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SEXUAL EXPRESSION AND SOCIAL CONNECTEDNESS AMONG
COMMUNITY-DWELLING OLDER ADULTS, IN THE UNITED STATES

A DISSERTATION

By

NEAL J. BLANGIARDO

Concentration: COMMUNITY, SOCIETY, AND HEALTH

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fulfillment of the requirement for the degree of Doctor of Public Health

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ABSTRACT

Sexual expression and social connectedness among community-dwelling older adults, in the

United States

By

Neal J. Blangiardo

Advisor: Professor William T. Gallo, PhD

Sexuality is a central aspect of human identity for all people, including older persons. Sexual expression continues across the lifespan, despite the cultural fallacy of the sexlessness of older adults. Older adults live active sexual lives which involve relationships, social roles, and an array of sexuality-related needs.

This dissertation examines the relationship between sexual expression and social connectedness, in older community-dwelling adults. Research on sexuality in this community predominately focuses on genital sexual expression, has not explored the non-genital dimension of sexual expression, and little is known about the role of social relationships that can play in supporting sexual expression. The present study addresses these critical needs by investigating the intersections of older age, holistic sexual expression, and social connectedness to better inform further investigation and to guide the development of interventions - all aiming to help support sexually healthier and happier lives of older adults.

The study uses data from the 2005 National Social Life, Health, and Aging Project (NSHAP), a nationally representative, longitudinal population-based survey of 3,005 adults (aged 57-85). It is a unique dataset that captures both sexuality questions and social connections

amongst older adults. My study sample is comprised of community-dwelling older adults. Using ten sexuality-related measures, the study used Exploratory Factor Analysis to develop summary factors to measure older adult sexual expression. To assess if social connectedness and social non-isolation, composite variables previously developed by Cornwell and Waite (2009) from the same NSHAP dataset, are associated with sexual expression, these social connectedness variables were tested as predictors of sexual expression. The study population was then stratified by age and gender to evaluate their interaction on the relationship between social connectedness and sexual expression variables.

To evaluate non-genital sexual expression, this study also established an “intimacy” factor, variables that were considered “above-the-waist” or more holistic in addition to a genitally focused “sensuality” factor. This study’s focus, which incorporates non-genital expression to the investigation of sexual expression, provides an important missing component to this public health issue: a lens that includes the whole person, for their whole lives.

This investigation’s findings build upon previous research and demonstrated that (1) sexual expression in older adults includes genital and non-genital domains, (2) is distinct from sexual expression in younger people, and (3) is under-explored. Results indicated that both a non-genitally focused intimacy domain and a genitally-focused sensuality domain exist. While the sensuality domain may dominate sexual expression in younger adults, the present study contributes evidence that the pendulum may swing in older adulthood with the intimacy domain driving their sexual expression. The study’s main finding was that the social variable (social non-isolation) is related to the intimacy dimension of sexual expression, and merits further study.

Notably intimacy is positively and significantly associated with social non-isolation (beta = .23; $p < .001$), whereas social connectedness’s estimated coefficient remains small, negative,

and statistically nonsignificant ($\beta = -.04$; $p > .05$). The association between intimacy and social non-isolation and social connectedness found that males (compared to female) and married subjects (compared to single) had significantly higher intimacy values, while Blacks (compared to Whites) had significantly lower intimacy values. Self-reported mental health was positively correlated with intimacy values. In addition to the connection between mental health and non-isolation, this study established a link between a person's perception of their mental health and their intimacy score. No relationship was shown to exist between social non-isolation and sensuality nor social connectedness and sensuality.

Based on these findings, it is recommended that interventions incorporate a focus on the intimacy and social connectedness dimensions of sexual expression in older adult programming. Service agencies and providers should train staff using a holistic approach to older adult sexuality; and incorporate sexual expression and social connectedness into their client resources, referrals, and services. As the present study's sample was predominantly white, married, and heterosexual, future research should investigate a more diverse population of older adults. New studies should include populations characterized by more racial diversity, individuals with diverse gender and sexual orientations, and those who are partnered/not partnered, but not married. Without advancing the knowledge of older adult sexual expression and its interaction with social connectedness, an entire dimension of sexuality, and its implications on the public's health may be lost.

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DISCLOSURE STATEMENT FOR CONFLICT OF INTEREST

The author has no conflicts of interest and nothing to disclose.

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CHAPTER ONE: INTRODUCTION

*“Whether decline has thinn'd my hair, I'm sure I neither know nor care...
...that still as death approaches nearer, the joys of life are sweeter, dearer;
And had I but an hour to live, that little hour to bliss I'd give!”*

-Odes of Anacreon (circa 500 B.C.), English translation in 1802¹

INTRODUCTION

Sexuality research is both a well-established and a growing field. However, the exploration of sexuality within the older adult population is an area of investigation that has been historically understudied and is still in its infancy. Despite the growth of the older community-dwelling population in the United States, research exploring sexuality in this age group is often limited to institutionalized older adults. Unfortunately, several areas of growth in older adult sexuality research are headed down a path that limits its public health impact. This direction is characterized by the heavy research focus on institutionalized older adults, by an emphasis that concentrates on older adult genital sexual expression, and by an overall dearth of investigation of the relationship between older adult sexuality and social connectedness. Certainly, a genital focus on sexual expression and the needs of institutional older adults have public health merit. However, the concern raised here is that resources are being focused primarily on these dimensions of sexuality research. Efforts targeting a more comprehensive approach to sexual expression and that are inclusive of community-dwelling older adults would help to close a public health gap and serve a greater segment of the population.

A public health gap exists in the understanding of sexuality and social variables in later life. Social connectedness has been associated with older adult health, and with adolescent female sexual health.² My study sample is comprised of community-dwelling older adults. Because an association between social connectedness and sexual expression may exist, this

research begins exploratory work on possible interactions that may affect the lives of older adults. The public health significance of addressing these gaps includes building a new body of research that has a holistic framework, improving policy and intervention work that may not be fully informed, and importantly helping to enrich the sexual lives of older adults.

This dissertation provides a more comprehensive, holistic approach to older adult sexual expression and seeks to advance public health understanding of this field and its relationship with social connectedness and social non-isolation. Advancements in understanding the intersection between older adults and sexual expression will provide an evidence-based approach to better guide future interventions, research, and policy.

Introduction to Older Adults and Sexuality

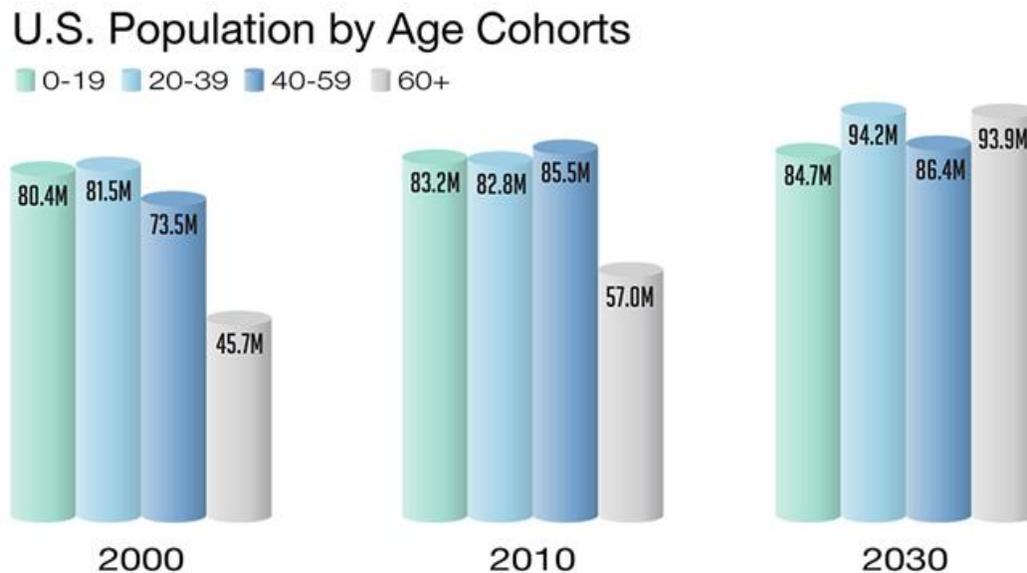
This review now starts with a discussion on sexuality, the graying of America, denial of sexuality in older age, and the examination of the existing literature on older adults and sexuality to establish the scope of their sexuality-related health issues and needs.

Sexuality

The World Health Organization (2006) defines sexuality holistically as a central aspect of being human throughout life.³ Sexuality encompasses sex, gender identities and roles, sexual orientation, eroticism, pleasure, intimacy and reproduction. Sexuality is experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behaviors, practices, roles and relationships. It is influenced by the interaction of biological, psychological, social, economic, political, cultural, ethical, legal, historical, religious and spiritual factors. It is a natural, life-long process and an important aspect of life for all people, including older persons. The expression of sexuality spans the lifecycle and remains a core aspect of human identity throughout later life.³

Graying of America

Figure 1.1: U.S. Population by Age Cohorts (US Census Bureau, 2010)



Source: The US Census Bureau, 2010 Census, and 2014 Population Projections

The United States is experiencing an extension of the average human lifespan and seeing far greater numbers of healthy, older people living longer. Treas (1995) described the general aging of the American population as “The Graying of America”.⁴ Whereas 100 years ago, few people lived past 65 years of age, at the turn of the 21st century, 35 million were aged 65 years and older.⁴ The United States Census (2010) reported that the older population – persons 65 years or older – numbered 41.4 million in 2011, representing 13.3% of the U.S. population.⁵ Over one in every eight Americans is older and the population has increased by 6.3 million, or 18%, since 2000. In comparison, the 65 years and under population has only increased by 9.4%. In 2011, there were 23.4 million older women and 17.9 million older men, or a sex ratio of 131 women for every 100 men. At age 85 years and over, this ratio increases to 203 women for every 100 men.⁵ The United States Census (2010) predicted the number of Americans aged 45-64 years – who will reach 65 years over the next two decades – will increase by 33%.⁶ Butler &

Lewis (2011) framed the graying of American as a longevity revolution.⁷ In the past century, Americans have gained an additional thirty years of life expectancy on average.⁷ As overall health in later life also continues to improve, many Americans can expect to enjoy reasonable health and wellness in those additional years.

Denial of Sexuality in Older Age

Arias (2006) reported that America's population is both aging and living healthier.⁸ As the baby boom's increase in birth rates tapered off after 1959 – from nearly 27% in 1946 to 14% by 1975 – it was met with a general population remaining healthier longer and leading more active lives.⁸ Nevertheless, pervasive cultural norms exist that reinforce the notion that sex and sexuality is a monopoly of the youth. In our principally youth-oriented society, sexuality in later years is often disregarded. Bowd (2003) conducted a study to describe and review stereotypes of older adults found in adult narrative jokes, based on a conceptual framework drawing from psychoanalytic and cognitive theories of humor.⁹ Approximately 4,200 jokes were examined. A content analysis by the researcher established eight stereotypes. Five of the eight stereotypes are based in sexuality (the impotent male, the unattractive female, the vain/virile male, the disinterested female, and conversely the insatiable female). The focus of many jokes on sexual dysfunction in older adults undoubtedly reflects widely held ageist stereotypes. Arias (2006) posited that even if the older adult does not accept these negative stereotypes (e.g., impotence and asexuality), younger persons and health care professionals may ascribe to such stereotypes and reinforce them in their interactions with older adults.⁸ Consequences of these assumptions could include limited discourse on the sexual lives of older adults and restricted access to sexual health care.

Botwinick (1984) described the cultural denial of sexual expression by older adults.¹⁰ He posited that the long-existing denial of sexuality in the lives of American older adults may be one of the most important factors in their self-perception of sexlessness. Botwinick (1984) then suggested that society often limits sexual expression of older individuals through what he terms restrictive social cues, including sexualized humor at the expense of older people and policies in assisted living environments that limit sexual expression, which implies that geriatric sexuality is taboo.¹⁰ Despite this limitation, he suggested that this cultural denial bears little basis in truth, where older adults live active sexual lives which include sexual intercourse, relationships and involve an array of sexual health needs. This author suggested that almost a third of a century after Botwinick identified the myth of sexlessness, this mythology remains pervasive in society – existing from sources both external to older adults, as well as internally by older persons themselves.

Sexuality, sexual expression, sexual health, and wellness all play an important role in this revolution and the lives of older people. Human sexuality is a life-long process, beginning at birth and lasting until death. The term sex is often used to describe the biological or genetic markers for male or female. Such sex characteristics – whether visual or chromosomal – exist on a spectrum. Sexuality has a broader meaning comprising not only these physical aspects but both social-emotional and societal aspects as well. Kessel (2001) suggested the denial of one's sexuality can have a detrimental effect on many aspects of sexuality, particularly reducing self-esteem, negatively impacting self-image, stressing interpersonal relationships whether romantic or platonic and in turn contributing to a decline in sexual health and wellness.¹¹

Landmark Research on Older Adult Sexuality

Many of the first major studies in human sexuality included investigation of sexuality through the lifespan, including older adulthood. These landmark studies are presented in chronological order and create the foundation that subsequent sexuality studies build upon, as discussed later in this review. Contemporary research into human sexuality began in 1948 with zoologist Alfred Kinsey's exploration into sexual behavior of human males.¹² The seminal research studies by Kinsey (and later by Masters and Johnson¹³) showed that sexual expression plays a very important role in the lives of the majority of older adults.

Kinsey and colleagues' (1953) report, "Sexual Behavior in the Human Male," was the first of the large-scale investigatory studies of human sexuality.¹² The book provided a detailed description of the methodology, including a chapter on interview techniques. One chapter is devoted to findings regarding aging and sexual outlets. Kinsey and colleagues provided the first research to break through the widely-held societal belief that sexual activity stopped at age 50. Kinsey and colleagues' (1953) subsequently released the study entitled "Sexual Behavior in the Human Female" based on interviews of 7,789 females.¹⁴ The data analyses were based on findings from 5,940 non-imprisoned white women interviewed prior to January 1, 1950. Of this population, 56 subjects were between the ages of 61 and 90. Their discussion of aging effects on sexuality and sexual behaviors of older women was limited. The authors concluded that male aging, rather than female loss-of-interest or capacity, was responsible for the observed age-related decline in female sexual activity. They found that female sexual activities were not dependent on male partners (such as masturbation) remained constant from youth to old age. Masters and Johnson (1966) later pioneered research into the nature of the human sexual response and the diagnosis and treatment of sexual disorders and dysfunctions.¹³ In the initial

phase of Masters and Johnson's studies, from 1957 to 1965, they recorded laboratory data on the anatomy and physiology of human sexual response based on direct observation of 382 women and 312 men in an estimated "10,000 complete cycles of sexual response."

Masters and Johnson (1966) were the first to conduct research on the sexual responsiveness of older adults, finding that given a state of reasonably good health and the availability of an interested and interesting partner, there was no absolute age at which sexual abilities disappeared.¹³ While they noted that there were specific changes to the patterns of male and female sexual responses with aging – for example, it takes older men longer to become aroused and they typically require more direct genital stimulation, and the speed and amount of vaginal wetness tends to diminish with age as well – they noted that many older men and women are perfectly capable of excitement and orgasm well into their seventies and beyond. Several subsequent landmark studies have explored sexuality in the later part of the lifecycle.

Research by Hite (1976) was a nationwide study on female sexuality.¹⁵ Hite reported findings from an investigation of what women felt, liked, and thought about sexual intercourse. The ages of subjects ranged from 14 to 73 with 19 subjects reporting their ages as 60 and older. In her chapter on older women, Hite reported that for most of these subjects, sexual pleasure increased with age, especially in the postmenopausal years. Most subjects were still active sexually and had feelings of desire and attraction. Subjects often reported a problem in finding romantic partners.¹⁵

The Janus Report on sexual behavior was conducted by Janus and Janus (1993).¹⁶ The researchers reported their findings from a cross-sectional national survey conducted between 1988 and 1992. The purpose of the study was to identify, track, and clarify Americans' sexual practices, attitudes toward sex and sexuality, and patterns of sexual behavior. Data were gathered

through questionnaires and interviews. The final sample consisted of 2,765 subjects from 18 years to over 65. There were 1,327 men and 1,418 women. Although sexual behaviors of older adults were not the focus of this study, the authors reported selected findings related to older people, including the rates of sexual intercourse, masturbation, and orgasm. The authors found that 74% of older men and 56% of older women stated that they were more cautious in their sexual decision-making process and were more hesitant to introduce intercourse into new relationships in their older age than during their younger adulthood.¹⁶

Recent Research on Older Adult Sexuality

Before these landmark studies, there was sparse scientific investigation of human sexuality. The referenced authors began the pioneering sex research but with less of a focus on aging and sexuality. As sex research evolves, sexuality's intersection with age is emerging as an aspect worthy of future exploration. More recent investigations of older adults and sexuality are now reviewed, presented in ascending chronological order.

Walz and Blum (1987) discussed the importance of older adult sexual health.¹⁷ They explored how sexual intercourse can be a pathway for older adults leading to improved body image and demonstrating how their bodies are capable of providing pleasure at a point in life when considerable focus is on discomfort and pain. Intercourse can also reinforce social engagement and can be a valuable source of exercise as well as foster a healthy self-image in older age and help to manage anxiety. The authors investigate same-sex relationships and notably use the term partner, as opposed to spouse, throughout their investigation. Notably, the study was among the first to refer to sexuality as something more than genital contact or sexual intercourse. It viewed sexuality beyond the narrow image of sexual activity and expanded it to include sensuality, self-esteem, intimacy, and self-image. The researchers found that sexuality

education for older adults, in the form of small group education/intervention sessions, appeared to be an appropriate way to help increase knowledge of sexuality and sexual health, similar to how it has been helpful as an intervention in other age groups.

Hayflick (1994) identified existing myths, stereotypes, and biases regarding the sexuality of the aging.¹⁸ Culturally, there exists a normative resistance – the denial of the sexuality, including sexual health needs, of older adults – that obscures progress in the field, both in terms of research interventions as well as in the lives and relationships of older people. Hayflick suggested that, when his book was written in 1994, sex and sexuality was one of the most important quality of life issues for older adults. Addressing human sexuality needs in older adults will enhance quality of life and help older adults enjoy living. Levy (1994) described the diversity of older Americans. She recognized that their lives and interests are not homogeneous.¹⁹ Older adults differ by race, class, life histories, sexual orientation, sexual practices, attitudes, values, and beliefs regarding sexuality. The author highlighted how the definitions in older population research have changed considerably with recent increased longevity. Specifically, age grading in research (how researchers categorize the various age groups) is being redefined as Americans live older and healthier. Whereas Masters and Johnson's research in 1966 included women aged 40 and up in their study of aging females, that age appears remarkably youthful by society's standards a half-century later. The author submitted that people first experiencing sexual intercourse in the 1930s confronted a social and sexual climate very different than their counterparts of the 1960s post-oral contraceptive pill era. The author advised that discussions of sexuality be sensitive to the changing nature of sexuality over the life course – situated within the social forces and events of a historical period.

By the last decade of the 20st Century, HIV and AIDS research had a dominating presence in the field of sexuality research. AIDS had reached an epidemic level and was a driving social force in American. HIV and AIDS were viewed as a disease of younger people, and prevention efforts were similarly focused. Chiao and colleagues (1999) report that individuals 50 years and older accounted for at least 10% of AIDS cases reported to the Centers for Disease Control and Prevention in the United States.²⁰ Little research devoted to addressing diagnosis, treatment and prevention of AIDS in older populations exists in the United States. Survival rates amongst older adults infected with HIV are consistently lower than those of younger patients. Older adults are also less likely to use condoms during sexual intercourse, as well as less likely to seek HIV testing. The authors reviewed literature concerning the changing epidemiology of AIDS among older Americans including that 11% of people with AIDS were 50 years or older, and that HIV-related conditions in older patients not known to be HIV-positive were often misdiagnosed as other diseases such as Alzheimer's-related dementia, malnutrition, and both bacterial and viral pneumonia.²⁰ The authors reviewed treatment issues and prevention behaviors among older adults including that common illnesses associated with HIV infection progress more rapidly in older patients resulting in later diagnosis and delays in treatment. Additionally, illnesses associated with older patients (such as similar opportunistic infections) still occur and can mask or confuse diagnosis and treatment when HIV-positive status is not known by providers. They concluded that enhanced clinician awareness of HIV in older adults, along with further research regarding treatment and prevention, will help improve survival and outcome for HIV-positive older adults.

DeLamater and Sill (2005) explored sexual desire in later life.²¹ The authors reported that there had been relatively little research that explored desire in later life, particularly among

persons over 60 years of age. The existing literature consists of studies of small samples, with much of the focus on biomedical implications. The prevailing literature during the time of their study suggests that age, hormone levels, specific illnesses, and various medications negatively affect sexual functioning in older persons. Their study reported results from a survey of a large sample (n = 1,384) of persons aged 45 and older that included measures on a variety of biological, psychological and social factors that potentially influence sexual functioning. The authors find that the principal influences on strength of sexual desire among women were age, the importance of sex to the person, and the presence of a sexual partner. Among men, the principal influences were age, the importance of sex to the person, and education. In this sample of the population of older persons, attitudes were more significant influences on sexual desire than biomedical factors. Several influences on sexual desire remain understudied including hormone levels (estrogen and testosterone), existing sexual dysfunctions, and earlier sexual histories. Illness and medication usage were primarily self-reported measures, which may introduce error to these datasets. Lastly, non-Caucasian subjects were underrepresented. Future research would benefit from more comprehensive exploration of potential racial and ethnic group differences.

Waite, Laumann, Das, and Schumm (2009) used The National Social Life, Health, and Aging Project (NSHAP) data to investigate intimate social relationships, including marriage, family social ties, and sexuality among older community-dwelling adults.²² Specifically, NSHAP was designed to examine the relationship between sexual behavior, sexual problems, and health among older adults. They described measures of sexual partnerships, sexual practices, sexual problems, attitudes toward sex, and nonsexual intimacy in the first wave of NSHAP. The authors compared measures of sexuality for 3,005 individuals 57–85 years old, by age, separately for

men and women and constructed scales of sexual mores, sexual interest, relationship satisfaction, and discussed properties of each scale. The authors suggested that the data obtained in the NSHAP can be used to construct key measures of sexuality among older adults; to examine sexuality itself; and to explore the link between sexuality, health, well-being, and other dimensions of the lives of older adults.

Hirayama and Walker (2011) further supported a non-genital dimension of older adult sexual expression.²³ Their study examined whether the psychological well-being of older adults might be threatened if they feel bothered by an intimate partner's sexual unresponsiveness and whether such partner unresponsiveness might be compensated by perceived supportiveness of significant others.²³ They anticipated that perceiving a partner's sexual unresponsiveness would affect men and women differently. Using data from 1,346 participants in the National Social Life, Health, and Aging Project, they conducted regression analysis and estimated models separately but simultaneously for women and men. Results showed that although feeling bothered by the sexual unresponsiveness of an intimate partner was significantly associated with both women's and men's depressive symptoms, the moderating effect of the partner's supportiveness was significant only for women. The results suggested that gender is a key dimension for understanding the relationship among negative feelings about sexual relationships, socioemotional support from significant others, and psychological well-being in older age.²³

Karraker and colleagues (2011) examined sexual intercourse frequency decline among American men and women between the ages of 44 and 72.²⁴ They used data from both the National Health and Social Life Survey (NHSL) and the National Social Life, Health, and Aging Project (NSHAP). They examined the contribution of changes in the composition of the population with respect to marital status, physical health, and happiness as well as changes in the

association between these factors and sexual frequency by age. For women, change in the proportion widowed was a significant factor in sexual frequency decline, as was change in the association between happiness and sexual frequency. Among men, both poorer physical health at older ages and a decrease in its association with frequency were significant factors in the decline. A change in the association between happiness and frequency is also a significant factor for men.²⁴

DeLamater (2012) summarizes an array of sexuality research literature on people over 50.²⁵ He categorized the types of research as biological, health-related, psychological, relationship factors, and lastly research on sexual functioning. DeLamater suggests that both men and women remain sexually active as they enter late old age (75 years and on), that age-related physical changes typically did not lead to a decline in sexual functioning, and lastly, that good health combined with positive sexual attitudes and combined with access to a healthy partner were associated with continued sexual activity.²⁵ DeLamater recommended researchers develop theoretical models to better understand later life sexuality. He specifically recommended a theoretical model with an interdisciplinary or biopsychosocial framework that explores the role of biological, psychological and social influences.²⁵ The author also recommended that future research turns its focus toward both intimacy and the investigation of coupled relationships to help move beyond the current genital-sexual expression focus of much research.

Syme and colleagues' (2012) sought to improve the knowledge of older adult sexuality by understanding how a myriad of partnered and individual physical and mental health factors, often associated with aging, affect sexual unwellness.²⁶ Using a case-control study derived from the Wisconsin Longitudinal Study, they evaluated risk factors for sexual unwellness (i.e., lack of sexual satisfaction, inability to maintain the sexual relationship) in older adults aged 63–67. They

found that higher risk for lack of sexual satisfaction was associated with poor spousal health, a history of diabetes, and fatigue symptoms. In addition, being male, being satisfied with marital support, and having better spousal health reduced the risk of being unsatisfied sexually. Their results showed the impact of several physical and mental health risk factors on the development of sexual unwellness in older adults. A gendered pattern also emerged, suggesting that women tended to be less sexually satisfied, as compared to their male peers, who tended to report sexual unwellness that is associated with individual health.²⁶

Galinsky and Waite (2013) investigated the pathways linking spousal health to marital quality in later life for older adults.²⁷ They developed a conceptual model that linked married older adults' physical health and that of their spouse to positive and negative dimensions of marital quality via psychological well-being of both partners and their sexual activity. They used data from 1,464 older adults in 732 marital dyads in the 2010–2011 wave of the National Social Life Health and Aging Project. They found that own fair or poor physical health is linked to lower positive and higher negative marital quality, spouse's health to positive quality, and that own and spouse's mental health and more frequent sex are associated with higher positive and lower negative marital quality. Further, they found that (a) sexual activity mediates the association between own and partner's physical health and positive marital quality, (b) own mental health mediates the association between one's own physical health and both positive and negative marital quality, and (c) partner's mental health mediated the associations of spouse's physical health with positive marital quality. Their results suggested sexual activity as protective of marital quality among older adults who are struggling with physical illness in themselves or their partners.²⁷

Ivankovich and colleagues (2013) sought to identify opportunities within nationally representative surveys and surveillance systems to measure indicators of sexual health.²⁸ They reviewed and inventoried existing data systems that include variables relevant to sexual health. They searched for U.S. nationally representative surveys and surveillance systems that provided individual-level sexual health data. They assessed the methods of each data system and cataloged them by their measurement of the following domains of sexual health: knowledge, communication, attitudes, service access and utilization, sexual behaviors, relationships, and adverse health outcomes. They identified eighteen U.S.-focused, nationally representative data systems: six assessing the general population, seven focused on special populations, and five addressing health outcomes. While these data systems provide a rich repository of information from which to assess national measures of sexual health, they present several limitations.²⁸

National data are currently focused primarily on negative aspects of sexual health (e.g., risk behaviors and adverse health outcomes) rather than more positive attributes (e.g., healthy communication and attitudes, and relationship quality). They concluded that nationally representative data systems provide opportunities to measure a broad array of domains of sexual health. However, current measurement gaps indicate the need to modify existing surveys and develop new tools to include additional indicators that address positive domains of sexual health across the lifespan.²⁸

Lee and colleagues (2016) examined the associations between different patterns of sexual behavior and function and indicators of subjective well-being (SWB) in a representative sample of partnered older people.²⁹ They used data from a Sexual Relationships and Activities Questionnaire (SRA-Q), latent class analysis identified groups characterized by distinctive patterns of sexual behavior and function and then examined their link to SWB. The researchers

found that sexual behavior and function was best described by six classes among men and five classes among women. These ranged from high sexual desire, frequent partnered sexual activities, and few sexual problems (Class 1) to low sexual desire, infrequent/no sexual activity, and problems with sexual function (Class 5[women]/6[men]). Men and women who reported either infrequent/no sexual activity, or were sexually active but reported sexual problems, generally had lower SWB than those individuals identified in Class 1. Poorer SWB in men was more strongly associated with sexual function difficulties, whereas in women desire and frequency of partnered activities appeared more important in relation to SWB. Within the context of a partnered relationship continuing sexual desire, activity and functioning are associated with higher SWB, with distinctive patterns for women and men.²⁹

Waite and colleagues (2017) proposed and tested a conceptual model of the predictors of partnered sexual activity in older adulthood.³⁰ This model began with the personality of each of the partners, which affects individuals' views of sex and characteristics of the partnership, both of which affect sexual expression in the couple. They measured a key feature of personality, Positivity, which reflects the individual's tendency to present oneself positively in social situations. Positivity also impacts characteristics of the relationship that promote dyadic sexual behavior. They tested this model with data from the National Social Life, Health and Aging Project, which conducted personal interviews with both partners in 940 dyads. They found that couples in which the husbands (but not wives) are high in Positivity show higher levels of sexual activity and that this association was partially mediated by relationship quality, but more so by individual factors such as thinking about sex and believing sex is important.³⁰

Syme and colleagues (2017) posited that sexual risk among older adults is prevalent, though little is known about the accuracy of sexual risk perceptions.³¹ Their aim was to

determine the accuracy of sexual risk perceptions among older adults by examining concordance between self-reported sexual risk behaviors and perceived risk. Data on older adults aged 50 to 92 were collected. Frequency of sexual risk behaviors (past 6 months) was reported along with perceived risk (i.e., sexually transmitted infection susceptibility). Accuracy categories (accurate, underestimated, overestimated) were established based on dis/concordance between risk levels (low, moderate, high) and perceived risk (not susceptible, somewhat susceptible, very susceptible). Approximately half of the sample reported engaging in vaginal (49%) and/or oral sex (43%) without a condom in the past 6 months. However, approximately two-thirds of the sample indicated they were “not susceptible” to sexually transmitted infections. No relationship was found between risk behaviors and risk perceptions, and approximately half (48.1%) of older adults in the sample underestimated their risk. Accuracy was found to decrease as sexual risk level increased, with 93.1% of high risk older adults underestimating their risk. Several sexual risk behaviors are prevalent among older adults, particularly men, however perception of the risk is often inaccurate and warrants attention.³¹

Social Connectedness and Older Adults

Examination of social connectedness in older age is important for several reasons. With the graying of America, there is an increased need for understanding the connection between social ties and older adult health. Sexuality and social connectedness (a measure of belonging) are both associated with communication, social roles, relationships, intimacy, self-image, and culture.

Whereas evidence by Markham and colleagues (2010) established a positive association between social connectedness and adolescent female’s sexual health, little research has explored such an association in later life.² While it is known that social connectedness plays an important role in

the positive health outcomes of older adults, its relationship with older adult sexual health is not known. This author posits such a relationship warrants exploration. De Leon and colleagues (2010) found that relationships can influence multiple facets of older adults' lives including their health.³²

Upon the surface, social relationships may appear to serve as merely a quality of life component, but de Leon and colleagues (2003) found that social relationships can influence multiple facets of individuals' lives including their health.³² Aspects of social relationships have been linked with both mortality and morbidity. Kawachi and Berkman (2001) found social relationships to be associated with mental health status.³³ Previous research by Hawkey and Cacioppo (2003) has identified social isolation as a risk factor for physical and mental health.³⁴ Heikkinen and Kauppinen (2004) found that socially disconnected individuals tend to suffer higher rates of morbidity and mortality including depression.³⁵ Wilson and colleagues (2007) also identified cognitive decline in that regard.³⁶ McPherson and colleagues (2006) revealed that older adults are more likely to have smaller social networks.³⁷ Dykstra and colleagues (2005) found they are also more likely to experience feelings of loneliness when compared with young adults.³⁸ To the extent that social isolation is often associated with worse health, it may pose a significant risk for older adults as they are more likely to experience bereavement and develop health problems than younger adults, which may increase their need for social support.

Definitions of Social Connectedness

Van Bel and colleagues (2009) defined social connectedness as the short-term affective experience of belonging to a social relationship or network.³⁹ They identified two types of social connectedness. The first referred to an overall level of social connectedness which pertains to one's whole social network. The second referred to social connectedness at the individual level,

which pertains to feelings regarding a specific person. For this review, social connectedness will be defined as the measure to which people come together and interact, both with other individuals and groups. The six components of social connectedness include duration of relationship, frequency of interaction, knowledge of the other's goals, physical intimacy or closeness with others, self-disclosure to others, and social network familiarity – how familiar others are with the rest of one's social circle.³⁹

Related to social connectedness (the measure of belonging to a relationship) is social network – the social structure made up of a set of actors, dyadic ties, and other social interactions. Ashida and Heaney (2008) defined social networks as the web of social ties within which individuals live.⁴⁰ Heaney and Israel (2008) defined the structural characteristics of these networks as including the number of network members, density of the network (extent to which members know each other), and the geographical proximity of its members.⁴¹ Social networks differ from social connectedness in that beyond being a measure, they are capable of providing actual social support, the provision of resources perceived to enhance the well-being of the recipient. Lin and colleagues (2013) defined social support as the perceived or actual instrumental and/or expressive provisions supplied by the community, social networks, and confiding partners.⁴² Ashida and Heaney (2008) operationalized older adults' social support through social networks as emotional support, tangible aid and support, informational support (advice, suggestions, and information), and appraisal support (information that is useful in self-evaluation).⁴⁰

Research on the ways that changes in an individual's social networks and partner relationships affect health and well-being during the last third of life have promising results. Recent studies by Cornwell and Waite (2012) and Shiovitz-Ezra and Litwin (2012) using the

NSHAP database have found that more resource-rich networks promote good health and protect against risky health behaviors.^{43,44} Cornwell and Laumann (2015) found changes in networks can change health outcomes.⁴⁵ Sbarra (2009) and McFarland and colleagues (2013) found marital relationship exerts a unique influence on health, offering protection from adverse physiological health states.^{46,47} Bookwala (2011) and Warner and Adams (2012) also found that marital relationships buffered the negative emotional consequences of disablement and functional decline, especially when the marriage were viewed as good.^{48,49} Cornwell (2009) found health affects social relationships – those with better cognitive function may be better able to manage their networks.⁵⁰

Social support is the perception that one is part of a supportive social network. That perception of one's social network, in turn, can positively or negatively affect an individual's measure of social connectedness. Cornwall and colleagues (2008) examined social disconnectedness and defined it as characterized by a lack of contact with others and influenced by situational factors, such as a small social network, infrequent interaction, and a lack of participation in social activities.⁵¹ Perceived isolation is characterized as a subjective experience of a shortfall in one's social resources (i.e., companionship and support). The author conceptualized that disconnectedness and perceived isolation as related but hypothesized that they each are distinct. Simply put, social connectedness is a measure of how people come together and interact. It is a type of belongingness (or the lack thereof). At an individual level, social connectedness involves the number and quality of connections. A social network is a set of relations, links, or ties among social actors. Social support refers to a social network's provision of resources intended to benefit an individual's ability to cope in times of need. Such needs can include emotional support during times of stress, tangible resources such as financial

assistance or material goods, informational resources including guidance and suggestion, and lastly companionship. Social support is often differentiated by three types of resources: instrumental, informational, and emotional. Smith and colleagues (2007) posit that social support is a social determinant of health that may improve physical activity in older adults, but the association has not been systematically reviewed, as high variability in measurement methods used to assess both social support and physical activity make it difficult to compare studies.⁵²

Background on Theory

Toepoel (2013) posited that long-existing social disengagement theory frames “aging” as the mutual social withdrawal that takes place between the (aging) person and others.⁵³ The process accelerates with the relinquishing of roles as older adults drop out of the workplace and as their children move out of the household. In their early work, Cumming and Damianopoulos (1961) found that social ties may be reduced over time as aging peers begin to die.⁵⁴ The idea of later life is associated with social isolation is not new – the classic social-psychological concept by Cumming and Damianopoulos (1961) was social disengagement theory, which holds that older adults’ isolation results from the gradual abandonment of social roles, narrowing role sets, and the weakening of social bonds over time.⁵⁴ A few decades later, Elder’s (1985) and George’s (1993) life course perspective work began to be used to underscore the implications of later-life challenges for social integration.^{55,56} Specifically, Elder (1985) examined the implications using two concepts: trajectory and life transition.⁵⁵ Trajectory offered a long-term view of the life course. For example, it can provide a perspective from which to examine careers. Each life course is seen as having multiple interlocking trajectories. Transitions are marked by events on the trajectories of work, marriage, and parenthood. This line of research portrays older adults as

resilient to potentially socially-isolating events including retirement and the loss of family and friends.⁵⁵

Later continuity theory by Rowe and Kahn (1998) argued that people with robust social roles and activities attempt to maintain them through such transitions in their lives.⁵⁷ Literature does exist that explores some of the contextual factor affecting social networks, specifically the age, network composition, and the concept of aging in place (the ability to live in one's own home and community independently, regardless of age). Ashida and Heaney (2008) hypothesized that social support influences well-being through two main pathways.⁴⁰ The first is a main effect where social support is seen as a source of positive affect, enhanced self-esteem, and feelings of belonging. In turn, Cohen and colleagues (2008) found these positive psychological states may result in improved neuroendocrine and immune function as well as greater motivation to engage in healthy behaviors.⁵⁸ The second pathway is through networks buffering the adverse effects of stressful life events. According to this view, the adverse effects of stressors can be reduced if individuals feel that others in his/her social network will provide resources or assistance.

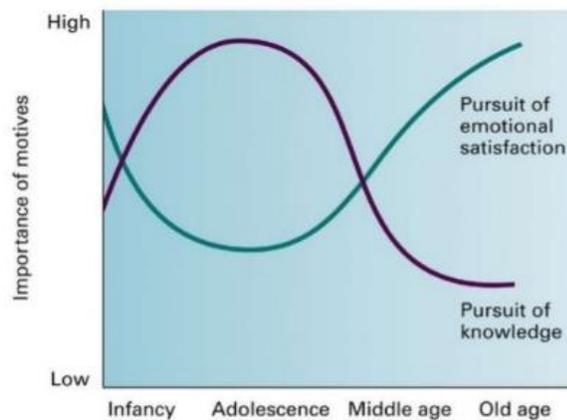
Lang and Carstensen (1994) explored how age demographics affect aspects of social connectedness.⁵⁹ The authors hypothesized that age-related reductions in network size are proactively managed by older people by examining the interrelationships among chronological age, network composition, social support, and feelings of social embeddedness (FSE). Comparisons are made between people with and without nuclear families, to explore the influence of opportunity structures (social ties providing access to opportunities) on network size. Social networks of very old adults are nearly half as large as those of old adults, but the number of very close relationships does not differentiate these age groups. Among subjects

without living nuclear family members, the number of emotionally close social partners predicted FSE better than among subjects with nuclear family members. Their findings provided evidence for proactive steps towards emotional bonds and social functioning in older age.⁵⁹

Socio-emotional Selectivity Theory

Figure 1.2: Model of Socio-emotional Selectivity depicting motivation by age. (Santrock J.W, 2009)

Model of Socio-emotional Selectivity



Santrock J.W. Life-span development. Boston, MA: McGraw-Hill; 2009.
Reproduced with permission of McGraw-Hill Education.

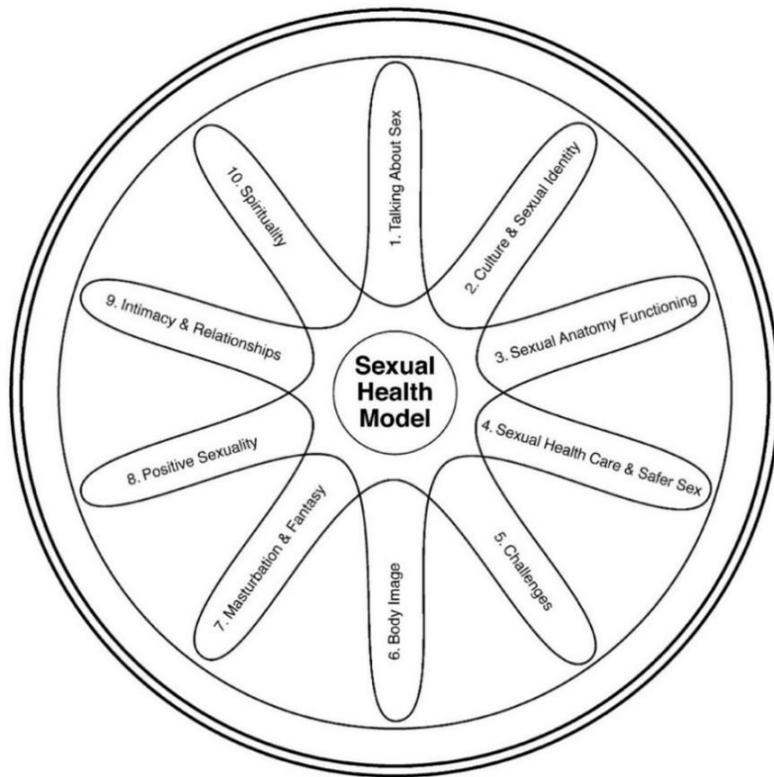
Another alternative to such social disengagement is offered by socio-emotional selectivity theory. The theory maintains that as life’s remaining timeline shrinks, people become increasingly selective, investing greater in emotionally meaningful goals. Older adults then spend more time with individuals with whom they have more emotionally rewarding relationships.

Carstensen (1992) posited that as adults become older, they become more selective and strengthen emotional ties, dissolving peripheral relationships and creating a smaller number of “high-quality” relationships.⁶⁰ Cornwell and colleagues (2008) posited that social networks (having numerous direct ties to people) provide alternate access to social resources, and increase

the opportunities for older adults to receive support when needed.⁵¹ Fiore and colleagues (2006) posited that some types of social ties may be more beneficial than others, relationships regarded as “high quality” (fewer in number with stronger emotional ties) are more likely to provide older adults with a sense of belonging and are associated with higher self-esteem and well-being.⁶¹ The research of Shaw and colleagues (2007) and McPherson and colleagues (2006) suggested that age is positively associated with the presence of higher-quality relationships.^{62,37} For example, older adults may have denser social networks (in which one’s network members know each other and can triangulate information, share caregiving duties, and pool resources) compared to younger adults, and they tend to interact more with supportive contacts and have more kin-centered networks. Frederickson and Carstensen (1990) posited that older people shed less meaningful, more superficial relationships as they age because they prefer to surround themselves with emotionally close contacts.⁶³ Cornwell and colleagues (2008) found a more complex and nuanced profile of older adult social lives than previous theories have anticipated.⁵¹ Cornwell posited that the literature suggests the association between age and social connectedness in interpersonal networks and voluntary associations is complex and depends on several life course factors – a picture that runs counter to the image of universal disengagement and social isolation offered by early research.

Holistic Sexuality

Figure 1.3: Sexual Health Model (Robinson, Bockting, Simon Rosser, Miner, Coleman, 2002)



Robinson BE, Bockting WO, Simon Rosser BR, Miner M, Coleman E. The sexual health model: Application of a sexological approach to HIV prevention. Health Education Research. 2002. Reproduced with permission of Oxford University Press.

Derived from a sexuality education approach, Robinson and colleagues (2002) developed the Sexual Health Model. It defines 10 key components posited to be essential aspects of healthy human sexuality: talking about sex, culture and sexual identity, sexual anatomy and functioning, sexual health care and safer sex, challenges to sexual health, body image, masturbation and fantasy, positive sexuality, intimacy and relationships, and spirituality.⁶⁴ Each of these components is represented as a spoke on the sexual health wheel reflecting the interactions and hierarchy of the 10 components have yet to be defined, are assumed to have equal importance.

Accordingly, the removal or addition of a spoke (component) as dictated by future findings would not disrupt the model. The model is anchored in a holistic definition of sexuality, with an aim to provide a framework for improving overall sexual well-being.⁶⁴

Gaps in the Literature and Questions for Future Research

Literature gaps included a lack of investigation of community-dwelling populations, and research that incorporates a more holistic (i.e., less genitally-focused) approach to older adult sexual expression. Additionally, little is known about the role that social relationships can play in supporting healthy and robust sexual expression in older adults. Social relationships can influence multiple facets of older individuals' health including mental and physical health. While this association with positive health outcomes is known, the relationship between social connectedness and sexual expression in older adults has not been established. Potential differences in this relationship may exist by age and gender based on what has been established in investigations of adolescent female sexual health.² This literature review has demonstrated that little is known about holistic older adult sexual expression and its interaction with social connectedness. This dissertation seeks to provide new research to fill that gap and serve as a foundation for future research in this nascent area of study. The absence of knowledge in this area is a barrier to the positive health impact that the field of public health can make in the sexual lives of older adults.

Data Source: The National Social Life, Health, and Aging Project (2005)

Waite and colleagues' (2007) National Social Life, Health, and Aging Project (NSHAP) was a longitudinal, population-based study of health and social factors, aiming to understand the well-being of older, community-dwelling Americans by examining the interactions among physical health and illness, medication use, cognitive function, emotional health, sensory

function, health behaviors, social connectedness, sexuality, and relationship quality. It is a unique dataset that captures both sexuality and social connections information amongst older adults. A few dozen key measures address sexual domains of 1) relationships, 2) attitudes and values regarding sex and sexuality, 3) sexual histories, 4) sexual behaviors and practices, 5) problems related to sexuality, and 6) sexual health issues. NSHAP was designed to examine the relationship between sexual behavior, sexual problems, and the health of older adults.⁶⁵

NSHAP's breadth of data permits a variety of investigations, including interactions between physical health and illness, health behaviors, social connectedness, sexuality, and relationship quality. NSHAP's advantage over other data sources for this project is its combination of measures of intimate social relationships—including those related to marriage, family social ties, community interactions—and those defining sexual expression, including sexual practices, attitudes toward sex, and nonsexual intimacy. Measures of sexual partnerships, sexual practices, sexual problems, attitudes toward sex, and nonsexual intimacy are described in the first wave of NSHAP. The authors compare measures of sexuality for 3,005 individuals 57–85 years old, by age, separately for men and women and construct scales of sexual mores, sexual interest, relationship satisfaction, and discuss properties of each scale. Blacks and Latinos were oversampled in this study. Data was collected through 120-minute in-home interview consisting of a questionnaire and biomeasure collection. A leave-behind questionnaire was utilized. A total of three waves of data have been collected over 10 years.⁶⁵

Specific Aims and Hypotheses

This study aims to evaluate the influence of non-genital factors on sexual expression in community-dwelling older adults by analyzing data from National Social Life, Health, and Aging Project (NSHAP), a large, longitudinal, population-based study. My study sample is comprised of community-dwelling older adults. NSHAP was conducted to explore the link between sexuality,

health, well-being, and other dimensions of the lives of older adults by Waite and colleagues (2007).⁶⁵

Aim 1: To develop sexual expression constructs for use with community-dwelling older adults.

Hypothesis: older adults have a distinct form of sexual expression and there are two latent factors underlying the observed sexual expression variables, sexual behavior (genital) and sexual attitudes (non-genital).

Methods Used: Exploratory factor analysis (EFA) will be conducted to develop a new scale of sexual expression. The constructs to be identified will be based on ten measures related to sexuality that are captured in the NSHAP dataset. These latent factors are assumed to be correlated, given their socio-behavioral nature.

Aim 2: To assess if social connectedness and social non-isolation, composite variables previously developed by Cornwell and Waite (2009) from the same NSHAP dataset, are associated with sexual expression (developed in Aim 1).⁶⁶ This research seeks to identify social variables that relate to sexual expression and are suitable for further research and exploration.

Hypothesis: Social connectedness is positively associated with sexual expression in older adults.

Methods Used: A cross-sectional regression analysis will be applied to evaluate whether the new sexuality expression scales developed in Aim 1 are associated with composite measures of social connectedness and social non-isolation. These social connectedness measures will be based on work developed by Cornwell and Waite's investigation of social connectedness.⁶⁶

Aim 3a: To determine whether the associations between the sexual expression measures — developed in Chapter 2—and the social variables (i.e., social connectedness and social non-isolation) vary by two factors: age and gender.

Hypothesis: That sexual expression will have a stronger positive association with social non-isolation among females compared to males, and for the younger age group compared to the older age group and that sexual expression will have a stronger positive association with social connectedness among females compared to males, and for the younger age group compared to the older age group.

Methods Used: To investigate this question, stratified models were estimated, and separate models were established for men and women, and older and younger study participants. This aim will test the interaction between social connectedness and age, then between social connectedness and gender, on sexual expression and will be tested as cross-product terms in multivariate linear regression models.

Aim 3b: To determine whether elements of the social connectedness and social non-isolation composite variables are particularly influential determinants of sexual expression.

Methods Used: The social variables developed by Cornwell and Waite (2009)¹⁰ are likely multi-dimensional may mask the influence of individual dimensions. To accomplish this Aim, the social measures will be disaggregated using principal components analysis (PCA). PCA will guide creation of subscales that will be explored in relation to the sexual expression outcomes.

CHAPTER TWO: EXPLORATORY FACTOR ANALYSIS, OF OLDER ADULT SEXUAL EXPRESSION

INTRODUCTION

Sexuality is a central aspect of human identity for all people, including older persons, as defined by The World Health Organization (2006).³ Botwinick (1984) argues that sexual expression continues across the lifespan, despite the presence of what Hayflick (1994) identifies as a strong cultural fallacy of the sexlessness of older adults.^{10,18} Butler & Lewis (2011) explain that the sexual lives of this population have important public health implications as older adults are a rapidly growing segment of the population, living longer, and living healthier.⁷ A more comprehensive, holistic approach to researching the sexuality of older adults would help advance public health understanding, especially now that the U.S. Department of Health and Human Services (2011) reports that national public health initiatives in health-related quality of life (HRQoL) and well-being are growing.⁶⁷ Advancements in older adult sexuality research may support this ongoing area of national focus and serve to better guide intervention work, further research, better inform policy as it pertains to older adults and their sexual expression, and provide sexual health services that are older-age appropriate.

This study utilizes a quantitative secondary data analysis to develop an innovative scale of sexual expression for older adults that is holistic in nature and serves a community-dwelling population. The cultural fallacy of sexlessness of older adults is being challenged more systematically by recent research. DeLamater and Sill (2005) explored sexual desire among older adults.²¹ While physiological effects of aging impact sexual functioning, the study found that while sexual desire varies by age, that attitudes about sex more significantly influence sexual

desire than do biomedical factors. In a subsequent literature review, DeLamater (2012) found that sexuality research among people over the age of 50 years report sexual activity among men and women in late age (75 years and older), that age related physical changes do not lead to a decline in sexual functioning, and that sexual activity is associated with a combination of good health, positive sexual attitudes, and availability of a partner.²⁵ He also recommends that future research move beyond genital sexual expression and explore the role of psychological and social influences as well as intimacy and partnered relationships (where the individuals identify as coupled). This study seeks to evaluate the influence of non-genital (sexual attitudes) factors on sexual expression in older adults by analyzing the large, longitudinal, population-based study: The National Social Life, Health, and Aging Project (NSHAP). NSHAP was conducted to explore the link between sexuality, health, well-being, and other dimensions of the lives of older adults.⁶⁵

NSHAP recruited community-dwelling men and women between the ages of 57-85 years. Institutionalized subjects were not included in this study and it is unclear how generalizable the results of this study will be to institutionalized populations, as there is a dearth of research comparing older adults' health status in these two populations. Many existing studies focus on one population or another and when both populations are compared, the study is typically evaluating a specific health condition across community-dwelling and nursing home residents, but does not provide a comparative assessment of health status.⁶⁸⁻⁷⁰ However, one study in Korea found institutionalized older adults had more health problems and experienced lower quality of life compared to community-dwelling older adults.⁷¹ Among the factors influencing health-related quality of life for institutionalized older adults was social support. A small study in Italy by Scocco and Nassuato (2017), compared social relationships among old community-dwelling

adults and nursing home residents found that nursing home residents tended to be older, male, never married or widowed, had lower physical health scores, but higher social relationship scores.⁷² The authors postulate that this surprising social relationship finding may be attributed to the opportunities to socialize that nursing homes provide, but requires further investigation.

Miller and Weissert (2000) argue that, unlike their institutionalized counterparts, community-dwelling older adults in the United States are healthier and more connected socially overall, and lives characterized by greater social activity and activity of daily living scores,⁷³ making the study of social connectedness both fertile and possible. Social relationships are a public health issue, not only because of their impact on quality of life, but also because they have been found to be linked with mental health (Kawachi and Berkman, 2001), physical health (Hawkey and Cacioppo, 2003), morbidity and mortality, depression (Heikkinen and Kauppinen, 2004), and cognitive decline (Wilson and colleagues, 2007).³³⁻³⁶ Among older adults, social networks tend to be smaller (McPherson and colleagues, 2006) and feelings of loneliness are experienced more often when compared with young adults (Dykstra and colleagues, 2006).^{37,38} However, Lang and Carstensen (1994) theorized that older people proactively manage their networks – via an active selection process in which emotionally close relationships are favored and less meaningful are dropped – keeping the highest quality relationships. All levels of closeness are examined and while overall network size decreases as people age, the number of emotionally close contacts remains similar. As morbidity and mortality would affect evenly over all levels of closeness, the change seen in the closest relationship speaks to the existence of an active selection process by older adults.⁵⁹ Their study found that while social networks of very old adults are nearly half as large as those of old adults, the number of very close relationships did not differ between the two groups.

Previous studies of social connectedness often explore components of, but not all three aspects of the variables explored in this study: the investigation of intersectionality between age, sexuality, and social connections. Markham and colleagues (2010) evaluated social connectedness and adolescent female sexual health.² de Leon and colleagues (2003) found that social relationships can influence multiple facets of older adult life but does not evaluate sexual health.³² To study all three aspects, the first aim of the present study is to develop sexual expression constructs for use with older adults. These constructs can be related to social connectedness constructs developed by Cornwell (2009) in another publication of the NSHAP study.⁶⁶ The hypothesis is that older adults have forms of sexual expression distinct from younger adults, that can be evaluated in a large national sample and that these forms describe both genital (behavioral) and non-genital (attitudinal) types of sexual expression. Exploratory factor analysis (EFA) will be conducted to develop a new scale of sexual expression. The constructs to be identified will be based on ten measures related to sexuality that are captured in the NSHAP dataset.

This study is grounded in two primary theories. The first is Socio-emotional Selectivity Theory (SeST). According to Carstensen (1992), SeST maintains that as life's remaining timeline shrinks, people become increasingly selective, investing more of their personal resources in emotionally meaningful goals.⁶⁰ SeST holds that older adults become more selective about their social networks because they begin to place greater value on emotional satisfaction. Consequently, SeST challenges the notion that older adults' experience despair from social isolation, but rather, postulates that they are intentional with social selectivity. For example, older adults spend more time with individuals with whom they have rewarding relationships.

Cornwell and colleagues (2008) add more complexity and nuance to the profile of older adult social lives than had been anticipated by previous theories.⁵¹ Cornwell and colleagues posit that the literature suggests the association between age and social connectedness in interpersonal networks and voluntary associations is complex and depends on several life course factors – a picture that challenges the image of universal disengagement and isolation offered by early social disengagement theory by Cumming and Henry (1961), which holds that older adults’ isolation results from a gradual and irreversible abandonment of social roles, narrowing role sets, and the weakening of existing social bonds.⁷⁴

The second theory that grounds this study is the Sexual Health Model described by Robinson and colleagues (2002).⁶⁴ It is derived from a sexuality education approach and defines 10 key components posited to be essential aspects of healthy human sexuality: 1) talking about sex, 2) culture and sexual identity, 3) sexual anatomy and functioning, 4) sexual health care and safer sex, 5) challenges to sexual health, 6) body image, 7) masturbation and fantasy, 8) positive sexuality, 9) intimacy and relationships, and 10) spirituality.⁶⁴ Each of these components is represented as a spoke in the “sexual health wheel” reflecting their interactions. The hierarchy of the 10 components have yet to be defined and are assumed to have equal importance.

Accordingly, the removal or addition of a spoke (component) as dictated by future research findings would not disrupt the model as it is anchored in a holistic definition of sexuality with an aim to view the person as whole and provide a framework for improving overall sexual well-being.⁶⁴ For instance, one does not have to currently be in an intimate relationship, nor be sexually active, to be a sexual being. Accordingly, the majority of the 10 components identified in this theory are non-genital (or attitudinal) by nature (e.g., talking about sex, culture and sexual

identity, body image, relationships, and spirituality), and view sexuality as both organic and comprehensive in its presence throughout the lifecycle.

This research will attempt to connect SeST and the Sexual Health Model theories by capturing *latent* variables that are thought to underlie – and give rise to – patterns of correlations in new domains of (manifest) variables. These new variables aim to represent aspects of the SeST and human sexuality theory as they pertain to the sexual lives of older adults. These aspects will include a broader non-genital lens – that encompasses relationship issues – such as intimacy, love, and connection – as a deepening of relationship quality in older adults.

METHODS

Study Design & Data Source

The research described in this chapter is a quantitative secondary data analysis to develop an innovative holistic scale of sexual expression for use with older adults. This scale will be developed through Exploratory Factor Analysis (EFA) using selected variables that are thought to capture both SeST and human sexuality variables. The secondary data analysis will utilize a cross-sectional study design by Waite and colleagues (2007) that analyzes data from the baseline wave of the National Social Life, Health, and Aging Project (NSHAP).⁶⁵ NSHAP is a national, longitudinal, population-based study of community-dwelling older individuals that focuses on the relationship between sexual behavior, sexual problems, and well-being. Its 3,005 participants were aged 57–85 years at baseline survey in 2005, oversampling for Blacks and Latinos. NSHAP's breadth of data permits a variety of investigations, including interactions among physical health and illness, medication use, cognitive function, emotional health, sensory function, health behaviors, social connectedness, sexuality, and relationship quality. A total of three waves of data have been collected over 10 years.⁶⁵ NSHAP's advantage over other data

sources for this project is its combination of measures of intimate social relationships—including those related to marriage, family social ties, community interactions—and those defining sexual expression, including sexual practices, attitudes toward sex, and nonsexual intimacy. Data were collected via a 120-minute, in-home interview consisting of a questionnaire and bio-measure collection. NSHAP also included a leave-behind questionnaire.

Analytic Sample

The study sample is comprised of community-dwelling older adults. Of the 3,005 participants at the 2005 survey wave, 2,743 records were available for analysis in the public use dataset. The process of extracting the relevant data are described here. Participants for this study were first selected from individuals who indicated that they had a spouse or intimate partner (n = 1843). From this eligible sample, a majority of the group included individuals who reported engaging in sex in the last year (n = 1,237), as only such participants were prompted to respond to most of the intimacy questions that were analyzed in this study. The sample was further reduced by those missing data within the 10 sexual expression variables (n = 385, accounting for overlap) which included “how often sleep in same bed” (n = 209), “happy in relationship” (n = 2), “physical pleasure in relationship” (n = 15), “importance of sex” (n = 79), “emotional satisfaction in relationship” (n = 8), “frequency of foreplay” (n = 27), “frequency of receiving oral sex” (n = 71), “frequency of giving oral sex” (n = 88), “frequency of masturbation” (n = 150), and “frequency of vaginal sex” (n = 58). Other missing data included entries for religion and religious attendance (n = 7), race (n = 4), working status (n = 1), self-rated physical health (n = 2), self-rated mental health (n = 2), and basic activities of daily living (BADL) components (n = 1), and family income (n = 321). Imputing family income at its median (\$55,000) value recovered 167 observations, leading to a final analytic sample of n = 754 for this aim.

Variables and Recoding

Ten sexual expression variables describing sexual behaviors and sexual attitudes were tested in the Exploratory Factor Analysis (EFA). The variables conformed to two general categories: sexual behaviors and attitudes toward sex (hereafter referred to as “sexual attitudes”). All variables related to sexuality were initially gathered from NSHAP and grouped into ten domains of sexuality as informed by the Sexual Health Model. The sexual attitudes variables were initially chosen that represent the less traditionally-focused domains of the human sexuality theory wheel (e.g., communicating about sex, values, intimacy and relationships, and positive sexuality). Then the scope of variables was broadened to include more traditional sexual behavior aspect (e.g., sexual behaviors and practices including oral intercourse, and foreplay).

Sexual Behavior Variables

This group of variables is intended to capture the genital aspect of sexual expression. “How often sleep in same bed” was a 3-level ordinal variable where 1 = never, 2 = some of the time, and 3 = all or most of the time. This variable was modified from the original coding (0, 1, 2) for consistency with other variables in the EFA and was based on the survey question: *In the last month, how often did you sleep in the same bed with your spouse or romantic partner?* “Frequency of foreplay during sex” was a 5-level ordinal variable where 1 = never, 2 = rarely, 3 = sometimes, 4 = usually, and 5 = always. This variable was modified from the original coding (0, 1, 2, 3, 4) for consistency with other variables in the EFA and was based on the survey question: *When you had sex with your partner in the last 12 months, how often did your activities include kissing, hugging, caressing, or other ways of sexual touching?* Note: NSHAP defined sexual activity as any mutually voluntary activity with another person that involves sexual contact, whether intercourse or orgasm occurs or not. “Frequency of receiving oral sex” is a 5-

level ordinal variable where 1 = never, 2 = rarely, 3 = sometimes, 4 = usually, and 5 = always. This variable was modified from the original coding (0, 1, 2, 3, 4) for consistency with other variables in the EFA and was based on the survey question: *When you had sex with your partner in the last 12 months, how often did he/she perform oral sex on you?* “Frequency of giving oral sex” is a 5-level ordinal variable where 1 = never, 2 = rarely, 3 = sometimes, 4 = usually, and 5 = always. This variable was modified from the original coding (0, 1, 2, 3, 4) for consistency with other variables in the EFA and was based on the survey question: *When you had sex with your partner in the last 12 months, how often did you perform oral sex on him/her?* “Frequency of masturbation in the last year” is a 10-level ordinal variable where 1 = not at all this year, 2 = 1-2 times a year, 3 = 3-5 times a year, 4 = every other month, 5 = once a month, 6 = 2-3 times a month, 7 = once a week, 8 = several times a week, 9 = every day, and 10 = more than once a day. This variable was modified from the original coding (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) for consistency with other variables in the EFA and was based on the survey question: *On average, in the past 12 months how often did you masturbate?* “Frequency of vaginal sex” is a 5-level ordinal variable where 1 = never, 2 = rarely, 3 = sometimes, 4 = usually, and 5 = always. This variable was modified from the original coding (0, 1, 2, 3, 4) for consistency with other variables in the EFA and was based on the survey question: *When you had sex with your partner in the last 12 months, how often did your activities include vaginal intercourse?*

Holistic Sexual Attitude Variables

This group of variables is intended to capture the non-genital sexual attitudes of sexual expression which include variables that describe intimacy in relationships. “Happy in relationship” is an ordinal variable measured on a scale from 1 to 7, where 1 = very unhappy and 7 = very happy and was based on the survey question: *Taking all things together, how would you*

describe your marriage/relationship with your partner? “Physical pleasure in relationship” is a 5-level ordinal variable where 1 = not at all, 2 = slightly, 3 = moderately, 4 = very, and 5 = extremely. This variable was modified from the original coding (0, 1, 2, 3, 4) for consistency with other variables in the EFA and was based on the survey question: *How physically pleasurable did/do you find your relationship with your partner to be?* “Importance of sex” is a 5-level ordinal variable where 1= not at all important, 2 = somewhat important, 3 = moderately important, 4 = very important, and 5 = extremely important and was based on the survey question: *For some people sex is a very important part of their lives and for others it is not very important at all. How important a part of your life would you say that sex is?* “Emotional satisfaction of relationship” is a 5-level ordinal variable where 1 = not at all, 2 = slightly, 3 = moderately, 4 = very, and 5 = extremely. This variable was modified from the original coding (0, 1, 2, 3, 4) for consistency with other variables in the EFA and was based on the survey question: *How emotionally satisfying did/do you find your relationship with him/her to be?*

Analytical Method: Exploratory Factor Analysis

EFA refers to a set of statistical procedures designed to explain correlations among variables in terms of more fundamental entities called factors. EFA grew out of the observation that variables from a carefully formulated domain, such as items in an assessment of interpersonal functioning, often correlate with each other. According to the factor analytic perspective, variables correlate because they are determined by common, but unobserved (i.e. latent) influences. Cudeck (2014) explains that these latent influences are superordinate to observed measurements because such unobserved factors are assumed to be responsible for differences, or variance, in values of the observed variables.⁷⁵ The goals of factor analysis are to determine the number of fundamental influences underlying a domain of variables and quantify

the extent to which each variable is associated with the factors. Fabrigar and Wegener (2012) further specify that to obtain information about their nature, one must observe which factors contribute to performance on which variables.⁷⁶

The justification for selecting EFA over an alternative method, Principal Components Analysis (PCA), relates to this study's objective, which is to develop sexual expression constructs for use with older adults under the hypothesis that genital and non-genital types of sexual expression (i.e. sexual behavior and sexual attitudes) are expressed in the correlation between observed variables that represent these concepts. Although Joliffe and Morgan (1992) suggest both EFA and PCA are similarly data-reduction aids—or tools which assume that variable correlations may be used to derive composite variables that replace a larger set of individual variables with little loss of information—only EFA relates variable clustering to latent constructs.⁷⁷ In other words, PCA is unconcerned with the concepts that link variables and is merely applied to reduce data dimension – i.e., reducing the data to its basic components, by removing unnecessary parts – and improve model efficiency and parsimony.

Tabachnick and Fidell (2007) explain that EFA is a multistep process that requires the investigator to make numerous decisions *prior to* and *during* analysis.⁷⁸ As described above, the initial decision is conceptual; it involves generating hypotheses about what latent constructs underlie the observed data. Next, observed variables that represent the unobserved constructs are identified and, if necessary, converted to ordinal variables, consistent with the assumptions of the correlation techniques applied in EFA. (Note that variables used in factor analysis are often Likert-scaled, and although ordinal, have limited ranges. EFA does not, however, assume that such variables are normally distributed.) At this point, the investigator develops the sample and evaluates sample size. Comrey and Lee (1992) suggest that a rule of thumb in EFA suggests that

minimum sample size of 300 helps reduce standard errors, improving factor robustness and construct validity.⁷⁹

Costello and Osborne (2005) show that the next step is an *a priori* selection of the method applied to extracting factors in the initial factor solution and the threshold for determining the number of factors.⁸⁰ Fabrigar and colleagues (1999) demonstrates that there are numerous extraction methods which vary according to how correlations between observed variables are calculated, transformed, and summarized prior to the computation of “communalities,” or the proportion of variance in a given variable explained by the factors.⁸¹ Technical sophistication contrasts widely across these methods, from those based on fairly simple correlation of variables to others relying on complex iterative or maximum-likelihood techniques. It is noteworthy that the more sophisticated methods are less widely used, as they tend to necessitate larger samples and investigator manipulation of iteration thresholds to achieve model convergence. Following the selection of extraction method, the investigator determines the initial number of factors (i.e. prior to rotation) to retain, a step which often combines computation and intuition. Per Fabrigar and colleagues (1999), EFA automatically retains factors with an associated Eigenvalue ≥ 1 , the so-called Kaiser Rule, a computational heuristic that may be inefficient and leads to the elimination of plausible factors.⁸¹ As such, alternatives to the Kaiser Rule should be considered. One option is the visual inspection of the scree plot of Eigenvalues (i.e., the amount of variance accounted for by a given factor) in conjunction with factor loadings. Factors associated with an Eigenvalue approaching 1, represented by the inflection point (i.e., the “elbow”) of the scree plot, should be considered for retention, as should those that correspond to the hypothesized relationships between the observed variables.

Walker and Maddan (2008) explain that the final decision is the method for rotating the initial factor solution.⁸² Rotation clarifies the data structure, making clearer the patterns of factor loading. This is done by “rotating” the axis upon which the factors fall to better fit the axis to the data. As with extraction methods, there is a variety of options for rotation, but selection typically depends on whether the investigator assumes the latent factors are correlated. When factors are considered uncorrelated, an “orthogonal” rotation can be applied. With social-behavioral phenomena, factors are generally assumed to be correlated, as human behavior is rarely partitioned into units that function independently of one another. Such studies typically apply “oblique” factor rotation methods which accommodate inter-factor correlation. Oblique rotations do not require the axis to be rotated to fit the data within axis drawn at 90-degree angles. Rather, the axis is drawn to create two least-squares lines, one through each group of factors. Consequently, oblique rotations are maximally effective if the data groups into two factors.⁸² Such an analysis would serve this chapter’s hypothesis well should the data indeed point to sexual expression separating into a “sexual behavior” and a “sexual attitudes” factor.

Analysis

In this study, it is hypothesized that there are two latent factors underlying the observed sexual expression variables: sexual behavior (genital) and sexual attitudes (non-genital). These latent factors are assumed to be correlated, given their socio-behavioral nature. Ten sexual expression variables were selected for evaluation in the EFA: it was assumed five variables would represent sexual behavior, and five variables would represent sexual attitudes. These variables were chosen to best reflect both the attitudinally and behaviorally focused spokes of the human sexuality theory wheel. The sample size is of 754, exceeds the minimum necessary for EFA. The principal axis factor technique was used to extract factor loadings from the original

correlation matrix. Fabrigar and colleagues (1999) and Osborne (2015) illustrate that this technique iterates over repeated sets of communalities until a default, SAS-specific, criterion for convergence is reached.^{81,83} A minimum or maximum number of factors (i.e., estimated an “unconstrained” model) was not specified, postulating that a two-factor solution would emerge in accordance with the hypothesized variable groupings. Promax, an oblique rotation method, was used to generate final factor solutions. In robustness testing, EFA models were estimated with Varimax rotation. Costello and Osborne (2005), Osborne (2015), and Brown (2009) show this to be the default orthogonal rotation technique included in most statistical software packages that assume that the factors are uncorrelated.^{80,83,84} The results were qualitatively consistent with those produced by Promax rotation. Because the 10 variables have different response metrics (albeit with a common minimum value of 1), and somewhat varied “meaning” (i.e., some variables measure frequency, whereas others measure strength of agreement), models were also estimated with z-score transformations of the variables. As variable transformation through rotation had no measurable effect on the EFA analysis, results were reported with the original, unstandardized variables.

RESULTS

Sample Characteristics & Sexual Expression

The sample of participants was predominantly male (61.7%), white (79.4%), and married (92.0%). Approximately half (49.9%) of the sample was between the ages of 57-64 years old and identified as being a part of the Protestant faith (45.7%). Given the small size of this sample after the extraction process, individuals between the ages of 57-64 were retained despite the initial plan to study adults aged 65 years and older. This was to ensure sufficient power in the analysis. Table 1 provides descriptive data on the 754 study participants. This study’s sample was selected

for sexually active individuals and is accordingly oversampled for married individuals. NSHAP recruitment included individuals of all sexual orientations. However, since the study sample was driven by a married population of older adults, its results may be most generalizable to a population that identifies as heterosexual. Although males made up 61.7% of the sample, their contribution to the analysis may be more significant than perceived. Considering that the sample consists of adults in later life when there is typically a greater ratio of women to men, the men in this sample may have an outsized influence on this study. Lastly, younger adults are more sexually active, so it is understandable that they form nearly half of the study sample.

Frequency distributions for the 10 sexual expression variables are included in Table 2. With regard to the sexual behavior variables, 77.8% of participants reported sleeping in the same bed as their partner “all or most of the time.” 79.58% reported always engaging in foreplay before sex. 58.0% reported never receiving oral sex and 54.9% reported never giving oral sex. 53.1% of participants reported that they did not masturbate at all this year. 67.2% reported always engaging in vaginal sex when having sex with their partner in the last 12 months. With regard to sexual attitudes, 61.9% reported being very happy in their relationship and 42.4% reported that their relationship is very physically pleasing. 43.0% of participants reported that sex is moderately important to their relationship. 41.5% reported being very emotionally satisfied in their relationship.

EFA Results

Pre-Rotation Correlations and Evaluation of Dimension

Table 3 includes two-way correlations of the 10 candidate variables for EFA. The strongest bivariate correlations were found between the frequency of giving oral sex and receiving oral sex (0.72); emotional satisfaction of relationship and physical pleasure in relationship (0.66); and, emotional satisfaction of relationship and happy in relationship (0.47). It is important to note that negative correlations exist between some variables, but this is to be expected in most instances; for example, that there might be a negative correlation between masturbation and frequency of vaginal sex. The strongest negative correlation between any variable pair of variables was between the frequency of masturbation in the last year and happiness in relationship (-0.12). Initial (i.e., prior to extraction) communality estimates were evaluated to determine whether all 10 variables, or some subset, should be entered to the EFA. In general, variables with multiple correlations (a measure of communality) that approach either 1, which suggests multicollinearity, or approach 0, which suggests singularity, should be considered for elimination. Multiple correlation values varied from .06 (frequency of vaginal sex) to .54 (frequency of giving oral sex), which are within acceptable bounds for retention, per Zwick and Velicer (2009).⁸⁵ As such, all 10 variables were retained in the factor loading analysis.

Tables 4 and 5, respectively, contain Eigenvalues and estimates of communalities from the unrotated Principal Axis solution. The results, which converged after 9 iterations, indicate dual-dimensionality, or two factors (Eigenvalue 1 = 1.96; Eigenvalue 2 = 1.36). Visual inspection of Eigenvalues on a scree plot (Figure 1) confirms the two-factor solution. A third factor is highly unlikely, considering the dramatic reduction in the Eigenvalue from the second

factor (Eigenvalue 3 = .22) and its vertical distance from the Kaiser threshold (Eigenvalue = 1). Therefore, the two-factor solution was subjected to Promax rotation.

Oblique (Promax) Rotation Factor Structure Evaluation

Post-rotation correlations for the two-factor solution are contained in Table 6. Further, the variance explained by each factor and the final communality estimates are presented in Tables 7 and 8, respectively. As there were no obviously conclusive patterns of variable clusters, several possible two-factor groupings were evaluated. Cronbach's test of internal consistency (i.e. alpha test) was applied to each potential grouping, more so to guide identification of reasonable variable clusters than to definitively establish them. *Post hoc* alpha testing was performed to minimize bias in evaluation; namely, logically related variables were established among the two factors, and subsequently assessed their internal consistency. The optimal grouping of variables consisted of a 6-variable and a 4-variable grouping. The variables and their accompanying post-rotation correlations are as follows: Group 1: emotional satisfaction of relationship (0.82), physical pleasure in relationship (0.72), happy in relationship (0.54), frequency of foreplay (.43), sleep in the same bed (0.31), and frequency of vaginal sex (.18). Group 2: frequency of receiving oral sex in the last year (0.83), frequency of giving oral sex in the last year (0.84), frequency of masturbation in the last year (0.27), and importance of sex (0.29). The results indicate a weak correlation between the two factors (reference axis correlation = .14).

Identification of Latent Factors

The two-factor model was chosen not solely due to model fit. The items loading onto each scale best matched theoretically driven distinctions in facets of human sexuality – the distinction between close interpersonal ties and connection as well as eroticism, passion, and genital sexual expression. As fabric is formed by interlacing distinct sets of threads, the fabric of

sexuality is woven from threads representing intimacy and above-the-waist form of expression (i.e., from the affective domain) and threads representing more physical, sensual form of genital expression. In this analysis, the variables that underwent EFA aligned with this mind/body dichotomy and the two-factor model was retained as the solution for this sexuality-related scale.

Factor 1 was labeled *Intimacy* (Intimacy: six items; accounting for 29.953% of the total variance). The items on this scale embodied the above-the-waist aspects of sexual expression related to older adults' sexuality with a focus that is relationship-centered, pertaining to the affective domain including intimacy, happiness, satisfaction and pleasure, and lastly is intrinsically above-the-waist in nature. There is alignment with the Sexual Health Model described by Robinson and colleagues.⁶⁴ The theory sees multiple components – the majority being non-genitally focused – represented as a spoke in the “sexual health wheel”, existing on an equal non-hierarchical playing field. Factor 1 embodies this broader non-genital lens – that encompasses relationship issues – such as intimacy, satisfaction, and a sense of pleasure – as a deepening of relationship quality as life course and aging progresses in older adults. In doing so, Factor 1 captures a holistic view of human sexuality.

These items included *sleep in same bed, happy in relationship, physical pleasure in relationship, emotional satisfaction of relationship, and frequency of vaginal sex*. The inclusion of the item “frequency of vaginal sex” in the Intimacy factor may appear inconsistent with the above-the-waist domain and warrants further explanation. First, it is notable that *frequency of vaginal sex* did not fall into post-rotation EFA groupings with the oral sex variables. The role that frequency of vaginal sex plays in Intimacy provides evidence that older adults are a different population than younger people. Among younger people, vaginal and anal intercourse is normatively considered the denouement of sexual activity and sexual expression is more heavily

weighted on genital or sensuality-type variables.⁸⁶ However, in older adulthood, vaginal intercourse becomes physically more difficult for women. Addis and colleagues report that sexual dysfunction in women increases after menopause to rates between 68% and 86.5%.⁸⁷ Avis and colleagues' (2009) Study of Women's Health Across the Nation (SWAN) that pain during sexual intercourse increased and sexual desire decreased over the menopausal transition.⁸⁸

In older adults, sexual activity may be less defined by intercourse and more by intimacy. Heiman and colleagues (2011) report that kissing and caressing during sexual activity were significantly related to sexual satisfaction among older adult men and women.⁸⁹ Hartmann and colleagues (2004) found that older women were more likely to report infrequent and unsatisfying sex lives when they were not touched or tenderly caressed.⁹⁰ In a market research survey by Gillespie (2017), 9,164 partnered older adults aged 50 to 85, were found that to report high satisfaction, high frequency of sex (HH) differed significantly from subjects with low satisfaction, low frequency of sex (LL), with no significant differences among older adults falling in the middle of the group.⁹¹ The HH group reported the highest frequency of all communication strategies, mood-setting techniques, sexual activities, and items of sexual variety than any other group and the LL group reported the lowest frequency among all communication items and acts of sexual variety. The HH group had more common vaginal intercourse than the LL group. Regardless of frequency of sex, groups with high satisfaction shared the same number of mood-setting strategies and sexual activities. Gillespie (2017) found vaginal intercourse in older age appears to take place more frequently among individuals who express communication and intimacy skills in their relationship.⁹¹ This may explain why vaginal sex, in the present study, is grouped with variables typically considered to be sensual in nature take on an expression of intimacy. However, vaginal sex may also be characteristic of intimate

relationships. Janus and Janus (1993) demonstrated that older men and older women were more cautious in their sexual decision-making process and more hesitant to introduce intercourse into new relationships compared to when they were younger, so relationships may be taking on a more intimate rather than sensual dimensionality.¹⁶ The EFA establishes that sexual expression among older adults falls into the hypothesized dichotomy of sexual expression. The evidence for genital expression aspect to sexuality is extensive. This has been strongly represented in the traditional literature. However, sex matters to older adults and Foley (2015) found there is no other time in life when vitality, health, sexual interest, and activity are as varied between people than in older age.⁹³

Importantly, this study suggests that a variable intended to describe a genital aspect to sexuality may have more depth than previously understood. Physiological changes associated with aging (including erectile function and hormone production) provided an opportunity for the medical and pharmaceutical industry to profit by the development of new medical diagnoses and provided large swaths of data to be focused on range and frequency of sexual intercourse. These “superficial” foci have limited a deeper exploration of the fuller sexual experience – including the attitudinal component of genital sexual expression. Research by Hirayama and Walker (2011) posit that gender is a key dimension for understanding the relations among negative feelings about an intimate partner’s sexual unresponsiveness, sexual relationships, socioemotional support, and psychological well-being in older age.²³ Specifically, supportive partnerships protect women’s, but not men’s, well-being when feeling bothered by their partner’s sexual dysfunction. Research by Lee and colleagues (2011) suggests that positive intimate relationships appear to convey tangible benefits in terms of better quality of life and subjective well-being, over and above satisfaction with one’s sexual life.²⁹ The depth and richness of

sexuality beyond the genital component is consistent with the Sexual Health Model which integrates social dynamics, communications, and connectedness. The coalescing of variables into the Intimacy factor aligns with the breath of “spokes” in the Sexual Health Model’s wheel.

Factor 2 was labeled *Sensuality* (Sensuality: four items; accounting for 22.55% of the total variance). The items on this scale embodied the physical aspects of sexual expression, with a focus on the frequency of genital sexual expression and its importance. This factor captures the more traditional focus of below-the-waist sexual expression. Again, there is alignment with the Sexual Health Model described by Robinson and colleagues (2002).⁶⁴ Within the theory of multiple non-genital components – represented as spokes in the “sexual health wheel” – exists the more genitally-focused components (spokes) of sexual anatomy, sexual functioning, and masturbation. Factor 2 accordingly embodies that more traditional view of sexual expression – that encompasses sexual intercourse – such as the frequency of vaginal and oral intercourse, as well as masturbation practices, in older adults. These items included *importance of sexual intercourse, frequency of receiving oral sex, frequency of giving oral sex, and frequency of masturbation in the last year*. This six-variable grouping for Intimacy and the four-variable grouping for Sensuality will be combined to create new scales that identify and describe the sexual expression of older, community-dwelling adults.

DISCUSSION

The study utilized a secondary data analysis to explore whether two latent concepts (i.e. sexual behavior and sexual attitudes) are expressed in the correlation between observed variables that represent these concepts among older adults. A sexual expression construct for use with older adults was developed using EFA. This analysis of a large national sample demonstrated

that older adults have distinct forms of sexual expression and that these forms describe both genital and non-genital types of sexual expression.

Pre-rotation, strong bivariate correlations were shown to exist between giving and receiving oral sex (0.72), between emotional satisfaction and physical satisfaction in relationship (0.66), and emotional satisfaction and happiness in relationship (0.47). Negative correlations were found between masturbation and frequency of vaginal sex and the strongest negative correlation between any variable pair of variables was between the frequency of masturbation in the last year and happiness in relationship. These correlations relate to recognizable relationship and sexual behavior dynamics. They strengthen the expectation that the subsequent factor analyses are rooted in an existing dynamic within this population.

Ten sexual expression variables were evaluated in the EFA. Post-rotation, six items were found to load on the scale representing sexual attitudes and labeled as “intimacy” and four variables were found to load on the scale representing sexual behaviors and labeled as “sensuality.” The presence of a third factor is highly unlikely given the low calculated Eigenvalues. The variables were obliquely rotated using Promax and a two-factor solution was identified and a weak correlation between the two factors was found. This optimal grouping of variables is in line with the literature on holistic sexual expression as well as the expectations established in the initial hypothesis.

Factor 1: Sexual Expression of Intimacy

Six variables formed the Intimacy factor and they include “emotional satisfaction of relationship,” “physical pleasure in relationship,” “happy in relationship,” “frequency of foreplay,” “Sleep in the same bed,” and “frequency of vaginal sex.” All the variables but “frequency of vaginal sex” were expected to fall into the Intimacy factor.

Factor 2: Sexual Expression of Sensuality

Four variables formed the Sensuality factor and they include “frequency of receiving oral sex in the last year,” “frequency of giving oral sex in the last year,” “frequency of masturbation in the last year,” and “importance of sex.” All these variables were expected to fall into the Sensuality factor.

This investigation’s findings build upon research demonstrating that sexual expression in older adults (1) includes genital and non-genital domains, (2) is distinct from sexual expression in younger people as it is more intimate and less genital, and (3) is underexplored. Sexual health has a state of physical, emotional, mental and social well-being in relation to sexuality and is not merely the absence of disease, dysfunction or infirmity in a person’s lifespan (WHO, 2006).³ Both men and women continue to remain sexually active as they enter late older adulthood.

First, DeLamater (2015) specifically recommends a theoretical model with an interdisciplinary or biopsychosocial framework that explores the role of biological, psychological and social influences.²⁵ The author also recommends that future research turns its focus toward both intimacy and the investigation of coupled relationships to help move beyond the current genital sexual expression focus of much research. This study addresses that recommendation by establishing a “sensuality” factor that represents the physical aspect of sexuality which can facilitate future studies of the complex biopsychosocial intersection by establishing an intimacy factor.

Second, this study also establishes an “intimacy” factor, variables that were considered “above-the-waist” or more affective and holistic. Initially, it may appear that “frequency of sexual intercourse,” a variable that is typically used to obtain genital sexual expression data, is not a heuristic fit in the intimacy factor. This result was unexpected yet explainable. The

physiological and biological effects of aging on genital sexual expression, related to vaginal sex are well established by Masters and Johnson (1966), and DeLamater and Sill (2005).^{13,21} Ambler and colleagues (2012) found that people have less sexual intercourse as they age because they are less likely to be partnered and more likely to have a form of sexual dysfunction.⁹³ Subjects in the present study are more likely to be partnered. Lodge and Umberson (2012) found that sexual expression in older couples is distinct as couples in “midlife” (ages 50-69) were in transition, distressed by life changes affecting sexual activity (e.g., age-related physiological changes), and later life couples (ages 70-86) no longer faced this distress and emphasized the importance of emotional connections over sexual connections.⁹⁴

Third, an abundance of sexuality scales exists that provide different metrics for the investigation of sexual expression across different populations. Fisher and colleagues (2013) found that among 218 commonly used scales for sexual expression, only two are intended for older populations.⁹⁵ Two sexual expression scales have been created specifically for older populations including White’s (1984) Aging Sexual Knowledge and Attitudes Scale (ASKAS) from 1982, and Weinstein’s (1984) Senior Adult Sexuality Scales (SASS) from 1984.^{96,97} A third scale entitled the Aging and Sexuality Questionnaire (ASQ) was devised by McCoy and Bretschneider (1988) from a subset of SASS, exists, but is not discussed further here because it was not tested for reliability.⁹⁸

Overall, these scales have a more traditional genital expression focus, lack a holistic view of sexuality, and are primarily designed for institutionalized older adult populations. This study’s focus, which incorporates non-genital expression to the investigation of sexual expression, provides an important missing component to this public health issue: a lens that includes the whole person, for their whole lives. Most research either outright excludes older adults or

focuses on genital sexual expression. This newly developed sexual expression construct views sexuality holistically and addresses these deficits.

Several potential limitations exist in this study. Primarily, this study and the subsequent work of this dissertation will focus on the NSHAP population that is married in the NSHAP population and not racially diverse. These limitations of the study population are exacerbated by sample reduction as only partnered people responded to sexual expression variables and of these individuals, only sexually-active people further responded. The findings of this study may only be applicable to community-dwelling older American adults. It may not be generalizable to older adults who are institutionalized, or those living outside the United States, as other phenomena may influence the relationship between sexual expression and older age. With EFA, there can often be difficulty discerning the factors. The exploratory nature of the factor analysis may limit its generalizability but should support the creation of new hypotheses worthy of further investigation as future studies can focus on sexual expression among populations that are more diverse in race, sexual and gender orientation, religion, age, and marital or partner status. The current study provides insights and a framework for exploring non-genital sexual expression in these more expansive populations.

This study has established that any evaluation of community-dwelling older adult sexuality must include both genital and non-genital dimensions of sexual expression. While this study takes an initial step in developing that tool and will apply it in subsequent research in this dissertation, future studies can target populations for which NSHAP was not designed to capture. The current study is most generalizable to white, married, heterosexual populations and future research should focus on racially-diverse populations as well as populations that represent the broader spectrum of sexual orientation.

Lastly, future studies on unmarried older adults would allow a comparative study of sexual expression between married and unmarried populations. Consequently, research should begin to evaluate the sexuality needs of older adults differently, as principles that have been applied to sexuality in younger adults are not directly transferable to older adult. The recognition of non-genital sexual expression, as an area ripe for future research and learning, among older adults is essential.

Through interpreting the data presented here and through a study of sexuality literature, the results demonstrate that while the sensuality domain may dominate sexual expression in younger adults, that the pendulum may swing in older adulthood with the intimacy domain driving sexual expression in older adults. Most sexual scales used in sexuality research are not designed for older adults and those that were designed for that population are genitally-focused. This study provides a novel sexuality scale for community-dwelling older adults that measure sexuality more comprehensively by including a non-genital dimension of evaluation. Without a mechanism for evaluating non-genital sexual expression, an entire dimension of sexuality, and its implications on health may be lost.

Table 2.1 Descriptive data on study participants.

Variables	Frequency (n=754)	Percent
Gender		
Female	289	38.3
Male	465	61.7
Age Group		
57-64	376	49.9
65-74	273	36.2
75-85	105	13.9
Marital Status		
Single	60	8.0
Married or Partnered	694	92.0
Ethnicity		
White	599	79.4
Black	75	10.0
Hispanic	63	8.4
Other	17	2.2
Religion		
Protestant	345	45.7
Catholic	216	28.7
Jewish	23	3.1
Other	109	14.4
None	61	8.1
Education		
Less than HS	89	11.8
High school graduate or equivalent	175	23.2
Some college or associate degree	243	32.2
Bachelor's degree or higher	247	32.8
Employment Status		
Unemployed	428	56.8
Employed	326	43.2

Table 2.2 Frequency distributions for the sexual expression variables.

Variables	Frequency	Percentage
<i>Sexual Behavior Variables</i>		
How often sleep in same bed		
Never	60	8.0
Some of the time	107	14.2
All or most of the time	587	77.8
Frequency of foreplay during sex		
Never	9	1.19
Rarely	15	1.99
Sometimes	37	4.91
Usually	93	12.33
Always	600	79.58
Frequency of receiving oral sex		
Never	437	58.0
Rarely	102	13.5
Sometimes	149	19.8
Usually	42	5.6
Always	24	3.2
Frequency of giving oral sex		
Never	414	54.9
Rarely	107	14.2
Sometimes	155	20.6
Usually	44	5.8
Always	34	4.5
Frequency of masturbation in the last year		
Not at all this year	400	53.1
1-2 times a year	58	7.7
3-5 times a year	56	7.4
Every other month	34	4.5
Once a month	81	10.7
2-3 times a month	53	7.0
Once a week	36	4.8
Several times a week	22	2.9
Every day	8	1.1
More than once a day	6	0.8
Frequency of vaginal sex		
Never	31	4.1
Rarely	23	3.1
Sometimes	53	7.0
Usually	140	18.6
Always	507	67.2
<i>Sexual Attitude Variables</i>		
Happy in relationship		
1 = Very unhappy	11	1.5
2	2	0.3
3	3	0.4
4	36	4.8
5	87	11.5

6	148	19.6
7 = Very happy	467	61.9
Physical pleasure in relationship		
Not at all	7	0.9
Slightly	16	2.1
Moderately	129	17.1
Very	320	42.4
Extremely	282	37.5
Importance of sex		
Not at all important	28	3.7
Somewhat important	117	15.5
Moderately important	324	43.0
Very important	213	28.2
Extremely important	72	9.6
Emotional satisfaction of relationship		
Not at all	4	0.5
Slightly	17	2.3
Moderately	126	16.7
Very	313	41.5
Extremely	294	39.0

Table 2.3 Two-way correlations of the candidate variables for EFA.

Two-Way Correlations										
	How often sleep in same bed	Frequency of foreplay during sex	Frequency of receiving oral sex	Frequency of giving oral sex	Frequency of masturbation in the last year	Frequency of vaginal sex	Happy in relationship	Physical pleasure in relationship	Importance of sex	Emotional satisfaction of relationship
How often sleep in same bed	1.00	0.16	-0.03	0.03	-0.09	0.13	0.25	0.18	0.03	0.24
Frequency of foreplay during sex	0.16	1.00	0.06	0.10	0.0	0.13	0.25	0.33	0.13	0.34
Frequency of receiving oral sex	-0.03	0.06	1.00	0.72	0.21	-0.06	-0.07	0.09	0.20	0.03
Frequency of giving oral sex	0.02	0.10	0.72	1.00	0.21	-0.02	0.06	0.18	0.23	0.10
Frequency of masturbation in the last year	-0.09	0.01	0.21	0.21	1.00	-0.06	-0.12	-0.03	0.17	-0.06
Frequency of vaginal sex	0.13	0.13	-0.06	-0.02	-0.06	1.00	0.05	0.16	0.10	0.08
Happy in relationship	0.25	0.25	-0.07	0.01	-0.12	0.05	1.00	0.39	0.05	0.47
Physical pleasure in relationship	0.18	0.33	0.09	0.18	-0.03	0.16	0.38	1.00	0.30	0.66
Importance of sex	0.03	0.13	0.20	0.23	0.17	0.10	0.05	0.30	1.00	0.23
Emotional satisfaction of relationship	0.24	0.3	0.03	0.10	-0.06	0.08	0.47	0.66	0.23	1.00

Table 2.4 Eigenvalues from the unrotated Principal Axis solution.

Preliminary Eigenvalues:				
Total = 2.91 Average = 0.29				
	Eigenvalue	Difference	Proportion	Cumulative
1	1.96	0.60	0.67	0.67
2	1.36	1.14	0.47	1.14
3	0.22	0.09	0.08	1.21
4	0.13	0.13	0.04	1.26
5	-0.00	0.05	-0.00	1.26
6	-0.05	0.09	-0.02	1.24
7	-0.14	0.02	-0.05	1.19
8	-0.16	0.03	-0.06	1.14
9	-0.20	0.01	-0.07	1.07
10	-0.20	--	-0.07	1.00

Table 2.5 Estimates of communalities from the unrotated Principal Axis solution.

Prior Communality Estimates: SMC									
How often sleep in same bed	Frequency of foreplay during sex	Frequency of receiving oral sex	Frequency of giving oral sex	Frequency of masturbation in the last year	Frequency of vaginal sex	Happy in relationship	Physical pleasure in relationship	Importance of sex	Emotional satisfaction of relationship
0.10	0.16	0.53	0.54	0.09	0.06	0.27	0.49	0.16	0.51

Figure 2.1 Scree plot of Eigenvalues.

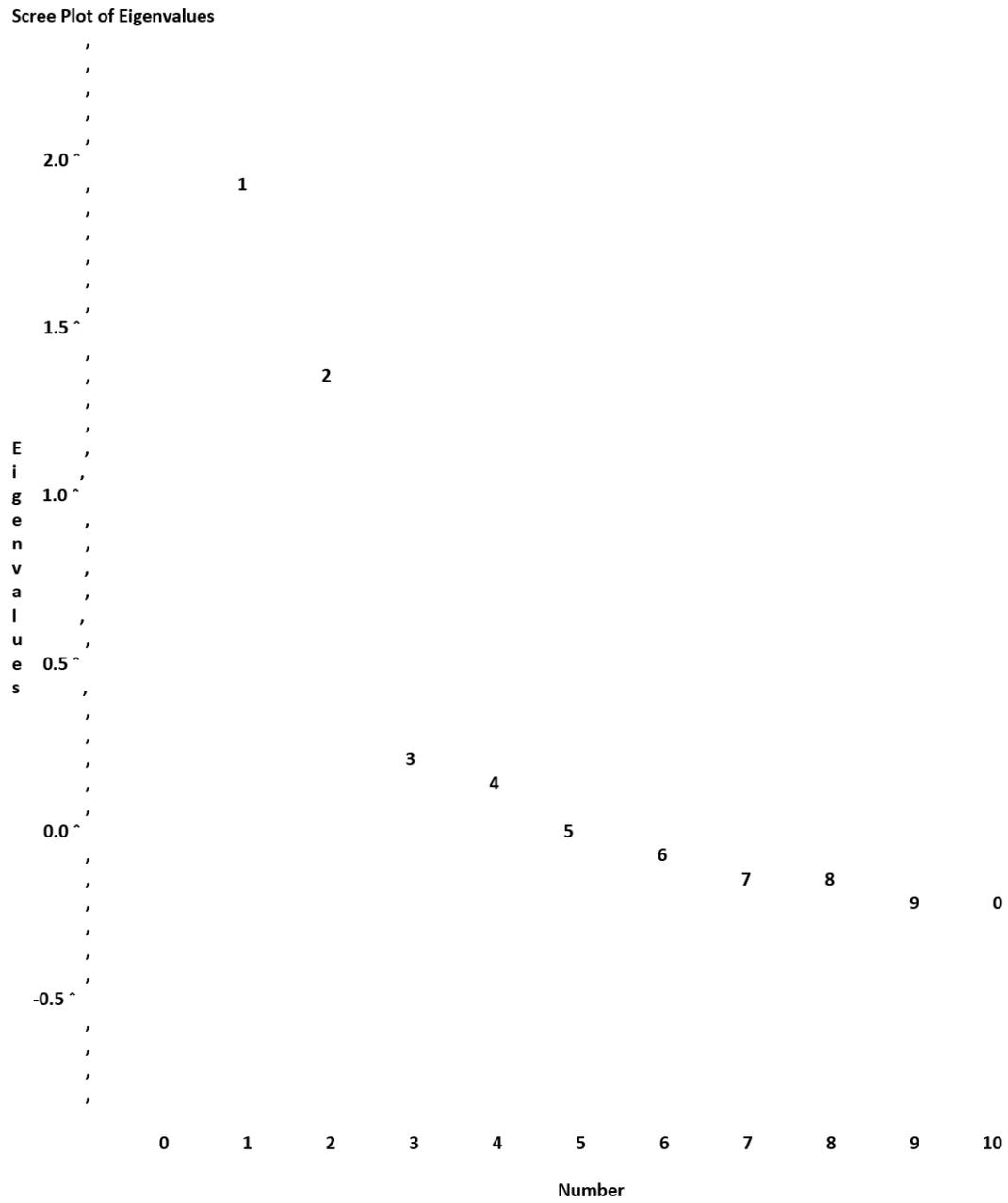


Table 2.6 Post-rotation correlations for the two-factor solution.

Factor Structure (Correlations)		
	Factor1	Factor2
How often sleep in same bed	0.31	-0.03
Frequency of foreplay during sex	0.44	0.11
Frequency of receiving oral sex	0.04	0.83
Frequency of giving oral sex	0.15	0.84
Frequency of masturbation in the last year	-0.07	0.28
Frequency of vaginal sex	0.18	-0.03
Happy in relationship	0.55	-0.05
Physical pleasure in relationship	0.77	0.19
Importance of sex	0.28	0.29
Emotional satisfaction of relationship	0.82	0.10

Table 2.7 Variance explained by factor.

Variance Explained by Each Factor Ignoring Other Factors	
Factor 1	Factor 2
1.97	1.6

Table 2.8 Estimates of communalities from the post-rotated solution.

Final Communality Estimates: Total = 3.57									
How often sleep in same bed	Frequency of foreplay during sex	Frequency of receiving oral sex	Frequency of giving oral sex	Frequency of masturbation in the last year	Frequency of vaginal sex	Happy in relationship	Physical pleasure in relationship	Importance of sex	Emotional satisfaction of relationship
0.10	0.19	0.70	0.71	0.09	0.03	0.32	0.61	0.14	0.69

CHAPTER THREE:
SEXUAL EXPRESSION AND SOCIAL CONNECTEDNESS

INTRODUCTION

Sexuality is a central aspect of human identity for all people, including older persons, as defined by The World Health Organization (2006).³ Botwinick (1984) argues that sexual expression continues across the lifespan, despite the presence of what Hayflick (1994) identifies as a strong cultural fallacy of the sexlessness of older adults.^{10,18} Another aspect of human identity for all people is their social relationships. Beyond improving the emotional quality of life of an individual, social relationship variables have been found to contribute to health status (de Leon, 2003).³² Cornwell and colleagues (2008) suggest the association between age and social connectedness in interpersonal networks and voluntary associations is complex and depends on several life course factors – a picture that challenges the image of universal disengagement and social isolation offered by early research.⁵¹ Consequently, the sexual and social lives of older adults are perceived through societal lenses that do not accurately reflect their actual lives. The “graying of America” calls for an increased need for an empiricism– rather than culturally popular assumptions of social disengagement and absence of sexual expression – to serve as the basis of policymaking in this area. Since both sexuality and social connectedness are associated with communication, social roles, relationships, intimacy, self-image, and culture, they have a great contribution to the quality of older adult lives and would contribute to important health implications on this rapidly growing segment of the population. The “graying of America” warrants more investigation to more accurately reflect their impact.

Cornwell and colleagues (2008) added more complexity and nuance to the profile of older adult social lives than previous theories anticipated through their scholarship of the National Social Life, Health, and Aging Project (NSHAP) cohort, but have not yet incorporated a study of sexual expression in their social relationship studies.⁵¹ DeLamater (2012), in his study of sexual expression in older adults, recommended that researchers develop theoretical models to better understand later life sexuality.²⁵ He specifically recommends a theoretical model with an interdisciplinary or biopsychosocial framework, such as future research with a focus on both intimacy and the investigation of coupled relationships to help move beyond the current genital-sexual expression focus of much research.

Upon the surface, social relationships may appear to serve as merely a quality of life component, but aspects of social relationships have been linked with both mortality and morbidity. Valtorta and colleagues (2018) found weaker social relationships to have an association with increased hospital readmission rates.⁹⁹ Kawachi and Berkman (2001) found social relationships to be associated with mental health status.³³ In fact, previous research by Hawkey and Cacioppo (2003) has identified social isolation as a risk factor for physical and mental health problems.³⁴ Additionally, Heikkinen and Kauppinen (2004) found that socially disconnected individuals tend to suffer higher rates of morbidity and mortality including depression.³⁵ A recent study by the AARP Policy Institute in collaboration by Flowers and colleagues (2018) found that Medicare spends an additional \$6.7 billion in additional federal spending annually on socially isolated older adults, approximately \$1,600-a-year per socially isolated adult.¹⁰⁰

Although Flowers and colleagues (2018) found that most adults are not socially isolated, Carstensen (1992) posits through the Socio-emotional Selectivity Theory (SeST) that as life's remaining timeline shrinks, people become increasingly selective, investing more of their personal

resources in emotionally meaningful goals.^{100,60} Additionally, the present study considers the Sexual Health Model described by Robinson and colleagues (2002).⁶⁴ Derived from a sexuality education approach, this theory defines 10 key components posited to be essential aspects of healthy human sexuality, including intimacy and relationships. The Sexual Health Model views human sexuality more comprehensively – addressing above-the-waist factors including social roles, intimacy, and relationships; social dynamics such as communications and connectedness; as well as traditional concepts of physical “below-the-waist” sexuality.

The present study connects SeST and the Sexual Health Model theories by capturing *latent* variables that are thought to underlie – and give rise to – patterns of correlations in variables that represent aspects of the SeST and human sexuality theory as they pertain to the sexual lives of older adults. These aspects include a broader non-genital lens that encompasses personal relationship issues – such as intimacy, love, and connection – a deepening of relationship quality as life course and aging progresses, and their intersection which are investigated along with social connectedness, defined by Lee & Robbins (1995) as a sense of belongingness which relates to one's opinion of self in relation to others.¹⁰¹

The hypothesis of the present study is that social connectedness is positively associated with sexual expression. Waite, Laumann, Das, and Schumm (2009) used the National Social Life, Health, and Aging Project (NSHAP) data to investigate intimate social relationships, including marriage, family social ties, and sexuality, among older community-dwelling adults.²² The authors suggest that the data obtained in the NSHAP can be used to construct key measures of sexuality among older adults; to examine sexuality itself; and to explore the link between sexuality, health, well-being, and other dimensions of the lives of older adults. The present study answers that call and utilizes the NSHAP data with the aim of assessing if social connectedness and social non-isolation, composite

variables previously developed by Cornwell and Waite (2009) from the same NSHAP dataset, are associated with sexual expression.⁶⁶ A cross-sectional regression analysis will be applied to evaluate whether the new sexuality expression scales developed in Aim 1 are associated with composite measures of social connectedness and non-isolation. This research seeks to identify social variables that relate to sexual expression and are suitable for further research and exploration.

A gap exists in the understanding of sexuality and social variables in later life. The public health consequence of this research gap includes policy and intervention work that is poorly informed and therefore potentially less effective, and predominately focuses on genital sexual expression. This study provides a more comprehensive, holistic approach and seeks to advance the understanding of older adult sexuality and its relationship with social connectedness and non-isolation. Advancements in understanding the intersection between social relations and sexual expression will provide an evidence-based approach to better guide future interventions, research, and public health policy.

METHODS

Study Design & Data Source

The research described in this chapter is a quantitative secondary data analysis used to test an innovative holistic scale of sexual expression for use with older adults, developed in Chapter One. Linear (Ordinary Least Squares) regression analysis will be applied to investigate the relationship between the outcome variables (i.e., intimacy and sensuality) and the independent variables (i.e., social connectedness and social non-isolation). A 3-step nested model-building strategy was applied to each outcome separately. The result of this analysis can suggest the effect of each social variable on the outcome, controlling for the other social variable and all covariates.

This is a cross-sectional study that analyzes data from the baseline (2005) wave of the National Social Life, Health, and Aging Project (NSHAP), which is a national, longitudinal, population-based study of community-dwelling older individuals that focuses on the relationship between sexual behavior, sexual problems, and well-being. As part of the NSHAP study, Waite and colleague (2007) investigated 3,005 participants, who were aged 57–85 years at the 2015 baseline survey. They oversampled for Blacks and Latinos.⁶⁵ The NSHAP’s advantage over other data sources for this project is its combination of measures of intimate (emotionally close) social relationships—including those related to marriage, family social ties, community interactions—and those defining sexual expression, including sexual practices, attitudes toward sex, and intimacy.

Analytic Sample

Of the 3,005 participants at the 2005 survey wave, 2,743 records were available for analysis in the public use dataset. The relevant data was extracted using the following process. Participants were first selected from those who indicated that they had a spouse or intimate partner (n = 1,843). From this group, an eligible sample was identified, which included those individuals who reported having engaged in sex in the last year (n = 1,237), as only such participants were prompted to respond to most of the intimacy questions that were analyzed in this study. Missing data among the eligible sample were identified next. Missing data within sexual expression variables (n = 385, accounting for overlap) comprised “how often sleep in same bed” (n = 209), “happy in relationship” (n = 2), “physical pleasure in relationship” (n = 15), “importance of sex” (n = 79), “emotional satisfaction in relationship” (n = 8), “frequency of foreplay” (n = 27), “frequency of receiving oral sex” (n = 71), “frequency of giving oral sex” (n = 88), “frequency of masturbation” (n = 150), and “frequency of vaginal sex” (n = 58). Other missing data included missing religion and religious attendance (n = 7), race (n = 4), working status (n = 1), self-rated physical health (n = 2), self-rated

mental health (n = 2), and BADL components (n = 1), and family income (n = 321). Imputing family income at its median (\$55,000) value allowed the recovery of 167 observations, which leads to a final analytic sample of n = 754 for this analysis. This imputation had no significant bearing on the analysis.

Outcome Variables

There are two outcome variables, each of which is a summary (composite) variable based on exploratory factor analysis (described in the previous chapter). Intimacy (Factor 1) comprises the sum (range: 6 - 30) of responses to the following 6 variables: “How often sleep in same bed” (3-level ordinal variable, coded 1, 2, 3, where higher values imply greater frequency); “Emotional satisfaction of relationship” (5-level ordinal variable; coded 1, 2, 3, 4, 5, where higher values imply greater satisfaction); “Frequency of vaginal sex” (5-level ordinal variable, coded 1, 2, 3, 4, 5, where higher values imply greater frequency); “Frequency of foreplay during sex” (5-level ordinal variable; coded 1, 2, 3, 4, 5, where higher values imply greater frequency); “Physical pleasure in relationship” (5-level ordinal variable 5-level ordinal variable, coded 1, 2, 3, 4, 5, where higher values imply greater levels of pleasure); and “Happy in relationship” (7-level ordinal variable, coded 1, 2, 3, 4, 5, 6, 7, where higher values imply greater levels of happiness).

Sensuality (Factor 2) comprises the sum (range: 4 - 25) of responses to the following 4 variables: “Frequency of receiving oral sex” (5-level ordinal variable, coded 1, 2, 3, 4, 5, where higher values imply greater frequency); “Frequency of giving oral sex” (5-level ordinal variable, coded 1, 2, 3, 4, 5, where higher values imply greater frequency); “Importance of sex” (5-level ordinal variable, coded 1, 2, 3, 4, 5, where higher values imply greater levels of importance); and frequency of masturbation in the last year” (10-level ordinal variable, coded 1, 2, 3, 4, 5, 6, 7, 8, 9,

10, where higher values imply greater frequency). Further detail on the outcome variables is included in Table 1.

Key Explanatory Variables

Cornwell and Waite (2009) developed social non-isolation and social connectedness as composite variables in previous research.⁶⁶ The NSHAP data was used to create these scales measuring social disconnectedness and perceived isolation among older adults. Social disconnectedness is simply social connectedness inverted and is defined as physical separation from others and perceived isolation is defined as feelings of loneliness and a lack of social support. The inverse of Nevitt and Cassells' (1990) definition of social isolation, social non-isolation can be defined structurally as the presence of social interactions, contacts, and relationships with family and friends, with neighbors on an individual level, and with "society at large" on a broader level.¹⁰² The authors assessed the reliability of the scales using Cronbach's alpha and item-total correlations and perform confirmatory factor analysis to test the model against the data.⁶⁶ Lastly, they tested differences in scale means across subgroups to assess the distribution of social disconnectedness and perceived isolation among older adults. Prior to this study, Cornwell and Waite's scales have been used by Fredriksen-Goldsen and colleagues (2013), Shankar and colleagues (2013), Gierveld and Tilburg (2010), Santini and colleagues (2015), Happé and Charlton (2012), and Choi and Dinitto (2013) for a variety of research issues as they pertained to older adults including LGB issues, social isolation and loneliness as they related to cognitive function, testing short scales for emotional and social loneliness, the association between relationships and depression, aging and autism disorders, and lastly, internet use as it related to social capital.¹⁰³⁻¹⁰⁸ However, no previous studies have evaluated the interaction between these social scales and sexual expression in older adults.

Social Non-isolation (9-item summary measure)

Social non-isolation is the sum of responses to 9 items that measure perceptions of emotional support, instrumental support, and loneliness. Responses to these 9 items were summed into a single score and converted to z-scores for consistency with the social connectedness score, whose variation in response metrics across items necessitated normalization. The 9 items are as follows. “Emotional support from family” is a 3-category variable based on responses to the following question: *How often can you open up to members of your family if you need to talk about your worries? Would you say: hardly ever, some of the time, or often?* “Instrumental support from family members” is a 3-category variable based on responses to the following question: *How often can you rely on [family] for help if you have a problem? Would you say hardly ever, some of the time, or often?* “Emotional support from friends” is a 3-category variable based on responses to the following question: *How often can you open up to members of your friends if you need to talk about your worries? Would you say hardly ever, some of the time, or often?* “Instrumental support from friends” is a 3-category variable based on responses to the following question: *How often can you rely on [friends] for help if you have a problem? Would you say hardly ever, some of the time, or often?* “Emotional support from spouse” is a 3-category variable based on responses to the following question: *How often can you open up to your spouse/partner if you need to talk about your worries? Would you say hardly ever, some of the time, or often?* “Instrumental support from spouse” is a 3-category variable based on responses to the following question: *How often can you rely on your spouse/partner for help if you have a problem? Would you say hardly ever, some of the time, or often?* “Lack of companionship” is a 3-category variable based on responses to the following 3 questions derived from the UCLA Loneliness Scale: 1) *How often do you feel that you lack companionship?* Response options are hardly ever (or never), some of the time, or often. Responses were reverse-coded to be

consistent with other variables; 2) *How often do you feel left out?* Responses include are hardly ever (or never), some of the time, or often. Responses were reverse-coded to be consistent with other variables; 3) *How often do you feel isolated from others?* Response options are hardly ever (or never), some of the time, or often. Responses were reverse-coded to be consistent with other variables.

Social Connectedness (8-item summary measure)

Social connectedness is the sum of responses to 8 items that measure social network, participation in social activities, and volunteering. Responses to these 8 items were summed to a single score and converted to z-scores, as response metrics and distributions varied across items. “Number of friends” is a 6-category variable based on responses to the following question: *About how many friends would you say that you have?* Responses are 0, 1, 2-3, 4-9, 10-20, >20. “Attendance at meetings of organized groups” is a 7-category variable based on responses to the following (non-work-related group) question: *In the past 12 months, how often did you attend meetings of any organized group (examples include: a choir, a committee or board, a support group, a sports or exercise group, a hobby group, or a professional society)?* Responses include: never, less than once a year, about once or twice a year, several times a year, about once a month, every week, several times a week. 1 was added to responses for consistency with other variables within the composite measure. “Frequency of socializing with friends or relatives” is a 7-category variable based on responses to the following question: *In the past 12 months, how often did you get together socially with friends or relatives?* Response includes: never, less than once a year, about once or twice a year, several times a year, about once a month, every week, several times a week. 1 was added to responses for consistency with other variables within the composite measure. “Frequency of volunteer work” is a 7-category variable based on responses to the following question: *In the past*

12 months, how often did you do volunteer work for religious, charitable, political, health-related, or other organizations? Responses include: never, less than once a year, about once or twice a year, several times a year, about once a month, every week, several times a week. 1 was added to responses for consistency with other variables within the composite measure. “Frequency of interaction with network alters (members of social network)” is an 8-category variable based on responses to the following question: *How often do you talk to this person (member of your social network)?* Responses include: less than once a year, once a year, a couple times a year, once a month, once every two weeks, once a week, several times a week, and every day. 1 was added to responses for consistency with other variables within the composite measure. “Network range” is a 17-category variable based on responses to the following question: *Which of the following best describes (name)'s relationship to you?* Responses include: Ex-spouse, Romantic/Sexual partner, Parent, Parent in-law, Child, Step-child, Brother or sister, Other relative of yours, Other in-law, Friend, Neighbor, Co-worker or boss, Minister/priest/or other clergy, Psychiatrist/psychologist/counselor/or therapist, Caseworker/Social worker, Housekeeper/Home health care provider, and Other (Specify). 1 was added to responses for consistency with other variables within the composite measure. “Proportion of network alters who live with respondent” is a 2-category variable based on responses to the following question: *Does (name) live in the same household with you?* Note that respondents were not asked specifically about part-time co-habitation, though a “yes” response could include such a situation. Responses include: Yes – lives in the same household, and No – does not live in household. 1 was added to responses for consistency with other variables within the composite measure. “Alters” is a 6-category variable based on responses to the following question: *Looking back over the last 12 months, who are the people with whom you most often discussed things that were important to you?* Responses include: listing up to 5

names of network members. 1 was added to responses for consistency with other variables within the composite measure.

Control Variables

Gender is a binary variable (male = 1; female = 0, referent). Age, originally a 3-category variable, was dummied for the purposes of the analysis (55 - 64, referent; 65 - 74; 75 - 85). Marital status is a binary variable (married or partnered = 1, single = 0, referent). Ethnicity is a 4-category variable (White, referent; Black, Hispanic, other). Religion is a 5-category variable (Protestant; Catholic; Jewish; other; none, referent). Education is a 4-category variable (less than high school, referent; high school graduate or equivalent; some college or associate degree; bachelor's degree or higher). Employment is a binary variable (employed = 1; unemployed = 0, referent). Religious Attendance is a 7-category ordinal variable based on the question: "Thinking of the past 12 months, about how often have you attended religious services?" Responses include: never, less than once a year, about once or twice a year, several times a year, about once a month, every week, several times a week). Household income is a continuous variable that measures approximate household income before taxes or deductions. It was divided by 1,000 for the regression analyses for ease of interpretation. Self-rated physical health and self-rated mental health are 5-category ordinal variables (1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent). Activities of Daily Living (ADL) score is a composite measure of difficulty with five basic activities of daily living: bathing, dressing, eating, toileting, and transferring (i.e., getting in and out of bed). Each activity's response metric was ordinal (0 = no difficulty; 1 = some difficulty; 2 = much difficulty; 3 = unable to do). The composite measure ranges from 0 to 15, with higher values reflecting more impaired body functioning.

Univariate Methods

Means (with standard deviations) were used to describe continuous variables, and number (with percentages) were used to describe categorical variables. Linear (Ordinary Least Squares) regression analysis was applied to investigate the relationship between the study's two outcome variables — the sexual expression components of intimacy and sensuality — and the independent variables of interest (i.e., social connectedness and social non-isolation). A 3-step nested model-building strategy was applied to each outcome separately, as follows. In Step 1 (Models 1 and 2), two bivariate models were fitted, in which the outcome was first regressed on social non-isolation, then on social connectedness. The results of these analyses imply the unadjusted relationship between the outcomes and the social variables. In Step 2 (Model 3), the outcome was regressed on the two social variables together. The result of this analysis implies the independent effect of social connectedness on the outcome, controlling for social non-isolation, and vice versa. In Step 3 (Model 4), control variables were added to the model described in Step 2. The result of this analysis suggests the effect of each social variable on the outcome, controlling for the other social variable *and all covariates*.

RESULTS

Sample Characteristics

Univariate Description of Outcomes and Key Independent Variables

The sample of participants was predominantly male (61.7%), white (79.4%), and married (92.0%). Approximately half (49.9%) of the sample was between the ages of 57-64 years old and identified as being a part of the Protestant faith (45.7%). The majority of participants received at least some college education or a bachelor's degree (65.0%) and were unemployed at the time of the survey (56.8%). The mean religious attendance score (measured on a 7-category ordinal scale) was

3.4. Mean self-rated physical and mental health (both measured on a 5-point Likert scale) were 3.6 and 3.9, respectively. Mean ADL score, a composite measure of difficulty, was 0.3. Mean household income was \$70,921. Regarding key independent variables, the mean social non-isolation score (a 9-item summary measure) was 23.2; the mean social connectedness score (a 7-item summary measure) was 23.2. Table 1 provides descriptive data on the 754 study participants.

Regression Results

Outcome 1: Intimacy

Bivariate analyses of the association between the composite intimacy variable and social non-isolation and social connectedness suggest positive and statistically significant relationships. That is, higher levels of social non-isolation ($\beta = .28$; $p < .001$) and social connectedness ($\beta = .07$; $p < .05$) are associated with higher levels of intimacy. Examination of r-square in the two bivariate models (Table 2, Models 1 and 2) reveals, however, that only one of the two relationships is statistically significant. Whereas social non-isolation explains roughly 17% of the variance in intimacy, social connectedness explains less than 1%, which suggests that the latter significant association is a statistical artefact. The inclusion of the two social variables, social connectedness and social non-isolation, in Model 3 underscores this claim, as the beta coefficient on social connectedness changes sign (from positive to negative), is reduced in magnitude (from .07 to -.03) and is no longer statistically significant ($p > .05$). The effects of the social variables in Model 4, in which both variables are joined by the set of control variables, are consistent with those of Model 3. Once more, intimacy is positively and significantly associated with social non-isolation ($\beta = .23$; $p < .001$), whereas social connectedness's estimated coefficient remains small, negative, and statistically nonsignificant ($\beta = -.04$; $p > .05$). Several of the control variables are significant in the fully adjusted model, which add approximately 8% to explained variance (R-square is .25 in

Model 4). Males have significantly higher intimacy values than females (beta = 1.25; $p < .001$), married or partnered participants (beta = 1.18; $p < .01$) have higher values than single participants, and Black participants have lower intimacy values than White participants (beta = -1.06; $p < .01$). Lastly, self-rated mental health was positively correlated with intimacy values. All other control variables proved to be nonsignificant.

Outcome 2: Sensuality

The results of bivariate regressions (Models 1 and 2) indicate no relationship exists between the independent variables of interest and sensuality. In both models, the coefficients are small in magnitude, negative, and not statistically significant. R-square is extremely low in both models, further supporting the null associations observed in the beta coefficients. As expected, neither the specification that includes both social non-isolation and social connectedness (Model 3), nor that which also adds covariates (Model 4), indicates any evidence of a relationship to the outcome of either social variable. The plausible expectation of such relationships would be strong correlation between either the two social variables or between one of the variables and another independent variable.

DISCUSSION

This study utilizes a quantitative secondary data analysis to test an innovative scale of sexual expression for older adults in the investigation of the intersectionality of sexuality, age, and social connections. The scale was tested with Cornwell and Waite's scales for social isolation and social disconnectedness,⁶⁶ to assess if social connectedness and social non-isolation as measured in the present study are associated with sexual expression. These Cornwell and Waite scales will both be inverted to create the new scales for use in the present study. The hypothesis that social connectedness, investigated as both social connectedness and social non-isolation, is positively

associated with sexual expression, which was investigated in its genital (Sensuality) and non-genital (Intimacy) dimensions, was confirmed in part.

The study's main finding was social non-isolation was related to intimacy. It may be noteworthy that the relationship exists between the emotional dimensions of the constructs in question (sexual expression and social connectedness) and merits further study. Notably intimacy is positively and significantly associated with social non-isolation (beta = .23; $p < .001$), whereas social connectedness's estimated coefficient remains small, negative, and statistically nonsignificant (beta = -.04; $p > .05$). The full model (Model 4) evaluating the association between intimacy and social non-isolation and social connectedness controlled for key demographic variables found that males (compared to female) and married subjects (compared to single) had significantly higher intimacy values, while Blacks (compared to Whites) had significantly lower intimacy values. Self-reported mental health was positively correlated with intimacy values. This is aligned with past literature that indicators of isolation are associated with worse health presented by Berkman (2009), Hawkey and Cacioppo (2003), House (2001), and House and colleagues (1998).^{109,34,110,111} This study established a link between a person's perception of their mental health and their intimacy score. No relationship was shown to exist between social non-isolation and sensuality nor social connectedness and sensuality.

Schick and colleagues (2010) report that despite an increase in life expectancy of Americans, this has not produced more research on the sexual experiences of older adults.¹¹² The dearth of research on older adult sexual expression extends to how it is related to social relationship variables. The results of this study begin to fill the knowledge gap that exists in social connectedness pertaining to older adult sexual expression.

Sexual Expression and Couple Relationships

There is a rich body of literature by Blumstein & Schwartz (1983), DeLamater & Moorman (2007), and Wang and colleagues (2008) on relationship factors associated with sexual desire and sexual activity, or genital sexual expression.¹¹³⁻¹¹⁵ However, in considering the relationship between couple relationships (intimate partnered relationships, where the members identify as coupled) and non-genital sexual expression, Sassler (2010) posited that the foundation of couple relationships or partnering is a desire for sexual and emotional intimacy, with coupled relationships typically more beneficial for physical and mental health.¹¹⁶ Blieszner (2006) demonstrated that coupled relationships provide instrumental and emotional support, social support, and meaningful activity as people age, the partner may become more important as one, or the only, source of these rewards.¹¹⁷ Happy relationships also exist in the absence of sexual activity. Studies by Kontula & Haavio-Mannila (2009) and Moore (2010) have found that as couples age, sex is less important for happiness in a relationship.^{118,119} In this study, married or partnered subjects had significantly higher intimacy values than single subjects, a result that is in line with the literature in this area. Practically, individuals with partners have a greater opportunity to have intimacy with another person and are less likely to be isolated. The literature and this study point to another distinct dynamic in older adults – that despite the decreasing frequency of genital sex in older age, couples remain happy in relationships, perhaps because sexual expression among older couples is attributed more toward intimacy than sensuality.

Due largely to its unique focus on social connectedness and sexuality, it is not surprising that recent investigation of older adults' sexual expression and social variables comes almost exclusively from the NSHAP dataset. Research by Laumann and Waite (2008), Karraker and colleagues (2012), Cornwell and Laumann (2011), Syme and colleagues (2012), Stroope and colleagues (2015) pertains

to older adult sexual expression and social variable influences.^{120,24,121,26,122} However, these studies have the more traditional foci on intercourse frequency, and sexual dysfunction, that are decidedly genital-focused approaches. Lastly, research by Sbarra (2009) that focused more holistically on subjects' relationship status found that older adults being married had a protective effect on Elevations in C-reactive Protein – a predictor of cardiovascular disease onset.⁴⁶

Sexual Expression and Gender Differences

In a review of major meta-analyses and large datasets on gender differences in sexual attitudes, Petersen and Hyde (2011) found that while there were substantial gender differences in some domains, that these differences are small and appear to be decreasing as people age.¹²³ Generally, small gender differences in sexual attitudes about sexual permissiveness, premarital sex, masturbation, sexual satisfaction were found between men and women, but men generally report more sexual activity, more liberal sexual attitudes, higher correlations between reported arousal and physiological measures, and a more stable sexual identity in men than women. Petersen and Hyde attributed these differences to biological factors, sociocultural factors, and methodological factors. These attitudes, however, focus on genital expression. The present study found that males had higher intimacy values than females and that intimacy is associated with non-isolation.

In contrast, Cornwell and Waite (2009) found that women had significantly lower scores for perceived isolation (or higher social non-isolation) than men.⁶⁶ Since women tend to have a longer life expectancy than men and in older age surviving men tend to be married, the state of marriage as a driver of this dataset may account for the differences in intimacy values by gender. However, Trudel and colleagues (2010) found that marital satisfaction, sexual satisfaction, and gender explain only 14.2% of the variance of psychological distress among older couples.¹²⁴ Therefore, the gender

differences in intimacy values may indeed be distinct from the state of being married but are difficult to tease out without further investigation.

Sexual Expression and Race

Cornwell and colleagues (2008) studied social connectedness in the NSHAP population and found that Blacks tended to have a greater volume of contacts, religious affiliation, volunteer frequently, and participate in organized groups compared to Whites.⁵¹ The present study did not find a relationship between race and social connectedness. However, while religious involvement, participating in organized groups and volunteering are known to reduce the sense of isolation, one might expect that Blacks would have higher intimacy values than Whites. In the present study, however, Blacks had significantly lower intimacy values than Whites. In the study in which Cornwell and Waite (2009) developed a social isolation factor using NSHAP, results were presented by age-groups, gender, and self-rated health. The paper did not present findings by race, which presents an opportunity for future investigation.⁶⁶ Avis and colleagues' (2005, 2009) Study of Women Across the Nation (SWAN), found that black women reported a higher frequency of sexual intercourse than white women; Hispanic women reported lower physical pleasure and arousal; Chinese and Japanese women reported more pain and less desire and arousal than white women, although the only significant difference was for arousal.^{125,126} There is evidence that older women differ in the expression of sensuality and intimacy by race. The present study indicates that there may be a race-specific dynamic in the sexual expression of intimacy in older adults that has not previously been studied and merits more study.

Sexual Expression and Mental Health

Cornwell and Waite (2009) evaluated social isolation and self-rated health and found higher levels of perceived isolation among older adults who reported worse health.⁶⁶ That study did not

evaluate social isolation and self-reports of mental health. This study found an association between social non-isolation and intimacy and that self-reported mental health has a positive correlation with intimacy values.

Coyle and Dugan (2012) found that loneliness was associated with higher odds of having a mental health problem (*OR*: 1.17; *CI*: [1.13, 1.21], *p* = 0.000); and isolation was associated with higher odds of reporting one's health as being fair/poor (*OR*: 1.39; *CI*: [1.21, 1.59], *p* = 0.000).¹²⁷ There is a strong body of literature supporting the association between social isolation and negative impacts on the health and well-being of older adults by Freyne and colleagues (2005), MuCulloch (2001), Alpass and Neville (2003), Victor and colleagues (2009), Barnes and colleagues (2006), and Victor and Scrambler (2000).¹²⁸⁻¹³³ Although it is unknown if intimacy influences mental health or vice versa, a correlation is known to exist between the two. As a public health issue, it calls for further explanation to explore, better understand, and better inform practices and policy for older adults by integrating social programming and treating them as a public health intervention rather than as an extracurricular activity.

Among its advantages, this study investigates new measures of sexual expression in relation to two types of social variables. Included in this exploration is a non-genital, more holistic perspective on sexual expression. Despite the growth of the older population, research exploring their sexuality is often limited to institutionalized older adults. This study utilizes a national dataset focused on community-dwelling older individuals.

This study also examined social connectedness and sexual expression holistically and teased out a relationship between non-physical dimensions of these two factors. In fact, social non-isolation and intimacy are associated and the physical dimension of social connectedness is not associated with either physical (sensuality) or mental (intimacy) forms of sexual expression.

Several potential limitations exist in this study. Primarily, this study and the subsequent work of this dissertation will focus on a population that is driven by the quality of being married in the NSHAP population and is not particularly racially diverse. Consequently, it limited the exploration of the association between race and the sexual expression of intimacy. The characteristics of the study population are exacerbated by sample reduction – loss of sample due to skip pattern (a series of questions associated with a conditional response. All respondents answer most questions on a survey, but certain questions pertain only to certain respondents.) as most respondents to sexual expression variables were partnered and of these individuals, only sexually-active people further responded. The findings of this study may only be applicable to community-dwelling older American adults. It may not be generalizable to older adults who are institutionalized, or living outside the United States, as other phenomena may influence their sexual expression.

By its definition, linear regression will only model relationships between independent and dependent variables that are linear in nature. This study assumes there is a straight-line relationship between the variables, which could potentially be incorrect as the social variables investigated may be multidimensional in nature. Although Cornwell's scales are referenced in several studies, they have not been utilized outside of this study. Further investigation with Cornwell's scales will help solidify whether these scales behave as other social variables do when tested against other variables. In this study, however, the Cornwell scales behaved predictably compared to known interactions in the literature. The next chapter will address this issue by applying validity testing to the social variables. Following such testing, those social variables may need to be divided into smaller composite variables and then tested on sexual expression.

CONCLUSION

In conclusion, this study's aim was to assess if social connectedness and social non-isolation, composite variables previously developed by Cornwell and Waite (2009) from the same dataset, are associated with sexual expression.⁶⁶ The hypothesis that social connectedness is positively associated with sexual expression was confirmed in part. A cross-sectional regression analysis evaluating the new sexual expression scales against composite measures of social connectedness and non-isolation found that social non-isolation is related to intimate sexual expression and merits further study. That is, there is a relationship between the emotional dimensions of both the social variable (social non-isolation) the sexual expression (intimacy) variable. The regression also found three interesting results: (1) married subjects had higher values of intimacy compared to single subjects, (2) male subjects had higher values of intimacy compared to female subjects, and (3) there exists a positive correlation between self-reported mental health and intimacy. An unexpected finding of this study was that Blacks had lower values for intimacy than Whites. This finding merits further investigation, but its exploration was limited by the characteristics of the sample set.

Table 3.1: Descriptive data on study participants.

Variables	Frequency (n=754)	Percent
Intimacy*	26.4 (3.2)	
Sensuality*	9.8 (3.9)	
Social Non-isolation*	23.2 (2.5)	
Social Connectedness*	23.2 (5.3)	
Gender		
Female	289	38.3
Male	465	61.7
Age Group		
57-64	376	49.9
65-74	273	36.2
75-85	105	13.9
Marital Status		
Single	60	8.0
Married or Partnered	694	92.0
Ethnicity		
White	599	79.4
Black	75	10.0
Hispanic	63	8.4
Other	17	2.2
Religion		
Protestant	345	45.7
Catholic	216	28.7
Jewish	23	3.1
Other	109	14.4
None	61	8.1
Education		
Less than HS	89	11.8
High school graduate or equivalent	175	23.2
Some college or associate degree	243	32.2
Bachelor's degree or higher	247	32.8
Employment Status		
Unemployed	428	56.8
Employed	326	43.2
Religious Attendance*	3.4 (2.0)	
Self-Rated Physical Health*	3.6 (1.0)	
Self-Rated Mental Health*	3.9 (0.9)	
ADL Scores*	0.3 (1.0)	
Household Income*	70921.2 (80023.2)	

*Frequency and percentages are presented, except where noted, mean (standard deviation)

Table 3.2: The association between Intimacy and social non-isolation and social connectedness: Nested Models (n = 754)

		Model 1 ^a	Model 2 ^b	Model 3 ^c	Model 4 ^d
Constant	$\hat{\beta}_0$	26.40*** (0.11)	26.40*** (0.12)	26.40*** (0.11)	21.89*** (0.82)
Key Predictor Variables					
Social Non-Isolation	$\hat{\beta}_1$	0.28*** (0.02)	-	0.29*** (0.02)	0.23*** (0.02)
Social Connectedness	$\hat{\beta}_2$	-	0.07* (0.03)	-0.03 (0.03)	-0.04 (0.03)
Covariates					
Gender					
Male	$\hat{\beta}_3$	-	-	-	1.25*** (0.22)
Female		-	-	-	Ref
Age Group					
57-64		-	-	-	Ref
65-74	$\hat{\beta}_4$	-	-	-	-0.16 (0.24)
75-85	$\hat{\beta}_5$	-	-	-	-0.27 (0.33)
Marital Status					
Single		-	-	-	Ref
Married or Partnered	$\hat{\beta}_6$	-	-	-	1.18** (0.39)
Ethnicity					
White		-	-	-	Ref
Black	$\hat{\beta}_7$	-	-	-	-1.06** (0.37)
Hispanic	$\hat{\beta}_8$	-	-	-	-0.34 (0.42)
Other	$\hat{\beta}_9$	-	-	-	-0.34 (0.69)
Religion					
Protestant	$\hat{\beta}_{10}$	-	-	-	-0.01 (0.42)
Catholic	$\hat{\beta}_{11}$	-	-	-	-0.47

					(0.44)
Jewish	$\hat{\beta}_{12}$	-	-	-	-0.14 (0.69)
Other	$\hat{\beta}_{13}$	-	-	-	-0.04 (0.48)
None		-	-	-	Ref
Education					
Less than HS		-	-	-	Ref
High school graduate or equivalent	$\hat{\beta}_{14}$	-	-	-	0.42 (0.38)
Some college or associate degree	$\hat{\beta}_{15}$	-	-	-	0.06 (0.37)
Bachelor's degree or higher	$\hat{\beta}_{16}$	-	-	-	-0.38 (0.40)
Employment Status					
Unemployed		-	-	-	Ref
Employed	$\hat{\beta}_{17}$	-	-	-	-0.32 (0.23)
Religious Attendance	$\hat{\beta}_{18}$	-	-	-	0.12 (0.06)
Self-Rated Physical Health	$\hat{\beta}_{19}$	-	-	-	-0.004 (0.12)
Self-Rated Mental Health	$\hat{\beta}_{20}$	-	-	-	0.71*** (0.14)
Activities of Daily Living	$\hat{\beta}_{21}$	-	-	-	-0.09 (0.11)
Household Income (per 1,000)	$\hat{\beta}_{22}$	-	-	-	-0.04 (0.13)
	R-squared	0.1676	0.0050	0.1673	0.2530

^aIn Model 1, a bivariate model was fitted in which the outcome was regressed on social non-isolation.

^bIn Model 2, a bivariate model was fitted in which the outcome was regressed on social connectedness.

^cIn Model 3, the outcome was regressed on both social non-isolation and social connectedness.

^dIn Model 4, control variables were added to Model 3.

*p<0.05; **p<0.01; ***p<0.001

Table 3.3: The association between sensuality and social non-isolation and social connectedness: Nested Models (n = 754)

		Model 1 ^a	Model 2 ^b	Model 3 ^c	Model 4 ^d
Constant	$\hat{\beta}_0$	9.77*** (0.14)	9.77*** (0.14)	9.77*** (0.14)	10.31*** (1.03)
Key Predictor Variables					
Social Non-Isolation	$\hat{\beta}_1$	-0.06 (0.03)	-	-0.06 (0.03)	-0.05 (0.03)
Social Connectedness	$\hat{\beta}_2$	-	-0.03 (0.04)	-0.01 (0.04)	0.04 (0.04)
Covariates					
Gender					
Male	$\hat{\beta}_3$	-	-	-	1.13*** (0.27)
Female		-	-	-	Ref
Age Group					
57-64		-	-	-	Ref
65-74	$\hat{\beta}_4$	-	-	-	-0.48 (0.29)
75-85	$\hat{\beta}_5$	-	-	-	-2.02*** (0.41)
Marital Status					
Single		-	-	-	Ref
Married or Partnered	$\hat{\beta}_6$	-	-	-	-2.94*** (0.49)
Ethnicity					
White		-	-	-	Ref
Black	$\hat{\beta}_7$	-	-	-	-0.36 (0.46)
Hispanic	$\hat{\beta}_8$	-	-	-	0.23 (0.52)
Other	$\hat{\beta}_9$	-	-	-	1.19 (0.86)
Religion					
Protestant	$\hat{\beta}_{10}$	-	-	-	0.13 (0.53)
Catholic	$\hat{\beta}_{11}$	-	-	-	-0.01

					(0.55)
Jewish	$\hat{\beta}_{12}$	-	-	-	0.36 (0.87)
Other	$\hat{\beta}_{13}$	-	-	-	-0.40 (0.60)
None		-	-	-	Ref
Education					
Less than HS		-	-	-	Ref
High school graduate or equivalent	$\hat{\beta}_{14}$	-	-	-	0.67 (0.48)
Some college or associate degree	$\hat{\beta}_{15}$	-	-	-	0.92* (0.46)
Bachelor's degree or higher	$\hat{\beta}_{16}$	-	-	-	1.47** (0.50)
Employment Status					
Unemployed		-	-	-	Ref
Employed	$\hat{\beta}_{17}$	-	-	-	-0.19 (0.28)
Religious Attendance	$\hat{\beta}_{18}$	-	-	-	-0.33*** (0.08)
Self-Rated Physical Health	$\hat{\beta}_{19}$	-	-	-	0.11 (0.15)
Self-Rated Mental Health	$\hat{\beta}_{20}$	-	-	-	0.32 (0.17)
Activities of Daily Living	$\hat{\beta}_{21}$	-	-	-	0.13 (0.13)
Household Income (per 1,000)	$\hat{\beta}_{22}$	-	-	-	0.007*** (0.002)
	R-squared	0.0035	0.0007	0.0022	0.2040

^aIn Model 1, a bivariate model was fitted in which the outcome was regressed on social non-isolation.

^bIn Model 2, a bivariate model was fitted in which the outcome was regressed on social connectedness.

^cIn Model 3, the outcome was regressed on both social non-isolation and social connectedness.

^dIn Model 4, control variables were added to Model 3.

*p<0.05; **p<0.01; ***p<0.001

CHAPTER FOUR:

SEXUAL EXPRESSION AND SOCIAL CONNECTEDNESS, BY AGE AND GENDER

INTRODUCTION

Chapter 2 of this dissertation painted a somewhat nuanced picture of sexual expression among older adults. The results obtained from subjecting an assortment of varied indicators of sexual behaviors and attitudes to exploratory factor analysis (EFA) yielded groupings of variables that may not be considered altogether intuitive from the perspective of traditionally sexually active (read: younger) subjects, which underscored the notion of sexual expression as a concept under evolution over the life course. If this effect is true, the results from Chapter 2 further imply that the changing nature of social relationships across late middle-age and older age—given life course transitions including retirement, relocation, changes in health, death of spouses and peers—could modify the way these two life domains, sexuality and society, interact.

Past research on sexual expression and social relations have found inconsistent results regarding age and gender. For example, Matthias and colleagues (1997) found that sexual activity and mental health are the most important predictors of sexual satisfaction and that predictors for sexual activity were different for men (younger age, more education) and women (being married).¹³⁴ Some earlier studies have found that frequency of sexual intercourse does not decline or remains the same in older age (Starr and Weiner, 1981; George and Weiler, 1981).^{135,136} Whereas more recent research by Karraker and colleagues (2011) found a decline in the frequency of sexual activity with gendered experiences — woman influenced by widowhood whereas men were affected by poorer health status.²⁴

The idea that aging and social relationships are entwined, and co-evolve along patterned trajectories, is now firmly established in the gerontologic literature by Moen and colleagues (2000),

Moen and colleagues (2001), and Yang colleagues (2016).¹³⁷⁻¹³⁹ Cornwell (2008) reports that aging has been linked to declining social connectedness, which is typically regarded as a function of either voluntary withdrawal from social relationships or the negative effects of modern social policies and programs.¹⁴⁰ The health consequences for social isolation, certainly related to receding connectedness, are associated with negative outcomes. Although older adults have a greater need for social ties than younger adults, they are at greater risk of being socially isolated.

Gender differences in social connectivity and sexual expression have similarly been reported in previous research. Petersen and Hyde (2011) attributed these differences to biological, sociocultural, and methodological factors. In their research, attitudes focused exclusively on genital expression.¹²⁴ Chapter Three found that males had higher intimacy values than females and that intimacy was associated with non-isolation.

Cornwell and Waite (2009) however found that women had significantly lower scores for perceived isolation (or higher social non-isolation) than men.⁶⁶ With women having a higher average life expectancy and with surviving men tending to be married, the state of marriage as a driver of this dataset may account for the differences in intimacy values by gender. Trudel and colleagues (2010) found that marital satisfaction, sexual satisfaction, and gender explained only 14.2% of the variance of psychological distress among older couples.¹²⁵ Chapter Three found that gender differences in intimacy values may be distinct from the state of being married but are difficult to tease out and warrant further investigation.

In fact, male-female variation in social isolation and loneliness have been researched extensively in recent decades; however, Clark's (2014) findings have also been inconsistent.¹⁴¹ Some inconsistencies may be due to measurement. For example, when loneliness was measured using direct self-labeling (e.g., "do you often feel lonely?"), Borys and Perlman (1985) found females tended to report higher levels of loneliness than males,¹⁴² which led to later research by

Matthias and colleagues (1997) and Steptoe and colleagues (2013) that studied highlighting loneliness and isolation as more prevalent among women than men.^{135,143} Gender-associated longevity differences may also contribute to the findings. The tendency of women to outlive male partners and other family members, as well as their traditional social roles, were cited by Vlassoff (2007) as contributing to social isolation in older age.¹⁴⁴ Alternatively, Singh and Misra's (2009) research found no significant gender difference, and still others have shown that males were lonelier than females.¹⁴⁵ Research by Aylaz and colleagues (2012) suggested that men may feel lonely more often than women because they are not as well socialized in the social-emotional area of life.¹⁴⁶ As a result, men may deal with their loneliness in ways that alienate them even further from social contact, whereas females may more successfully buffer loneliness, especially in the social-emotional areas of life. The work of Chipperfield and colleagues (2001) showed some interaction between gender, lack of spouse and loneliness.¹⁴⁷

This evidence demonstrating variation in sexual expression and social patterning over the life course and by gender implies that the association between sexual expression and social factors merits consideration at the level of those strata. The first Aim of this chapter is therefore to determine whether the associations between the sexual expression measures —developed in Chapter 2—and the social variables (i.e., social non-isolation and social connectedness) vary by two factors: age and gender. To investigate this question, stratified models were estimated, and separate models were established for men and women, and older and younger study participants. The hypothesis for Aim 1 is that sexual expression will have a stronger positive association with social non-isolation among females compared to males, and for the younger age group than for the older age group, and that sexual expression will have a stronger positive association with social connectedness among females compared to males, and for the younger age group than for the older age group.

A second Aim is to determine whether elements of the social non-isolation and social connectedness composite variables are particularly influential determinants of sexual expression. Although the social variables have been developed and validated in previous research by Cornwell and Waite (2009),⁶⁶ they are likely multi-dimensional, and combining dimensions, as in Chapter 3, may mask the influence of individual dimensions. To accomplish this Aim, the social measures were disaggregated using principal components analysis (PCA). PCA-guided creation of subscales that were explored in relation to the sexual expression outcomes.

METHODS

Study Design & Data Source

This is a cross-sectional study that analyzes data from the baseline (2005) wave of the National Social Life, Health, and Aging Project (NSHAP). The research conducted here in Aim 1 is a PCA followed by multivariable linear regression models to explore the association between the sexual expression outcomes (i.e., intimacy and sensuality) and social non-isolation and social connectedness (complete 9-item and 8-item composite measures) in the age- and gender-specific strata. In contrast to the Chapter 3 approach, intimacy and sensuality were regressed on the social connectedness and social non-isolation subscales that were developed from the PCA.

NSHAP is a national, longitudinal, population-based study of community-dwelling older individuals that focuses on the relationship between sexual behavior, sexual problems, and well-being. Waite and colleagues' (2007) 3,005 participants were aged 57–85 years at baseline, oversampling for Blacks and Latinos.⁶⁵ NSHAP's advantage over other data sources for this project is its combination of measures of intimate social relationships—including those related to marriage, family social ties, community interactions—and those defining sexual expression, including sexual practices, attitudes toward sex, and nonsexual intimacy.

Analytic Samples

Full Sample

Of the 3,005 participants at the 2005 survey wave, 2,743 records were available for analysis in the public use dataset. The process of extracting the relevant data was as follows. Participants were first selected who indicated that they had a spouse or intimate partner (n = 1,843). From this group, an eligible sample was identified, which included those individuals who reported that they had engaged in sex in the last year (n = 1,237), as only such participants were prompted to respond to most of the intimacy questions that were analyzed in this study. Next missing data was identified among the eligible sample. Missing data within sexual expression variables (n = 385, accounting for overlap) comprised “how often sleep in same bed” (n = 209), “happy in relationship” (n = 2), “physical pleasure in relationship” (n = 15), “importance of sex” (n = 79), “emotional satisfaction in relationship” (n = 8), “frequency of foreplay” (n = 27), “frequency of receiving oral sex” (n = 71), “frequency of giving oral sex” (n = 88), “frequency of masturbation” (n = 150), and “frequency of vaginal sex” (n = 58). Other missing data included missing religion and religious attendance (n = 7), race (n = 4), working status (n = 1), self-rated physical health (n = 2), self-rated mental health (n = 2), and BADL components (n = 1), and family income (n = 321). Imputing family income at its median (\$55,000) value allowed the recovery of 167 observations, leading to a final analytic sample of n = 754 for this Aim.

Aim 1 Subsamples

This study’s first Aim required the creation of age and gender subsamples. Two age subsamples were developed from the set of three age dummies that were used as explanatory variables in Chapter 3. They are 55 – 64 years of age (n = 376) and 65 years and older (n = 378). The latter age subsample combines Chapter 3’s 65 – 74 and 75+ categories, which were judged to be too small (as independent subsamples) for meaningful statistical inference. Gender subsamples

are as follows: men (n = 465); women (n = 289). Race was explored as a moderator variable to evaluate interaction with social connectedness and sexual expression, however, independent racial groups were not sufficiently large for stratified analysis.

Outcome Variables

As in Chapter 3, there are two outcome variables, each of which is a summary (composite) variable, based on EFA (described in Chapter 2). Intimacy (Factor 1) comprises the sum (range: 6 - 30) of responses to the following 6 variables: “How often sleep in same bed” (3-level ordinal variable, coded 1, 2, 3, where higher values imply greater frequency); “Emotional satisfaction of relationship” (5-level ordinal variable; coded 1, 2, 3, 4, 5, where higher values imply greater satisfaction); “Frequency of vaginal sex” (5-level ordinal variable, coded 1, 2, 3, 4, 5, where higher values imply greater frequency); “Frequency of foreplay during sex” (5-level ordinal variable; coded 1, 2, 3, 4, 5, where higher values imply greater frequency); “Physical pleasure in relationship” (5-level ordinal variable 5-level ordinal variable, coded 1, 2, 3, 4, 5, where higher values imply greater levels of pleasure); and “Happy in relationship” (7-level ordinal variable, coded 1, 2, 3, 4, 5, 6, 7, where higher values imply greater levels of happiness).

Sensuality (Factor 2) comprises the sum (range: 4 - 25) of responses to the following 4 variables: “Frequency of receiving oral sex” (5-level ordinal variable, coded 1, 2, 3, 4, 5, where higher values imply greater frequency); “Frequency of giving oral sex” (5-level ordinal variable, coded 1, 2, 3, 4, 5, where higher values imply greater frequency); “Importance of sex” (5-level ordinal variable, coded 1, 2, 3, 4, 5, where higher values imply greater levels of importance); and “Frequency of masturbation in the last year” (10-level ordinal variable, coded 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, where higher values imply greater frequency). Further detail on the outcome variables is included in Table 1 of Chapter 3.

Explanatory Variables of Interest

Aim 1: Full Scales (Complete Composite Measures)

The analysis in Aim 1 is identical to that which was performed in Chapter 3. The difference was that the analysis was applied to subsamples (described above) drawn from the total sample. As such, the explanatory variables of interest are equivalent to those used in Chapter 3: composite measures of social non-isolation (9 items) and social connectedness (8 items). They are described in detail below.

Social Non-isolation (9-item summary measure)

Social non-isolation is the sum of responses to 9 items that measure perceptions of emotional support, instrumental support, and loneliness. Responses to these 9 items were summed to a single score and converted to z-scores for consistency with the social connectedness score, whose variation in response metrics across items necessitated normalization. The 9 items are as follows. “Emotional support from family” is a 3-category variable based on responses to the following question: *How often can you open up to members of your family if you need to talk about your worries?* “Would you say: hardly ever, some of the time, or often?” “Instrumental support from family members” is a 3-category variable based on responses to the following question: *How often can you rely on [family] for help if you have a problem?* “Would you say hardly ever, some of the time, or often?” “Emotional support from friends” is a 3-category variable based on responses to the following question: *How often can you open up to members of your friends if you need to talk about your worries?* “Would you say hardly ever, some of the time, or often?” “Instrumental support from friends” is a 3-category variable based on responses to the following question: *How often can you rely on [friends] for help if you have a problem?* “Would you say hardly ever, some of the time, or often?” “Emotional support from spouse” is a 3-category variable based on responses to the following question: *How often can you open up to members of your spouse/partner if you*

need to talk about your worries? “Would you say hardly ever, some of the time, or often?”

“Instrumental support from spouse” is a 3-category variable based on responses to the following question: *How often can you rely on your spouse/partner for help if you have a problem? Would you say hardly ever, some of the time, or often?* “Lack of companionship” is a 3-category variable based on responses to the following 3 questions derived from the UCLA Loneliness Scale: 1) *How often do you feel that you lack companionship?* Response options are hardly ever (or never), some of the time, or often. Responses were reverse-coded to be consistent with other variables; 2) *How often do you feel left out?* Responses include are hardly ever (or never), some of the time, or often. Responses were reverse-coded to be consistent with other variables; 3) *How often do you feel isolated from others?* Response options are hardly ever (or never), some of the time, or often. Responses were reverse-coded for consistency.

Social Connectedness (8-item summary measure)

Social connectedness is the sum of responses to 8 items that measure social network, participation, and volunteering. Responses to these 8 items were summed to a single score and converted to z-scores, as response metrics and distributions varied across items. “Number of friends” is a 6-category variable based on responses to the following question: *About how many friends would you say that you have?* Responses were 0, 1, 2-3, 4-9, 10-20, >20. “Attendance at meetings of organized groups” is a 7-category variable based on responses to the following question: *In the past 12 months, how often did you attend meetings of any organized group (examples include: a choir, a committee or board, a support group, a sports or exercise group, a hobby group, or a professional society)?* Response included: never, less than once a year, about once or twice a year, several times a year, about once a month, every week, several times a week). 1 was added to responses for consistency with other variables within the composite measure.

“Frequency of socializing with friends or relatives” is a 7-category variable based on responses to

the following question: *In the past 12 months, how often did you get together socially with friends or relatives?* Response included: never, less than once a year, about once or twice a year, several times a year, about once a month, every week, several times a week). 1 was added to responses for consistency with other variables within the composite measure. “Frequency of volunteer work” is a 7-category variable based on responses to the following question: *In the past 12 months, how often did you do volunteer work for religious, charitable, political, health-related, or other organizations?* Responses included: never, less than once a year, about once or twice a year, several times a year, about once a month, every week, several times a week). 1 was added to responses for consistency with other variables within the composite measure. “Frequency of interaction with network alters” is an 8-category variable based on responses to the following question: *How often do you talk to this person?* Responses included: less than once a year, once a year, a couple times a year, once a month, once every two weeks, once a week, several times a week, and every day. 1 was added to responses for consistency with other variables within the composite measure. “Network range” is a 17-category variable based on responses to the following question: *Which of the following best describes (name)'s relationship to you?* Responses included: Ex-spouse, Romantic/Sexual partner, Parent, Parent in-law, Child, Step-child, Brother or sister, Other relative of yours, Other in-law, Friend, Neighbor, Co-worker or boss, Minister/priest/or other clergy, Psychiatrist/psychologist/counselor/or therapist, Caseworker/Social worker, Housekeeper/Home health care provider, and Other (Specify). 1 was added to responses for consistency with other variables within the composite measure. “Proportion of network alters who live with respondent” is a 2-category variable based on responses to the following question: *Does (name) live in the same household with you?* Responses included: Yes – lives in the same household, and No – does not live in household. “Alters” is a 6-category variable based on responses to the following question: *Looking back over the last 12 months, who are the people with whom you most often discussed*

things that were important to you? Responses included: listing up to 5 names of network members. 1 was added to responses for consistency with other variables within the composite measure.

Aim 2: Subscales (Disaggregated Composite Measures)

Aim 2 seeks to determine whether elements of the multidimensional social measures are especially influential in explaining their overall association with the sexual expression outcome variables. Investigation of Aim 2, therefore, requires disaggregation of the measures of social non-isolation and social connectedness.

One potential means of accomplishing this Aim is to disaggregate the social measures to the individual-variable level. Following this course has two drawbacks: first, 16 variables would need to be included in the regression equations, using up critical degrees of freedom in a relatively small sample; and second, the individual variables comprising the social measures are, unquestionably, related, which implies that combining them in some manner is appropriate. With these ideas in mind, principal components analysis (PCA) was applied to guide the development of subscales from within the 9-item measure of social non-isolation and 8-item measure of social connectedness. As described in somewhat greater detail in Chapter 2, PCA is similar to EFA, in that it is a technique which uses advanced correlation analysis to identify groups of variables that may be combined in some manner, with the ultimate goal of achieving data reduction. However, unlike EFA, PCA does not require the relating of revealed variable clustering to latent constructs, rendering PCA a more practical technique than EFA. PCA is therefore suitable to the investigation of this Aim, which requires the creation of subscales to explore the impact of “dimensions” within the composite social variables on sexual expression, but does not necessitate that the investigator theorize, or even speculate on the latent constructs represented by the factors. Rather, it is sufficient to conclude that the variables cluster into “components” that are logical, in light of their outward measurement (i.e. more obvious meaning).

Since PCA is employed merely to identify clusters of variables within the composite measures of social non-isolation and social connectedness, detailed explication of the PCA process was omitted in favor of a more economical presentation. PCA models were run for the 9 social non-isolation variables and 8 social connectedness variables, and each model was estimated without a condition constraining the number of components. The results of the PCA analysis of the social non-isolation variables suggested three components (Eigenvalues 2.49, 1.96, and 1.13), with a highly distinct factor pattern in the factor loadings. (See Table 1. Note that colors are used to distinguish components.) Component 1 comprised four variables: “emotional support from family,” “emotional support from friends,” “instrumental support from family,” and “instrumental support from friends”; Component 2 included two variables: “emotional support from spouse” and “instrumental support from spouse”; and Component 3 included the three variables from the UCLA loneliness battery (i.e., “felt left out,” “lacked companionship,” “isolated from others.”) The analysis of the social connectedness variables also indicated three components (Eigenvalues 2.06, 1.43, and 0.93), although based on the Kaiser Rule, whose limitations are discussed in Chapter 2, there is only weak evidence of a third component. Nevertheless, the factor pattern in the two-factor solution—generated based on Eigenvalues ≥ 1 —is clearly indicative of a third component, which, this paper would argue, was intuitively supported. (See Table 2. Note that colors are used to distinguish components.) Component 1, which included two variables, comprises “frequency of interaction with network alters” and “proportion of network alters who live with respondent”; Component 2, also a two-variable cluster, included “network range” and “alters”; Component 3 included four variables: “number of friends,” “attendance at meetings of organized groups,” “frequency of socializing with friends or relatives,” and “frequency of volunteer work.”

Subscales (see Table 3) were created by combining responses according to the PCA components described in the previous paragraph. Thus, social non-isolation is, for Aim 2, measured

by 3 subscales: “emotional and instrumental support from family and friends” (Component 1), “emotional and instrumental support from spouse” (Component 2), and “absence of loneliness” (Component 3). Similarly, social connectedness is, for Aim 2, measured by 3 subscales: “interaction with and proximity to network alters” (Component 1), “range of social network and alters” (Component 2), and “intensity of informal and formal social activity” (Component 3). The naming of the components/subscales is not meant to suggest a latent construct behind the variable groupings. Rather the naming serves as a classification device that assists interpretation of the regression models.

Control Variables

The same set of control variables from Chapter 3’s analyses are included in this investigation. The only difference is that gender is not controlled in the gender-specific analyses (Aim 1), and age is not controlled in the age-specific regressions (also Aim 1). Gender is a binary variable (male = 1; female = 0, referent). Age, originally a 3-category variable, was dummied for the purposes of the analysis (55 - 64, referent; 65 - 74; 75 - 85). Marital status is a binary variable (married or partnered = 1, single = 0, referent). Ethnicity is a 4-category variable (White, referent; Black, Hispanic, other). Religion is a 5-category variable (Protestant; Catholic; Jewish; other; none, referent). Education is a 4-category variable (less than high school, referent; high school graduate or equivalent; some college or associate degree; bachelor’s degree or higher). Employment is a binary variable (employed = 1; unemployed = 0, referent). Religious Attendance is a 7-category ordinal variable based on the question: “Thinking of the past 12 months, about how often have you attended religious services?” Responses included: never, less than once a year, about once or twice a year, several times a year, about once a month, every week, several times a week). Household income is a continuous variable that measures approximate household income before taxes or deductions. It was divided by 1,000 for the regression analyses for ease of interpretation. Self-rated

physical health and self-rated mental health are 5-category ordinal variables (1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent). ADL score is a composite measure of difficulty with 5 basic activities of daily living: bathing, dressing, eating, toileting, and transferring (i.e., getting in and out of bed). Each activity's response metric was ordinal (0 = no difficulty; 1 = some difficulty; 2 = much difficulty; 3 = unable to do). The composite measure ranged from 0 to 15, with higher values reflecting more impaired physical functioning.

Aim 1 Approach

Aim 1 is investigated by means of classic moderation analysis — the two variables of age and gender were tested for whether they “moderate” the relationship between sexual expression and social interaction. Multivariable linear regression models were applied to explore the association between the sexual expression outcomes (i.e., intimacy and sensuality) and social non-isolation and social connectedness (complete 9-item and 8-item composite measures) in the age- and gender-specific strata. The models regress the outcomes on the two social variables together, along with control variables, which were included in the final analysis stage of the nested models fitted in Chapter 3. The results of these analyses are interpreted as the effect of each social variable on the outcome in the given stratum, controlling for the other social variable and all covariates.

Aim 2 Approach

In Aim 2, models were built as they were in Chapter 3—from unadjusted analyses of social non-isolation and social connectedness alone, to partially adjusted models that combine the two domains as explanatory variables, to fully-adjusted models, in which covariates are added to partially adjusted models. However, in contrast to the Chapter 3 approach, intimacy and sensuality were regressed on the social connectedness and social non-isolation subscales that were developed from the PCA, rather than the broader composite measures. These analyses, therefore, yield estimated coefficients for each of the subscales which because they are standardized, may be

directly compared. The interpretation of Aim 2 regression coefficients was the association between the sexual expression outcomes and related elements (or components) of social non-isolation and social connectedness, with and without adjustment for other variables.

RESULTS

Aim 1/Outcome 1: Stratified Analysis of Intimacy— Association with Social Non-isolation and Social Connectedness

Table 4 contains results of fully-adjusted stratified linear regression models that describe the association between intimacy and social non-isolation and social connectedness. After adjustment, a significant positive relationship was found between intimacy and social non-isolation in all four strata. The association is stronger in magnitude among women (beta = .28; $p < .001$) than men (beta = .19; $p < .001$), and younger study participants (beta = .25; $p < .001$) than older participants (beta = .22; $p < .001$). There is no evidence of an association between intimacy and social connectedness in the subgroups.

Aim 1/Outcome 2: Stratified Analysis of Sensuality—Association with Social Non-isolation and Social Connectedness

The results in Table 5 reflect fully-adjusted associations between sensuality and social non-isolation and social connectedness in the age- and gender-specific strata. These models indicate a negative, significant relationship between sensuality and social non-isolation among men (beta = -.13; $p < .01$) and a strong trend among the 65+ group (beta = -.11; $p < .06$); otherwise, no other associations were suggested. Notably, the distribution of age across gender groups is similar. This eliminates the possibility that the age-related outcome is being drive by an older male population, as it appears to be an effect of age not of maleness.

Aim 2/Outcome 1: Analysis of Intimacy—Association with Elements of Social Non-isolation and Social Connectedness

The results in Table 6 suggest that two of the three non-isolation subscales are associated with sexual intimacy. Intimacy is positively related to subscale 2, “emotional and instrument support from spouse” (fully adjusted beta = .57; $p < .001$) and subscale 3, “absence of loneliness” (fully adjusted beta = .26; $p < .001$). No association was found for the intimacy measure and subscale 1, “emotional and instrumental support from family and friends.”

Intimacy does appear to be associated with one social connectedness subscale, but only in unadjusted analysis. Social connectedness’s subscale 3, which measures “intensity of informal and formal social activity” is positively associated with sexual intimacy (unadjusted beta = .09; $p < .05$). However, explained variance is .01, which may suggest that this association is spurious.

Aim 2/Outcome 2: Analysis of Sensuality—Association with Elements of Social Non-isolation and Social Connectedness

The results in Table 7 suggest that one of the three social non-isolation subscales is associated with sexual sensuality. Sensuality is negatively associated with non-isolation subscale 1, which measures “emotional and instrumental support from family and friends.” Nonetheless, this association is only significant in the unadjusted (Model 1; unadjusted beta = -.12; $p < .05$) and partially adjusted (Model 3; partially adjusted beta = -.13; $p < .05$) specifications, both of which have exceedingly low explained variance (R-square =.01 in both models). It is worth noting that in the fully adjusted model, the association between sensuality and non-isolation subscale 1 approaches statistical significance ($p < .06$).

DISCUSSION

This chapter explored two related Aims: one, whether the association between sexual expression, measured by composite variables that represent latent concepts of intimacy and

sensuality, and social factors, measured by summary variables that suggest non-isolation and connectedness, vary by age and gender; and two, whether particular dimensions of social non-isolation and social connectedness, which were identified via principal components analysis, determined the overall association between sexual expression and the social variables. The results suggested no meaningful age or gender variation, apart from a magnitude difference in the intimacy-social non-isolation relationship. Aim 1 findings suggest that women and younger participants demonstrate a stronger relationship between sexual intimacy and social non-isolation than men and older participants. Regarding Aim 2, sexual intimacy appears to be largely explained by two particular social non-isolation dimensions—emotional and instrumental support from family and friends, and emotional and instrumental support from spouse—whereas sensuality is most prominently explained by lack of emotional and instrumental support from family and friends. It is notable that direction of effects is opposite—as emotional and instrumental support increases, intimacy increases and sensuality decreases.

Considering expectations, Aim 1 results are somewhat tepid. The age and gender differences uncovered in the intimacy-social non-isolation relationship are magnitude differences, rather than inferential differences. Neither age nor gender stratum was responsible for explaining the overall associations that were indicated by the Chapter 3 analysis; instead, both age and both gender strata contributed, but at varying degrees. This may imply that the mean effects, which were reported in Chapter 3, are sufficient, and moderating influences are not relevant, despite the conceptual and empirical arguments proposed in this chapter's introduction.

Interestingly, the disaggregating components of the social variables in Aim 2 yield some noteworthy information. Emotional and instrumental support from family and friends appears as a significant predictor in both intimacy and sensuality, albeit in opposite directions, as noted above. This could mean that active relationships and regular interaction with friends and family provide a

level of emotional satisfaction that fulfills a need in older adults. However, absent that support, an individual may seek to derive that emotional satisfaction through sensual sexual activity. The Sexual Health Model is depicted as a wheel with spokes representing genital and non-genital aspects of sexuality. It may be that some sort of balance is needed of all the component “spokes” to achieve sexual health and when the spokes are out of balance, that some effort is made to compensate for the absence of that aspect of a person’s sexuality. Additionally, if one considers the Socio-emotional Selectivity Theory (SeST) that as people advance in years of age, they become more selective regarding their social networks, it may be that instead of developing new emotional and intimate relationships that older adults would choose to fill that absence with a relationship that is sensual in nature.

Chapter Two demonstrates that there exist unique intimacy and sensuality aspects of older adult sexual expression. This differentiation between above and below-the-waist sexuality is consistent with the Sexual Health Model theory described by Robinson and colleagues (2002),⁶⁴ with its framing of sexuality as a wheel comprised of spokes, with both genital expression focus and that of the affective domains. This consistency extended to the World Health Organization (2006) definition of sexuality as holistic—a central aspect throughout life and encompassing gender identities and roles, and intimacy and genital expression.³ Chapter Three then expounds upon that unique form by finding that social connectedness is linked with intimate older adult sexual expression. This finding dovetails off previous research by DeLamater (2012) who suggests that researchers develop theoretical models to explain later life sexuality that integrate interdisciplinary or biopsychosocial frameworks.²⁵ Finally, Chapter Four then takes social connectedness and deconstructs it. Consistent themes emerge in the cumulative findings of this exploration—that older adult sexuality exists in a holistic manner and above-the-waist sexual expression of intimacy is

associated/connected with social non-connectedness. This advances previous research which focused on social connectedness and genital sexual expression.

There is alignment with Sexual Health Model theory in that the negative relationship between sensuality and social non-isolation among men and the older age group is interpreted as a form of compensating for lack of emotional and intimate relationships by seeking sensuality in relationships. A second theory which integrates Socio-emotional Selectivity is that it may be that in the absence of emotional and intimate relationships, older age groups may seek to compensate for this absence with sensual relationships instead of developing new emotional and intimate relationships.

This paper contributes novel investigation of above-the-waist sexual expression (in addition to below-the-waist sexual expression) in the exploration of older adult sexuality and social connectedness. It adds to the body of literature in older adult sexuality which typically focuses on genital sexual expression and has a dearth of investigations regarding above-the-waist, or intimate sexual expression. Lastly, this research supports the theory that older adult sexuality is unique and because this study population was not diverse, that further research among more diverse populations is warranted to understand whether and how diversity contributes other dimensions to sexual expression in this age group.

This paper did not consider differences in the sexual partners of subjects, which presents an opportunity for future investigation. There may exist unique dynamics in the sexual partnering of older adults, which could influence their emotional and instrumental support needs. This was not investigated in the NSHAP dataset and merits more exploration. Lastly, future research which explores the age and gender dynamics in the relationship between older adult sexual expression and social connectedness could benefit from larger study samples and attention to diversity amongst those samples. This paper was based on a dataset where subjects were overwhelmingly white,

Christian, married, and heterosexual. Future research focused on sexual expression among older adults should be more diverse in terms of race, sexual and gender orientation, religion, age, and marital or partner status.

CONCLUSION

In conclusion, this study's first aim was to first assess whether the association between sexual expression, measured by composite variables that represent latent concepts of intimacy and sensuality, and social factors, measured by summary variables that suggest non-isolation and connectedness, vary by age and gender. The second Aim was whether particular dimensions of social non-isolation and social connectedness, which were identified via principal components analysis, determined the overall association between sexual expression and the social variables. The hypothesis for Aim 1 is that sexual expression will have a stronger positive association with social connectedness among females compared to males, and for the younger age group than for the older age group.

The PCA followed by multivariable linear regression models to explore Aim 1 found a significant positive relationship between intimacy and social non-isolation in all four strata. The association is stronger in magnitude among women than men, and younger study participants than older participants. There is no evidence of an association between intimacy and social connectedness in the subgroups. Additionally, these models indicate a negative, significant, relationship between sensuality and social non-isolation among men and a strong trend among the 65+ group; otherwise, no other associations were suggested.

For Aim 2, models were built to regress intimacy and sensuality on the social connectedness and social non-isolation subscales that were developed from the PCA and found that two of the three non-isolation subscales are associated with sexual intimacy – a positive relationship to both subscale 2, “emotional and instrument support from spouse” and subscale 3, “absence of

loneliness”. Intimacy does appear to be associated with one social connectedness subscale, but only in unadjusted analysis. Lastly, results in Aim 2 suggest that one of the three social non-isolation subscales is associated with sexual sensuality. Sensuality is negatively associated with non-isolation subscale 1— “emotional and instrumental support from family and friends. These findings were based on a homogenous study population that was primarily Christian, married, and heterosexual merits further investigation among more diverse populations to see how the relationship with between sexual expression and social connectedness may differ or be similar.

Table 4.1: Principal components (factor pattern) of social non-isolation

Factor Structure (Correlations)			
	Component1	Component2	Component3
• Emotional support from family	0.37	0.60	-0.17
• Instrumental support from family	0.40	0.54	-0.26
• Emotional support from friends	0.29	0.65	-0.10
• Instrumental support from friends	0.37	0.58	-0.06
• Emotional support from spouse	0.59	0.02	0.56
• Instrumental support from spouse	0.47	0.06	0.73
• Frequency of feeling left out	0.66	-0.46	-0.09
• Frequency of feeling you lacked companionship	0.70	-0.41	-0.30
• Frequency of feeling you were isolated from others	0.68	-0.42	-0.28

Note: Colors are used to convey potential factor (i.e., component) structures.

Table 4.2: Principal components (factor pattern) of social connectedness

Factor Structure (Correlations)		
	Component1	Component2
• Frequency of interaction with network alters	-0.15	0.60
• Proportion of network alters in household	0.22	-0.65
• Network range	-0.07	0.72
• Number of people listed in section	0.47	-0.20
• Number of friends	0.55	0.07
• Attendance at meetings of organized groups	0.77	0.16
• Frequency of socializing with friends or relatives	0.53	0.19
• Frequency of volunteer work	0.77	0.16

Notes: Colors are used to convey potential factor (i.e., component) structures. Although two-factor solution is presented, third factor (where Eigenvalue = 0.93) is obvious in factor pattern. Thus, three-factor solution is not presented.

Table 4.3: Social non-isolation and social connectedness subscales

	Subscale Name	Subscale components
Social non-isolation		
Subscale 1	Emotional and instrumental support from family and friends	<ul style="list-style-type: none"> • Emotional support from family • Instrumental support from family • Emotional support from friends • Instrumental support from friends
Subscale 2	Emotional and instrumental support from spouse	<ul style="list-style-type: none"> • Emotional support from spouse • Instrumental support from spouse
Subscale 3	Absence of loneliness	<ul style="list-style-type: none"> • Frequency of feeling left out (reverse coded) • Frequency of feeling you lacked companionship (reverse coded) • Frequency of feeling isolated from others (reverse coded)
Social connectedness		
Subscale 1	Interaction with and proximity to network alters	<ul style="list-style-type: none"> • Frequency of interaction with network alters • Proportion of network alters in household
Subscale 2	Range of social network and alters	<ul style="list-style-type: none"> • Network range • Number of people listed in section
Subscale 3	Intensity of informal and formal social activity	<ul style="list-style-type: none"> • Number of friends • Attendance at meetings of organized groups • Frequency of socializing with friends or relatives • Frequency of volunteer work

Table 4.4: Relationship between intimacy and social non-isolation and social connectedness: stratified by gender and age.

	Men	Women	57-64	65+
	n = 465	n = 289	n = 376	n = 378
Intercept	23.12 (0.99)	22.64 (1.47)	22.31 (1.20)	21.62 (1.21)
Social non-isolation	0.19*** (0.03)	0.28*** (0.04)	0.25*** (0.03)	0.22*** (0.03)
Social connectedness	-0.06 (0.04)	-0.01 (0.05)	-0.02 (0.05)	-0.05 (0.05)
R-squared	0.23	0.36	0.31	0.27

Models were adjusted for age, marital status, religion, education, race, religious attendance, employment status, household income, self-rated physical health, self-rated mental health, basic activities of daily living score.

*p<0.05; **p<0.01; ***p<0.001

Table 4.5: Relationship between sensuality and social non-isolation and social connectedness: stratified by gender and age.

	Men	Women	57-64	65+
	n = 465	n = 289	n = 376	n = 378
Intercept	10.61 (1.32)	13.10 (1.66)	11.54 (1.48)	8.60 (1.54)
Social non-isolation	-0.13** (0.04)	0.04 (0.04)	0.01 (0.04)	-0.11 (0.04)
Social connectedness	0.10 (0.05)	-0.02 (0.06)	0.03 (0.06)	0.05 (0.06)
R-squared	0.22	0.24	0.24	0.21

Models were adjusted for age, marital status, religion, education, race, religious attendance, employment status, household income, self-rated physical health, self-rated mental health, basic activities of daily living score.

*p<0.05; **p<0.01; ***p<0.001

Table 4.6: Relationship between intimacy and subscales of social non-isolation and social connectedness (n = 754)

	Model 1	Model 2	Model 3	Model 4 ^a
Intercept	26.40 (0.10)	26.40 (0.11)	26.40 (0.10)	22.71 (0.82)
Social non-isolation				
Subscale 1	0.02 (0.04)	--	0.02 (0.04)	0.02 (0.04)
Subscale 2	0.65*** (0.06)	--	0.65*** (0.06)	0.57*** (0.06)
Subscale 3	0.35*** (0.04)	--	0.35*** (0.04)	0.26*** (0.04)
Social connectedness				
Subscale 1	--	-0.03 (0.08)	-0.00 (0.07)	-0.00 (0.06)
Subscale 2	--	0.07 (0.08)	0.03 (0.07)	0.05 (0.07)
Subscale 3	--	0.09* (0.04)	0.01 (0.04)	-0.03 (0.04)
R-squared	0.25	0.01	0.25	0.32

^a Adjusted for age, marital status, religion, education, race, religious attendance, employment status, household income, self-rated physical health, self-rated mental health, basic activities of daily living score
 *p<0.05; **p<0.01; ***p<0.001

Table 4.7: Relationship between sensuality and subscales of social non-isolation and social connectedness (n = 754)

	Model 1	Model 2	Model 3	Model 4 ^a
Intercept	9.77 (0.14)	9.77 (0.14)	9.77 (0.14)	10.26 (1.05)
Social non-isolation				
Subscale 1	-0.12* (0.05)	--	-0.13* (0.05)	-0.10 (0.05)
Subscale 2	0.03 (0.09)	--	0.03 (0.09)	0.07 (0.10)
Subscale 3	-0.04 (0.06)	--	0.04 (0.06)	-0.10 (0.06)
Social connectedness				
Subscale 1	--	-0.01 (0.09)	-0.01 (0.09)	0.03 (0.08)
Subscale 2	--	0.12 (0.10)	0.16 (0.10)	0.17 (0.09)
Subscale 3	--	-0.08 (0.05)	-0.05 (0.05)	0.02 (0.05)
R-squared	0.01	0.004	0.01	0.23

^a Adjusted for age, marital status, religion, education, race, religious attendance, employment status, household income, self-rated physical health, self-rated mental health, basic activities of daily living score
 *p<0.05; **p<0.01; ***p<0.001

CHAPTER FIVE: DISCUSSION AND CONCLUSION

The aim of this dissertation was to 1) develop a sexual expression construct for use with older adults that incorporates latent factors which underlie the observed sexual expression variables, 2) assess if social connectedness and social non-isolation, composite variables previously developed by Cornwell and Waite (2009) from the same NSHAP dataset,⁶⁶ are associated with sexual expression, 3a) determine whether the associations between the sexual expression measures and the composite social variables, vary by age and gender, and 3b) determine whether elements of the composite social variables are particularly influential determinants of sexual expression.

This study addressed three main gaps in the current literature on older adults, specifically, the need to better understand sexual expression in holistic terms, the lack of investigation of the community-dwelling older adult population, and lastly, that little is known about the relationship between social connectedness and sexual expression in older adults. This final chapter presents a summary and discussion of this study's observed results. The empirical process which informed the work is detailed to describe how unexpected and null findings led to additional, unplanned, analyses. Next, limitations are discussed which may affect the interpretation of the results. Then suggestions are provided for the future direction of intervention, service work, and scientific investigation.

Summary and Discussion of Study Results

This study investigated the following questions:

- Can quantitative secondary data analysis using exploratory factor analysis determine if an innovative scale of sexual expression for older adults that is holistic in nature and serves a community-dwelling population be developed?

- Are social connectedness and social non-isolation, the composite variables previously developed by Cornwell and Waite (2009), associated with sexual expression?⁶⁶
- Do the associations between these sexual expression measures and the social variables, vary by the factors of age and sex? And are elements of the social non-isolation and social connectedness composite variables particularly influential determinants of sexual expression?

An empirical process informed the design and direction of this investigation. Interest in the interactions of social variables on older adult sexual expression led to the identification of the NSHAP dataset. Gaps in the literature were identified after a review which narrowed the research aims and guided the investigative approach. The first aim of the study addressed a need for a data reductive method which led to the application of exploratory factor analysis, as latent constructs could be developed for sexual expression factor. EFA resulted in interesting groupings of the variables, both expected and unexpected. While I hypothesized that EFA would reveal a genital (sensuality) and a non-genital (intimacy) dimension of sexual expression, I did not anticipate that frequency of vaginal sex would cluster with the non-genital intimacy factor. The second aim of this study was to study the interaction between the sexual expression variables and the Cornwell and Waite (2009) social connectedness variables.⁶⁶ This analysis revealed that the strongest relationship was the association between intimacy and social non-isolation. Unexpectedly, the regression analysis in Chapter Three revealed the lack of association between the social variables and sensuality.

The third aim of the study was to further investigate the association between sexual expression and social connectedness stratified by age and gender, as these variables could interact with both the dependent and independent variables. This analysis revealed an association between

mental health and intimacy, as well as married subjects presenting greater intimacy and black subjects presenting lower intimacy levels. Lastly, these unexpected and null findings led to an additional, unplanned, analysis. Aim 3b explore whether any components of the social variables were particularly influential in the relationship with sexual expression. This additional analysis would help ascertain if the tepid results found in Aim 2 and Aim 3a were due to the absence of a relationship between sexual expression variables (especially sensuality) and social connectedness, or if the analyses were missing a relationship with a social measure that was obfuscated by the composite Cornwell and Waite factor. Consequently, I conducted a principal components analysis of the social connectedness and social non-isolation factors. This analysis revealed the role of emotional and social support on both the intimacy and sensuality factors of sexual expression. Although Aim 3b was established after conducting the planned analysis, it was scientifically driven by the course of the analysis and allowed this study to inspect the contribution of social variables that could not previously be surfaced.

With regard to the exploratory factor analysis, a two-factor solution was identified, confirmed, and retained. This finding was consistent with the study aim of developing a sexual expression construct for use with older adults whose latent factors underlie the observed sexual expression variables. Factor 1 was labeled *Intimacy*. The items on this scale embodied the above-the-waist aspects of sexual expression with a focus that is relationship-centered, pertaining to the affective domain including intimacy, happiness, satisfaction, and pleasure. These items included *sleep in same bed, happy in relationship, physical pleasure in relationship, emotional satisfaction of relationship, and frequency of vaginal sex*. Contrary to this author's initial expectations, frequency of vaginal sex fits into the Intimacy factor, not the Sensuality factor. This variable was identified through EFA as grouping with the Intimacy rather than the Sensuality factor which led to an exploration in the literature of the role of vaginal sex in older adult sexuality. The decision to

include this item in the Intimacy factor suggests that a variable intended to describe a genital aspect of sexuality may have more depth among older adults than previously understood.

Factor 2 was labeled *Sensuality*. The items on this scale embodied the physical aspects of sexual expression, with a focus on the frequency of genital sexual expression and its importance. This factor captures the more traditional focus of below-the-waist sexual expression. These items included *importance of sexual intercourse, frequency of receiving oral sex, frequency of giving oral sex, and frequency of masturbation in the last year.*

With regard to the linear regression testing, the association between sexual expression and the composite social variables suggested positive and statistically significant relationships. This is consistent with the study hypothesis that social connectedness – investigated as both social connectedness and social non-isolation – is positively associated with sexual expression dimensions. However, only the social non-isolation relationship was shown to be statistically valid. Self-rated mental health was positively correlated with intimacy values, and all other control variables were shown to lack statistical significance.

With regard to whether the associations between the sexual expression measures and the social variables (i.e., social non-isolation and social connectedness) are influenced by age and gender, results of the stratified linear regression models showed that after adjustment, a significant positive relationship was found between intimacy and social non-isolation when stratified by both age and gender. The association is stronger among women than men, and younger study participants than older participants. There was no evidence of an association between intimacy and social connectedness. Considering the study hypothesis, results here are tepid. Although findings suggest that women and younger participants demonstrate a stronger relationship between sexual intimacy and social non-isolation than men and older participants, the differences uncovered are magnitude differences, not inferential differences. This may imply that the mean effects, reported in

Chapter 3, are sufficient, and the moderating influences of age and gender are not relevant, despite the conceptual and empirical arguments proposed in this chapter's introduction.

With regard to the principal components analysis, components of the social non-isolation and social connectedness composite variables emerged that were particularly influential determinants of sexual expression. Social non-isolation is measured by 3 subscales: “emotional and instrumental support from family and friends” (Component 1), “emotional and instrumental support from spouse” (Component 2), and “absence of loneliness” (Component 3). Similarly, social connectedness is measured by 3 subscales: “interaction with and proximity to network alters” (Component 1), “range of social network and alters” (Component 2), and “intensity of informal and formal social activity” (Component 3).

Sexual intimacy appears to be largely explained by two social non-isolation dimensions—emotional and instrumental support from family and friends, and emotional and instrumental support from a spouse—whereas sensuality is most prominently explained by lack of emotional and instrumental support from family and friends. Of note, the direction of effects is opposite – as emotional and instrumental support increases, intimacy increases and sensuality decreases. The disaggregating components of the social variables yield some noteworthy information. Emotional and instrumental support from family and friends appears as a significant predictor in both intimacy and sensuality, albeit in opposite directions. This could mean that active relationships and interactions with friends and family provide a level of emotional satisfaction for older adults, while the absence of these relationships and interactions leads an individual to pursue sensual relationships instead.

Generalization and Limitations

The older adult population in the United States is growing not only in size but in its diversity. Older adults' diversity encompasses racial and ethnic aspects, religion, sexual and gender

orientations, as well as a diversity of life experiences. The current study is most generalizable to white, married, heterosexual populations. Subsequent research should focus on racially and ethnically diverse populations as well as populations that represent the broader spectrum of sexual and gender orientations.

These limitations are exacerbated by sample reduction, as only partnered people responded to sexual expression variables and, of these individuals, only sexually-active people further responded. Regarding external validity, the findings of this study may only be applicable to community-dwelling older American adults. It may not be generalizable to institutionalized older adults, or those living outside the United States, as other phenomena may influence the relationship between sexual expression and older age. The exploratory nature of the factor analysis may limit its generalizability but should support the creation of new hypotheses worthy of further investigation. Such future studies should focus on sexual expression among older populations that are more diverse in race, sexual and gender orientation, religion, and partner status.

This study has established that any evaluation of sexual expression in community-dwelling older adult sexuality must include both genital and non-genital dimensions. The recognition of non-genital sexual expression, as an area ripe for future research and learning among older adults, is essential. While this study takes an initial step in developing that tool, future studies can target populations to which the present study may not be generalized with the use of NSHAP subset data.

Limitations

This study has several limitations. First, the data are analyzed as a snapshot in time and do not allow for the determination of causality nor show the temporal relationship between the variables. Another limitation to consider is that the NSHAP data relies on self-reporting. Self-reported data can be prone to reporting bias. When individuals offer self-assessed measures, there are many reasons individuals might offer biased estimates. Rosenman and colleagues (2011) state

these reasons may range from a misunderstanding of what a proper measurement is to social-desirability bias, where respondents want to ‘look good,’ even if the survey is anonymous.¹⁴⁸

A third limitation is that this study’s sample, which was a subset of the NSHAP population, was not racially diverse. Consequently, it limited the exploration of the association between race and the sexual expression of intimacy. Ambler and colleagues (2012), in their review of the SWAN dataset, found substantial ethnic differences in sexual expression domains in women of all ages.⁹⁴ After controlling for a range of variables, they found the differences in arousal, desire, and attitudes toward sex and aging. They posited that racial and cultural backgrounds may have a significant impact on aspects of sexual function. Racial differences in older adult sexual expression may exist and warrant additional research.⁹⁴ The characteristics of the study population are exacerbated by sample reduction—loss of sample due to skip pattern. In a series of questions associated with a conditional response, respondents answer most questions on a survey, but certain questions pertain only to certain respondents. In the present study, most respondents to sexual expression variables were partnered and of these individuals, only sexually-active people further responded.

A fourth potential limitation is that linear regression will only model relationships between independent and dependent variables that are linear in nature. This study assumes there is a straight-line relationship between the variables, which could potentially be incorrect if the social variables investigated are multidimensional in nature. Although Cornwell’s scales are referenced in several studies, they have not been utilized outside of this study beyond the paper establishing the scales. Further investigation with Cornwell’s scales will help solidify whether these scales behave as other social variables do when tested against other variables. In this study, however, the Cornwell scales behaved predictably compared to known interactions in the literature.

A final limitation is that this paper did not consider the differences in the sexual partners of subjects, which presents an opportunity for future investigation. There may exist unique dynamics

in the various sexual partnering of older adults, which could influence their emotional and instrumental support needs. These differences in the partnerships were not investigated in the NSHAP dataset and merits more exploration.

Strengths

Apart from the aforementioned limitations, this study has a number of strengths. This study has established that comprehensive evaluations of older adult sexuality should include both genital and non-genital dimensions of sexual expression. By establishing new measures of sexual expression covering both the genital and non-genital dimensions, this study provided a more complete, holistic perspective on human sexuality in later life. The examination of social connectedness and sexual expression through this holistic lens also teased out a relationship between emotional dimensions of these two factors. In fact, social non-isolation and intimacy are associated and the physical dimension of social connectedness is not associated with either genital (sensuality) or non-genital (intimacy) forms of sexual expression. Incorporating this above-the-waist view of sexual expression (in addition to the traditional genital lens) into the exploration of sexual expression and social connectedness serves to more fully develop the body of literature on older adult sexuality.

Despite the growth of the older population, research exploring their sexuality is often based on – or limited to – institutionalized older adults. Among this study’s strengths, the use of community-dwelling older individuals makes the results more reflective of the active lives of older adults “graying” today. This study provides a framework for exploring non-genital sexual expression in more expansive populations. Future research can dovetail off this dissertation and target populations which the NSHAP data were not specifically designed to capture.

Lastly, this research supports the view that older adult sexuality is unique compared to younger people, which is important for the development of interventions and provision of services.

Older adults, as revealed here, are not just adults who are older. They are in fact a distinct population with different and evolving sexuality-related needs.

Future Directions

The end goal of this research is to better inform and influence the health of older adults in the sexuality domain. This can be done by incorporating findings to better inform interventions, research, and ultimately policy for community-dwelling adults as well as help support the sexual lives of all older adults.

Interventions

There are promising opportunities for interventions among older adults, investments should be made to incorporate social connectedness in any older adult sexuality-related programming. Sexual expression is a central aspect of the older adult and service agencies can take steps toward meeting their needs. In working with older adults, agencies of service providers should train staff about older adult sexuality, incorporate sexual expression and social connectedness into their client and staff resources, referrals, and programming. Mental health and social service providers can assist older adults through their life course, as their sexual expression evolves. Sexuality education and improvement of general knowledge and awareness of later life sexuality can assist challenges by engaging older adults in above-the-waist dimensions of sexual expression.

Since nearly all sexuality education curricula available have been developed for children, adolescents, and younger adults, a great need exists for the development of education intervention tools to fill in the gap that exists in effective interventions that support older adult sexuality. Brick and colleagues' (2009) "Older, Wiser, Sexually Smarter" sex education curriculum is noteworthy because it incorporates a sex-positive, above-the-waist approach to sexuality education, and is designed for an older population inclusive of community-dwelling old adults.¹⁴⁹ As more is learned about the needs of different subgroups within the older adult population, there can be better design

and implementation of educational interventions. For example, future older adult interventions should incorporate a more holistic lens of sexual expression by engaging in sexuality education opportunities that integrate or improve social engagement and reduce isolation among older adults in a community. Additionally, this research can inform service providers who may play an influential role in the sexual health resources and service of older adults. A holistic intervention approach to older adult sexuality should provide a sex-positive and age-positive approach with a focus on relationships and communication skills, and provide conversations pertaining to relationship loss, body image, gender roles, diversity of life experiences, sexual and gender orientation, and the effects of aging on sexuality and sexual health.

Research

This study highlights areas for future research. Subsequent research should focus on the diversity of the older adult population. A focus should extend to racially-diverse populations, the unmarried/unpartnered, as well as populations that represent the broader spectrum of sexual and gender orientations. Future studies on unmarried older adults would allow a comparative study of sexual expression between partnered and unpartnered populations and possibly an evaluation of whether there are differences between unmarried partnered people and married people. The study of sexual expression should more extensively examine community-dwelling populations, to better serve older adults who live outside of an institutionalized setting.

Of note, Chapter 2 established a link between a person's perception of their mental health and their intimacy score. Though no such relationship was shown to exist with sensuality, the link with mental health and intimacy scores may warrant further investigation. Previous findings by Berkman (1995), Hawkley and Cacioppo (2003), House (2001), and House and colleagues (1998) show that indicators of isolation are associated with worse health.^{110,34,111,112} This may speak to an interaction with perceived mental health and the relationship between the higher levels of social

non-isolation, and higher levels of intimacy, that was observed in Chapter 3. Perhaps the sexual expression variable of intimacy functions as a bridge between mental health and non-isolation. Alternatively, intimacy and non-isolation may have a similar relationship with perceived mental health. Further research can evaluate mental health status along with these intimacy and non-isolation variables.

Research should begin to evaluate the sexuality needs of older adults differently, as principles that have been applied to sexuality in younger adults are not directly transferable to older adults. Lastly, a targeted focus that encompasses an above-the-waist approach to sexual expression and investigates its relationship to social connectedness would better inform the tools public health has at hand – e.g. inventions, research, policy, and theory – to advance the health and wellness of older adults.

CONCLUSION

This study of the NSHAP dataset sheds light on a deeper understanding of the expression of human sexuality in older age. There exist deeper, fuller nuances to sexual expression than what the literature has most often investigated, what is popularly believed, and what is presently known. Sexuality and its expression in older age transcend cultural denial and a traditional emphasis on genital-expression. It interacts with social connectedness, in ways that are unique. Sexual expression is not the monopoly of the youth. Incorporating the affective domain – comprised of values, beliefs, and emotions – with social connectedness will deepen the understanding of sexuality over the lifespan. Further investigation of older adult sexual expression and its interaction with social connectedness will enrich knowledge and help to ensure more thoughtful and effective public health efforts.

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