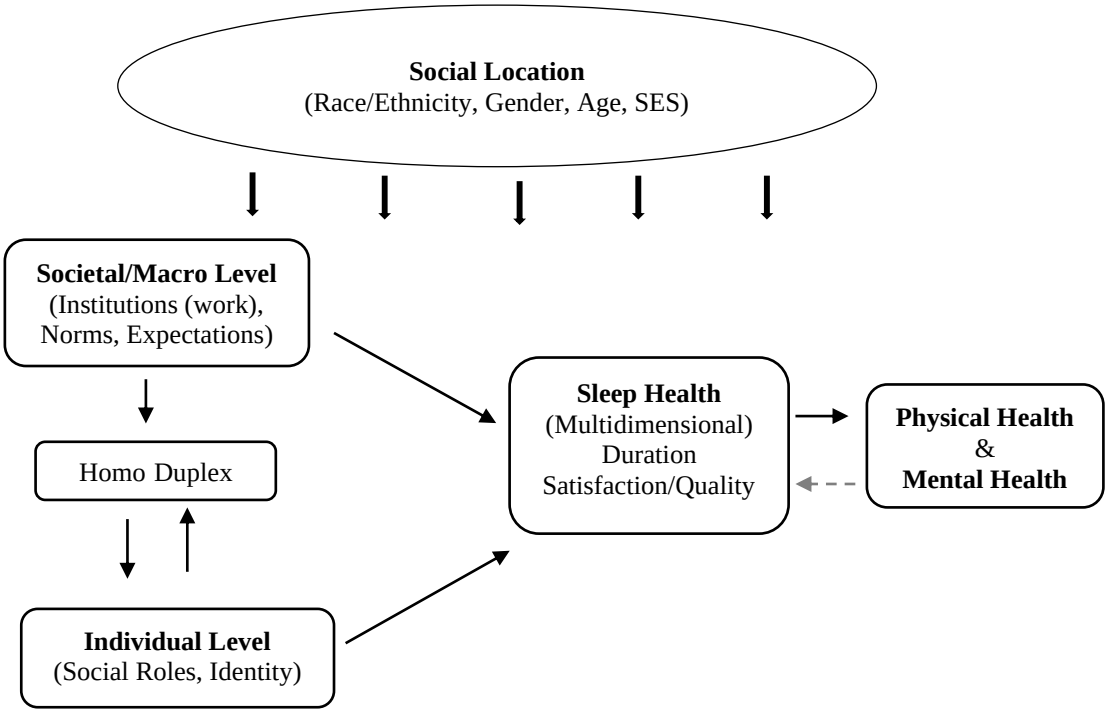

Figure 1: Conceptual Model of the Relationship between Social Integration, Social Roles, and Sleep

The model shows that at the macro-level, institutions such as work, norms, and societal expectations affect sleep. For example, working a third shift dictates when a person can sleep or there are norms in society that prohibit sleeping during a company meeting. These macro level factors also impact the individual level determining expectation of social roles. However, homo duplex, connects individuals to the broader society through the dual need to meet societal obligations and the need to fulfil one's roles. The roles that people occupy affect sleep duration and sleep quality, which in turn has implications for physical and mental health. However, as the model eludes there may be a bidirectional relationship between sleep and other health outcomes. Finally, people's social location in society (i.e., social statuses like race/ethnicity, age, gender, and class), influence the entire relationship between social structure, the ability to meet social roles, sleep, and physical and mental health.

To Durkheim ([1914] 2005), the individual person, is not the source of integration; rather, social structures create and exert considerable restraint on individuals (Ross 2017). Society influences individual behavior by increasing trust, cooperation, and identification at the group level (Abrutyn and Mueller 2016; Kluver, Frazier, and Haidt 2014). Moreover, people are integrated in society through the socialization process where they internalize the values, norms, and beliefs of the broader population (Ross 2017). The dualistic nature of individuals espoused through homo duplex reveals that individuals are deeply social. People want to develop and maintain tight bonds to society by adhering to group norms and identifying with the group through social roles (Kluver et al. 2014). The extent to which people see themselves integrated in society can influence health behaviors, such that people are willing to suppress self-interest to work together to maintain society (Alexander and Smith 2005; Durkheim [1914] 1973). However, it is important to note that disintegration (i.e., lack of integration in or disconnected to society) can precipitate pathological behaviors due to a lack of regulation of the desire to fulfill individual needs.

Although current research related to social integration under-utilizes homo duplex, it is an important concept that has persisted throughout Durkheim's writings (Hawkins, 1977; Mestrovic and Glassner 1983; Paoletti 2012; Ross 2017; Smith and Alexander 2005). In fact, the issue of balance and the dualism of human nature is an integral part of Durkheim's thesis on suicide; so much so, that Durkheim posits that these two aspects of individuals are antagonistic forces that create imbalance. In turn, it is this tension (i.e., stress) that affects the degree of integration in society (Mestrovic Glassner 1983). Thus, including the concept of homo duplex into the broader discussion of Durkheim's work on suicide reveals that suicide is not simply the

result of too much integration and regulation by society; rather, it occurs due to an imbalance in the dual consciousness of individuals (Mestrovic and Glassner 1983).

Homo duplex is easily applied to the study of sleep. There is a dualistic nature of sleep such that there is a physiological need for sleep, but integration in society through institutions such as work and family, may interfere with sleep duration and quality in two opposing directions. Imbalance can occur when people try to uphold the social order. For example, individuals may forgo sleep to meet work deadlines or take care of children. Within the context of homo duplex, this imbalance between the individual and society can lead to stress and subsequently disordered sleep. However, work and family play a major part in integrating people into society, which may encourage healthy sleep behaviors that result in getting the recommended hours of sleep. Although Durkheim ([1897]1951) proposes in his examination of suicide that the dual nature of individuals is inherently antagonistic, it is unclear if this applies to sleep. More specifically, these examples show that the dual nature of sleep can be antagonistic or harmonious within the context of social integration. Sleep is about the individual and a reflection of society. In short, to achieve optimal integration, one must find balance between the individual need for sleep and fulfilling societal expectations and obligations.

In this dissertation, social integration represents a broad conceptual framework that provides insight about how sleep is embedded in the social world; and homo duplex is useful in facilitating the interplay between society and individuals. However, due to the type of data that is collected about sleep (i.e., data focus primarily on individuals), social integration as a macro-level phenomenon is not easily tested. Other theories, such as role theory, stress process, the life course perspective and intersectionality, which are related to central tenants of social integration and homo duplex, are required to engage in hypotheses testing at the micro-level.

Role Theory

Beginning with Durkheim's work on suicide, sociologists have long recognized the importance of individuals' attachment to social structure through social roles such as marriage and parenthood (Burton et al. 1993). Roles are important to society because they link individuals to the social and material resources of institutions (Pearlin 1983; Turner 1956). Furthermore, the notion that institutions are comprised of roles is useful because "it links a more easily observable phenomenon, social behavior, to an important but less easily observable abstraction, social structure" (Goode 1960:483). The roles that people occupy are indicative of shared normative expectations that prescribe and explain human behavior (Abrutyn and Mueller 2016; Biddle 1986; Thoits 1983). Social roles provide access to material resources and opportunities, they are learned through experience, and people are socialized to view the roles they hold as important to the functioning of the broader society and their own welfare (Ahrens and Ryff 2006; Pearlin 2010). According to Durkheim ([1897] 1951), ties to institutions through social roles provide norms and obligations that reduce alienation from society. Individuals who occupy multiple roles are highly integrated in society (House and Kahn 1985), while those without social ties (i.e., fewer roles) are less likely to abide by prescribed norms, which can increase engagement in unhealthy behaviors (Mirowsky and Ross 1986; Seeman 1959; Sieber 1974). Thus, role theory provides a useful framework for understanding the connection between social roles and health.

The basic premise behind role theory is that people enact patterned social behaviors and identities that reflect scripts and expectations that are understood by members of a society (Thoits 1983). In role theory, social roles are defined as "a pattern of expectations which apply to a particular social position and which normally persist independently of the personalities occupying the position" (Sieber 1974:569). According to Goode (1960), different social roles

have disparate goals and expectations, which can place incompatible demands on the individual. As such, stress can arise that can lead to the emergence of physical and mental health problems. Within this framework there are two competing hypotheses in role theory: role strain and role enhancement (Moen, Dempster-McClain and Williams 1989).

The role strain hypothesis suggests that competing demands from different social roles can lead to tension and stress, causing role overload or role conflict (Goode 1960; Merton 1957; Verbrugge 1986). Role overload occurs when an individual has too many role demands given the time available to satisfy them (Coverman 1989; Pearlin 1989). Role overload can lead to role conflict, which refers to problems and difficulties that arise when people must meet incompatible demands of multiple roles, especially demands of work and family (Pearlin 1989). The second hypothesis, role enhancement, posits that occupying multiple social roles is beneficial for physical and psychological health (Marks 1977; Sieber 1974; Thoits 1983). Social support, access to financial resources, and sense of meaning and purpose provided through multiple role engagement affords several benefits that outweigh any disadvantages (Moen et al. 1989; Sieber 1974; Thoits 1983).

In addition to role strain and role enhancement, sociologists also recognize that social roles can be characterized in terms of their combinations or repertoire (Christie-Mizell et al. 2019; Jackson and Erving 2020; Menaghan 1989). Scholars propose that the context within which roles are enacted determine whether they are positive or negative for health; thus, not only are the total number of roles occupied important, but also the specific configurations of each role (Christie-Mizell et al. 2019; Jackson and Erving 2020; Menaghan 1989). Overall, despite the different perspectives that comprise role theory, research shows that involvement in social roles is associated with a variety of health and well-being outcomes such as psychological distress,

depressive symptoms, self-esteem, and self-rated health (Abrutyn and Mueller 2016; Christie-Mizell et al. 2019; Jackson and Erving 2020; Kikuazawa 2006; Kostiainen et al. 2009; Thoits 1983).

Although there is a plethora of social roles that comprise society, this dissertation focuses on roles related to work, marriage, and parenthood. These roles are emphasized because they are viewed as highly valued social positions acquired through some degree of personal effort (Jackson and Berkowitz 2005). Moreover, these primary roles reflect purposeful engagement in society. They are an outward expression of conformity with social norms and agreement with the social value assigned to these roles (Jackson and Erving 2020). Research shows that roles related to work, marriage, and family have varying effects on health. For example, employment improves mental health and decreases depressive symptoms, marriage protects against substance abuse, and parenthood is associated with increased stress (Christie-Mizell and Peralta, 2009; Evans-Polce 2020; Leupp 2017; Umberson 1987).

It is important to note that the ways in which people are integrated into society through role occupancy varies by race/ethnicity and gender. The assumption that group membership is equivalent to integration into the dominant society may not apply to marginalized groups (Jackson 1997). Certain role combinations are not equally beneficial due to unequal opportunity in society. For instance, racial/ethnic minorities may be unattached to the worker role due to barriers in meaningful employment; thus, being an employee may be associated with feelings of social and economic marginalization instead of work being a rewarding experience (Jackson 1997).

The acquisition and experience of social roles are not only racialized, but also gendered.

While women are increasingly likely to occupy both the mother and the worker roles, they still perform a greater share of childcare and housework responsibilities than men; however, men's jobs are likely to take precedence over women's in dual-earner families (Cha 2010; Hochschild and Machung 2003). Furthermore, there are differences in the perceptions of roles between women and men. The former perceive employment as competing with their ability to meet family obligations, whereas men view work as allowing them to fulfil a natural obligation to family (Simon 1995). Thus, men's family roles largely involve economic support and women's family roles are based on emotional support and nurturance. Overall, when thinking about how racial/ethnic and gender influence people's location in social structure, it is apparent that social roles are experienced in socially patterned ways.

While studies show that role theory is useful in examining the effects of social roles on various aspects of physical and mental health, it is underutilized in sleep research. Before discussing how role theory applies to sleep, it is important to discuss how sleep is both a social role and a health outcome. First, sleep is a socially negotiated and regulated role and like all other social roles, involves expectations for the sleeper and other waking members of society (Williams 2008). For example, the sleep role is governed by routines and rituals that facilitate the entry and exist out of the role (Schwartz 1970; Williams 2007a). The sleep role can include pre-sleep and post-sleep routines. Pre-sleep includes brushing teeth, putting on pajamas, and setting the alarm, while post-sleep includes going to the bathroom, taking a shower, and putting on day clothes (Williams 2008). These are a few examples of activities that signal when a person is entering or exiting the sleep role.

However, to understand sleep as a health outcome, it needs to be situated within the context of people's social lives, roles, and relationships (Williams 2005). Sleep is both an

individual, intimate act and is affected by broader societal factors. According to Arber et al. (2007) sleep problems are not purely symptomatic of psychological ill-health, but also connected to wider aspects of the social context of everyday lives. In the context of this dissertation, role theory provides an opportunity to show how the determination about when and how people sleep is dictated by the social roles people occupy. More importantly, role theory helps answer the question about whether the social roles promote good sleep health in order to meet role expectations or are roles detrimental to sleep health due to role demands and obligations.

For example, employed individuals may get the required 7 to 8 hours of sleep to be prepared for work the following day. However, the notion of 'you snooze you lose' may cause individuals to engage in short sleep to meet work demands. In fact, research shows that employment and parenthood are both time-intensive social roles that reduce time available for sleep, leisure, and self-care (Bianchi, Robinson, and Milkie 2006). Sleep is bound and shaped by gendered demands of daily life and is a site where gender inequality is produced and reproduced (Maume et al. 2010). Gendered inequality in sleep is particularly evident among married women and mothers whose sleep is deprioritized due to commitments to caring for family (Arber 2003; Arber et al. 2007). In short, social roles may positively or negatively affect sleep, but people can also use sleep in agentic ways to fulfil role obligations.

The Stress Process

A central part of Durkheim's ([1897]1951) research on suicide is that while social integration is necessary for optimal health, too little or too much integration can have deleterious effects. Interference with social roles causes stress and the stressors that arise from social roles are especially noxious on health and wellbeing (Krause 1994). A key premise of stress research is that the extent to which exposure to role-related stressors undermines health depends on the

importance of the role to the individual (Williams and Umberson 2004; Thoits 2013). The stress process is well suited for studying social integration because it accounts for differences in health and well-being that is related to people's status locations and the social roles they occupy within systems of inequality (Christie-Mizell, Leslie, and Hearne 2017; Griffith et al. 2013; Pearlin et al. 2005; Pearlin et al. 2010). There are three components that comprise the stress process: stressors, psychosocial resources (i.e., mediators and moderators) and outcomes (Pearlin et al. 1981).

Stressors are any event or experience that can challenge the adaptive capacities of people (Aneshensel 1992; Pearlin 1983; Wheaton et al. 2014). One important type of stressors are chronic stressors, which represent ongoing problems that are often, but not solely, role related (Aneshensel 2014). Chronic stress refers to continuous and persistent conditions in the social environment resulting in a problematic level of demand on an individual's capacity to adequately perform social roles (Wheaton 1999). The consequences of chronic stressors may be particularly severe when arising within major social domains, such as work or family (Avison and Turner 1988; Griffith et al. 2013; Pearlin 1983; Thoits 2013; Wheaton 1999). The potency of chronic stressors in these domains is due to the fundamental nature of work and family to the broader society and to individuals occupying these roles (Pearlin et al. 2005; Wheaton et al. 2014).

Stressors are also characterized as primary or secondary. Primary stressors represent the initial event that disrupts people's ability to cope and secondary stressors emerge from primary stressors (Pearlin 1989; Williams 2003). For example, a primary stressor may be job loss and the secondary stressor is financial strain. In this dissertation stress arises from the ways in which people are integrated in society via the various social roles they possess or lose. It is important to note that poor sleep health can also be a stressor within the stress process framework.

Psychosocial resources serve to change the situation from which stressors arise, manage the meaning of stress, or keep symptoms of stress within manageable bounds (Pearlin 1981). Psychosocial resources are also referred to as mediators or moderators, which help explain the relationship between stress and health (Aneshensel 2015). Specifically, these resources serve as protective barriers that weaken or exacerbate (i.e., moderate) or buffer (i.e., mediate) the effect of stressors on mental and physical health. Common psychosocial resources are coping, social support, mastery, and self-esteem. This dissertation focuses on coping resources, which refers to the cognitive and behavioral strategies that people use to avoid or minimize the effects of stress exposure (Pearlin 1989).

Psychosocial resources differ by social position (Brown and Hargrove 2018; Erving, Satcher, and Chen 2020; Keith 2014; Perry, Pullen, and Oser 2012). While racial/ethnic minorities may have less access to psychosocial resources, their collective racial identity and supportive religious networks provide more protection against adversity in later life compared to Whites (Brown, Mitchell, and Ailshire 2020; Ida and Christie-Mizell 2012). Nevertheless, stressors damage health by eroding psychosocial resources that are used to reduce the harmful effects of stress (Aneshensel and Mitchell 2014; Pearlin 1989). In the second study, sleep is a psychosocial resource that may mediate the effect of stress on health. Specifically, this dissertation examines how sleep duration and sleep quality may mediate the effects of shift work on depressive symptoms and self-rated health.

Outcomes are the final component of the stress process and refer to the mental and physical health consequences or manifestations of stress (Pearlin 1981). Although mental health outcomes are most typically studied, the stress process model is well-suited to examine physical health (Goode et al. 1998; Minnotte et al. 2018; Pearlin and Bierman 2013; Zehner et al. 2014).

In fact, including both physical and mental health outcomes in the stress process model reduces the chance of misclassification (Turner 2013). When considering sleep as an outcome, insomnia is the specific focus of this work. Research shows that various factors, such as retirement and loss of a loved one can precipitate the onset of insomnia (Pillemer and Glasgow 2000).

In addition to specifying the major components of the stress process, understanding the structural arrangements in which people are embedded in society is another important aspect to consider (Pearlin 1989). Observed differences in health arise out of the social context of people's lives and are impacted by an individual's history and current circumstances (Gayman 2018; Pearlin 1999; Turner and Avison 2003; Turner 2013). People are classified in society based on various status characteristics such as race/ethnicity, gender, class, and age. In turn, these statuses determine stress exposure, the resources one can mobilize to manage stressors, and one's personal experience of stress (Aneshensel and Mitchell 2014; Brown et al. 2020; Brown and Hargrove 2018; Erving et al. 2020; Pearlin 1989; Thoits 2010).

Several studies indicate that key social statuses (i.e., gender, age, and race/ethnicity) influence sleep health. For example, there is evidence that women are at increased risk for experiencing sleep disruptions, especially if they are parents (Akerstedt 2003; Hislop and Arber 2003b). Blacks and Hispanics are more likely to experience shorter sleep duration compared to Whites due to differences in jobs that require longer hours and more shift work (Walseman et al. 2017). Further, older adults face new stressors as they transition out of roles, such as paid worker, and face diminishing social networks due to loss of friends and family (Pillemer et al. 2000). Overall, the structural context of people lives not only affects all components of the stress process, but also group differences in stress exposure represent inequalities that exclude people

from full participation and integration in the social system (Aneshensel 1992; Gayman 2018; Griffith et al. 2013; Keith 2014).

Life Course

The themes of integration and isolation have long been features of aging research (Pillemer et al. 2000). Riley, Johnson and Forner (1972) define aging as involving "the accumulation of experience through participation in a succession of social roles" (10). Roles help define one's sense of passage through the life course; they provide guidance and shape expectations as roles are added and lost (Ferraro 2001). The times at which role and status transitions take place and the temporal order of their occurrence are among the hallmarks of the life-course perspective (Elder, Johnson, and Crosnoe 2003; George 1993).

Transitions, which refer to the movement into and exit from various institutional roles and statuses, tend to be aligned with age and serve as markers of movement along the life course. Life transitions are governed by proper timing, sequencing, duration, and spacing, which are key concepts within life course theory (Elder et al. 2003; George 1993). Timing is the age at which transitions occur; it is also connected to milestone transitions such as finding one's first job, buying a home, and parenthood. Sequencing refers to the order in which transitions take place. Duration is the length of time spent in any given state and spacing refers to the amount of time between two or more transitions. Generalized norms and expectations specify the appropriate occurrence of transitions and deviance from these norms can result in negative outcomes (Elder et. al. 2003; George 1993; Marshal and Muller 2003; Recksiedler and Stawski 2019; Won and Shobo 2017). Transitions can be normative (i.e., occurring at expected times based on societal norms) or off-time (i.e., occurring against societal norms).

In contrast to transitions that signify normative movement along the life course, disruptive transitions that occur off-time have a negative impact on social integration and well-being (Pearlin 2010; Pillemer et al. 2000; Thoits 1983; Won and Shobo 2017). Disruptive transitions, that involve undesired and unanticipated changes entailing loss, impinge on established roles and are more likely to occur at later stages of the life course (Pearlin et al. 2005; Recksiedler and Stawski 2019). The way in which older adults deal with role transitions are contingent on the resources that they possess. Race/ethnicity, socioeconomic status, and gender must be considered because people are differentiated in a system of social stratification. Specifically, theses statuses affect life course trajectories and how transitions are experienced. For example, African Americans' life course trajectories differ in terms of the timing and rates of marriage, employment, and fertility compared to other groups (i.e., they marry later, have children younger, and have more unstable employment) (Christie-Mizell et al. 2019).

Transitioning out of important social roles can result in declining social integration, which increases the risk of social isolation among older adults (Pillemer et al. 2000). Although retirement represents a transition that is highly prevalent, predictable, and a positive experience for some individuals, it still represents an exit from a highly valued role (i.e., paid worker) (Bamberger 2015; George 1993; Post et al. 2013). Also, in many cases retirement entails a loss of friends and social connections developed through work. While transitioning from employment brings reprieve from work schedules and increased leisure time, retirement can also be a time of uncertainty and worry about status changes and financial stability. If new meaningful roles are not found for those who retire, a break in social integration occurs and stress rises (Fothergill et al. 2011; Pillemer and Glasgow 2000).

Within the context of life course theory, research indicates that sleep frequency, duration, and quality diminish with age; and women show greater sleep deterioration during later stages of the life course compared to men (Guidozzi 2015; Hale et al. 2007; Porkka-Heiskanen et al., 2013). When coupled with life transitions that are occurring during the second half of life (i.e., 50 and beyond), sleep health can be viewed as the cumulative results of the interaction of life events and physiological aging (Hislop and Arber 2003b). More specifically, changes in sleep in later life are due to both biological and social factors that shape life course trajectories. For example, while increasing chronic conditions can affect sleep duration and quality, a trigger for insomnia is the loss of a loved one (Simpson et al. 2014). Overall, a more dynamic understanding of sleep emerges when both physiological and social determinants are considered.

Sleep is also gendered in ways that reveal power relations and social inequalities, especially during midlife (Hislop and Arber 2003b). Compared with other life stages, midlife is particularly challenging for women due to involvement in multiple roles that are more likely to affect sleep. For example, while employment is vital to both men and women in midlife, the latter are more often tasked with additional parenting and caregiving responsibilities (Burgard and Ailshire 2013; Maume et al. 2010; Yoshioka et al. 2012). While both men and women's sleep patterns are influenced by commitments made to and concerns about employers and loved ones, conformity to traditional expectations that men are providers and women are caregivers (regardless of women's paid labor) privilege men's sleep over women's (Maume et al. 2010).

Intersectionality Theory

A central tenant of role theory, stress process, and the life course perspective is that status characteristics such as race/ethnicity and gender influence people's social roles, exposure to stressors, and transitions in the life course. Sleep research also shows that these statuses create

differences in sleep duration and quality. While it is important to include these characteristics in any examination of sleep, investigating sleep along the lines of either race/ethnicity or gender, limits understanding of how the intersection of these two factors shape sleep health over the life course. Thus, to avoid neglect of the importance of intersecting identities, this dissertation employs intersectionality theory.

First, espoused by Crenshaw (1989) to examine the discrimination Black women faced in the workplace, the basic premise behind intersectionality theory is that multiple social identities interact in ways that reflect interconnected systems of power and privilege (Crenshaw 1991). Specifically, racism, classism and patriarchy represent interlocking systems of discrimination and oppression that, in the context of health, can give rise to health inequalities and disparities. Moreover, in the context of intersectionality theory, examining these statuses separately obfuscates their intersecting consequences and essentializes race/ethnicity and gender (Brown et al. 2016). As such, intersectionality highlights the importance of examining the multiplicative effects of several social statuses on health instead of examining these effects separately (Choo and Ferree 2010; Collins and Bilge 2020). Intersectionality does not assume that the total disadvantage experienced by people with multiple disadvantaged statuses is equivalent to the sum of their disadvantages (Choo and Ferree 2010; Richardson and Brown 2016).

As an analytic tool, intersectionality does not view categories such as race/ethnicity, class, and gender as discrete or mutually exclusive entities. Rather, these categories are inextricably linked together, and while often invisible, these intersecting dimensions affect all aspects of the social world (Collins and Bilge 2020). Furthermore, in taking an intercategorical approach to intersectionality, there is recognition that while relationships of inequality among

social groups are imperfect and fluid, these relationships lie at the center of analysis (McCall 2005). It is important to note that in general, intersectionality calls attention to systems of inequality and hierarchy, which is particularly important in sleep research to avoid focusing solely on the physiological factors that may give rise to poor sleep.

Utilizing an intersectional framework allows the study of sleep to be situated within broader upstream factors related to systems of patriarchy and racism. For example, patriarchal notions of gender limit women's occupational opportunities outside the home and dictate their roles and responsibilities in the home. Many women, particularly Black and Hispanic women, work in low wage jobs that lack security, factors that can create psychological worry that may impede sleep. Within the home, women are primarily responsible for housework and caregiving, which are activities that disrupt sleep (Hislop and Arber 2006). Similarly, racialized systems of inequality built upon economic exploitation, political marginalization, and social stigmatization, create conditions that promote poor sleep (e.g., discrimination, chronic stress, resource-poor communities) (American Sociological Association 2003; Hicken et al. 2013; Slopen, Lewis, and Williams 2016). Many sleep disparities, such as shorter sleep duration and more difficulty sleeping, found among minority populations can be attributed to the chronic stress from living in a racist society (Slopen et al. 2016). In fact, Hicken et al. (2013) found that racism-related vigilance (i.e., being on constant alert of and/or anticipating racism and/or discriminatory events) is positively associated with greater sleep difficulties in Blacks compared to Whites. Overall, intersectionality theory is utilized as an analytic tool to demonstrate how race/ethnicity and gender interact to influence the association between social integration and sleep during midlife and beyond.

CONTRIBUTION

This dissertation makes several contributions to the field. First, it adds to the sociological study of sleep, which is under-studied. The relative neglect of sleep in sociological inquiry renders it invisible; it is an inactive biological process that has no effect on society. However, centering sleep in the context of people's lives reveals that it is affected by social inequality and is vital in ensuring that people are able to meet societal expectations and obligations. Second, sleep is examined from new perspectives. Apart from suicide, social integration, role theory, and stress process are primarily used to study mental health, substance abuse, and marital quality; few studies have used these frameworks to understand the social implications of sleep. In addition, this study incorporates an under-utilized concept, homo duplex, to theorize about the interconnection between social integration, social roles, and sleep. Third, conceptualizing sleep health as multidimensional provides an opportunity to show that sleep is an important health outcome, as well as a potential mechanism that may explain and/or contribute to persistent health inequalities. Moreover, understanding the social aspects of sleep can help inform policies and interventions designed to improve slumber. Current interventions focus primarily on pharmacological solutions, ignoring inequalities that arise from different status locations in society. Finally, previous studies that examine sleep are based on cross-sectional data, which limits generalizability. This dissertation employs nationally representative samples and longitudinal data.

CHAPTER II

Social Roles, Sleep Duration, and Insomnia: Variation at the Intersections of Race and Gender

ABSTRACT

There is continued debate about whether too much or too little integration in society affects psychological health and well-being. This study extends this debate to the sociological study of sleep. Specifically, two competing hypotheses are examined: role strain and role enhancement. Role strain posits that the accumulation of social roles is detrimental to health, while role enhancement suggests the opposite. In this study, I examine whether social integration via social roles is beneficial or harmful for sleep duration and sleep quality. Data for this study come from the age 50 health module from the National Longitudinal Survey of Youth 1979 Cohort (*N*=3,364). Ordinary least squares regression is used to assess the effects of the total number of roles and role combinations on hours of sleep during the week, hours of sleep on the weekends and insomnia. The findings show support for both role strain and role enhancement. For the role strain perspective married, employed, parents get less sleep during the week compared to those who are married employed only. For role enhancement, an increase in the total number of roles is associated with decreased insomnia and married employed parents have better sleep duration on the weekend compared to married only, parent only, married parents, and those with no roles. The race-gender analysis revealed significant differences in the effect of role accumulation on insomnia among Black men, Black women, and White men. The study concludes that social roles affect sleep health among adults in midlife.

INTRODUCTION

Do the number and repertoire of social roles affect sleep health? Is there variation at the intersection of race and gender? Durkheim's ([1897]1951) seminal work on suicide showed that the degree to which one is integrated in society has implication for health and well-being. Durkheim ([1897]1951) does not provide a specific definition of social integration. As such, the concept has been operationalized to refer to network size, frequency of contact with network members, participation in voluntary and civil organizations, and individuals' connection to social institutions (Berkman and Glass 2000; Pillemer and Glasgow 2000; Song, Frazier and Petits 2018; Turner 1981; Voydanoff 2005). In this study social integration specifically refers to the ways in which individuals are attached to society through shared rituals, social roles, and mutually reinforcing gestures (Turner 1981). Over the years, sociologists have examined the effects of social integration (i.e., social roles) on various psychological outcomes such as depression, anxiety, and psychological distress (Christie-Mizell et al., 2019, Jackson and Erving 2020; Sieber 1974; Thoits 1983). While these studies reveal that social roles can be both beneficial and detrimental for psychological well-being, few studies have examined the effects of social roles on sleep among adults in midlife.

Research increasingly shows that getting the proper amount of sleep, which is a minimum of 7 to 8 hours for those 18 and older, is beneficial for both mental and physical health (Ojile 2017). For example, studies reveal that poor sleep is associated with diminished cardiovascular health, increased mortality, diabetes, obesity, asthma, and lower self-rated health (Buxton and Marcelli 2010; Calhoun and Harding 2010; Grandner et al. 2010; Hale et al. 2013; Jackson et al. 2015; Liu et al. 2013). Mental health outcomes associated with poor sleep include anxiety and depressed mood (Hale et al. 2005; Leggett et al. 2016, 2018). While sleep can affect health

through various biological pathways, it is also important to investigate how sleep itself is a health outcome that is affected by sociological factors. In fact, epidemiological research indicates a social patterning of sleep that reveals class, racial/ethnic, and gender differences in sleep health. For example, those with less education, low income, and employment instability are more likely to experience sleep problems, as well as be short and long-term sleepers, which is associated with increased mortality (Hale 2007; Liu et al. 2013). Compared to Whites, African Americans report more difficulty maintaining sleep and Hispanics report more sleep disruptions due to snoring (Carnethon 2016; Petrov and Lichstein 2016; Sheehan et al. 2019; Williams et al. 2016). Finally, women in midlife experience more sleep disruptions compared to men, while men report shorter sleep duration than their female counterparts (Hale et al. 2003; Hislop and Arber 2003b; Luyster et al. 2012; Medic et al. 2017).

Midlife is an important point in the life course to study the effects of social roles on sleep. During this time, key roles such as marriage, parenthood, and employment can create pressure to balance work and family. The difficulty entailed in fulfilling work and family obligations can impede an individual's ability to adapt and cope (Christie-Mizell et al. 2019). On the one hand, many of the social roles that people occupy may require substantial commitment that can displace time spent sleeping. On the other hand, engaging in social roles may also encourage optimal sleep as people seek to fulfill and meet societal obligations.

The purpose of this study is to examine how social integration, via social roles, may be a factor that can help explain differences in sleep. Specifically, I ask whether the number of social roles and role combinations are detrimental or beneficial for sleep duration and sleep quality. I also examine whether the effects vary at the intersection of race and gender. This study contributes to the field in three ways. First, examining the association between social roles and

sleep is an understudied area. While previous studies have established that social roles affect psychological health, there are limited studies that examine the association between social roles and sleep. Second, this study focuses on intersectional dimensions of sleep. While there is evidence of racial and gender differences in sleep health, there is a lack of understanding of how interlocking identities affect sleep. Finally, unlike previous studies which are cross-sectional and use localized samples, this study uses longitudinal, nationally representative data.

BACKGROUD AND THEORY

Social Integration and Role Theory

Social integration, which refers to the roles that people occupy, provides an opportunity to examine the interconnection between social structure, individual behavior, and health (Durkheim ([1897]1951). Roles such as marriage, employment, and parenthood are important to society because they link individuals to social and material resources of institutions (Burton et al. 1993; Pearlin 1983; Turner 1956). The roles that people occupy are also indicative of shared normative expectations that prescribe and explain human behavior (Abrutyn and Mueller 2016; Biddle 1986; Thoits 1983). Social roles provide access to material resources and opportunities, they are learned through experience, and people are socialized to view the roles they hold as important to the functioning of the broader society and their own welfare (Ahrens and Ryff 2006; Pearlin 2010). According to Durkheim ([1897] 1951), ties to institutions through social roles provide norms and obligations that reduce alienation from society. Individuals who occupy multiple roles are highly integrated in society (House and Kahn 1985), while those without social ties (i.e., fewer roles) are less likely to abide by prescribed norms, which can increase engagement in unhealthy behaviors (Mirowsky and Ross 1986; Seeman 1959; Sieber 1974).

Role theory provides a useful framework for understanding the connection between social roles and health. The basic premise behind role theory is that people enact patterned social behaviors and identities that reflect scripts and expectations that are understood by members of a society (Thoits 1983). In role theory, social roles are defined as "a pattern of expectations which apply to a particular social position and which normally persist independently of the personalities occupying the position" (Sieber 1974:569). Different social roles have disparate goals and expectations. Stress can arise when role obligations or expectations are not fulfilled, which can lead to the emergence of physical and mental health problems. Within this framework there are two competing hypotheses in role theory: role strain and role enhancement (i.e., role accumulation).

The role strain hypothesis suggests that different social roles have different goals, which place conflicting demands on the individual. Competing obligations can lead to tension and stress, causing role overload or role conflict (Goode 1960; Merton 1957; Verbrugge 1986). Role overload occurs when an individual has too many role demands given the time available to satisfy them (Coverman 1989; Pearlin 1989). Role overload can lead to role conflict, which refers to problems and difficulties that arise when people must meet the demands of multiple roles, especially demands of work and family (Pearlin 1989). Thus, the role strain perspective demonstrates that there is a 'dark side' (i.e., not always beneficial) to social integration (Song 2015). The second hypothesis, role enhancement, posits that occupying multiple social roles is beneficial for physical and psychological health (Marks 1977; Sieber 1974; Thoits 1983). Social support, access to financial resources, and the sense of meaning provided through multiple role engagement, entail several benefits that outweigh any disadvantages (Moen et al. 1989; Sieber 1974; Thoits 1983).

In addition to role strain and role accumulation, sociologists also recognize that social roles can be characterized in terms of their combinations or repertoire (Christie-Mizell et al. 2019; Jackson and Erving 2020; Menaghan 1989). Scholars propose that the context within which roles are enacted determine whether they are positive or negative for health; thus, not only are the total number of roles occupied important, but also the specific configurations of each role (Christie-Mizell et al. 2019; Jackson and Erving 2020; Menaghan 1989; Umberson 1989). Overall, despite the different perspectives that comprise role theory, research shows that the involvement in social roles is associated with a variety of health and well-being outcomes such as psychological distress, depressive symptoms, self-esteem, and self-rated health (Abrutyn and Mueller 2016; Christie-Mizell et al. 2019; Jackson and Erving 2020; Kikuazawa 2006; Kostiainen et al. 2009; Thoits 1983).

Sleep: A Social Role and Indicator of Health

While studies show that role theory is useful in examining the effects of social roles on various aspects of physical and mental health, it is underutilized in sleep research. Nevertheless, sleep is both a social role and indicator of health. First, sleep is a socially negotiated and regulated role that, like all other social roles, involves expectations for the sleeper and other waking members of society (Williams 2008). For example, the sleep role is governed by routines and rituals that facilitate the entry and exist out of the role (Schwartz 1970; Williams 2007). The sleep role can include pre-sleep and post-sleep routines. Pre-sleep includes brushing teeth, putting on pajamas, and setting the alarm, while post-sleep includes going to the bathroom, taking a shower, and putting on day clothes (Williams 2008).

Sleep as a health outcome is best understood within the context of people's social lives, roles, and relationships (Williams 2005). Sleep is both an individual, intimate act and is affected

by broader societal factors. According to Arber et al. (2007) sleep problems are not purely symptomatic of psychological ill-health, but also connected to wider aspects of the social context of everyday lives. Specifically, when and how people sleep is dictated by the social roles they occupy. For example, employed individuals may get the required 7 to 8 hours of sleep to be prepared for work the following day. However, the notion of "you snooze you lose" may cause individuals to engage in short sleep in order to meet work demands. In fact, research shows that employment and parenthood are both time-intensive social roles that reduce time available for sleep, leisure, and self-care (Bianchi, Robinson, and Milke 2006). Moreover, inequality in the enactment of social roles, particularly for married women and mothers, can give rise to disrupted sleep due to a deprioritization of sleep in the face of commitment to family care giving (Arber 2003; Arber et al. 2007). Social roles may positively or negatively affect sleep duration and quality, but people can also use sleep in agentic ways to fulfil role obligations.

Social Integration and Sleep

The agentic nature of sleep connects to an overlooked concept espoused by Durkheim ([1914] 2005) that provides further insight into how social roles can impact sleep health: homo duplex. Homo duplex refers to the dualistic nature of humans; there is a part that wants to fulfill the desires of the individual and another part that seeks to fulfill the demands of society (Durkheim [18971]1951; Durkheim [1914] 2005; Mestrovic and Glassner 1983). In short, homo duplex involves the constitutive relationship between individuals and society (Paoletti 2012). Although underutilized in sociological research, homo duplex reflects Durkhiem's ([1914] 2005) recognition of the importance of the individual in the study of society. Moreover, Durkheim ([1914] 2005) posited that social structure is based on integration in familial, religious, and occupational domains. Specifically, it is through social roles such as marriage, parenthood, and

employment that people are bonded to society by upholding and internalizing the values, beliefs, and norms of institutions (Berkman and Glass 2000; Ross 2017). The dualistic nature of individuals espoused through homo duplex reveals that individuals are deeply social. People want to develop and maintain tight bonds to society by adhering to group norms and identifying with the group through social roles (Kluver, Frazier, and Haidt 2014). As such, the extent to which people see themselves integrated in society can influence health behaviors, such that people are willing to suppress self-interest to work together to maintain society (Alexander and Smith 2005; Durkheim [1914] 1973).

When applied to the study of sleep it is apparent that there is a dualistic nature of sleep where on the one hand, people need to fulfill the physiological need for sleep by disengaging from society and on the other hand, integration in society through institutions such as work and family, may interfere with sleep duration and quality. Within the context of homo duplex, the imbalance between the individual and society can lead to stress and subsequently disordered sleep (i.e., role strain). However, social roles that connect people to society may encourage healthy sleep behaviors that result in getting the recommended hours of sleep (i.e., role enhancement). Although Durkheim ([1897]1951) proposed in his examination of suicide that the dual nature of individuals' is inherently antagonistic, it is unclear if this applies to sleep. The dual nature of sleep can be antagonistic or harmonious within the context of social integration (i.e., role strain vs. role enhancement). In short, sleep is about the individual and a reflection of society and to achieve optimal integration, one must find balance between the individual need for sleep and fulfilling societal expectations and obligations.

Intersectionality, Social Roles, and Sleep

Although all individuals need to find balance between the social roles they possess and sleep, the assumption that there is equivalent integration into the dominant society via social roles may not apply to marginalized groups (Jackson 1997). More specifically, the acquisition, experience, and combination of social roles are racialized and gendered in ways that may not be equally beneficial due to unequal opportunity in society. For example, women are increasingly likely to occupy both the mother and the worker roles and they still perform a greater share of childcare and housework responsibilities than men (Cha 2010; Hochschild and Machung 2003). Even the effects of these roles on sleep differ based on gender. There is evidence that suggests that the types of social roles women occupy explains their poorer sleep health compared to men (Walsemann et al. 2017). The roles of mother, wife, and caregiver often require that women prioritize family needs during normal sleep hours (Burgard 2011; Hislop and Arber 2003b). Thus, not only are men's jobs more likely to take precedence over women's in dual-earner families, but men's sleep also takes priority. Due to inequality in employment opportunities, there are also differences in attachment to social roles like worker. Specifically, ethnic minorities may be unattached to the worker role due to barriers in meaningful employment; thus, being an employee may be associated with feelings of social and economic marginalization instead of work being a rewarding experience (Jackson 1997).

While it is important to examine how the acquisition of social roles and sleep represent racialized and gendered processes, analyses along the lines of either race/ethnicity or gender, limits understanding of how these social statuses intersect to shape social integration and sleep health over the life course. In the context of intersectionality theory, examining these statuses separately obfuscates their intersecting consequences, essentializes race/ethnicity and gender, and ignores status and power hierarchies that create and define these categories (Brown et al.

2016; Cho, Crenshaw, and McCall 2013; MacKinnon 2013). An intersectional perspective helps elucidate how intersecting dimensions of race/ethnicity and gender affect access to social roles and role repertoire. For example, Black men are less likely to occupy the role of worker compared to White men due to employment discrimination and Black women are less likely to be married compared to White women because of a lack of marriage partners (Coleman et al. 1987; Marcussen and Piatt 2005). In sum, intersectionality highlights the importance of examining the multiplicative effects of race/ethnicity and gender instead of examining these effects separately (Choo and Ferree 2010; Collins and Bilge 2020). As an analytic tool, intersectionality does not conceptualize race/ethnicity and gender as discrete or mutually exclusive categories. Within this framework, both social statuses are inextricably linked together in ways that influence social integration and sleep in mid-to-late life.

SUMMARY AND HYPOTHESIS

The goal of this study is to examine how different configurations of key social roles (e.g., married, worker, and parent) and the total number of roles affect sleep duration and sleep quality (i.e., insomnia). It also employs an intersectional perspective that considers variation by race-gender groups (i.e., Black men and women, White men and women, and Hispanic men and women). It is important to note that roles related to work, marriage, and parenthood are emphasized because they are viewed as highly valued social positions acquired through some degree of personal effort (Jackson and Berkowitz 2005). Moreover, these primary roles reflect purposeful engagement in society. They are an outward expression of conformity with social norms and agreement with the social value assigned to these roles (Jackson and Erving 2020). Research also shows that roles related to work, marriage, and family have varying effects on

health. For example, employment improves mental health and decreases depressive symptoms, marriage protects against substance abuse, and parenthood is associated with increased stress (Christie-Mizell and Peralta, 2009; Evans-Polce 2020; Leupp 2017; Umberson 1987).

Drawing from prior research, two competing hypotheses are tested: role strain and role enhancement. The following hypotheses are proposed in accordance with the role strain perspective:

Hypothesis 1 (a-c): An increase in the number of roles is associated with **a)** decreased sleep during the week, **b)** decreased sleep on weekends and **c)** increased insomnia.

Hypothesis 2 (a-g): Compared to those who are married, employed, parents **a)** married only, **b)** employed only, **c)** parent only, **d)** married and employed, **e)** married parent, **f)** employed parent, and **g)** no roles is associated with increased sleep during the week.

Hypothesis 3 (a-g): Compared to those who are married, employed, parents **a)** married only, **b)** employed only, **c)** parent only, **d)** married and employed, **e)** married parent, **f)** employed parent, and **g)** no roles is associated with increased sleep during the weekend.

Hypothesis 4 (a-g): Compared to those who are married, employed, parents **a)** married only, **b)** employed only, **c)** parent only, **d)** married and employed, **e)** married parent, **f)** employed parent, and **g)** no roles is associated with decreased insomnia.

To test the role enhancement perspective, the following hypotheses are proposed:

Hypothesis 5 (a-c): An increase in the number of roles is associated with **a)** increased sleep during the week, **b)** increased sleep on weekends and **c)** decreased insomnia.

Hypothesis 6 (a-g): Compared to those who are married, employed, parents **a)** married only, **b)** employed only, **c)** parent only, **d)** married and employed, **e)** married parent, **f)** employed parent, and **g)** no roles is associated with decreased sleep during the week.

Hypothesis 7 (a-g): Compared to those who are married, employed, parents **a)** married only, **b)** employed only, **c)** parent only, **d)** married and employed, **e)** married parent, **f)** employed parent, and **g)** no roles is associated with decreased sleep during the weekend.

Hypothesis 8 (a-g): Compared to those who are married, employed, parents **a)** married only, **b)** employed only, **c)** parent only, **d)** married and employed, **e)** married parent, **f)** employed parent, and **g)** no roles is associated with increased insomnia.

Finally, this study investigates whether the association between social roles and sleep health vary across race-gender groups. Prior research reveals complexity in the effects of different role combinations on mental health with regards to race/ethnic groups (Jackson 1997, Jackson and Erving 2020). I expect to find similar complexity in the effects of the number and combination of social roles on sleep health for different race-gender groups. The effect of total roles and role combinations on sleep health (i.e., sleep duration and sleep quality) should have a weaker effect for the most marginalized race-gender groups (e.g., Black men and women) compared to the most privileged group (e.g., White men and women). The effect for Hispanic women and men should fall in the middle. I propose that the differences in effect are due to differential access to resources in the context of racialized and gendered systems of hierarchy in the U.S. In sum, I expect to find that while the accumulation of social roles may be beneficial for sleep, the effects will be muted as one proceeds along the racial hierarchy that situates White men and women on top, Hispanic men and women in the middle, and Black men and women on the bottom (Bonilla-Silva 2004).

DATA AND METHODS

Data

Data for this study are from the National Longitudinal Survey of Youth 1979 cohort (NLSY79). The NLSY79 is a nationally representative sample of non-institutionalized Americans and is part of a project sponsored and directed by the U.S. Bureau of Labor Statistics and managed by the Center for Human Resource Research (CHRR) at The Ohio State University (BLS 2019b). Interviews are conducted by the National Opinion Research Center (NORC) at the University of Chicago (BLS 2019b). The original sample consists of 12,682 individuals interviewed annually from 1979 to 1994 and biennially thereafter. The age of the original sample ranged from 14 to 22 and included an overrepresentation of African Americans, Hispanics, and economically disadvantaged Whites. The NSLY79 includes measures of labor force participation, family life, health, and demographic factors to name a few. Researchers incorporated two health modules when respondents turned 40 and 50. Each of these modules have detailed questions about mental and physical health conditions. Respondents were asked about their sleep health in the age 50 health module. This study utilizes the age 50-health module, which consists of waves 2008-2016 (N=3,364).

Measures

The dependent variables in this study are sleep duration and insomnia. To assess sleep duration, respondents were asked: "How much sleep (i.e., hours) do you get on weekdays/workdays" and "How much sleep (i.e., hours) do you get on weekends/non-workdays?" Insomnia is comprised of the following four questions: 1) "How often do you have trouble falling asleep;" 2) "How often do you wake up during the night and have trouble falling back asleep;" 3) "How often do you wake up too early in the morning and are unable to get back to sleep;" and 4) "How often do you feel unrested during the day no matter how many hours of sleep you've had?" Responses ranged from 1) almost always, 2) often, 3) sometimes, and 4)

rarely or never. Each item, except for item four, was reversed coded to indicate more severe symptoms. Insomnia ranges from 4 (low) to 16 (high). The alpha reliability is .82.

The independent variables are role configurations and total roles. First, I constructed dummy variables indicating if the respondent held each of the following roles: married (1=yes) compared to all other statuses; parents with dependent children age 17 and younger in the home (1 = yes) compared to non-parents; and employed (1 =yes) compared to respondents not working. Next, dichotomous variables for 8 role configurations were created: 1) no roles; 2) married only; 3) parent only; 4) employed only; 5) married and employed; 6) married parent; 7) employed parent; and 8) married, employed, parent (reference). A measure for total roles was created by summing married only, parent only, and employed only.

To assess intersectional effects, six race-gender groups were created: 1) Black men; 2) Black women; 3) Hispanic men; 4) Hispanic women; 5) White men; and 6) White women (reference). Based on extant studies I control for whether respondents live in an urban (1=yes) or a rural (reference) location. Self-rated health is assessed with the following question, “In general would you say your health is 1) poor, 2) fair, 3) good, 4) very good, and 5) excellent. A binary variable was created indicating poor health (poor and fair) and good health (good, very good and excellent). Good health is the reference. Income is measured in thousands of dollars and logged to correct for skewness. Education is measured as high school or less (reference), one to four years of college (1=yes) and five or more years of college (1=yes).

ANLAYTIC STRATEGY

First, descriptive statistics were generated for all study variables for the full study sample (Table 1). Second, I estimated t-tests and chi-square tests to determine whether race-gender

groups were significantly different from White women on all study variables (Table 1). Third, ordinary least squares regression (OLS) is used to examine the relationships among role configurations, total roles, sleep duration, and insomnia. In all analyses, White women are chosen as the reference category because they are more likely to occupy and be actively engaged in all role combinations. It is important to note that although Black women have been historically engaged in the labor force longer than White women, one cannot ignore how structural racism may have affected the job trajectory of Black women and mass incarceration has limited the likelihood of marriage, which reduces their opportunity of possessing and engaging in certain social roles. Finally, while White men occupy the most privileged position in society and theoretically are more likely to occupy all three social roles, gender socialization relegates women as primary caregivers of children, which may limit men's active engagement in childrearing (Bianchi, Robinson, and Milke, 2006).

To answer the research questions posed in this study, three steps were taken. First, the number of hours of sleep during the week, number of hours of sleep on the weekend, and insomnia were each regressed on total roles. Second, each of the three sleep variables were regressed on role configurations. Third, a race-gender subgroup analysis was conducted to access moderating effects. A supplemental analysis (e.g., comparison *T* statistic) was conducted to determine if effect sizes differ between each race-gender group (e.g., White women versus Black men or Hispanic men versus White men). The findings from the supplemental analysis are discussed in the results section. All analyses were weighted to allow for generalizability.

RESULTS

Descriptive statistics for the full study sample are shown in Table 1. Respondents in this study sample average around 6.68 hours of sleep during the week and 7.31 hours of sleep on the weekends. The mean for insomnia is 6.65. The average total number of roles occupied by sample participants is 2.01. The study sample is comprised of 6% Black women and men respectively, 3% Hispanic women and men, respectively, 39% White women, and 43% White men. With regards to primary social roles, 4% of the sample are married only, 18% employed only, and 3% are parents only. Six percent of the sample do not occupy any social roles. Sixteen percent of respondents are married and employed, 6% are married parents, 9% employed parents, and 38% are married, employed, parents. Fifteen percent of respondents indicate they experience poor health. Most of the sample (44%) have a high school degree or less, 41% have 1 to 4 years of college, and about 15% has five or more years of college. The log of income is 10.89 and 74% of respondents report living in an urban area.

When looking at significant differences in study variables by race-gender groups, Black men (6.34), Black women (6.42), and White men (6.67) get less sleep compared to White women (6.79) during the week. On the weekends, only Black men (6.94) and women (7.03) get less sleep compared to White women (7.31). Black men (6.61), Hispanic men (6.26), and White men (6.15) all experience less insomnia compared to White women (6.55). For total roles, Black women (1.61), Hispanic women (1.84), and Black men (1.50) occupy fewer social roles compared to White women (2.00). However, White men hold more roles (2.13) compared to White women (2.00). With regards to role combinations, 10% of Black women and 12% of Hispanic men report no roles compared to White women (5%). More White women (7%) are married only, compared to Hispanic women (3%) and White men (2%). Black women (19%) and White men (20%) are more likely to be employed only compared to 15% of White women.

Black women (15%) and Hispanic women (8%) are more like to be parents only compared to their White counterparts (3%). However, more White women (3%) are parents only compared to White men (1%). Likewise, more White women are married and employed (17%) compared to Black women (9%), Hispanic women (11%), and Hispanic men (11%). White women are also more likely to be married parents compared to Black women (3%), Hispanic men (3%), and White men (4%). A larger proportion of Black (24%) and Hispanic women (19%) are employed parents, compared to White women (11%). Finally, while fewer Black women (17%) and Hispanic women (26%) are married, employed, parents compared to White women (34%), more Hispanic men (47%) and White men (46%) are married, employed parents than White women.

Table 1 Weighted Means, Proportions, and Standard Deviation by Race-Gender Groups at Age 50. National Longitudinal Survey of Youth 1979 Cohort.

Variables	Total Sample (*N* = 3,364)		White Women (*N* = 908)		Black Women (*N* = 524)		Hispanic Women (*N* = 320)		Black Men (*N* = 416)		Hispanic Men (*N* = 273)		White Men (*N* = 923)	
	Mean/ Proportion	SD	Mean/ Proportion	SD	Mean/ Proportion	SD	Mean/ Proportion	SD	Mean/ Proportion	SD	Mean/ Proportion	SD	Mean/ Proportion	SD
Sleep Health														
Hours sleep weekdays	6.68	1.21	6.79	1.21	6.42*	1.55	6.65	1.25	6.34*	1.37	6.62	1.40	6.67*	1.24
Hours sleep weekend	7.31	1.42	7.42	1.42	7.03*	1.81	7.33	1.48	6.94*	1.82	7.33	1.50	7.29	1.36
Insomnia	6.65	3.11	7.10	3.11	7.46	3.53	7.18	3.58	6.61*	3.15	6.26*	2.96	6.15*	2.90
Role Accumulation														
Total Roles	2.01	.89	2.00	.89	1.61*	.88	1.84*	.90	1.50*	1.08	2.04	1.07	2.13*	.93
Role Combinations														
No roles	.06	—	.05	—	.10*	—	.08	—	.20	—	.12*	—	.05	—
Married only	.04	—	.07	—	.05	—	.03*	—	.03	—	.04	—	.02*	—
Employed only	.18	—	.15	—	.19*	—	.15	—	.30	—	.14	—	.20*	—
Parent only	.03	—	.03	—	.15*	—	.08*	—	.03	—	.03	—	.01*	—
Married, employed	.16	—	.17	—	.09*	—	.11*	—	.13	—	.11*	—	.17	—
Married parent	.06	—	.08	—	.03*	—	.10	—	.02	—	.03*	—	.04*	—
Employed, parent	.09	—	.11	—	.24*	—	.19*	—	.04	—	.08	—	.05*	—
Married, employed, parent	.38	—	.34	—	.17*	—	.26*	—	.26	—	.47*	—	.46*	—
Controls														
Poor health	.15	—	.16	—	.28*	—	.22*	—	.18	—	.19	—	.12*	—
High school or less	.44	—	.42	—	.45	—	.56*	—	.59	—	.59*	—	.44	—
College (1 to 4 years)	.41	—	.42	—	.46	—	.38	—	.34	—	.33*	—	.40	—
College Plus (5 plus years)	.15	—	.17	—	.09*	—	.06*	—	.07	—	.08*	—	.16	—
Income (logged)	10.89	1.51	10.89	1.51	10.09*	1.88	10.45*	1.82	9.95*	2.71	10.51*	2.22	11.13*	1.52
Urban residence	.74	—	.69	—	.85*	—	.91*	—	.87	—	.89*	—	.71	—

Note: *Indicates significant difference from White Women.
*$p < .05$

Table 2 shows the effects of total roles on each of the sleep variables for the full sample. In the first model, there is no association between total roles and sleep during the week. For the

Table 2: Sleep Variables Regressed on Total Roles at Age 50 Full Sample NLSY79 Cohort, (N = 3,364).

	Model 1 Weeknight Sleep (hours)		**Model 2** Weekend Sleep (hours)		**Model 3** Insomnia	
Variables	b	se	b	se	b	se
Total Roles	.01	.03	.14***	.03	-.38***	.06
Controls						
Black Women [a]	-.29**	.09	-.25*	.11	-.15	.21
Hispanic Women [a]	-.13	.13	-.07	.15	.01	.30
Black Men [a]	-.44***	.09	-.36***	.11	-.69**	.22
Hispanic Men [a]	-.18	.13	.00	.15	-.87**	.30
White Men [a]	-.14**	.05	-.17**	.05	-.77***	.11
Poor health[b]	-.51***	.06	-.52***	.07	2.70***	.14
College (1 to 4 years)[c]	.19***	.04	.23***	.05	-.17**	.11
College Plus (5 or more years)[c]	.17**	.07	.30***	.08	-.06	.15
Income (logged)	-.01	.01	.02	.02	-.06	.03
Urban residence[d]	-.00	.05	.10	.06	-.17	.11
Constant	6.85***	.15	6.87***	.17	8.23***	.35
R^2	.04		.06		.17	

Note: *p < .05; **p < .01; ***p < .001.
[a]White Woman (reference)
[b]Good health (reference)
[c]High school degree or less (reference)
[d]Rural residence (reference)

controls, Black women (b = -.29, p <.01), Black men (b = -.44, p <.001), and White men (b = -.14, p<.01) get less sleep during the week compared to White women. Poor health is associated with decreased sleep during the week (b = -.51, p <.001) compared to those with good health. One to four years of college (b =.19, p <.001) and five or more years of college (b =.17, p <.01) are associated with increased sleep during the week compared to those with a high school degree or less. Model 2 shows that an increase in roles is associated with increased sleep during the weekend (b = .14, p <.001). The findings for the control variables remain consistent from the previous model with Black women (b = .25, p <.01), Black men (b = -.36, p <.001), and White men (b = -.17, p <.01) getting less sleep on the weekend compared to White women. Poor health

is associated with decreased sleep on the weekends (b = .51, p <.001) compared to good health. Further, 1 to 4 years of college (b = .19, p <.001) and 5 or more years of college (b = .17, p <.01) are associated with increased sleep on the weekend compared to those with a high school degree or less. In Model 3, as the number of roles increase there is a decrease in insomnia (b = -.38, p < .06). Black men (b = -.69, p <.01), Hispanic men (b = -.87, p <.01), and White men (b = -.77, p<.001) all experience decreased insomnia compared to White women. Respondents reporting poor heath (b = 2.70, p <.001) experienced worse insomnia compared to those reporting good health. Having 1 to 4 years of college (b = -.17, p <.01) is associated with decreased insomnia compared to having a high school degree or less.

The effects of role combinations on sleep health are displayed in Table 3. In Model 1, the only role combination that is significantly associated with sleep during the week is married and employed. Compared to respondents who are married, employed, parents, those who are married and employed get more sleep during the week (b = -.17, p <.01). Black women (b = -.25, p <.01), Black men (b = -.45, p <.001), and White men (b = -.15, p <.01) get less sleep during the week compared to White women. Poor health is associated with decreased sleep during the week (b = -.49, p <.001). One to 4 years of college (b = -.19, p <.001) and five or more years of college are associated with less sleep during the week (b = -.19, p <.01). In Model 2 no roles (b = -.16, p<.001), married only (b = -.78, p <.001), parent only (b = -.61, p <.001), and married parent (b=-.36, p <.001) are associated with decreased sleep on the weekend compared to those who are married, employed, parents. However, there is an increase in sleep on the weekends for respondents who are married and employed (b =.15, p <.05) compared to those who are married, employed, parents. Black women (b = -.26, p <.05), Black men (b = -.40, p <.001), and White men (b =-.20, p <.001) get less sleep on the weekends compared to White women. Poor health is

inversely associated with sleep on the weekend (b = -.43, p <.001). Having 1 to 4 years (b = .23, p <.001) or 5 or more years (b = -.30, p <.001) of college education increases sleep on the weekend. In Model 3, compared to those who are married, employed, parents, no roles (b =1.74, p <.001), married only (b =1.08, p <.001), employed only (b =.30, p <.05), parent only (b =1.53,

Table 3: Sleep Variables Regressed on Role Combinations at Age 50 Full Sample, NLSY79 Cohort, (N= 3,364).

Variables	**Model 1** Weeknight Sleep (hours)		**Model 2** Weekend Sleep (hours)		**Model 3** Insomnia	
	b	se	b	se	b	se
Role Combinations						
No Roles	-.16	.11	-.68***	.12	1.74***	.24
Married only	-.22	.11	-.78***	.13	1.08***	.26
Employed only	.06	.06	-.01	.07	.30*	.14
Parent only	-.12	.13	-.61***	.15	1.53***	.30
Married employed	.17**	.06	.15*	.07	-.02	.14
Married parent	.13	.10	-.36***	.11	.71**	.22
Employed parent	-.11	.08	-.00	.09	.15	.18
Controls						
Black Women [a]	-.25**	.09	-.26*	.11	-.18	.21
Hispanic Women [a]	-.11	.13	-.06	.15	-.02	.30
Black Men [a]	-.45***	.10	-.40***	.11	-.66**	.22
Hispanic Men [a]	-.17	.13	.00	.15	-.88**	.30
White Men [a]	-.15**	.05	-.20***	.05	-.73***	.11
Poor health[b]	-.49***	.06	-.43***	.07	2.55***	.14
College (1 to 4 years)[c]	-.19***	.05	.23***	.05	-.17	.11
College Plus (5 or more years)[c]	-.19**	.07	.30***	.08	-.08	.15
Income (logged)	-.02	.02	-.00	.02	-.02	.03
Urban residence[d]	.00	.05	.10	.06	-.18	.11
Constant	6.99***	.18	7.43***	.20	6.74***	.40
R^2	.05		.07		.17	

Note: *p < .05; **p < .01; ***p < .001.
[a]White Women (reference)
[b]Poor health (reference)
[c]High school degree or less (reference)
[d]Rural residence (reference)

p <.001), and married parent (b =.71, p <.01) are associated with increased insomnia. Black men (b = -.66, p <.01), Hispanic men (b = -.88, p <.01), and White men (b = -.73, p <.001) experience decreased insomnia compared to White women. Poor health is positively associated with insomnia (b = 2.55, p <.001).

The race-gender subgroup analysis of the effects of total roles on sleep health is displayed in Table 4. There is no association between the total number of roles and sleep during the week for any of the race gender groups. In Model 2 there is a positive association between an increase in the number of roles and sleep on the weekend for White women (b = .20, p <.001) and Hispanic women (b = .26, p <.05). The comparison T statistic did not reveal a significant difference in effect between total number of roles and weekend sleep. Model 3 shows that as the number of roles increase, there is an inverse association with insomnia for White women (b = -.36, p <.01), Black women (b = -.79, p <.001), Black men (b =-.66, p <.001), Hispanic men (b = -.46, p <.01), and White men (b = -.27, p <.05). The comparison T statistic shows that the effect of total roles on insomnia is significantly different between Black women and White men (t = 2.37) and Black men and White men (t = 2.10). Thus, role accumulation has a stronger effect on insomnia among White men compared to Black women and men.

Table 4: The Effects of Total Roles on Sleep Health by Race-Gender Groups at Age 50 Full Sample NLSY79 Cohort, (N = 3,364).

	Model 1 Weeknight Sleep (Hours)			**Model 2** Weekend Sleep (Hours)			**Model 3** Insomnia		
	b	se	R^2	b	se	R^2	b	se	R^2
White Women	-.00	.05	.03	.20***	.06	.07	-.36**	.12	.15
Black Women	.05	.09	.08	.13	.10	.06	-.79***	.19	.14
Hispanic Women	.15	.09	.06	.26*	.10	.08	-.41	.24	.11
Black Men	.10	.07	.03	.17	.09	.05	-.66***	.15	.13
Hispanic Men	.03	.08	.07	.02	.10	.05	-.46**	.17	.14
White Men	.01	.05	.04	.09	.05	.06	-.27*	.11	.15

Note: *p < .05; **p < .01; ***p < .001.
All models control for good health, education, income, and residence.

Table 5 displays the race-gender analysis (i.e., moderation) for the effects of various role combinations on hours of sleep during the week. Only married, employed White women experience increased sleep on during the week (b = .27, p <.05). There are no other significant findings for any of the other race-gender groups. Table 6 shows complexity in the effects of role

combinations on weekend sleep. When looking at no roles, Black men (b = -.77, p <.05), and White men (b = -.83, p <.001) get less sleep on the weekends compared to White women occupying all three roles. However, the comparison T statistic shows no significant differences across these race-gender groups. Hispanic women (b = -.97, p <.05), and White men (b = -1.04, p<.001) who are married only, experience reduced sleep on the weekend compared to White women who are married, employed, parents; there are no significant differences across groups. Among all race-gender groups, there is no association between employed only and weekend sleep. Hispanic women (b = -.83, p <.05) and Hispanic men (b = -1.53, p <.05) who are parents only get less sleep on the weekend compared to White women who are married, employed, parents. However, the comparison T statistic test revealed no significant differences between these race-gender groups. Married and employed Hispanic men (b = .64, p <.001) experience increased sleep on the weekend, compared to White women who are married, employed, parents; there are no significant differences between the two groups. With regards to married parents, Hispanic men (b = -.43, p <.001), and White men (b = -.47, p <.05) experience diminished sleep on the weekend, compared to White women who occupy all three roles. However, there are no statistically significant differences. Finally, White men who are employed, parents (b = .43, p <.05) get more sleep on the weekend compared to White women who are married, employed, parents; the comparison T statistic reveal no significant differences.

Table 7 shows the effects of different role combinations on insomnia. Black women with no roles (b = 2.04, p <.001) and who are parents only (b = 1.92, p <.001), and Hispanic women with no roles (b = 2.21, p <.05) and are parents only (b = 2.12, p <.01) experience increased insomnia compared to White women occupying all three roles. Black men with no roles

(b =1.90, p <.001) and who are employed only (b = .97, p <.05) experience increased insomnia. For Hispanic men, no roles (b = .97, p <.05), parent only (b = .97, p <.05), and married parents (b = .97, p <.05) is positively associated with insomnia. Compared to White women who are married, employed, parents, White men who have no roles (b =2.19, p <.001), are married only (b =1.80, p <.01), parent only (b =2.24, p <.01) and married parents (b =.96, p <.05) experience increased insomnia. It is important to note that none of the findings in Table 7 for the race-gender group analysis differ significantly from White women who are married, employed, parents.

Table 5: Weeknight Sleep Regressed on Role Combinations by Race-Gender Groups at Age 50 NLSY79 Cohort (*N* = 3,364).

Variables	White Women (*N* = 908)		Black Women (*N* = 524)		Hispanic Women (*N* = 320)		Black Men (*N* = 416)		Hispanic Men (*N* = 273)		White Men (*N* = 923)	
	b	se	b	se	b	se	b	se	b	se	b	se
Role Combinations												
No roles	-.15	.20	.35	.29	-.14	.32	-.19	.24	.01	.31	-.43	.23
Married only	-.19	.17	.12	.34	-.19	.41	.06	.42	-.47	.45	-.40	.27
Employed only	.09	.12	-.12	.20	-.16	.22	-.10	.18	-.08	.26	.11	.11
Parent only	-.19	.24	-.19	.22	-.48	.29	-.34	.42	-.97	.60	.54	.38
Married, employed	.27*	.12	.18	.27	-.30	.25	.22	.23	-.14	.27	.13	.11
Married parent	.23	.15	.00	.42	-.09	.25	.24	.51	-.79	.70	.02	.21
Employed, parent	-.15	.14	.16	.18	-.31	.20	-.55	.40	.01	.32	-.06	.20
Controls												
Poor health[a]	-.40***	.12	-.86***	.16	-.70***	.19	-.46*	.19	-.69**	.25	.41**	.13
College (1 to 4 years)[b]	.24**	.09	-.33*	.14	-.22	.15	-.13	.15	-.24	.19	.34**	.09
College Plus (5 plus years)[b]	.33**	.12	-.01	.25	-.24	.31	-.02	.27	-.71*	.32	.16	.12
Income (logged)	-.02	.03	-.04	.04	-.06	.05	-.06*	.03	-.08	.04	.01	.03
Urban residence[c]	-.03	.09	-.14	.20	.04	.26	.02	.20	-.43	.29	.04	.09
Constant	6.92***	.34	7.27***	.49	7.61***	.55	7.12***	.40	8.13***	.53	6.34***	.37
R^2	.05		.08		.08		.04		.09		.05	

Note: *$p < .05$; **$p < .01$; ***$p < .001$.
[a]Poor health (reference)
[b]High school degree or less (reference)
[c]Rural residence (reference)

Table 6: Weekend Sleep Regressed on Role Combinations by Race-Gender Groups at Age 50 NLSY79 Cohort (*N* = 3,364).

Variables	White Women (*N* = 908)		Black Women (*N* = 524)		Hispanic Women (*N* = 320)		Black Men (*N* = 416)		Hispanic Men (*N* = 273)		White Men (*N* = 923)	
	b	se	b	se	b	se	b	se	b	se	b	se
Role Combinations												
No roles	-.84***	.23	.20	.34	-.44	.38	-.77*	.30	-.38	.32	-.83***	.24
Married only	-.84***	.19	-.23	.40	-.97*	.49	-.51	.54	-.10	.47	-1.04***	.29
Employed only	-.18	.14	.00	.24	-.17	.26	.16	.23	.27	.28	.06	.12
Parent only	-.74**	.27	-.41	.26	-.83*	.34	-.79	.54	-1.53*	.62	.09	.40
Married, employed	.10	.13	.42	.32	.00	.29	.03	.29	.64*	.29	.17	.12
Married parent	-.36*	.17	-.17	.49	-.40	.30	-.26	.65	-1.71*	.74	-.47*	.22
Employed, parent	-.23	.16	.27	.22	-.07	.23	-.72	.52	.31	.34	.43*	.21
Controls												
Poor health[a]	-.25	.13	-.76***	.18	-.72**	.22	-.69**	.25	-.47	.26	-.38**	.14
College (1 to 4 years)[b]	.33**	.10	-.06	.14	-.17	.17	-.02	.19	-.16	.20	.31**	.10
College Plus (5 plus years)[b]	.49*	.13	.28	.04	-.61	.36	-.37	.35	-.56	.34	.28*	.13
Income (logged)	.03	.03	.02	.05	-.02	.05	-.10**	.04	-.07	.04	.01	.03
Urban residence[c]	-.03	.09	-.17	.23	.20	.30	-.31	.26	-.23	.30	.25**	.10
Constant	7.13***	.39	7.14***	.58	7.80***	.64	8.57***	.52	8.46***	.55	6.89***	.40
R^2	.10		.07		.09		.08		.11		.09	

Note: *$p < .05$; **$p < .01$; ***$p < .001$.
[a]Poor health (reference)
[b]High school degree or less (reference)
[c]Rural residence (reference)

Table 7: Insomnia Regressed on Role Combinations by Race-Gender Groups at Age 50 NLSY79 Cohort (*N* = 3,364).

Variables	White Women (*N* = 908)		Black Women (*N* = 524)		Hispanic Women (*N* = 320)		Black Men (*N* = 416)		Hispanic Men (*N* = 273)		White Men (*N* = 923)	
	b	se	b	se	b	se	b	se	b	se	b	se
Role Combinations												
No roles	1.42	.50	2.04***	.62	2.21*	.86	1.90***	.50	1.32*	.61	2.19***	.49
Married only	.82**	.42	.67	.73	-.11	1.10	1.60	.89	.20	.88	1.80**	.59
Employed only	.58*	.31	.21	.44	.02	.60	.97*	.38	.94	.52	-.02	.24
Parent only	.72	.58	1.92***	.48	2.12**	.77	1.72	.90	3.14**	1.17	2.24**	.81
Married, employed	-.34	.28	-.69	.57	-.46	.66	.24	.48	.68	.54	.25	.24
Married parent	.57	.37	-.25	.90	.63	.67	.26	1.07	3.43*	1.38	.96*	.45
Employed, parent	.48	.34	-.41	.39	.72	.53	.85	.86	-.04	.63	-.49	.43
Controls												
Poor health[a]	2.91***	.28	1.99***	.34	2.16***	.51	2.38***	.41	1.94***	.49	2.41***	.28
College (1 to 4 years)[b]	.03	.21	-.42	.31	.55	.40	-.18	.32	.37	.37	-.40*	.20
College Plus (5 plus years)[b]	-.26	.29	-.80	.54	.04	.82	-.62	.57	.87	.63	.13	.27
Income (logged)	.03	.07	.16	.09	-.01	.12	.13*	.06	.02	.08	-.13	.07
Urban residence[c]	-.02	.21	.50	.43	-1.24	.69	-.61	.42	.25	.56	-.27	.20
Constant	6.04***	.84	4.73***	1.05	7.33***	1.46	4.73***	.85	4.81***	1.04	7.38***	.82
R^2	.16		.16		.17		.16		.17		.18	

Note: *$p < .05$; **$p < .01$; ***$p < .001$.
[a]Poor health (reference)
[b]High school degree or less (reference)
[c]Rural residence (reference)

DISCUSSION AND CONCLUSIONS

The goal of this study was to examine the association between social integration (i.e., social roles) and sleep. It also investigated if this relationship varied for different race-gender groups. Two competing hypotheses were tested: role strain verses role enhancement. On the one hand, the role strain perspective posits that an increase in the number of roles contributes to stress due to limited time to meet obligations associated with each role. Furthermore, one would expect that the most complex role combinations would be associated with increased stress (e.g., married, employed, parent). The role strain hypothesis was supported by Hypothesis 2d and 3d which states that compared to those who are married, employed, parents, being married and employed is associated with increased sleep during the week and on the weekend, respectively. These findings demonstrate that while occupying all three roles is indicative of high integration in society, it negatively impacts the amount of sleep obtained during the week and on the weekend.

On the other hand, the role enhancement perspective suggests that the accumulation of roles and different role repertoire are beneficial to health because not only does it increase access to resources and networks, but also occupying multiple roles gives people a sense of meaning and purpose in their lives. Thus, within this context one would expect that people are more likely to get more hours of sleep during the week and on the weekend to fulfill their role obligations. Furthermore, occupying more roles also increase access to resources that may help reduce depression and anxiety that can affect insomnia (Goldman-Mellor et al. 2014). Support for the role enhancement perspective comes from Hypothesis 5c which states that an increase in the number of roles is associated with decreased insomnia. I also found support for Hypothesis 7a, 7c, 7e, and 7g which states that married only, parent only, married parent, and no roles is

associated with decreased sleep during the weekend compared to married, employed, parents, respectively. These findings seem to suggest that occupying all three roles encourages increased sleep on the weekend to fulfill role obligations (Tienoven, Glorieux, and Minnen 2014). Hypothesis 8a, 8b, 8c, 8e, and 8g also support the role enhancement perspective. Specifically, those who are married, employed, parents have less insomnia compared to married only, employed only, parent only, married parents, and no roles. These findings demonstrate that a higher degree of integration in society is more beneficial in reducing insomnia. Being a parent at age 50 who is not married or employed can cause stress that can disrupt sleep due to lack of economic and social support. Moreover, during midlife occupying one or no roles can cause anxiety and stress that may interfere with sleep quality. For instance, midlife adults who are married only or employed only, may face ridicule or pressure from family to acquire additional roles that align with 'normalized' role repertories at this stage of the life course (Moore, Allbright-Campos, and Strick 2017). Specifically, those who are married only may be frequently asked why they are childless, while those who are employed only may face pressure to get married. Overall, these results demonstrate that both the number of roles and role combinations matter for sleep health, especially on the weekend and with insomnia.

The study also sought to examine whether the association between social roles and sleep health varied across race-gender groups. I expected to find that the effect of total roles and role combinations on sleep duration and insomnia would have a weaker effect for the most marginalized race-gender groups (e.g., Black men and women) compared to the most privileged groups (e.g., White men and women). This hypothesis was only supported in the race-gender analysis when comparing the effects of total roles on insomnia among White men, Black women, and Black men. Specifically, there was a statistically significant difference in the effect of role

accumulation on insomnia across these three groups. These results show that while an increase in the number of roles decreases insomnia for each group, White men benefit more (i.e., have a larger decrease in insomnia). Considering that White men occupy the most privileged position in society, role accumulation provides access to different resources (i.e., more diverse networks, increased financial opportunity) that decreases insomnia. The access to resources via role accumulation is not equivalent among Black women and men who occupy lower positions in society (McDonald 2014). Thus, while the acquisition of more roles decreases insomnia for Black men and women, the stressors that accompany being a Black person in the United States may reduce the overall effect compared to White men. Although there are no additional significant differences in effects of total roles or role combinations across race-gender groups, interesting patterns emerge within each race-gender subgroup. Three findings merit further discussion.

First, within several race-gender groups having no roles or only one role (i.e., married only, parent only, and employed only) is associated with less sleep on the weekends and increased insomnia. These findings reflect both a lack of social integration and a lack of social control. For instance, those with no roles have limited societal obligations, which can discourage good sleep behavior. In addition, occupying no roles at midlife may be indicative of a life filled with hardship and stress that prevents societal integration and long-term stress exposure that negatively impacts sleep duration and sleep quality (Kajeepeta et al. 2015; Martire et al. 2019). Second, not only is 'parent only' harmful for sleep duration on the weekends and insomnia, but intragroup results show that role combinations with parenthood are also related to diminished sleep health. Thus, while parenthood is an important social role that allows people to be integrated in society, it may also be associated with stress that can interfere with sleep. In fact,

this finding may demonstrate parental role strain or parenting stress, which refers to the enduring hardships, challenges and conflicts that parents face daily (Pearlin 1983, 1989; Nomaguci and Milke 2017). Moreover, as people age, it may be more difficult to meet the demands of other roles and social expectations of the parenting role. Finally, the findings suggest that White men who do not occupy all three roles are particularly at risk of poor sleep on the weekends and increased insomnia. Being the most privileged group in society, White men who are less integrated in society (i.e., more socially isolated), may view themselves as failures in the context of societal expectations of White male masculinity (Alcaraz et al. 2019).

Limitations

There are a few limitations to this study. First, while studies show that self-reports of sleep duration and quality are reliable and valid measures, there can also be biases in self-reports of sleep due to a person's mood, memory, and personal characteristics (Krystal and Edinger 2008; Tsuchiyama et al. 2003). Incorporating more objective measures of sleep from actigraphy can assist in overcoming some of these biases (Morgenthaler 2007). The way sleep is measured in the NLSY79 is another limitation. Respondents are asked how much sleep they get on their workdays/weeknights and nonwork days/weekends. This question assumes that people do not work on the weekends, which may affect how respondent report sleep duration and quality. Next, the study could also benefit from incorporating different social roles. Although marriage, parenthood, and employment are important social roles during midlife that represent social integration, there are other roles that people occupy (e.g., caregiver, sibling, religious) that could provide more insight about role strain and role enhancement. Furthermore, it is important to assess role quality and role salience. A bad marriage and work-related stress can be detrimental for sleep health even if these roles reflect a certain degree of integration in society.

Despite these limitations, the study offers several contributions to the literature. First, it applies the social integration perspective to the study of sleep among adults in midlife. Not only is this theoretical perspective underutilize in sleep research, but also no studies, to my knowledge, have tested two competing hypothesis, role strain vs. role enhancement in the study of sleep. Moreover, this study also examines how role combinations may affect sleep health. Second, an intersectional lens is applied to both social integration and sleep. While previous sleep research elucidates differences in sleep along the lines of race/ethnicity and gender, few studies examine how the intersection of these status locations affect sleep health. In short, this is one of a few studies that takes an intersectional approach to investigating the association between social roles and sleep health. Finally, using a nationally representative sample allows for generalizability to the broader population. This is particularly important when examining the broader implications of social integration at midlife and the effects on sleep health.

Future Research

Future research should examine how status locations beyond race/ethnicity and gender affect social roles. Specifically, more insight is needed with regards to how class (i.e., socioeconomic status) may moderate the effects of role combinations and total number of roles on sleep. For instance, one's education or occupation could cause different stressors that make employment more detrimental to sleep. Moreover, analysis along the intersection of race, class, *and* gender is needed, especially since there is a class component to sleep health. Examining sleep in other racial/ethnic and nonbinary groups are additional intersectional dimensions that warrant further examination. While this study operationalizes sleep duration as a continuous measure, future research should consider if there are differences in the effects of social

integration for short, normal, and long-term sleepers. Finally, it is important to examine disparate sleep disorders such as snoring, sleep apnea, and restless leg syndrome to name a few.

CHAPTER III

The Effects of Shift Work and Sleep on Depressive Symptoms and Self-rated Health

ABSTRACT

The institution of work plays an important role in determining the degree to which one is integrated in society, as well as when people sleep. Studies show that shift work and sleep have independent effects on mental and physical health. While these effects are often examined separately, this study investigates the relationship between shift work, sleep, and health outcomes in the same study. Specifically, I examine whether sleep duration (i.e., hours of sleep during the week) and sleep quality (i.e., insomnia) mediate the association between shift work and health, with depressive symptoms and poor self-rated health as dependent variables. Data used for this study are from the National Longitudinal Survey of Youth 1979 cohort (*N*=5,652). The results show that working a non-day shift increases the odds of reporting poor health, but not depressive symptoms. The effect of shift work on depressive symptoms is mediated by hours of sleep during the week and insomnia, but only insomnia mediates the association between shift work and poor health. Increased sleep during the week decreases depressive symptoms, while insomnia is positively associated with depressive symptoms. Insomnia also increases the odds of poor health. These findings suggest that the number of hours of sleep a person gets during the week may be a coping behavior that can help buffer the effects of shift work on depressive symptoms. However, insomnia may act as secondary stressor that increases depressive symptoms. While working a non-day shift is associated with poor health, there is an indirect effect through insomnia.

INTRODUCTION

Is there an association between shift work and health? Do sleep duration and sleep quality mediate this association? From 2017 to 2018 approximately 16% of wage and salary workers in the United States engaged in shift work (BLS 2019a). Shift work refers to employment or work that occurs outside normal or 'standard' daily work typically between 8-9am and 5-6pm; shift work covers the entire 24 hours through the alternation of different groups of workers (Brown 2020; Costa 2016; Perrucci et al. 2007; Vogel et al. 2012). Shift work is characterized by a variety of schedules such as evening and night shifts, rotating and split shifts, an irregular schedule, and some other schedule (Åkerstedt et al. 2019; BLS 2019a; Jehan 2017). Shift work is increasingly prevalent due to a 24-hour society where there is increased demand for round the clock service. Unfortunately, while many industries may benefit from shift work, research shows that engaging in shift work can have deleterious effects on physical and mental health. Shift work is associated with increased risk for cardiovascular disease (CVD), diabetes, obesity, gastrointestinal issues, poor self-rated health, depressed mood, anxiety, and substance abuse (Åkerstedt 2003; Brown et al. 2020; Cho 2018; Goodrich and Weaver, 1998; Kwon et al. 2016; Luyster et al. 2012; Park, Shuh and Lee 2019; Rajaratnam et al. 2013; Takahashi 2014). Another indicator of health that is negatively impacted by shift work is sleep.

Many physiological processes follow a 24-hour rhythm of the body known as the circadian rhythm. Circadian rhythms evolve in response to a light-dark cycle established by sunrise and sunset, along with the daily rhythm of other external factors, such as temperature and noise (Kulkarni, Schow, and Shubrook 2020). Shift work disrupts the normal sleep-wake cycle because it requires workers to sleep during normal waking hours and work during normal sleep periods for the human body (Hale 2005; Henry et al. 2008; Jehan 2017). Disruption to the

circadian rhythm can have various effects on sleep. According to Åkerstedt et al. (2008), the effects of shift work on sleep involves quantitative and qualitative aspects of sleep reduction, disturbed sleep, and altered sleep quality. Engaging in shift work is associated with short sleep, excessive fatigue, increased sleep disturbance, difficulty falling asleep, and insomnia (Åkerstedt 2008; Henry et al. 2008; Kecklund and Axelsson 2016; Vallières 2014). In fact, studies show that 25% of workers report that their current work schedules do not support sufficient sleep and compared to non-shift workers, shift workers report more sleep problems and shorter sleep duration (Flo et al. 2013; National Sleep Foundation 2009; Ohayon et al. 2002; Yong, Li and Calvert 2017). Shift work is detrimental to sleep because it can be difficult for shift workers to achieve a typical sleep schedule and sleep duration (Burgard and Ailshire 2009). The deleterious effects of shift work are especially true for night shift workers, who are at higher risk for all sleep problems, because the night shift is in direct opposition to the circadian rhythm (Driesen et al. 2011; Ohayon et al. 2002; Vogel et al. 2012; Yong et al. 2017).

However, it is important to note that while there is evidence that shift work can disrupt the circadian rhythm, poor sleep has independent effects on mental and physical health. In the United States, a third of adults sleep less than the recommended 7-8 hours per night (Luyster et al. 2012; Sheehan et al. 2019). Short sleep is associated with cardiovascular diseases, diabetes, obesity, pulmonary and gastrointestinal diseases, increased mortality risk, depressive symptoms, decreased cognitive functioning, and dementia (Åkerstedt et al. 2019; Assari et al. 2017; Buxton and Marcelli 2010; Calhoun and Harding 2010; Choi et al. 2017; Grandner et al. 2010; Jackson et al. 2015; Leggett et al. 2016, 2018; Sheehan et al. 2019). Sleep disorders such as insomnia, which affects about 40% of Americans, are also associated with depressed mood, anxiety, CVD, and increased risk for mortality (Hale, Peppard, and Young 2007; Henry et al. 2008; Laposky

2016; Sheehan et al. 2019; Simpson et al. 2014). In short, both shift work and poor sleep can negatively impact health.

Research on the effects of shift work on health demonstrates that there are physiological, psychological, and social adjustments to working nonstandard schedules (Fenwick, Rudy, and Mark 2001). However, there is a lack of understanding and few studies consider the mechanisms by which shift work can lead to chronic health problems (Cho 2018; Kecklund and Axelsson 2016). To address this gap in the literature, I examine whether sleep duration and sleep quality are mechanisms that can help explain how shift work impacts health. Specifically, the goal of this study is to examine the effect of shift work on depressive symptoms and the impact of shift work on poor self-rated health. I also investigate whether the relationship between shift work and health is indirect, operating through sleep duration and sleep quality.

BACKGROUND AND THEORY

The Stress Process: Shift Work and Social Integration

The stress process model, which is the primary theoretical framework for this study, is comprised of three components: stressors, psychosocial resources (i.e., mediators and moderators) and outcomes (Pearlin et al. 1981). Figure 1 shows a conceptual model of how the stress process is articulated in this study. The first component, stressors, are any event or experience that can challenge a person's adaptive capacities (Aneshensel 1992; Pearlin 1983; Wheaton et al. 2013). One important type of stressor is chronic stressors, which represent continuous and persistent conditions in the social environment that can overwhelm an individual's capacity to adequately perform social roles (Aneshensel 2014; Wheaton 1999). The consequences of chronic stressors may be particularly severe when arising within major social

domains, such as work or family (Avison and Turner 1988; Griffith et al. 2013; Pearlin 1983; Pearlin et al. 2005; Thoits 2013; Wheaton et al. 2013).

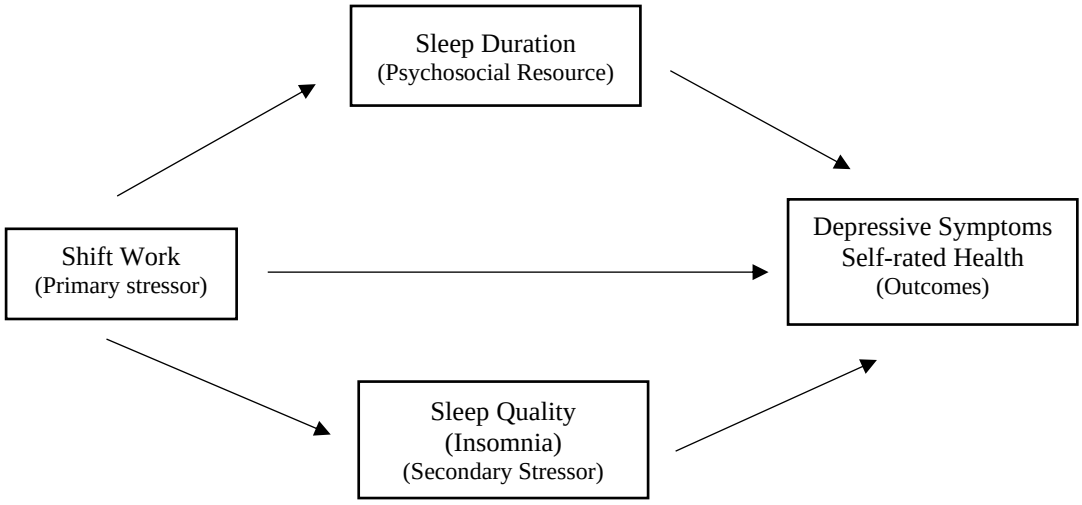

Figure 1: Conceptual Diagram of the Stress Process of Shift work, Sleep Duration and Quality, Depressive Symptoms and Self-Rated Health.

Shift work is a chronic stressor that has implications for the ways in which people are integrated in society and it can impact sleep health. Stressors are also characterized as primary or secondary. Primary stressors represent the initial event that disrupts people's ability to cope and secondary stressors emerge from primary stressors (Pearlin 1989; Williams 2003). In this study shift work is a primary stressor that results in poor sleep quality (i.e., insomnia), a secondary stressor.

Durkheim's concepts of social integration and homo duplex provide useful frameworks to reveal how stress can arise from engaging in shift work. First, social integration is a way to understand both individual behavior and social structure (Durkheim [1897]1951). Durkheim ([1897]1951) proposes that social integration is a fundamental characteristic of all social institutions. Specifically, Durkheim ([1897] 1951) posited that social structure is based on

integration in familial, religious, and occupational organizations and people are bonded to society by upholding the values, beliefs, and norms of these institutions (Berkman and Glass 2000). The institution of work has considerable control of the way in which people are integrated in society, particularly for shift workers who may face difficulty with social integration.

Second, homo duplex refers to the dualistic nature of humans; there is a part that wants to fulfill the desires of the individual and another part that seeks to fulfill the demands of society (Durkheim [18971]1951; Durkheim [1914] 2005; Mestrovic and Glassner 1983). Durkheim ([1914] 2005) posits that these two aspects of individuals are antagonistic forces that can create imbalance and affect the degree of integration in society (Mestrovic and Glassner 1983). For example, the dualistic nature of individuals espoused through homo duplex reveals that individuals are deeply social. People want to develop and maintain tight bonds to society by adhering to group norms, identifying with the group through social roles, and interacting with community (Kluver, Frazier, and Haidt 2014). However, shift work, can make developing strong bonds to society and family difficult, which can lead to stress.

At the social level, shift workers are frequently out of phase with society because part of the shared reality of American life is the understanding that the normal hours for paid work are daytime hours (Silva-Costa 2015). The idea that normal working hours are day hours is supported and reinforced by a variety of institutions such as schools, medicine, and civic activities. Most communities are oriented to support day schedules, which is reflected in that fact that businesses, recreational, social, and other facilities are primarily available during day-time hours (i.e., 9am to 5pm) (Dunham 1977; Silva-Costa 2015). Consequently, shift work can lead to diminished integration in society and social marginalization due to an inability to engage in typical community activities and responsibilities in the home (Silva-Costa 2015; Vogel et al.

2012). Many of the problems associated with shift work may be more closely related to living out of phase or being less integrated with the broader society, rather than to adjustment to changes in circadian rhythms (Hendrix 2016; Tuttle 2012; Vogel et al. 2012).

For example, studies show that compared to non-shift workers, shift workers spend less time with family, are less close, and there are more conflicts in the home (Barnes-Farrell et al. 2008; Hendrix 2016; Tuttle 2012; Wöhrmann 2020). Likewise, shift workers are more likely to be dissatisfied with their work-life balance than regular day workers and are more likely to suffer from role overload (Williams 2008). The lack of integration in society and difficulties with work-life balance are chronic stressors that can impact shift workers' mental and physical health. Shift workers frequently complain of irritability, nervousness and anxiety, and greater difficulties in family and social life compared to non-shift workers (Costa 2016). In short, to achieve optimal integration, one must find balance between engaging in shift work and being integrated with family and community. Shift work can be particularly hard on adults in midlife as they try to balance family and work responsibilities, which may be even more challenging for shift workers. Within the context of homo duplex, the imbalance between the individual and society can lead to stress, disturbed sleep, and poor health.

Sleep Duration and Sleep Quality as Psychosocial Resources

Psychosocial resources, the second component of the stress process, serve to change the situation from which stressors arise, help manage the meaning of stress, and keep symptoms of stress within manageable bounds (Pearlin 1981). Also referred to as mediators and/or moderators, psychosocial resources help explain the relationship between stress and health (Aneshensel 2015). Specifically, these resources serve as protective barriers that weaken or exacerbate (i.e., moderate) or buffer (i.e., mediate) the effect of stressors on mental and physical

health. Common psychosocial resources include coping behaviors, social support, mastery, and self-esteem. This study focuses on coping, which refers to the cognitive and behavioral strategies that people use to avoid or minimize the effects of stress exposure (Pearlin 1989). Stressors, such as shift work, can damage health by eroding psychosocial resources that are used to reduce the harmful effects of stress (Aneshensel and Mitchell 2014; Pearlin 1989). It is important to note that coping behaviors can also be negative and strengthen the effects of stress exposure. In this study, sleep duration is conceptualized as psychosocial resource (i.e., coping behavior) that may mediate the effect of shift work on depressive symptoms and shift work, respectively. Likewise, although poor sleep quality is characterized as a secondary stressor, Figure 1 demonstrates that it also acts as a mediator within the stress process.

There are several studies that have examined sleep as a mechanism that may explain various biopsychosocial pathways to health outcomes. For example, using the Pittsburgh Sleep Quality index, Uchino et al. (2019) found that sleep quality mediates the association between self-rated health and inflammatory markers. There is also evidence that disturbed sleep mediates the association between low network support and myocardial infarction in women (Nordin, Knutsson, and Sundbom 2008). When examining the association between various aspects of work and mental and physical health, disparate dimensions of sleep are shown to be mediators. For instance, Nakata (2011) found that the association between depressive symptoms and longer work hours was mediated by sleep deprivation, rather than directly linked to work schedules. Sleep quality was also found to be a mediator between night shift work and health related quality of life and shift work and depressive symptoms (Lim et al. 2020; Park et al. 2019).

Shift Work, Depressive Symptoms, and Self-Rated Health

Outcomes are the final component of the stress process and refer to various health consequences or manifestations of stress (Pearlin 1981). Although mental health outcomes are most typically studied, the stress process model is well-suited to examine other aspects of health and well-being (Goode et al. 1998; Minnotte et al. 2018; Pearlin and Bierman 2013; Zehner et al. 2014). Depressive symptoms and self-rated health are the outcomes of this study. The findings on the effects of shift work and depressive symptoms are mixed. Driesen (2011) found that shift work did not have a large impact on the development of depressed mood. However, other studies show that depressive symptoms are higher among shift workers compared to non-shift workers (Lee et al. 2016; Park et al. 2019; Perry-Jenkins 2007). There is also evidence that sleep problems in shift workers are associated with depressive symptoms and poor sleep quality (Booker et al. 2018; Driesen et al. 2011; Nordin et al. 2008; Skouteris et al. 2009). While fewer studies examine self-rated health, there is evidence that nonstandard work schedules and long and short work hours are associated with poor self-rated health (Cho 2018; Jeon et al. 2020; Magee et al. 2011; Shankar et al. 2011).

SUMMARY AND HYPOTHESIS

Shift work is a stressor that can directly affect health. However, this effect may be indirect, operating through secondary stressors and psychosocial resources. As such, this study uses the stress process model to examine the association between shift work and depressive symptoms and shift work and self-rated health. It also investigates whether sleep duration and sleep quality mediate these associations. The following hypotheses are examined:

H1 (a-b): Working a non-day shift is positively associated with, **a)** depressive symptoms and **b)** poor health compared to working a day shift.

H2 (a-b): There is a smaller association between working a non-day shift and **a)** depressive symptoms and **b)** poor health due to the mediating effects of the number of hours slept during the week.

H3 (a-b): There is a smaller association between working a non-day shift and **a)** depressive symptoms and **b)** poor health due to the mediating effects of the number of hours slept during the weekend.

H4 (a-b): There is a smaller association between working a non-day shift and **a)** depressive symptoms and **b)** poor health due to the mediating effects of insomnia.

DATA AND MEASURES

Data

The data for this study are from the National Longitudinal Survey of Youth 1979 cohort (NLSY79). The NLSY79 is a nationally representative sample of non-institutionalized Americans. The U.S. Bureau of Labor Statistics sponsored data collection and it is managed by the Center for Human Resource Research (CHRR) at The Ohio State University (BLS 2019b). Data was collected annually from 1979 to 1994 and biennially thereafter. The original sample consists of 12,682 respondents age 14 to 22. African Americans, Hispanics, and economically disadvantaged Whites are oversampled. Two health modules were conducted when respondents turned 40 and 50. These modules contain information about mental and physical health conditions. In the 50-health module respondents were asked about sleep duration and sleep quality. The 40-health module consists of waves 1998-2006, and the 50-health module consists of waves 2008-2016. The dependent variables in this study are from the 50-health module and all control variables are from a wave prior to the respondent turning 50 years old. The sample size is 5,652.

Measures

The dependent variables in this study are depressive symptoms and self-rated health. Depressive symptoms are assessed using a 7-item version of the Center for Epidemiologic Studies Depression Scale (CES-D). Respondents are asked, "How often in the past week did you: 1) not feel like eating; 2) have trouble keeping your mind on what you were doing; 3) feel depressed; 4) feel everything was an effort; 5) experience restless sleep; 6) feel sad; and 7) feel like you could not get going." The responses range from 0 (rarely/none) to 3 (most/all of the time). Each item was summed to create a scale of depressive symptoms ranging from 0 to 21, with higher values indicating more depressive symptoms. A prior measure of depressive symptoms from the 40-health module is held constant in the following analysis. Both measures are logged in the analyses to correct for skewness. The alpha reliability for depressive symptoms at age 50 is .80 and at age 40 is also.80. Self-rated health, the other dependent variable, is a single-item measure in which individuals rate the status of their health on a five-point scale ranging from excellent to poor. Respondents are asked the following question, "In general would you say your health is 1) poor, 2) fair, 3) good, 4) very good, and 5) excellent." A binary variable indicating poor (poor and fair) and good health (good, very good, and excellent) was created. A prior measure of self-rated health from the age 40-health module is included in the analysis.

The explanatory variable for this study is shift work. Respondents were asked "At your current job do you usually work a regular daytime schedule or some other schedule." A dummy variable was created to represent respondents who work a regular day shift (1=yes, reference) and a non-day shift (1=yes). Sleep duration and sleep quality (i.e., insomnia) are mediators for this study. To gauge sleep duration, respondents were asked:1) "How much sleep (i.e., hours) do you get on weekdays/workdays?"; and 2) "How much sleep (i.e., hours) do you get on weekends/non-workdays?" Insomnia was assessed with four questions: 1) "How often do you

have trouble falling asleep;" 2) "How often do you wake up during the night and have trouble falling back asleep;" 3) "How often do you wake up too early in the morning and are unable to get back to sleep;" and 4) "How often do you feel unrested during the day no matter how many hours of sleep you've had?" Responses ranged from 1) almost always, 2) often, 3) sometimes, and 4) rarely or never. Each item, except for item 4, was reversed coded to indicate more severe insomnia. The items were added to create an index of insomnia ranging from 4 (low) to 16 (high). The alpha reliability is .82.

Based on extant studies, I control for race/ethnicity, gender, marital status, residence, number of children under age 17 in the home, number of jobs, education, and income. Race/ethnicity is coded as Black (1=yes), Hispanic (1=yes) and the omitted category is Whites (1=yes). Gender is a dummy variable of female (1=yes) and male (reference). Marital status is coded as married (1=yes, reference) and not married. Residence is a dummy variable coded as urban (1=yes) and rural (reference). The number of children under age 17 in the home is categorized as no children in the home (reference) and one or more children in the home (1=yes). The number of jobs is coded as one job (reference) and two or more jobs (1=yes). Education is a categorical variable comprised of high school or less (1=yes), 1 to 4 years of college (1=yes) and 5 or more years of college (1=yes); the last two categories are merged as the reference group. Income is a continuous measure that is logged to correct for skewness.

ANALYTIC STRATEGY

Ordinary least squares regression (OLS) is used to examine the relationship between shift work and depressive symptoms, while logistic regression is used to investigate the association between shift work and self-rated heath. The analytic strategy for this study is a mediation

analysis. The mediating model proposed by Baron and Kenny (1986) states that there should be causal effects between all the included variables (i.e., independent, dependent, and mediating variables). As such, the study occurs in three steps. In step one, the association between shift work and sleep duration and sleep quality was confirmed by regressing sleep during the week, sleep during the weekend, and insomnia on non-day shift work, respectively. For conciseness, step one is not shown, but is available upon request. Step two estimates the association between depressive symptoms and non-day shift work. In step three, each sleep variable is added to the model separately. A full model that contains all three sleep variables is also estimated and a final determination of mediation was assessed based on the full model. The analysis for the association between shift work and self-rated health proceeded according to the same steps as the depressive symptoms analysis. For each analysis, I control for a prior measure of depressive symptoms and self-rated health, respectively. Controlling for these previous measures provide more robust tests of effects by accounting for prior levels of the dependent variable, which includes the effects of omitted variables (Parcel and Menaghan 1993; Christie-Mizell 2003). Sobel tests were performed to confirm full or partial mediation (Sobel 1982).

RESULTS

Table 1 shows descriptive statistics for the study sample. The mean for depressive symptoms at age 50 is 3.29 (log 1.08) and the mean at age 40 is 2.77 (log .96). About 13% of the sample report poor health at age 50 and 7% report poor health at age 40. Nineteen percent of the sample work a non-day shift and 81% work a regular day schedule. On average, respondents get 6.67 hours of sleep on weekdays and 7.33 hours of sleep on the weekend. The mean for insomnia is 6.70. Thirteen percent of the sample are Black, 6% Hispanic and 81% White. Forty-seven

percent of the sample are female. Thirty-five percent of the sample are not married and 53% reported having one or more children in the home. When looking at residence, 73% of respondents live in an urban area. Forty-five percent have a high school degree or less, 40% have one to four years of college, and 15% have five or more years of college. The log mean of income is 9.79. Finally, 29% of the sample report working two or more jobs.

Table 1. Weighted Means, Proportions, and Standard Deviations (SD) for All Study Variables at Age 50. National Longitudinal Survey of Youth 1979, (*N*=5,652).

Variables	Mean/Percent	S.D.
Dependent Variables		
Depressive Symptoms 0 (low) to 21 (high)	3.29	4.62
Depressive Symptoms (logged)	1.08	1.02
Poor health (1=yes) [a]	.13	—
Explanatory Variable		
Non-Day Shift (1=yes)	.19	—
Day Shift (1=yes)	.81	—
Mediators/Moderators		
Number hours sleep weekdays	6.67	1.42
Number house sleep weekend	7.33	1.62
Insomnia 4(low) to 16 (high)	6.70	3.60
Control Variables		
Black (1=yes)	.13	—
Hispanic (1=yes)	.06	—
White	.81	—
Female (1=yes)	.47	—
Not married (1=yes)	.35	—
Children in home (1=yes)	.53	—
Urban Residence (1=yes)	.73	—
Highschool or less (1=yes)	.45	—
College 1 to 4 years (1=yes)	.40	—
College Plus 5 or more years (1=yes)	.15	—
Income (logged)	9.79	3.44
Two or more jobs (1=yes)	.29	—
Depressive Symptoms Age 40 0 (low) to 21 (high)[a]	2.77	4.13
Depressive Symptoms Age 40 (logged)	.96	.99
Poor Health Age 40	.07	—

[a]Poor health is fair or poor health.

Table 2 shows the results of the mediation analysis of depressive symptoms regressed on, shift work, sleep duration, and sleep quality. Model 1 shows that working a non-day shift is associated with increased depressive symptoms (b = .078, p <.01) compared to working a regular

day schedule. Depressive symptoms at age 40 is positively associated with depressive symptoms at age 50 (b = .360, p <.001). Compared to Whites, Blacks (b = -.069, p <.05) and Hispanics (b = -.127, p <.01) experience decreased depressive symptoms. Men (b = -.176, p <.001) have fewer depressive symptoms compared to women and income (b = -.036, p <.001) is also negatively associated with depressive symptoms. Respondents who are not married (b = .120, p <.001) have increased depressive symptoms compared to those who are married. Having a high school degree or less (b = .043, p <.05) is associated with increased depressive symptoms compared to those with 1 to 4 years of college or 5 years or more of college. Respondents who report two or more jobs (b = .063, p <.01) experience increased depressive symptoms compared to those with only one job. Model 2 shows that there is a negative association between hours of sleep during the week (b = -.142, p <.001) and depressive symptoms. Working a non-day shift is not significantly associated with depressive symptoms. There is little change in coefficients for the controls when compared to the previous model. Specifically, depressive symptoms at age 40, (b = .339, p <.001), respondents who are not married (b = .112, p <.001) compared to those who are married, and respondents with two or more jobs, (b = .060, p <.01) compared to those with one job, all remain positively associated with depressive symptoms. Similarly, Blacks (b = -.108, p <.001), Hispanics (b = -.130, p <.01), and men (b = -.194, p <.001) have decreased depressive symptoms compared to Whites and women, respectively. Income (b = -.036, p <.001) is still negatively associated with depressive symptoms. Hours of sleep on the weekend is added in Model 3. Working a non-day shift (b = .065, p <.05) is positively associated with depressive symptoms compared to working a day shift. Increased hours of sleep on the weekend (b = -.094, p <.001) is associated with a decrease in depressive symptoms. The findings for the covariates in Model 3 are similar in both significance and direction of effect when compared to Model 2. In

Model 4, working a non-day shift is not significantly associated with depressive symptoms. However, as insomnia worsens, there is a .114 increase (p <.001) in depressive symptoms. Unlike the previous models, there is no significant difference between Blacks and Whites in Model 4; the results for the other controls are similar to the findings in Model 3. Model 5 is the full model that contains all study variables. First, hours of sleep during the week (b = -.044, p <.001) is negatively associated with depressive symptoms. Insomnia is also significant (b = .107, p <.001), and positively associated with depressive symptoms. The lack of significance of working a non-day shift is indicative of full mediation by hours of sleep during the week (S = 3.35, p <.001) and insomnia (S = 2.71, p <.001). In Model 5, depressive symptoms at age 40 (b = .266, p <.001) is positively associated with depressive symptoms at age 50. Hispanics (b = -.097, p <.05) and men (b = -.117, p <.001) experience decreased depressive symptoms compared to Whites and women, respectively. Income remains negatively associated with depressive symptoms (b = -.022, p <.001). Compared to those who are married, respondents who are not married (b = .092, p <.001) experience increased depressive symptoms and working two or more jobs (b = .054, p <.05) is also associated with increased depressive symptoms.

Table 3 displays results of the mediation analysis of self-rated health regressed on non-day shift work, sleep duration, and sleep quality. In Model 1 respondents who work a non-day shift have 54% increased odds of poor health. If respondents reported poor health at age 40, they have 644% increased odds of reporting poor health at age 50. Compared to those who are married, respondents who are not married have 41% greater odds of poor health. Having a high school degree, compared to 1 to 4 or 5 or more years of college, increase the odds by 60% of having poor health. Those with higher incomes have 10% lower odds of having poor health. In Model 2 working a non-day shift results in 46% increased odds of reporting poor health.

However, increased sleep during the week decreases the odds of poor health by 21%. Like the previous model, poor health at age 40, respondents who are not married, and having a high school degree or less increase the odds of poor health by 624%, 38%, and 56%, respectively. People with higher incomes have 11% lower odds of poor health. Model 3 shows that working a non-day shift increases the odds by 50% of reporting poor health when sleep during the week is added to the model. However, increased sleep on the weekend reduces the odds of poor health by 18%. The findings for the covariates in Model 3 are similar to the results in Model 2. Model 4 shows that working a non-day shift increases the odds of poor health by 45%, while insomnia increases the odds of poor health by 21%. There is one change in controls that is worth noting in Model 4; compared to Whites, Blacks have 31% increased odds of poor health. There were no significant findings for Blacks in previous models. In the full model, Model 5, all three sleep variables are included. Compared to day shift workers, non-day shift workers have higher odds (44%) of reporting poor health. Hours of sleep during the week and on the weekend are no longer significant. However, insomnia remains significant and increase the odds of poor health by 20%. Poor health at age 40 increases the odds of poor health at age 50 by 563%. Blacks still have 30% increased odds of reporting poor health compared to Whites. Respondents who are not married have 32% increased odds of poor health compared to those who are married and having a high school degree or less increases the odds of poor health by 51% compared to college educated respondents. Finally, higher income reduces the odds of poor health by 8%.

Table 2. Logged Depressive Symptoms at Age 50 Regressed on Sleep Variables NLSY79 Cohort, (*N*=5,652).

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	b	se	b	se	b	se	b	se	b	se
Work non-day shift[a]	.078**	.027	.046	.026	.065*	.027	.047	.025	.040	.025
Number hours sleep weekdays			-.142***	.008					-.044***	.010
Number hours sleep weekends					-.094***	.007			.001	.009
Insomnia							.114***	.003	.107***	.004
Depressive symptoms (Age 40)	.360***	.013	.339***	.012	.352***	.012	.267***	.012	.266***	.012
Black[b] (1=yes)	-.069*	.033	-.108***	.032	-.091**	.032	-.044	.029	-.057	.029
Hispanic[b] (1=yes)	-.127**	.044	-.130**	.043	-.120**	.044	-.094*	.040	-.097*	.040
Male[c] (1=yes)	-.176***	.021	-.194***	.021	-.188***	.021	-.108***	.020	-.117***	.020
Not married[d] (1=yes)	.120***	.024	.112***	.024	.110***	.024	.093***	.022	.092***	.022
Children in home[e] (1=yes)	.021	.023	.003	.022	.016	.022	.031	.020	.025	.020
Urban residence[f](1=yes)	.007	.024	-.000	.024	.010	.024	.007	.022	.005	.022
High school or less[g] (1=yes)	.043*	.022	.027	.021	.027	.021	.016	.020	.013	.020
Income (logged)	-.036***	.004	-.036***	.004	-.032***	.004	-.021***	.003	-.022***	.003
Two or more jobs[h] (1=yes)	.063**	.023	.060**	.023	.056*	.023	.054**	.021	.054*	.021
Constant	1.086***	.049	2.105***	.077	1.776***	.072	.252***	.050	.608***	.090
R^2	.19		.23		.21		.33		.34	

*p <.05; **p < .01; ***p < .001.

[a] Working day shift is the reference group.

[b] Whites are the reference group.

[c] Female is the reference group.

[d] Married is the reference group.

[e] No children in the home is the reference group.

[f] Rural residence is the reference group.

[g] College (1 to 4 years) and College Plus (5 or more years) are the reference groups.

[h] Working no or one job is the reference group.

Table 3. Poor Health at Age 50 Regressed on Sleep Variables NLSY79 Cohort, (*N*=5,652).

	Model 1		Model 2		Model 3		Model 4		Model 5	
Variables	*Odds Ratio*	*95% CI*	*Odds Ratio*	*95% CI*	*Odds Ratio*	*95% CI*	*Odds Ratio*	*95% CI*	*Odds Ratio*	*95% CI*
Work non-day shift[a]	1.54***	(1.22, 1.95)	1.46**	(1.15, 1.85)	1.50***	(1.18, 1.90)	1.45**	(1.13, 1.85)	1.44**	(1.13, 1.84)
Sleep weekdays			0.79***	(0.73, 0.85)					1.00	(0.90, 1.11)
Sleep weekends					0.82***	(0.77, 0.89)			0.97	(0.89, 1.07)
Insomnia							1.21***	(1.18, 1.25)	1.20***	(1.17, 1.24)
Poor Health (T1)	7.44***	(5.73, 9.67)	7.23***	(5.52, 9.44)	7.20***	(5.52, 9.39)	6.64***	(5.02, 8.77)	6.63***	(5.02, 8.75)
Black[b] (1=yes)	1.22	(0.99, 1.50)	1.15	(0.93, 1.42)	1.18	(0.95, 1.45)	1.31*	(1.05, 1.62)	1.30*	(1.04, 1.61)
Hispanic[b] (1=yes)	1.05	(0.81, 1.36)	1.05	(0.81, 1.36)	1.07	(0.83, 1.39)	1.15	(0.88, 1.51)	1.15	(0.88, 1.51)
Male[c] (1=yes)	0.91	(0.75, 1.11)	0.89	(0.73, 1.09)	0.91	(0.74, 1.11)	1.08	(0.88, 1.33)	1.08	(0.87, 1.32)
Not married[d] (1=yes)	1.41**	(1.14, 1.75)	1.38**	(1.11, 1.72)	1.38**	(1.11, 1.71)	1.32*	(1.06, 1.65)	1.32*	(1.05, 1.65)
Children in home[e] (1=yes)	0.81	(0.66, 1.01)	0.78*	(0.63, 0.97)	0.80*	(0.64, 0.99)	0.81	(0.65, 1.01)	0.80	(0.64, 1.00)
Urban residence[f](1=yes)	1.04	(0.82, 1.32)	1.04	(0.82, 1.33)	1.06	(0.83, 1.34)	1.03	(0.81, 1.31)	1.03	(0.81, 1.31)
High school or less[g] (1=yes)	1.60***	(1.30, 1.97)	1.56***	(1.26, 1.92)	1.54***	(1.25, 1.90)	1.52***	(1.22, 1.88)	1.51***	(1.22, 1.87)
Income (logged)	0.90***	(0.87, 0.91)	0.89***	(0.87, 0.92)	0.90***	(0.88, 0.92)	0.92***	(0.89, 0.94)	0.92***	(0.89, 0.94)
Two or more jobs[h] (1=yes)	0.90	(0.72, 1.12)	0.88	(0.71, 1.11)	0.88	(0.70, 1.10)	0.86	(0.68, 1.09)	0.86	(0.68, 1.08)

*p <.05; **p < .01; ***p < .001.

[a] Working day shift is the reference group.

[b] Whites are the reference group.

[c] Female is the reference group.

[d] Married is the reference group.

[e] No children in the home is the reference group.

[f] Rural residence is the reference group.

[g] College (1 to 4 years) and College Plus (5 or more years) are the reference groups.

[h] Working no or one job is the reference group.

DISCUSSION AND CONCLUSIONS

The goal of this study was to examine the association between shift work and depressive symptoms and shift work and self-rated health. The findings show support for several hypotheses. First, I found support for Hypothesis 1b which states that working a non-day shift is positively associated with poor health compared to working the day shift. This finding shows that people who work a non-day shift have worse self-assessment of health compared those working during standard day-time hours. Several factors may contribute to reporting poor health among workers with non-standard day-time jobs. For example, many industries that require non-day shift work can be more physically demanding and increase the risk of exposure to occupational hazards (Costa 2020). Working under such conditions can cause physiological wear and tear on the body. Moreover, research shows that shift workers, especially those working the night shift, have increased risk for workplace injury, due to the negative effects of shift work on sleep (i.e., increased on the job sleepiness) (Kecklund and Axelsson 2016). Often, jobs that require shift work offer low wages, lack of schedule control, and provide limited access to health and family benefits (Hendrix 2016); all of these factors can cause stress, which negatively impacts health. The lack of access to health benefits not only limits access to healthcare and increases the risk of poor health, but also prevents assistance with harmful health behaviors, such as smoking, that can develop because of shift work (KivimÄki et al. 2001). Finally, these results support previous research that demonstrate shift work is associated with poor self-rated health (Cho 2018).

The findings also show that the effect of shift work on self-rated health is partially, mediated by insomnia. This supports Hypothesis 4b, which states that insomnia mediates the association between shift work and poor health such that the effect is reduced. The effect of

working a non-day shift was reduced by 10% when insomnia was added to the model. Since research shows that shift work can lead to insomnia, there is also theoretical support that insomnia may be a secondary stressor in the stress process framework. Thus, this study provides some evidence that sleep quality is a specific indirect pathway whereby shift work negatively impacts self-rated health. Moreover, research shows the people with disturbed sleep exhibit similar physiological changes as those under stress, exhibiting increased levels of cortisol (Åkerstedt 2006). Increased exposure to cortisol is associated with allostatic load, which can have deleterious effects on health, further increasing shift workers' negative perceptions of health.

Not only is quality sleep essential for daily functioning and physical well-being, but it also has an impact on mental health. Specifically, this study reveals that insomnia fully mediates the effects of working a non-day shift on depressive symptoms, which supports Hypothesis 4a. Evidence for full mediation of the relationship between shift work and depressive symptoms by insomnia is interesting because it appears that any effect that shift-work has on depressive symptoms, is muted if a person has insomnia. Thus, the findings indicate that people are not experiencing symptoms of depression because they work a nonstandard shift; rather, they are depressed because they cannot get quality sleep. In this instance, it is insomnia's role as a secondary stressor that affects depressive symptoms, not shift work.

While the previous findings detail the negative effects of shift work, there is also evidence that sleep duration can be used as a psychosocial resource to the mediate the effects of working a non-standard schedule. I found support for Hypothesis 2a, which states that increased sleep during the week mediates the association between depressive symptoms and working a non-day shift such that there is a reduced effect. In fact, getting more sleep during the week fully

mediates the effects of shift work on depressive symptoms. Shift work negatively affects mental health because it can interfere with workers' ability to engage in activities that occur during day-time hours and it can reduce sleep duration (Chang et al. 2011; Hendrix 2016; Tuttle 2012; Vogel et al. 2012). However, these findings suggest getting more sleep during the week is protective against the effects of shift work on depressive symptoms. Thus, being able to take advantage of the restorative properties of sleep is beneficial for mental health.

Limitations

There are a few limitations to this study. First, it does not capture the reasons why people engage in shift work. While many people engage in shift work because it is the only option available, some people voluntarily work non-standard schedules. Although research shows that shift work can negatively affect family life, people may choose shift work to help with childcare costs and to achieve work-life balance (i.e., unbinding time) (Hendrix 2016; Tausig and Fenwick 2001; Wöhrmann 2020). Future research should investigate why people engage in shift work to better identify which shift work-related stressors impact health. Second, this study could benefit from stronger measures of physical health. Although self-rated health has been shown to predict mortality and can accurately capture people's self-assessment of health, there are questions about the validity of race/ethnic group comparisons of self-rated health, particularly between Mexican Americans and Whites (Erving and Zajdel 2021). There are additional questions about whether self-rated health reflects objective health status and if age changes people's assessment of their health (Layes et al. 2012; Schnittker 2005; Wu et al. 2013; Zajacova 2011). Considering these questions, future research should examine the effects of shift work and sleep on more objective measures of physical health. Finally, this study does not examine whether the effects of shift work vary by occupation. For example, it is important to examine whether there are differences

among people who work shifts in protective services, such as fire and police, transportation, or machine operators, verses those working shifts in health or food services; interestingly, these occupations are gendered, which adds an additional element for further study.

Despite these limitations this study makes three contributions to the literature. First, it incorporates new guiding theoretical frameworks (i.e., social integration and homo duplex) to study the association between shift work and health. Unlike previous research that focus primarily on biophysiological explanations, this study reveals that social factors need consideration. Second, instead of examining the independent effects of shift work and sleep, separately, this study investigates both simultaneously. The inclusion of both shift work and sleep provide further insight about specific mechanisms, which is understudied in the literature. Finally, utilizing longitudinal data helps provide more reliable results than cross-sectional studies.

Conclusion

The 24-7 economy has reshaped the timing of work. Individuals working nonstandard work schedules may face worse mental and physical health compared to those working daytime hours. These effects may be particularly harmful for midlife adults, who are entering a stage of the life course marked by declining health and increased financial responsibility to family and in many instances, aging parents. This study demonstrates that among adults in midlife, shift workers are more likely to assess their health as poor compared to non-shift workers. However, sleep is an important mechanism that provides more nuanced insight about this association. Specifically, while insomnia is a secondary stressor that contributes to poor health and depressive symptoms, increased sleep during the week can protect against the negative effects of shift work on mental health. Considering rapid changes in the global economy that may

increasingly require people to work non-standard schedules, more research is needed to understand the effects of shift work and sleep health on physical, mental, and social well-being.

CHAPTER IV

Disintegration: Labor Force Status, Retirement Transitions, and Sleep Quality in Older Adults

ABSTRACT

The transition to retirement is an important and expected part of the life course. However, changes in labor force status can decrease social integration due to role loss, which can have a negative impact on sleep. Guided by role theory, the life course perspective, and intersectionality this study examines how labor force status and the transition to retirement affect insomnia in older adults. Data used for this study are from waves 2006-2014 of the Health and Retirement Study (*N*=8,556). The results show that older adults who are retired and who transitioned from part-time to retirement experience increased insomnia compared to those working full-time throughout the study period. There is also evidence that race-gender group status moderates the association between labor force status, transitions to retirement, and insomnia for Black and White women. The findings highlight the importance of social integration and intersectional identities to the study of retirement and sleep.

INTRODUCTION

Most changes in sleep patterns occur by age 60 and sleeping disorders are frequently reported in late life (Leggett 2018). One sleep disorder, insomnia, is prevalent among older adults with 40% to 70% reporting difficulty sleeping (Dong et al. 2017; Kaufmann et al. 2016). Insomnia is broadly defined as dissatisfaction with either sleep quantity or sleep quality. It is associated with one or more of the following symptoms: difficulty initiating sleep, difficulty maintaining sleep, frequent awakenings and an inability to return to sleep, and daytime sleepiness (American Psychological Association 2013, Fetveit 2009; Jaussen et. al 2011; Kaufmann et al. 2016). Insomnia is estimated to cost 6.6 billion dollars in direct costs of healthcare utilization, transportation, medications, and loss work productivity (Simpson et al. 2014). It is commonly comorbid with physical and mental health and is linked to increased risk for cardiovascular disease, diabetes, anxiety and depression, cognitive performance, memory, and shorter telomere length in adults aged 70 to 88 (Baglioni et al. 2011; Carroll et al. 2016; Cricco and Foley 2001; Fetveit 2009; Ford and Kamerow 1989; LeBlanc et al. 2007; Li and Gooneratne 2019; Simpson et al. 2014; Sofi et al. 2014). Insomnia is also associated with decreased quality of life, risk for falls, and increased mortality (Brassington 2000; Rodriguez, Dzierzewski and Allessi 2015).

Sleep problems, such as insomnia, are not an inherent part of the aging process because at least 50% of older adults report no sleep disturbances (Brewster, Riegel, and Gehrman 2018). Instead, increased risk of insomnia in older adults is due to environmental, behavioral, medical, and social factors (Chowdhuri, Patel, and Badir 2018). In fact, insomnia is often viewed as a condition of increased physiological activation that arises due to repeated stress exposure

(Nordin 2005). For example, stress induced situations, such as loss of kin and divorce are common causes of insomnia (Roehrs, Zorick, and Roth, 2000). Work-related factors such as work stress, changes in employment, and shift work are two common contributors to insomnia (Henry et al. 2008). For older adults, retirement is an important life course transition that also affects sleep health.

Although retirement, (i.e., the exit from full-time employment accompanied with receipt of a pension or social security) is a normative transition, it is a time of uncertainty (Osborne 2012). Retirement requires a major life adjustment to the loss of a work-life structure and the building of a retirement structure (Osborne 2012; Van Solinge and Henkens, 2008). Moreover, if the work role is a person's primary identity, loss of this role can cause psychological distress and anxiety, which are factors that can disrupt sleep (LeBlanc 2015; Osborne, 2012; Vo et al. 2015). Findings from the few studies examining the effects of retirement on sleep are mixed. On the one hand, research shows that retirement is accompanied by life changes that increase time availability, which results in longer sleep duration, later bedtimes, later wake times, and a reduction in sleep problems in older adults (Ekerdt 2010; Hagen et al. 2016; Myllyntausta 2017). On the other hand, retirement is associated with higher prevalence of sleep disturbances, premature awakening, and insomnia (Henry et al. 2008; Marquiáe et al. 2012; Myllyntausta 2018; Vahtera et al. 2009).

The goal of this study is to examine how exiting full-time work and transitioning to retirement affects insomnia in older adults. It also investigates whether race-gender group status moderates this association. This study addresses three gaps in the literature. First, there is limited evidence of the effects of retirement on insomnia in late life. While there is a plethora of studies that examine the effects of retirement on physical and psychological health, few studies focus on

the connection between retirement and sleep (Vahtera et al. 2009). Although increasing age is associated with diminished sleep quality, it is important to examine retirement as a social factor that affects insomnia in older populations. Second, this study incorporates an intersectional approach to the study of sleep. Research shows that there are differences in sleep with regards to race and gender in older adults (Baldwin 2010; Hale 2006; Lichstein 2016; Petrov 2016). However, there is a paucity of research on how the combined or interactive effects of race and gender affect sleep in late life. Previous studies are cross-sectional and use localized samples. This study employs longitudinal, nationally representative data.

BACKGROUND AND THEORY

Role Theory, the Life Course, and Retirement

The life course can be depicted as a series of movements in and out of various roles. For example, as people age, they can transition from parents to empty nesters, married to divorce or widowhood, and from employment to retirement. The study of roles and role transitions are pivotal to understanding the aging process because they help define one's sense of passage through the life course (Ferraro 2001; George 1993). Roles provide normative guidance to a person occupying a given social status and therefore help shape expectations of the life course as roles are added and relinquished. In fact, Riley, Johnson and Foner (1972) defined aging as "involving the accumulation of experience through participation in a succession of social roles" (10). Retirement is a life transition because it denotes exit from one role and entry into another (Wheaton 1990). However, the transition out of work represents the loss of a formal role (i.e., worker) and the transition into an informal tenuous role that lacks clear social functions (Rosow 1985). The entry into this informal role can cause stress, anxiety, and depression since older

adults may be unsure about where they fit in society and experience declining social integration. Thus, within the context of role theory, the retirement transition is less a transition 'to' a new role, than a transition 'from' a career that is central in terms of one's identity and status (Moen et al. 2000).

One of Durkheim's ([1897]1951) lasting contribution to sociology is his revelation that social dynamics give rise to individual pathology (Berkman and Glass 2000). Specifically, Durkheim ([1897]1951) posited that social integration, which refers to people's attachment to society through social roles, is an important concept that can be used to study both individual behavior and social structure, as well as provide a framework for the sociological analysis of health. According to Durkheim ([1897] 1951), ties to institutions through social roles provide norms and obligations that reduce alienation from society. However, while retirement is an expected life course transition, it can disrupt social integration in older adults. For Durkheim, ([1897]1951) disruptions, albeit originally characterized as large-scale societal crisis, weakens social control, integration, and norms that help regulate individual behavior. The transition to retirement, while occurring on an individual level, is a disruption for older adults, that can be beneficial or detrimental to social integration and subsequently sleep.

Industrialized society is theoretically conceived as a 'work society' (Kohli 1988; Moen 2012). This characterization arises from the fact that much of social life is structured around work. More specifically, work not only provides the economic basis of society, but it is also the foundation of societal values and the identity of its members (Kohli 1988; Moen 2012; Post et al. 2013). Paid work is a master status the provides a framework for organizing and integrating every aspect of social existence across the life course (Moen 2016). Work provides a source of

income, skill development, daily routines, information acquisition, and social relations. It also shapes identities, values, sense of mastery, and current and future expectations (Moen 2016). For many adults, paid work is a major, if not, the principal source of purposive activity, social relations, independence, identity, and self-respect (Pillemer and Glasgow 2000). Since jobs provide routines, rituals, and role identity, retirement from one's career restructures not only life patterns but also self-conceptions and meanings (Moen et al. 2000). Retirement from paid work can cut individuals off from participation in the broader society and deteriorate the sense of community that paid work provides. Thus, for many individuals, the retirement transition is a time of ambiguity in terms of both identity and status (Damman, Henkens, and Kalmijn 2015; Moen et al. 2000; Pietilä et al. 2020; Wang, Henkens and van Solinge 2011). Retirement is an objective life course transition and a subjective developmental and social psychological transformation in identity, expectations, preferences, and meaning (Dannefer 1984). Both objective and subjective components can affect psychological and physiological health, including sleep.

Retirement and Sleep

The increased uncertainty associated with the transition to retirement can create psychological distress and anxiety, which may give rise to poor sleep quality. Of course, feelings about retirement vary depending on how long one has been retried or whether retirement was voluntary or involuntary. Nevertheless, research shows that even in the presence of a wanted or 'on-time' retirement, the transition from the long-held role of worker can have negative psychological effects that require adjustment to a new, but uncertain social role (Moen et al. 2000; Rosow 1985). Moreover, with increased economic insecurity, for many older adults, retirement is accompanied by worries about pensions and having enough money to last

throughout retirement considering the increase in life expectancy (Auerbach et al. 2017; Dudel and Myrskylä 2017).

In addition to psychological distress and anxiety, which can disrupt sleep, Durkheim's ([1914] 2005) concept of homo duplex also provides insight about how retirement can affect sleep in late life. Homo duplex refers to the dual nature of people where there is a constant need to find balance between one's obligation to society, via social roles, and the need for self (Durkheim's ([1914] 2005; Paoletti 2012). Within the context of homo duplex, working adults' sleep behavior is largely regulated by the institution of work. However, retired individuals are no longer subject to work schedules that help regulate and/or influence the quantity and quality of sleep (Zantinge et al. 2014). Retirement provides more opportunity for agency in sleep behavior (i.e., satisfy the individual need for sleep) and research supports this perspective.

For example, retired adults have better sleep duration and quality compared to their working counterparts (Garefelt et al. 2020; Myllyntausat et al. 2017, 2018). While this demonstrates a positive aspect of retirement and that the loss of the worker role can be beneficial to sleep, there is also evidence that the transition to retirement can negatively affect sleep health. Studies show that retirement is associated with sleep disturbances such as premature awakenings and an increase in nonrestorative sleep (Henry et al. 2008; Marquiáe et al. 2012; Myllyntausta 2018; Vahtera et al. 2009). Likewise, lack of work schedules can interrupt important time cues (i.e., zeitgebers) for circadian rhythms, that can contribute to insomnia (Patel, Steinberg, and Patel 2016). Ancoli-Israel et al. (2008) also found that early awakenings may cause frequent naps, which further accentuates the problem of insomnia during the night. Women report more insomnia compared to men (Brewster et al. 2018; Grander 2017; Hale 2006). While often attributed to physiological changes due to hormones and menopause, gender differences

in insomnia may also be the result of sociological factors that influence women's place in society and in the family (Dzaja et al. 2005). Specifically, the gendered nature of women's roles and responsibilities impinge upon sleep quality; and transitions such as retirement contribute to the worsening of sleep disturbances (Hislop and Arber 2006).

There are also racial differences in insomnia, but the findings are mixed. On the one hand, studies show that Blacks report more difficulty falling asleep and poor-quality sleep compared to whites (Baldwin et al. 2010; Lichstein 2016; Petrov 2016; Turner 2016). Hispanics have increased rapid eye movement (REM) compared to Asians, Blacks, and Whites, which may be associated with increased risk for depression and subsequently sleep disturbance (Baldwin 2010). There are also intragroup differences among Hispanics such that Mexican-born immigrants have decreased risk of insomnia compared to non-Mexican Hispanic immigrants and U.S.-born Mexican Americans (Hale et al. 2010, 2011; Sinziana and Seicean 2010). Severity of insomnia is more pronounced among older Hispanics compared to their White counterparts (Kaufmann et al. 2016). On the other hand, research shows that the prevalence of insomnia is higher in older Whites compared to Blacks (Petrov 2016; Lichstein 2016). There is also evidence that minority groups, in general, are less likely to report insomnia, nonrestorative sleep, and daytime sleepiness compared to Whites (Grander 2017). These racial/ethnic differences in insomnia can be attributed to higher rates of unemployment, less earnings, increased poverty, lower education, and increased food insecurity among Blacks and Hispanics compared to their White counterparts (Hale 2006; Pager and Shephard 2008).

Intersectionality and Sleep in Late Life

A central tenant of role theory and the life course perspective is that status characteristics such as race/ethnicity and gender influence aging and transitions in the life course. There is

ample evidence that aging does not affect men and women the same; rather differences are due to divergent roles and responsibilities in earlier life that remain in late life (Arber, Davidson and Ginn 2003; Russell 2007). Employment and retirement are also gendered and racialized in ways that create differences (Beutell et al. 2020). For example, the transition to retirement can be particularly difficult for men, whose identities are shaped by their jobs and societal characterization of men as the breadwinner of the home (Antonovsky and Sagy, 1990). Similarly, the previous section demonstrates that these statuses also create differences in sleep health in older adults. While insightful, few studies using the life course perspective examine the racialized and gendered experience of older adults as interlocking forms of oppressions (Ferrer et al. 2017). This gap represents a missed opportunity for a more integrated analysis of the interplay between identity categories, individual chronological life events, and the impact of institutions and policies that come to shape identities over a lifetime (Ferrer et al. 2017). In short, there is a lack of intersectional theory in aging research.

Intersectionality highlights the importance of examining the multiplicative effects of several social statuses on health instead of examining these effects separately (Choo and Ferree 2010, Collins and Bilge 2020). In the context of intersectionality theory, examining these statuses separately obfuscates their intersecting consequences and essentializes race/ethnicity and gender (Brown et al. 2016). As an analytic tool, intersectionality does not view categories such as race/ethnicity, class, and gender as discrete or mutually exclusive entities. Rather, these categories are inextricably linked together, and while often invisible, these intersecting dimensions affect all aspects of the social world (Collins and Bilge 2020). Intersectionality reveals privileges and disadvantages inherent in one's social location in society (Hulko 2009). When applied to older ages, an intersectional perspective elucidates the complex ways in which

people's life experience emerge from the interconnection between various categorical memberships within systems of inequalities (Calasanti 2018).

The transition to retirement within a life course perspective represents a normative, on-time transition governed by broader social factors. Nevertheless, this focus ignores that transitions differ with respect to intersectional identities (Fuller-Iglesias et al. 2016). In other words, what is expected or normative for one group may not be for another. For example, in the United States, national pension schemes tend to be based on White, middle class, heterosexual men's occupations and patterns of work that assume careers in private industry and unpaid support from women at home (Calasanti and King 2015). However, the transition to retirement for Black and Hispanic men, and subsequent pension income, may differ due to a career trajectory replete with low pay, unemployment, lack of promotion and workplace discrimination.

Similarly, women as a group may have lower incomes due to interrupted career trajectories where they care for children and parents and increased likelihood of employment in low-wage jobs; however, the interactive effects of race and gender exacerbates this issue for Black and Hispanic women (Calasanti and Giles 2018). For instance, unlike White women, Black women have had to work for pay for longer periods and are unable to stay at home due to racial discrimination that limits employment for Black men (Calasanti and Giles 2018). Black women also get paid less than White women throughout their work careers and have worse finances in older age despite higher participation in the workforce (Federal Interagency Forum on Aging-Related Statistics 2020). Finally, since White women receive social security benefits based on their husband's employment, they tend to have lower poverty rates in older age compared to Black women (Federal Interagency Forum on Aging-Related Statistics 2020). These complexities (e.g., differences in work trajectories, income, and retirement) also apply to

Hispanic women who are also disadvantaged earlier in the life course due to factors such as acculturation, language barriers, low-wage work, and immigration policies. When looking at late life and the transition to retirement, White men are the most advantaged, followed by White women who earn more than Black and Hispanic men; Black and Hispanic women are the worst (Calasanti 2018). Overall, using an intersectional approach in aging research requires one to ask why some groups age faster than others, why some groups have increased risk for mortality, why some older adults are excluded from full participation in society, and why some groups have better sleep health (Calasanti 2018). In sum, it is important to note that people do not 'age out' of inequalities that exist earlier in life, instead these disparities are compounded in old age.

SUMMARY AND HYPOTHESES

The purpose of this study is to examine how labor force status and transitions to retirement affect insomnia in older adults. It also seeks to determine whether this association varies by race-gender group status. The following hypotheses are proposed:

> **Hypothesis 1 (a-e):** Compared to working full-time **a)** part-time or partially retired, **b)** retired, **c)** not in the labor force, **d)** transitioning from full-time to retired, and **e)** transitioning from part-time or partially retired to retired is associated with increased insomnia.
>
> **Hypothesis 2 (a-e):** Black women who are **a)** part-time or partially retired, **b)** retired, **c)** not in the labor force, **d)** transitioning from full-time to retired, and **e)** transitioning from part-time or partially retired to retired experience increased insomnia compared to White men working full-time.

Hypothesis 3 (a-e): Black men who are **a)** part-time or partially retired, **b)** retired, **c)** not in the labor force, **d)** transitioning from full-time to retired, and **e)** transitioning from part-time or partially retired to retired experience increased insomnia compared to White men working full-time.

Hypothesis 4 (a-e): Hispanic women who are **a)** part-time or partially retired, **b)** retired, **c)** not in the labor force, **d)** transitioning from full-time to retired, and **e)** transitioning from part-time or partially retired to retired experience increased insomnia compared to White men working full-time.

Hypothesis 5 (a-e): Hispanic men who are **a)** part-time or partially retired, **b)** retired, **c)** not in the labor force, **d)** transitioning from full-time to retired, and **e)** transitioning from part-time or partially retired to retired experience increased insomnia compared to White men working full-time.

Hypothesis 6 (a-e): White women who are **a)** part-time or partially retired, **b)** retired, **c)** not in the labor force, **d)** transitioning from full-time to retired, and **e)** transitioning from part-time or partially retired to retired experience increased insomnia compared to White men working full-time.

DATA AND MEASURES

Data

Data for this study are from the Health and Retirement Study (HRS), which is a biennial longitudinal survey of over 7,000 households in the United States. The HRS is funded by the National Institute on Aging and is housed at the Institute for Social Research at the University of Michigan. The Health and Retirement Study, which began in 1992, is a nationally representative

sample of the U.S. population over age 50. Sampling for the study used a multistage area probability design. Black and Hispanic households were oversampled. HRS public release data and RAND HRS data are used in this analysis. This study uses waves 2006 and 2014 (*N*=8,556) where respondents were asked a series of questions related to sleep quality (i.e., insomnia).

Measures

The dependent variable for this study is insomnia (wave 2014), which is adapted from a modified version of the Jenkins Questionnaire (Jenkins 1988). Respondents were asked how often they 1) had trouble falling asleep, 2) had trouble waking too early and not falling back asleep, 3) had trouble waking during the night, and 4) felt rested when they woke up in the morning. Each item, except for 4, was reversed coded to align with higher levels of insomnia. Each symptom of insomnia was assessed on a scale of 0 (rarely or never), 1 (sometimes), and 2 (most of the time.) The four items were summed to create an index of insomnia that ranges from 0 to 8, with higher scores indicating more severe insomnia. The alpha reliability is .65. A prior measure of insomnia from wave 2006 was also created to include in the analysis; the alpha reliability for this measure is .66.

The independent variable in this study is labor force status. This measure is coded to reflect specific labor force categories and the transition to retirement from 2006 to 2014. First, groups were created to represent full-time (reference), part-time (1=yes), partially retired (1=yes), retired (1=yes), and not in the labor force (1=yes). Respondents who reported part-time or partially retired were combined into one group (Hagen 2016, here after referred to as part-time). The category for not in the labor force is comprised of respondents who are unemployed, disabled, and not in the labor force. Next, measures were created to capture various labor force categories and transitions to retirement from 2006 to 2014. Six categories were created. Four

categories represent no change in labor force status between 2006 and 2014: 1) full-time (reference), 2) part-time, 3) retired, and 4) not in the labor force. The next two categories capture transitions to retirement from 2006 to 2014: 1) full-time to retired and 2) part-time to retired. No transitions were created for not in the labor force to retired because this category does not represent active involvement in work.

Based on extant studies, I control for several factors related to both labor force status and insomnia. All control measures are from wave 2006. Gender is measured as female (1=yes) and male (1=yes, reference). Race is categorized as Black (1=yes), Hispanic (1=yes) and White (1=yes, reference). Age is measured in years. Income is measured in thousands of dollars and logged to correct for skewness. Education is a categorical measure represented by less than a high school degree (1=yes), GED or a high school degree (1=yes), and college (1=yes, reference). Marital status is a dummy variable coded as not married (1=yes) and married (reference). I control for self-rated health; respondents were asked to rate their health as: 1 (poor), 2 (fair), 3 (good), 4 (very good), and 5 (excellent). A binary measure was created for poor health (poor and fair) and good health (excellent, very good, and good). Good health is the reference category. Finally, six race-gender groups were also created: Black men, Black women, Hispanic men, Hispanic women, White women, and White men (reference).

ANALYTIC STRATEGY

First, descriptive information was obtained for the study sample (Table 1). Second, ordinary least squares (OLS) regression is used to assess the association between and labor force status, retirement transitions, and insomnia. The analysis also examines moderation by race-gender group status. In the regression analysis, Model 1 regresses insomnia on labor force status,

transitions to retirement, and the control variables. Model 2 is a change model that includes a prior measure of insomnia from 2006. The estimation of a change model provides a more rigorous test of effects in the model by accounting for prior levels of the dependent variable, which, by definition, include the effects of omitted variables (Christie-Mizell, Steelman, and Stewart 2003; Parcel and Menaghan, 1993). Thus, the prior measure of insomnia increases confidence of the effect of labor force status and transitions to retirement on insomnia. The final part of the analysis employs an intersectional perspective by including race-gender group interactions.

RESULTS

Table 1 shows descriptive information for the study sample. The mean for insomnia in 2014 is 2.68 and in 2006 the mean for insomnia is 2.51. When looking at the labor force status categories, 15% of the sample works full-time, 16% are part-time, 59% are retired, and 10% are not in the labor force. Eighteen percent of the sample transitioned from full-time to retired and 11% transitioned from part-time to retired from 2006 to 2014. Five percent of the sample are Black women, 4% Black men, 3% Hispanic men and women, 46% are White women and 39% are White men. The mean age of the sample is 64 years and 20% report poor health. Thirty percent of the sample are not married. With regards to education, 13% have less than a high school degree, 35% have a high school degree or GED and 52% have a college degree. The logged value for income is 10.75 and the mean for income prior to logging to correct for skewness is $80,485 dollars.

Table 2 shows insomnia regressed on all study variables. In Model 1, respondents who are part-time (b = .257, p <.01), retired (b = .471, p <.001) and not in the labor force (b = .397,

p <.01) experience increased insomnia compared to those working full-time. The transition from full-time to retired (b = .220, p <.01) and the transition from part-time to retired (b = .414, p <.001) is positively associated with insomnia compared to those who are full-time continuously. Among the race-gender groups, only White women experience increased insomnia compared to White men (b = .364, p <.001). Compared to those with good health, respondents reporting poor health experience increase insomnia (b = .909, p <.001). Respondents with less

Table 1: Weighted Means, Proportions, and Standard Deviations (SD), Health and Retirement Study Baseline 2006, *(N* = 8,556).

	Total Sample	
Variables		
	Mean/ Proportion	SD
Sleep Health		
Insomnia (2014)	2.68	2.46
Insomnia (2006)	2.51	2.49
Labor Force Status		
Full-time	.17	—
Part-time	.07	—
Retired	.44	—
Not in the labor force	.03	—
Full-time to retired	.18	—
Part-time to retired	.11	—
Race-Gender Status Groups		
Black women	.05	—
Black men	.04	—
Hispanic women	.03	—
Hispanic men	.03	—
White women	.46	—
White men	.39	—
Controls		
Poor health	.20	—
Age	64.04	9.86
Not married	.30	—
Less than High school	.13	—
High school	.35	—
College	.52	—
Income (logged)	10.75	1.44

than a high school education (b = .350 p <.001) and those with a high school degree or GED

(b = .139, p <.01) experience more insomnia than college graduates. Age (b = -.015, p <.00) and income (b = -.096, p <.001) are inversely associated with insomnia.

Model 2 is the change model, which adds the prior measure of insomnia; it is significant

Table 2: Insomnia Regressed on All Study Variables, Health and Retirement Study, 2006-2014 (N = 8,556).

Variables	**Model 1**		**Model 2**	
	b	se	b	se
Labor Force Status[a]				
Part-time (1=yes)	.257**	.099	.124	.086
Retired (1=yes)	.417***	.076	.161*	.066
Not in Labor force (1=yes)	.397**	.140	.119	.122
Full-time to retired (1=yes)	.220**	.073	.091	.063
Part-time to retired (1=yes)	.414***	.087	.239**	.076
Race Gender Status[b]				
Black Women (1=yes)	.064	.102	.062	.088
Black Men (1=yes)	-.107	.116	.112	.101
Hispanic Women (1=yes)	.165	.133	.157	.116
Hispanic men (1=yes)	-.144	.128	.125	.111
White women (1=yes)	.364***	.048	.103*	.042
Controls				
Insomnia (2006)			.496***	.009
Poor Health[c] (1=yes)	.909***	.058	.330**	.052
Age (years)	-.015***	.003	-.005	.003
Not married[d] (1=yes)	.089	.053	.000	.046
Less than high school[e] (1=yes)	.350***	.073	.279***	.064
Ged or high school[e] (1=yes)	.139**	.049	.080	.042
Income (logged)	-.096***	.022	-.072***	.019
Constant	3.917***	.313	2.204***	.274
R^2	.07		.30	

Note: * p < .05; ** p < .01; *** p < .001.
[a] Full-time employment 2006-2014 (reference)
[b] White men (reference)
[c] Good health (reference)
[d] Married (reference)
[e] College (reference)

and positively predicts insomnia in 2014 (b = .496, p <.001). In this model, only retired (b = .161, p <.05) and the transition from part-time to retired (b = .229, p <.01) are associated with

increased insomnia compared to those working full-time. Although the effects from the previous model are reduced, White women (b = .103, p <.05) experience increased insomnia compared to White men. Unlike the previous model, only poor health (b = .330, p <.001) and less than a high school degree increases insomnia (b =.279, p <.001). Income (b = -.072, p <.001) is still negatively associated with sleep quality.

Table 3 shows the results for the moderation analysis by race-gender groups. The main effects indicate that compared to those who work full-time continuously throughout the study period, part-time (b = .283, p <.05), retired (b =.296, p <.001), not in the labor force (b = 1.706, p <.01), the transition from full-time to retired (b = .192, p <.05), and the transition from part-time to retired (b =. 375, p <.01) are all associated with increased insomnia. Among the race-gender groups only White women (b = .396, p <.001) experience increased insomnia compared to White men working full-time. There are significant interactions for Black women not in the labor force (b = -1.858, p <.05) and White women who are retired (b = -.321, p <.01), part-time, (b = -.375, p <.05), not in the labor force (b = -1.909, p <.001), transition from full-time to retired (b = -.364, p <.05) and transition from part-time to retired (b = -.364, p <.001). Figures 1 and 2 provide a graphical representation of these significant interactions.

In Figure 1, Black women not in the labor force experience decreased insomnia compared to White men not in the labor force, retired, part-time, and who transition from part-time to retired. However, Black women not in the labor force experience more insomnia compared to White men who work full-time. There are no significant differences between Black women in the labor force and White men who transition from full-time to retired. Figure 2 shows the significant interactions between White women and labor force status. There are two notable findings. First, White women who work full-time, part-time, and who transition from part-time

to retired experience increased insomnia compared to White men with the same labor force statuses. Second, White women who are not in the labor force have decreased insomnia than White men not in the labor force. Third, at all labor force status categories and transitions to retirement, White women experience increased insomnia compared to White men who work full-time.

Table 3: Moderation by Race-Gender Groups Health and Retirement Study, 2006-2014 (*N* = 8,556).

Variables	**Model 1**	
	b	se
Labor Force Status[a]		
Part-time (1=yes)	.283*	.137
Retired (1=yes)	.296***	.087
Not in Labor force (1=yes)	1.706**	.563
Full-time to retired (1=yes)	.192*	.090
Part-time to retired (1=yes)	.375**	.118
Race-Gender Groups[b]		
Black women	.322	.213
Black men	.035	.228
Hispanic women	-.177	.369
Hispanic men	.138	.218
White women	.396***	.099
Interactions		
Retired × Black women	-.404	.247
Retired × Black men	-.104	.275
Retired × Hispanic women	.337	.410
Retired × Hispanic men	-.030	.276
Retired × White women	-.321**	.117
Part-time × Black women	-.137	.454
Part-time × Black men	-.444	.506
Part-time × Hispanic women	.271	.528
Part-time × Hispanic men	-.005	.770
Part-time × White women	-.375*	.184
Not in Labor force × Black women	-1.858*	.742
Not in Labor force × Black men	-.041	1.22
Not in Labor force × Hispanic women	-.894	.720
Not in Labor force × Hispanic men	-1.701	1.587
Not in Labor force × White women	-1.909***	.581
Full-time to retired × Black women	-.209	.286
Full-time to retired × Black men	.390	.309
Full-time to retired × Hispanic women	.642	.460
Full-time to retired × Hispanic men	.032	.304
Full-time to retired × White women	-.364**	.138
Part-time to retired × Black women	-.097	.339
Part-time to retired × Black men	.454	.386
Part-time to retired × Hispanic women	-.245	.497
Part-time to retired × Hispanic men	.130	.520
Part-time to retired × White women	-.364***	.158
Constant	1.982***	.281
R^2	.30	

Note: * $p < .05$; ** $p < .01$; *** $p < .001$.
Models are adjusted for age, education, income, marital status, poor health, and insomnia in 2006.

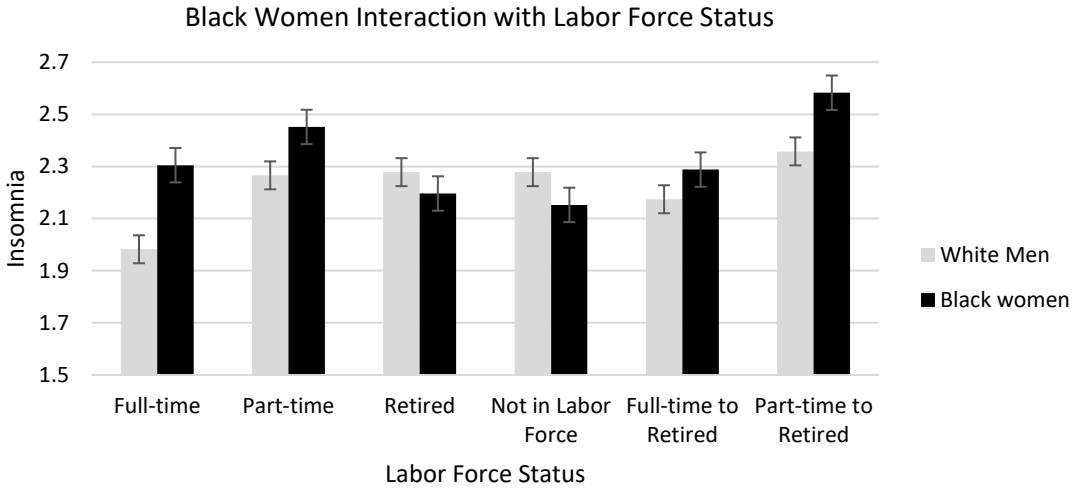

Figure 1: Interaction of Black Women with Labor Force Status.

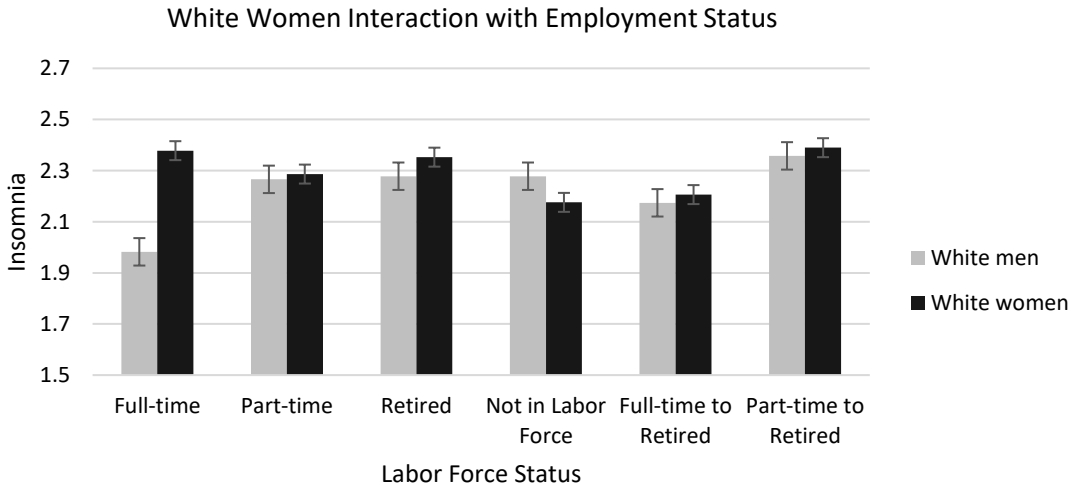

Figure 2: Interaction of White Women with Labor Force Status.

DISCUSSION AND CONCLUSIONS

Discussion

This study examined the effects of labor force status and transitions to retirement on insomnia in older adults. It also investigated whether this association varies by race-gender group status. I found support for Hypothesis 1b and 1e, which stated that compared to respondents

working full-time, H1b) retirement and H1e) transitioning from part-time to retired is associated with increased insomnia. These findings lend support to the notion that declining social integration, due to the loss of the worker role, negatively impacts sleep quality. While adults may look forward to the reprieve from work that accompanies retirement, the loss of the master role of worker, may be difficult to replace. In fact, insomnia increased for respondents who were retired continuously from 2006-2014 compared to those continuously working full-time; this may provide some indication that length of retirement may not reduce the effects of role loss. Those newly transitioning from part-time to retirement, may be in a period where they are trying to cope with initial changes in social integration (i.e., lack of work schedule, loss of work associates). Overall, both findings support the increasing characterization of retirement as a 'process' that plays out over time, involving several transitions between paid and unpaid work (Han and Moen 1999, Moen 2003).

The findings also indicate that race-gender group status moderates the association between labor force status, transitions to retirement, and insomnia. Specifically, I found support for hypothesis 2c which states that Black women not in the labor force experience increased insomnia compared to White men working full-time. I also found support for all parts of hypothesis 6, which states that White women who are H6a) part-time H6b) retired, H6c) not in the labor force, H6d) transitioning from full-time to retired, and H6e) transitioning from part-time to retired experience increased insomnia compared to White men working full-time. These results demonstrate that retirement differs between men and women and the intersection of race and gender influences the association between labor force status, transitions to retirement, and insomnia. Moreover, there is support for the idea that the entire process of retirement is

qualitatively different for men and women, partly due to different experiences in the labor force (Han and Moen 1999).

For example, the results show that Black women not in the labor force experience increased insomnia compared to White men working full-time. On the surface one could surmise that being out of the labor force automatically reduces integration in society. While this perspective has some validity, incorporating an intersectional perspective requires a more nuanced analysis. Specifically, part of the reason that older Black women may be out of the labor force is due to different experiences that arise at the intersection of being Black and a woman. For many Black women, their career trajectory is characterized by low wages, hiring discrimination, and occupational segregation to name a few (Ortiz and Roscigno 2009). Not only do these factors affect how Black women interact with the labor force, but they also play a substantial role in determining the type of pension and social security benefits one receives after retirement (Moen 2003). Consequently, Black women often enter retirement with less financial resources compared to White men, which can contribute to psychological distress and increased insomnia. Finally, increased insomnia among Black women is also likely due to the substantial difference between retirement and being out of the labor force or unemployed; the former usually generates financial support through private pensions and social security (Moen 2003).

The findings for White women also demonstrate the importance of an intersectional approach to aging and sleep research. In fact, at all labor force statuses and transitions to retirement, White women experience increased insomnia compared to White men working full-time. While the results are also indicative of how declining social integration through loss of the worker role can have deleterious effects on sleep quality, they also provide insight about the complexity White women face along intersecting dimensions of race, gender, and status.

For example, while retirement in theory may offer the opportunity to construct and engage in new opportunities, in an ageist society that focuses on youth, productivity, and vitality, the loss of status and power associated with paid work may linger into retirement among White women (Hislop and Arber 2006). White women may be oppressed due to their status as women, but their whiteness places them at the top of the racial hierarchy alongside White men. Thus, both the loss of the worker role and loss of status may contribute to increased insomnia in White women. Further support for this perspective comes from consideration of White women's participation in the labor force. Compared to White men, White women, particularly those who are middle class or higher, have a shorter history in the labor force, as well as discontinuity due to having to focus on family responsibilities (Hardy 2011). White women benefit from the stable employment of their spouses, which in some instances allow them to withdraw from the labor force to care for children (Calasanti 2018). However, this disruption in labor force participation can increase insomnia among White women in two ways.

First, compared to White men, the discontinuity of employment may result in lower income in retirement, which can induce worry and decrease sleep quality (Hardy 2011). Second, White women who are retired may experience an unfulfilled career trajectory due to interruptions that require a focus on family responsibilities; thus, unfulfillment may contribute to increased insomnia. In addition, many of the caregiving responsibilities that disrupted their careers earlier in the life course continue into retirement. It is important to note that Black women also experience discontinuity of employment, albeit for different reasons. However, since Black men are discriminated in the workplace, Black women must continue to work even in the face of family responsibilities due to a lack of financial support from their partners.

Overall, these findings lend support to the notion that while there are benefits to retirement (e.g., lack of work schedules, more leisure time, and a chance for new opportunities), not everyone is able to change their sleep patterns or get quality sleep. The inability to control sleep in retirement is especially true in the context of declining social integration due to the loss of the worker role, financial worries, and inequality surrounding the distribution of public pensions (Henkens et al. 2018; Stenholm 2017). Moreover, for many older women, who are still constrained by lack of income and increased caregiving responsibilities, retirement offers limited freedom. Moreover, despite the promise of freedom from the temporal structures of paid work, women are conscious that retirement is not only a confirmation of their loss of power in terms of economic productivity, but also an extension of gender inequalities in earlier stages of the life course (Hislop and Arber 2006).

Limitations

This study is not without limitations. First, while the use of labor force status categories (i.e., full-time, part-time, and not in the labor force) and transitions to retirement is a good strategy to classify people, it does not capture the complexities of the decisions behind transitions to retirement (Hardy 2011). Second, the study is unable to assess the meanings that people attribute to retirement. It is widely acknowledged that people retire in different ways and retirement has variable meanings (Elder, George, and Shanahan 1996). For some, it could be seen as a time of leisure and travel, but for others retirement may represent a time of insecurity due to financial concerns. Last, although an intersectional perspective is employed, older adults possess other social statuses (e.g., sexuality, disability, nativity) that could impact sleep. Capturing these different interlocking identities can provide a more nuanced understanding of the aging process, career trajectories, and subsequently the transition to retirement.

Despite these limitations there are several contributions to this research. First, this study utilizes intersectionality theory, which is largely absent from aging research. The results elucidate how inequalities at older ages, in this case with regards to sleep and retirement, are due to the structuring of people's experiences and social worlds due to various intersecting categories. Second, the focus on the association between retirement and sleep brings a new perspective for medical sociology and the sociology of work. Sleep as an indicator of health is rarely studied in medical sociology and while there is plethora of work that provides insight on the effects of retirement on mental and physical health, few studies examine sleep. Finally, the use of longitudinal data provides stronger support to ascertain the effects of labor force status on insomnia.

Conclusion

As the body ages there are physiological changes that affect sleep quality. However, sleep is an embodied experience in which biological and social boundaries are blurred (Hislop and Arber 2006, Williams 2007). Thus, insomnia is not simply an outcome of aging, but also a reflection of life course changes associated with the lost status of worker. Although this study reveals how labor force status and transitions to retirement can affect sleep, future research should examine how other transitions, such as married to widowhood, affect sleep among older adults. Likewise, while insomnia is highly prevalent in older populations, other dimensions of sleep such as timing, duration, and alertness, to name a few, warrant exploration. Finally, while the loss of the worker role is associated with decreased integration, more information is needed to examine how volunteer work, civic activities, or religious attendance, may help older adults stay integrated in society and buffer the effects of changes in work status.

CHAPTER V

CONCLUSION

Sleep is a universal activity that is important for the physiological renewal of the body and mind. Most of what we know about sleep comes from fields such as biology, epidemiology, and public health. This body of research reveals that sleep is connected to a variety of physical and mental health outcomes, such as diabetes, cardiovascular disease, obesity, anxiety, and depressive symptoms to name a few (Grandner et al. 2010; Hale et al. 2013; Jackson et al. 2015; Liu et al. 2013; Leggett et al. 2016, 2018). There is also evidence of disparities in sleep, particularly with regards to race/ethnicity, gender, education, and age (Burgard and Ailshire 2013; Hale 2005, 2007; Hislop and Arber 2003b). Despite this wealth of knowledge from a biomedical perspective, sleep in sociology is understudied. As such, this dissertation addressed this gap in sociology by using one important concept that lies at the heart of the discipline: social integration.

Social integration refers to attachment to society through social roles and institutions such as work (Durkheim ([1897]1951). Analyzing sleep from the perspective of social integration helps provides insight about the connection between individual behavior and society. In addition to social integration, I utilize a key principle from Durkheim's ([1914] 2005) work that is broadly absent from current social integration research: homo duplex. Homo duplex refers to the dualistic nature of humans, where one tries to balance meeting the needs of society and the needs of the self (Durkheim [1914] 2005). Both social integration and homo duplex are interconnecting frameworks for these three independent, but interrelated studies, that examine this central question: Is social integration harmful or beneficial for sleep?

The first study, found in chapter two, examined whether the number of social roles and/or role combinations were detrimental or beneficial for sleep duration and sleep quality. I also investigated whether these associations varied by race-gender groups. Role theory and intersectionality were two guiding frameworks for this study. Role theory is useful for understanding the connection between social roles and health. Within this perspective, social roles are a fundamental part of people's lives, because they provide meaning about one's place in society, provide access to resources, and help people know what is expected of them as they interact with others and fulfill role obligations (Abrutyn and Mueller 2016; Pearlin 1983; Turner 1956).

Two competing hypotheses were tested: role strain and role enhancement. The role strain perspective suggests that an accumulation of roles is detrimental to health due to role conflict and role overload (Goode 1960; Merton 1957; Verbrugge 1986). Role enhancement posits that acquiring more roles is beneficial to health because it increases access to resources and social networks (Marks 1977; Sieber 1974; Thoits 1983). Intersectionality theory was also utilized in this study. The roles that people are able to occupy or accumulate are determined, in part, based on one's social location in society. Thus, race/ethnicity, gender, class, and age must be considered when determining the effect that social roles have on sleep. Intersectionality is an integral guiding framework because it highlights the importance of examining the interactive (i.e., multiplicative) effects of various social statuses, instead of examining them separately (Choo and Ferree 2010; Collins and Bilge 2020). Intersectionality also brings attention to systems of inequality and hierarchy.

To examine the research questions in this study, I used longitudinal, nationally representative data from the National Longitudinal Survey of Youth 1979 Cohort. The results

showed support for both role strain and role enhancement. Specifically, the findings revealed that the role combination of married, employed, parents, which is indicative of high integration in society, negatively impacted sleep duration during the week and on the weekends, compared to those who were married and employed. The results also indicated that role accumulation decreased insomnia, which supported the role enhancement perspective. Further support for role enhancement was found among various role combinations. For example, married, employed, parents, get more sleep on the weekend compared to married only, parent only, married parents, and those with no roles. In addition, married, employed, parents experience less insomnia compared to married only, employed only, parent only, married parents, and those with no roles. The race-gender analysis revealed a statistically significant difference in the effect of role accumulation on insomnia among Black men, Black women, and White men. While there is evidence that an increase in roles reduced insomnia for all three groups, White men experienced a greater reduction of insomnia.

Several conclusions were drawn from this study. To begin, determining whether role accumulation and/or role combinations are beneficial or harmful to sleep, is contingent upon which aspect of sleep examined. For instance, when examining the association between role accumulation and sleep duration, there was no significant association for hours of sleep during the week. However, a greater number of roles reduced insomnia. Next, higher integration in society through complex role combinations such as married, employed, parents increased sleep on the weekend and reduced insomnia. Finally, an intersectional perspective revealed that role accumulation varied with regards to reducing insomnia based on race-gender group status.

Chapter three covers the second study, which examined the effects of shift work on mental and physical health. Engaging in shift work can be physiologically and mentally stressful.

Shift work is associated with cardiovascular disease (CVD), diabetes, short sleep, and insomnia (Brown et al. 2020; Cho 2018; Kecklund and Axelsson 2016). The ways in which people are integrated in society are also affected by shift work. For example, shift workers are 'out of phase' in a society that primarily operates according to a day-time schedule (i.e., 8/9am to 5/6pm) (Silva-Costa 2015). As such, developing strong bonds to society through interaction with family and community can be difficult, resulting in stress. Stress exposure can have deleterious effects on health and well-being. To better understand how stress from shift work affects health, this study utilized the stress process. Within this model, shift work was operationalized as a chronic and primary stressor, insomnia was a secondary stressor, sleep duration a mediator (i.e., psychosocial resource), and the outcomes were depressive symptoms and self-rated health. The stress process model was useful in this study because it provided an opportunity to examine the direct effects of shift work on depressive symptoms and self-rated health, as well as investigate whether sleep duration and sleep quality mediate the effects of shift work.

Data from the National Longitudinal Survey of Youth 1979 Cohort was used in this study. The results show that working a non-day shift was not associated with depressive symptoms. Rather, increased sleep during the week and insomnia completely buffered the effects of shift work on depressive symptoms. Specifically, increased sleep during the week decreased depressive symptoms and there was a positive association between insomnia and depressive symptoms. With regard to poor health, working a non-day shift increased the odds of poor health. However, the effect of shift work on poor health was indirect, operating through insomnia. Based on these findings it was concluded that the hours of sleep a person gets may be a coping behavior that can be used to manage the stress associated with shift work, particularly with regards to depressive symptoms. However, insomnia was a secondary stressor that

increased depressive symptoms. Since insomnia fully mediated the effects of shift work, another conclusion from this study is that people do not have depressive symptoms because they work non-day shifts; rather, they are depressed because they cannot get quality sleep. Overall, the findings from this study elucidate that insomnia has negative effects on health and well-being among midlife adults.

The final study, located in chapter 4, incorporates the life course perspective, role theory, and intersectionality to examine whether labor force status and transitions to retirement affect insomnia in older adults. The study also investigated whether there was variation in this association based on race-gender group status. The life course perspective was utilized because aging involves passage through a succession of roles (Johnson and Forner 1972). For example, the transition to retirement is an important and expected part of the life course (Osborne 2012). However, it is also a time of uncertainty, anxiety, and stress, as people start to exit important roles, such as worker (LeBlanc 2015; Osborne 2012; Van Solinge and Henkens, 2008). Within the context of social integration, the transition to retirement represents a disruption that can reduce integration in society (Durkheim, ([1897]1951). The stress and lack of integration associated with retirement, can negatively impact sleep in older adults. Furthermore, the intersection of race/ethnicity and gender influences the aging process in ways that can produce disparate effects on sleep.

This study used longitudinal, nationally representative data from the Health and Retirement Study (HRS). The findings revealed that compared to full time workers, continuous retirement throughout the study period and transitioning from part-time to retired increased insomnia. There were also race-gender group differences in the association between labor force status, transitions to retirement, and insomnia. First, Black women not in the labor force

experienced increased insomnia compared to White men working full-time. The results for White women were especially interesting. Compared to White men who work full time, White women occupying all labor force statuses (i.e., part-time, retired, and not in the labor force) and all transitions (i.e., full-time to retired and part-time to retired) experienced increased insomnia.

One conclusion drawn from this study was that loss of the worker role, negatively affects sleep quality. While retirement is an expected transition that people may look forward to, the loss of the master role of worker may be difficult to replace (Moen 2016). Next, insomnia among Black women who are not in the labor force may differ from White men because of different career trajectories linked to status hierarchies tied to interlocking statuses of race and gender. Compared to White men, Black women are more likely to reach older ages without being in the labor force due to a career trajectory characterized by low wages, hiring discrimination, and occupational segregation (Ortiz and Roscigno 2009). In addition, being retired is different from being out of the labor force. Income in retirement comes from pensions and social security; however, Black women who are out of the labor force may face more financial strain compared to White men working full-time.

Finally, the results for White women revealed difficulties at the intersection of race, gender, and status. White women at all labor force statuses and transitions, had increased insomnia compared to full-time working White men. This finding may arise from disrupted career trajectories caused by child and other caregiving responsibilities. Furthermore, White women lose both the worker role and status associated with being White in the United States (Hislop and Arber 2006). In short, while White women may be oppressed due to their status as women, their whiteness places them at the top of the racial hierarchy alongside White men. As

such, this loss of status may be particularly harmful for sleep as they enter retirement; a status that is widely associated with a loss of vitality for older women.

This dissertation makes several contributions to the literature. First, it examines a topic that is understudied in sociology. Since people spend a third of their lives asleep, it is important to understand how various social factors affect sleep, as well as how sleep influences the social world. Next, it incorporated various theories that are underutilized in sleep research. Few studies examine sleep within the context of social integration, role theory, stress process, and intersectionality. Moreover, this dissertation introduced an underutilized concept, homo duplex, that can enrich social integration research. Finally, the use of intersectionality theory, which is lacking in aging research, demonstrates how social roles and transitions to retirement, and their subsequent effects on sleep, differ based on intersecting identities.

In addition to these contributions, there are areas for future research that can expand the sociology of sleep among adults in mid-to-late life. First, additional dimensions of sleep health, which is multidimensional, must be studied. This dissertation primarily focused on sleep duration and sleep quality. Other aspects of sleep health to examine include regularity, alertness, timing, and satisfaction (Buysse 2014). Social roles and work may impact these dimensions of sleep differently. Next, continued examination of the ways in which social integration affects sleep is needed. This means that other conceptualizations of social integration such as social networks, frequency of contact, civic and community engagement, and social support warrant investigation. While a decline in social integration can occur as people age and transition out of various social roles, new ways of late-life integration in society through friend or family networks, religious participation, or community engagement, may serve as protective factors. Finally, the sociology of sleep could benefit from qualitative research that can better capture the meanings people

attribute to sleep and how they use sleep in their day to day lives. Specific questions related to the agentic nature of sleep can help with the creation of measures that can directly test the underutilized concept of homo duplex.

In conclusion, this dissertation demonstrates that sleep is an indicator of health, a mechanism that explains biopsychosocial pathways to health, and is influenced by transitions in late life. Based on these findings and additional areas of research, it is apparent that sleep warrants additional study in sociology. While sleep provides a momentary reprieve from involvement in society, it is structured by broader societal factors. Many of the same factors that contribute to persistent health inequalities and disparities also affect sleep. Thus, if sociologists want a more complete picture of the interconnection between humans, health, and the social world, it is time to employ the sociological imagination to the other third life; the time people spend in slumber.

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