

**The Effects of Subjective Age and Aging Attitudes on Mid to Late Life  
Sexuality**

by

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## **AUTHOR'S DECLARATION**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

## ABSTRACT

**Background:** Sexuality is being recognized by the medical community as an increasingly important factor for well-being in older adults. Sexual activity produces many benefits for adults in later life including releasing endorphins producing natural painkillers, burning fat, releasing testosterone to strengthen bones and muscles, strengthening the immune system, preventing wrinkles, improving ease for activities of daily living, and increasing longevity. Age and well-being are important factors that contribute to older adults' sexuality. Subjective age and attitudes towards aging are known to impact physical and mental wellness for adults over 40. However, there is no research that looks at the impact of subject age and aging attitudes on older adult sexuality.

**Objective:** This secondary analysis of longitudinal Mid-Life in the United States (MIDUS) study data will explore the relationship between subjective age and attitudes toward aging from MIDUS Wave I on sexual activity, frequency of sex, quality of sex, and interest in sex, among adults 40 and older from MIDUS Wave II.

**Methods:** Secondary data analysis of 1170 participants that completed both Wave I and Wave II of the MIDUS survey was completed. Data were analyzed to determine the relationship between the independent variables subjective age and aging expectations on the four dependent sexuality variables number of sex partners, frequency of sex, quality of sex, and interest in sex. The interaction terms subjective age by aging expectations, subjective age by gender, aging expectations by gender. A three way interaction between subjective age, aging expectations, and gender was also included in the analyses.

**Results:** Subjective age was significantly associated with quality of sex and interest in sex such that the older people felt, the less likely they were to rate their sex life positively or put much thought and/or effort into sex. Aging expectations were significantly associated with quality of sex such that the worse people felt about getting old, the less likely they were to have good quality sex later in life. Neither subjective age nor aging expectations had an impact on the behavioural variables number of sex partners and frequency of sex. None of the interaction terms tested were statistically significant.

**Conclusion:** The present findings illustrate the importance of subjective aging factors on quality of sex and interest in sex for older adults. People who feel better about aging and who feel younger than their actual age are more likely to rate the quality of the sexual aspects of their lives positively and are also more likely to put thought and effort into their sex lives. Although the current study provides some new insight into the topic of older adult sexuality, more research is required to fully understand the factors that contribute to older adult sexuality and how that relates to overall well-being.

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# **THE EFFECTS OF SUBJECTIVE AGE AND AGING ATTITUDES ON MID TO LATE LIFE SEXUALITY**

## **1.0 Introduction**

Medical professionals and researchers have begun to highlight sexuality as an important protective health factor for older adults (Lindau et al., 2007, Onder et al., 2003). Sexual activity frequency and quality has been shown to be positively related to good health across the lifespan in adults aged 25-84 (Lindau et al., 2007). Health Canada promotes the benefits of sexual activity for older adults, including: releasing endorphins producing natural painkillers, burning fat, releasing testosterone to strengthen bones and muscles, strengthening the immune system, and preventing wrinkles (Health Canada, 2006). Women over 65 who are satisfied with their sex lives also experience less trouble with activities of daily living (Onder et al., 2003). In 1982, sexual relations were also first associated with longevity (Palmore, 1982). Frequency of intercourse became a significant predictor of longevity for men, and past and present enjoyment of sexual activity was a strong longevity predictor for women 60 to 94 years old (Palmore 1982). Among men 45-59, mortality was reported to be 50% lower among men with high orgasmic frequency, with evidence of a dose response relationship across groups (Smith, Frankel, & Yarnell, 1997).

Age is a significant predictor in the amount of sexual activity an adult engages in, often due to its affect on health status (Lindau et al., 2007). Lindau et al. (2007) reveal that the prevalence of sexual activity declines with age, and moreso for women than men due to well-being. Subjective age and aging attitudes have also been shown to influence well-being (Moch and Eibach, 2011); however, their affect on sexuality has not yet been explored. Since sexuality is such an important factor for late life health, this study aims to determine whether subjective

age and aging attitudes influence the four dimensions of sexual activity explored by Lindau and Garilova (2010): sexual activity, frequency of sex, satisfaction with sex life, and interest in sex, in older adults.



## **2.0 Literature Review**

### **2.1 Sexual Activity Among Older Adults**

Studies show that North Americans remain sexually active until late life. A study of American older adults established that 91.1% of men and 86.8% of women aged 57-64 had vaginal sex within the previous 12 months, 78.5% of men and 85.4% of women aged 65-74 had sex in the previous 12 months, and 83.5% of men and 74.4% of women 75-84 had sex in the previous 12 months (Lindau et al., 2007). The Canadian Community Health Survey stops asking questions relating to sexual activity or health to people at age 49; thus, looking at small studies is very important to gain an understanding of Canadian seniors' sexual activity patterns. A pilot<sup>1</sup> study of Canadian snowbirds produced similar numbers, reporting that 89.64% of married or common law snowbirds and 81.4% of dating snowbirds had sexual intercourse in the previous 12 months (Mairs, 2010). In that study, 23.14% had been on a date or in a new relationship in the past 5 years, and 78.6% were married. Global studies confirm these results, where more than 80% of men and 65% of women between the ages of 40 and 80 reported that they had sex during the previous 12 months (Niclosi et al., 2004).

### **2.2 Predictors of Mid to Late Life Sexuality**

#### *2.2.1 Gender and Sexual Activity*

Gender, defined as whether a person is male or female, plays a significant role in predicting sexuality among North Americans of all ages. Lindau et al., (2007) reported that men are significantly more likely to be sexually active than women in all age categories and that sexual activity declines over time uniformly for adults 57 to 84 years of age. However, the

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<sup>1</sup> Canadian snowbirds are older adults who travel to and live in warmer Southern locations such as Florida, Texas, and Arizona, throughout the winter months (Marshall & Longino, 1988; Longino & Marshall, 1990). Snowbirds present an interesting example of the older adult population by placing themselves at higher risk for STIs by wintering in Florida, the US location with the highest HIV rates among older adults (Drummond, 1999).

difference in rates of sexual activity between genders, were less drastic among those with a spousal or intimate relationship (Lindau et al., 2007). In fact, married people were more likely to have sex overall, despite their gender, compared to those who were not in a relationship.

### *2.2.2 Health Status and Sexual Activity*

Many biological factors associated with aging can directly affect the sex life of an older adult. As women age, hormonal changes due to menopause cause drying of the vaginal wall, decreasing comfort and increasing the likelihood of vaginal tearing during sexual activity (Jacobs & Kane, 2009; Savasta, 2004). Furthermore, older women experiencing diabetes were less likely to be sexually active than women without (Lindau et al., 2007). For older men, cardiovascular issues and diabetes are associated with erectile dysfunction (ED), which is present in between 10-22.5% of males over 50 (Lindau et al., 2007, Niclosi et al., 2004, Laumann et al., 2009). For both genders, age-related physical declines such as memory loss, neuropathy, anaemia, weight loss, frequent illness and disease, and the treatment of those illnesses, can also negatively impact sexual behaviour (Linsk, 2000; Williams & Donnelly, 2002). Diabetes is also associated with lower likelihood of masturbation among both genders (Williams & Donnelly, 2002).

As such, health status is thought to be one of the biggest influences on late life sexuality. In fact, in 2007 Lindau et al. reported that health was much more likely to affect older adult sexual health rates than actual age (2007). Lindau et al. (2007) revealed that participants who reported their health as “poor” or “fair” were much less likely to be sexually active than those who reported “very good” or “excellent” health (OR=0.21, 95% CI = 0.14 to 0.32). Lindau and Garilova (2010) explored this relationship further by looking at self-rated health status (excellent, very good, good, fair, poor) and its effect on many dimensions of sex including frequency, quality, and interest. They reported that among sexually active respondents, good

health is significantly related to frequent sex in men and good quality sex in women and men in midlife (Lindau & Garilova, 2010). Good health was not significantly related to number of sex partners or interest in sex (Lindau & Garilova, 2010).

### *2.2.3 Subjective Age and Physical and Mental Health*

Recent literature shows a relationship between subjective age and health. In terms of psychological health, many studies show that adults in midlife who feel older than they are experience lower positive and higher negative affect, lower life satisfaction, lower self-esteem, lower self-efficacy, lower meaning-focused coping, higher pessimism about aging, and higher work strain relative to those who feel younger in their age (Mock & Eibach, 2011). Montepare (1996) also reported that higher subjective age was negatively correlated with positive body image and sexual attractiveness for middle aged and older women. Mock and Eibach (2011) expand the relationship between subjective health and psychological health to look at how a person's attitudes toward aging influence the relationship between subjective age and well-being. The results show that aging attitudes interact with subjective age to influence well-being such that people who have negative attitudes about aging experience worse psychological outcomes in relation to well-being as they age than those that hold favourable attitudes towards aging (Mock & Eibach, 2011). A study by Levy et al., (2002) reveals the same for physical well-being by examining self-perceptions of aging on health, revealing that positive self-perceptions of aging at time one were positively correlated with general functional health 18 years later.

## **2.3 Theoretical Framework**

Research from many disciplines has highlights the self-concept as an appropriate theoretical framework for guiding inquiry into adult behaviour. The basic tenant reveals that how individuals interpret and respond to life experiences depends critically on the content,

organization, and functioning of their self-concept (Markus & Herzog, 1991). Furthermore, the theory states that self-concept actually mediates and regulates behaviour (Markus & Wurf, 1987).

The self-concept theory involves merging individual theories about social cognition with a lifespan developmental approach, incorporating the transitions of adulthood and aging (Markus & Herzog, 1991). The self-concept includes all of the individual variables that have been significantly associated with aging over time: self-esteem, identity, locus of control, old age identification, all tied to the view of oneself (Markus & Herzog, 1991). The self-concept also includes the collection of a person's images, schemas, theories, goals, tasks, conceptions, and prototypes (Markus & Wurf, 1987). The conglomeration of these variables is responsible for fine-tuning individual behaviour in adulthood (Markus & Wurf, 1987). Research on self-concept and behaviour emphasizes that will, control, motivation, or intention for behaviour is always self-relevant, based on the self-appraisal of ideas, events, and objects formed out of one's self-concept (Cross & Markus, 1990).

As people age, the factors that contribute to their self-concept multiply. Knowledge and self-understanding accumulates, producing a more defined self-concept (Markus & Herzog, 1991). Aging self-stereotypes are included in that accumulation of knowledge. Formed in childhood, stereotypes about aging originate in a person's social and cultural environment (Levy, 2003). These early-life stereotypes towards aging eventually become internalized due to reinforcement by societal stereotypes and a variety of cognitive processes that make the existing stereotype the default process for interpreting information (Levy, 2003). Once internalized the aging stereotypes become aging-self stereotypes, guiding adult behaviour and even influence health and physical functioning (Levy, 2003). While the emphasis is often on negative self-

stereotypes, positive ones also exist and should also be considered (Levy, 2003). Through experimental research, Levy (2003) has reported that when measured directly, aging self-stereotypes do alter physical functioning and survival.

In relation to this study, the subjective age and aging attitudes variables provide insight into a person's self-concept and aging self-stereotypes. Aging attitudes, the independent variable that asks people to rate life at 60 versus life at 20, specifically explores that aging self-stereotypes question directly. Participants are given the option to express how they feel about aging and the result can either be positive or negative. These variables and their relation to the self-concept theory may be able to lend insight into the relationship between subjective age and aging attitudes and the sexual behaviour and intent outcome variables being explored in this study.

## **3.0 Research Rationale & Objective**

### **3.1 Research Rationale**

It is known that health status is an important predictor of the four dimensions of sexual health for older adults (Lindau et al., 2007). It is also known that subjective age and aging attitudes affect physical and mental health in older adults (Levy et al., 2002; Mock & Eibach, 2011). There is currently no evidence on how subjective age and aging attitudes might impact sexual health in elderly adults. Thus, this study will explore that important relationship.

It is hypothesized that subjective age and aging attitudes and their interaction will be correlated directly with all aspects of mid to late life sexuality among adults 40 and over.

#### *3.1.1 Objectives and Hypotheses*

This secondary analysis of longitudinal Mid-Life in the United States (MIDUS) study data will explore the relationship between subjective age and attitudes toward aging from MIDUS Wave I on sexual activity, frequency of sex, quality of sex, and interest in sex among adults 40 and older from MIDUS Wave II.

*Hypothesis 1:* 1. Subjective age will be related to all four aspects of sexuality, such that, as people feel older their number of sex partners will decrease, they will have less frequent sex, the quality of their sex lives will decrease, and their interest in sex will decrease.

*Hypothesis 2:* Aging attitudes will be related to all four aspects of sexuality, such that, as people feel negatively about getting older their number of sex partners will decrease, they will have less frequent sex, the quality of their sex lives will decrease, and their interest in sex will decrease.

*Hypothesis 3:* The interaction of subjective age and aging attitudes will be significant showing that how a person feels about getting older will affect the relationship between subjective age and each sexual aspect outcome variable.

Hypothesis 4: Two-way interactions between gender and subjective age and aging attitudes will be tested and it is expected that gender will impact the association between subjective age and aging attitudes on each sexual aspect outcome variable. It is hypothesized that men will have sex regardless of how old they feel or how they feel about getting older, whereas women might not, especially since it is known that subjective age plays a large role in how women feel about their body image, independent of self-esteem (Montepare, 1996).

Hypothesis 5: A three-way interaction of subjective age, aging attitudes and gender will be tested and it is expected that the association of subjective age and aging attitudes on the sexuality outcome variables will differ for men and women.

## **4.0 Methods**

### **4.1 Background**

This study is based on data from two waves of the MIDUS survey which collected psychosocial, sociodemographic, and biological variable data related to physical and mental health from a sample of American adults (Brim et al., 1996; Ryff et al., 2006). Wave I survey data was collected between 1994-1995 and included a nationally representative main sample of community-dwelling English speaking American adults 25-74 years of age ( $n = 3,485$ ), an oversample of five urban areas, and sibling and twin samples for a total of 7,000 respondents. This study will only consider the nationally representative main-sample participants. Data were collected through a 30 minute phone interview and participants were also mailed a self-administered questionnaire.

Wave II data were collected between 2004 to 2006, with every effort made to contact the participants included in Wave I (Ryff et al., 2006). Participants completed a follow-up 30 minute telephone questionnaire (75% response rate) and a mailed self-administered questionnaire (81% response rate). Many of the same psychosocial, sociodemographic, and biological variables from Wave I were measured.

### **4.2 Sample Selection**

For Wave I of the MIDUS survey, participants were selected using a multi-stage sampling design. First, an equal probability sample of telephone numbers was selected and households were determined using random digit dialing. Next, upon speaking to an adult respondent at the randomly selected phone number, household demographic information was collected and a list was generated of all English speaking adults in the household between 25 and 74. A random respondent from that list was then asked to complete the survey. Oversampling



was conducted for men and older adults by varying the probability of carrying out an interview by age and sex. The total number of respondents for the Wave I main sample that completed both the telephone and paper questionnaire is 3,032 (Brim, Ryff, & Kessler, 2004)<sup>2</sup>.

The response rate for the main sample telephone interview was 70%. Of the telephone respondents, 86.3% completed the mailed, self-administered questionnaire. Thus, the overall response rate was 60.8% with 3,032 respondents (1561 men, 1471 women) completing both parts of the survey (Brim, Ryff, & Kessler, 2004).

Wave II data were collected by telephone and self-administered questionnaire from approximately 70% of the Wave I participants. Approximately 25% of the non-participants for Wave II refused directly and 75% of them did not participate due to confirmed or suspected mortality, informant refusal, or inability to be contacted (Ryff et al., 2006).

This study only includes main-sample participants that answered both the telephone and self-administered questionnaires in both Wave I and Wave II and that have complete information for each outcome variable. Mock and Eibach (2011) compared the characteristics of those who remained in the study with those who did not and reported no significant differences for subjective age or aging attitudes. The study is also restricted to participants aged 40 and over at Wave I because literature shows that after age 40 people start to feel younger than they actually are, maintaining a subjective age that is 20% younger than their actual age (Rubin & Bernsten, 2006). Considering those restrictions, the final sample size for this project is 1,170 participants.

The descriptive statistics for the sample are available in **Table 1**.

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<sup>2</sup> The MIDUS study also sampled a sibling cohort (n=921), identified from 529 members of the nationally representative main sample who had two or more siblings with same biological mother and father. Overall, researchers obtained 1,614 sibling pairs. Twin pairs (n = 998) were also obtained through a nationally representative sample of 50,000 households (Brim, Ryff, & Kessler, 2004). Oversampling was conducted in five urban areas where more in-depth interviews were conducted based on the principal researcher's needs in that area. The overall number of participants including main sample, sibling, twin, and urban oversample was 7,108 (Brim, Ryff, & Kessler, 2004).

## 4.3 Measures

### 4.3.1 Demographic Measures

The following demographic measures were included for all participants: gender (dichotomous), education (linear), income (linear), self-rated health (linear), marital status (dichotomous), and employment status (dichotomous) as they have been found to be associated with well-being (Diener, Suh, Lucas, & Smith, 1999). Gender was coded as 1 = female and 0 = male. Education was coded as 1 = did not graduate high school, 2 = graduated high school, 3 = some college, 4 = college graduate or greater. Income was coded to represent yearly income deciles so that \$0 thru \$17,041 = 1, \$17,042 thru \$25,000 = 2, \$25,001 thru \$32,000 = 3, \$32,001 thru \$39,500 = 4, \$39,501 thru \$47,000 = 5, \$47,001 thru \$58,000 = 6, \$58,001 thru \$69,000 = 7, \$69,001 thru \$90,000 = 8, \$90,001 thru \$116,371 = 9, \$116,372 or more = 10. Marital status was coded so that 1 = currently married or cohabiting and 0 = all other possible conditions. Employment status was coded so that 1 = yes a person was working for pay and 0 = no a person was not working for pay. A number of chronic conditions were chosen due to their impact on older adult sexuality, as stated in the Literature Review section of this report. Diabetes was coded so that 1 = having experienced or been treated for diabetes in the past 12 months and 0 = no. Aches or stiffness in joints was coded so that 1 = having experienced aches or stiffness in joints in the last 12 months and 0 = no. High blood pressure was coded so that 1 = having experienced or been treated for high blood pressure in the last 12 months, and 0 = not. Subjective physical health was measured with the question “In general, would you say your physical health is poor, fair, good, very good, or excellent?” and was scored from 1 to 5 with higher values indicating better subjective health. Descriptive statistics for the demographic variables are presented in **Table 1**.

**Table 1: Means, Percentages, and Standard Deviations for Study Variables (n=1170)**

Variable	M/Percent	SD	Range
<i>Demographic Variables</i>			
Age T1	53.70	9.08	Min: 40 Max: 74
Age T2	62.80	9.00	Min: 48 Max: 84
Gender (female)	47.10%	--	
Gender (male)	52.90%	--	
Marriage	73.30%	--	
Education			
Did not graduate high school	8.40%		
Graduated high school	28.0%		
Some college	28.50%		
College or greater	35.00%		
Income	\$ 61,365.93	\$ 51,782.34	Min: 0 Max: \$300,000+
Employment	73.80%	--	
Aches and Stiffness in Joints	68.90%	--	
Diabetes	5.30%	--	
High Blood Pressure	20.9%	--	
Self Rated Health	2.17	0.89	Min: 1 Max: 5
<i>Aging Variables</i>			
Subjective Age T1	-9.73	8.15	Min: -38 Max: 18
Subjective Age T2	-11.23	9.91	Min: -50 Max: 38
Aging Expectations	1.41	2.47	Min: -10 Max: 10
<i>Sexuality Variables</i>			
Number of Sex Partners T1	1.87	0.71	Min: 0 Max: 7
Number of Sex Partners T2	0.70	0.52	Min: 0 Max: 6
Frequency of Sex T1	3.47	1.87	Min: 1 Max: 6
Frequency of Sex T2	3.30	1.60	Min: 1 Max: 6
Quality of Sex T1	5.42	3.12	Min: 0 Max: 10
Quality of Sex T2	4.64	3.10	Min: 0 Max: 10
Interest (thought/effort) in Sex T1	5.66	2.99	Min: 0 Max: 10
Interest (thought/effort) in Sex T2	4.73	3.10	Min: 0 Max: 10

#### 4.3.2 Dependent Variables

As a measure of sexual health the four variables that Lindau et al. (2007) used were considered: 1) sexual activity, 2) frequency of sex, 3) quality of sex, and 4) interest in sex. The variable for sexual activity was explored by the question: “Over the past year, how many sex

partners have you had?” In examining the descriptive statistics of the time one and time two variables for all of the outcome variables, it was evident that only number of sex partners was highly skewed, Wave I skewness = 3.03, Wave II skewness = 1.45. As such, the variables were recoded for use in the model so that 0 partners = 0, 1 partner = 1, and 2 or more partners = 2. The variable for frequency of sexual activity was determined by the question “Over the past six months, on average, how often have you had sex with someone?” The variable for quality of sex was assessed using a scale of 0 to 10 where 0 meant “worst possible situation” and 10 meant “best possible situation”, the question being “how would you rate the sexual aspect of your life these days?”. The variable for interest in sex was measured using a scale from 0 to 10 where 0 meant “no thought or effort” and 10 meant “very much thought and effort”, the question being “how much effort do you put into the sexual aspect of your life these days?”.

#### *4.3.3 Independent Variables*

The independent variables that were included in the model were subjective age, and aging expectations.

Subjective age. Subjective age was calculated as the difference between participants’ chronological age and the age they normally feel (Mock & Eibach, 2011; Westerhoff & Barrett, 2005). Participants were asked how old they felt with the following question “Many people feel older or younger than they actually are. What age do you feel most of the time?” Thus, positive values for this variable indicate that a person feels older than he or she actually is, zero indicates that a person feels the same age as his or her chronological age, and negative values indicate that a person feels younger than he or she actually is. Subjective age was included in both Wave I and Wave II of the study.

Aging expectations. Aging expectations were calculated by subtracting how positively

people rate life at 20 versus life at 60 years of age. The data for this variable were only measured at Wave I. In this case, positive values indicated higher life quality ratings for those in their 60s compared to those in their 20s. This variable illustrates a measure of people's beliefs about the relative quality of life in older adulthood compared to younger adulthood.

#### **4.4 Data Analysis**

All statistical analyses have been performed using SPSS 19 statistical software.

##### *4.4.1 Univariate analyses*

Univariate analyses were used to obtain descriptive statistics for demographic, dependent, and independent variables. This provided information on the sample characteristics in order to determine the comparability of this study with existing and future work on this topic.

##### *4.4.2 Regression*

Linear regression models were used to determine the relationship between subjective age, aging expectations, and each of the four facets of sexual activity. Each outcome facet of sexuality, sexual activity, frequency of sex, quality of sex, and interest in sex, was explored using five step regression models.

Step one of the analysis included Wave 1 variables for gender, education, socioeconomic status, health, marital status, chronic conditions, and employment status, and the Wave 1 data for the dependent (criterion) variable. In step two, Wave 1 and Wave 2 subjective age data variables were added as well as aging attitudes at Wave 1. Wave 2 aging attitudes could not be included because they were not measured at Wave 2. At step two, significant findings for Wave 2 subjective age would indicate that change in subjective age leads to a change in the criterion variable over time, due to the significant effect of the predictor variable after controlling for Wave 1 levels of the predictor and criterion variables (Cronbach, & Furby, 1970; Holahan &

Moos, 1981). The statistical significance of each variable was then assessed to determine the association between the variables included in the model and the outcome variable.

In step three, a two-way subjective age by aging attitudes interaction term was added to the model. In step four, all gender terms were added as two-way interaction terms and two new interactions were tested including gender by subjective age and gender by aging attitudes.

Finally, in step five a three-way interaction between gender, subjective age, and aging attitudes was added to the model. As such, 20 models, five for each of the four outcome variables, were explored using this method of analysis.

#### **4.5 Ethics**

As this study used secondary data, there were no direct risks or benefits to the participants that took part in the study. There were also no anticipated indirect risks to participants. Indirectly, the participants would have benefited by being able to contribute to the research. This study may also have benefited participants indirectly by leading to improved health care and program outcomes for older adults leading to improved quality of life.

## 5.0 Results

### 5.1 Description of the Study Sample

The study sample was comprised of 1,170 participants, of whom 551 were male and 619 were female. The following sections provide information on the demographic characteristics, health, and sexual activity of the study sample.

#### 5.1.2 Sociodemographic Variables

As illustrated in **Table 1**, 47% of participants were males and 53% were females. In Wave I of the study, participants ranged from 40 to 74 years old, with a mean age of 53.70 ( $SD=9.1$ ). In the Wave II of the study, participants ranged from 48 to 84 years of age, with a mean age of 62.80 ( $SD=9.0$ ). With regards to marital status, 73% of participants were married, broken down by gender as 83% of men and 65% of female participants. The mean education level for participants was 2.90 ( $SD=0.98$ ) corresponding approximately to some college. The mean household income for participants was \$61,365.93 the mode was \$47,000; and 74% of study participants were working for pay. Among study participants, 69% reported aches or stiffness in joints, 5% (6% of males and 4% of females) reported experiencing or being treated for diabetes in the last 12 months, and 21% (20% of males and 22% of females) reported experiencing or being treated for high blood pressure in the last 12 months. In regards to subjective physical health, the mean rating for study participants was 2.71 ( $SD = 0.89$ ) on a scale of 1 to 5, with higher values indicating better health.

#### 5.1.3 Aging Attitudes and Expectations Variables

As illustrated in **Table 1**, the mean subjective age value at time one for study participants was 9.73 years younger than actual age. At time two, the mean subjective age value was 11.23 years younger than actual age. A paired samples T-Test confirms a significant change in mean

subjective age for participants from time one to time two ( $t=5.654$ ,  $p=0.00$ ), illustrating that as people age their subjective age also increases. The mean value for aging expectations, how positively one feels towards aging, was 1.41 among the study sample. Aging expectations were only assessed during Wave I.

#### 5.1.4 Sexuality Outcome Variables

For the variable “sexual activity”, which is based on the number of sex partners, the mean number of sex partners in the last year was 1.87 ( $SD = 0.66$ ), 2.01 for males and 1.75 for females, at Wave I. At Wave II, the average number of sex partners for study participants was 0.71 ( $SD = 0.59$ ), 0.83 for males and 0.60 for females. As illustrated by a paired samples  $t$ -test, the sexual activity variable significantly decreased over time ( $t(1099) = 54.35$ ,  $p < .001$ ). After recoding was completed (as mentioned in the Methods Section of this report), the mean for the new Wave I variable was 0.84 ( $SD = 0.49$ ) and 0.70 for the new Wave II variable 0.70 ( $SD = 0.52$ ). The paired samples  $t$ -test still illustrated a significant decrease in means from Wave I to Wave II ( $t(1,099)=8.67$ ,  $p<0.001$ ).

For the “frequency of sex” variable at Wave I, the average number of times study participants had sex with someone over the last six months was 3.47 times ( $SD = 1.87$ ), 3.14 times for males and 3.76 times for females. At Wave II, the average number of times study participants had sex with someone over the past six months was 3.30 times ( $SD = 1.60$ ), 3.3 times for males and 3.2 times for females. As illustrated by a paired samples  $t$ -test, the frequency of sex variable also significantly decreased over time ( $t(733)=-7.79$ ,  $p<0.001$ ).

With regards to the “quality of sex variable”, assessed on a scale from 1 to 10 with higher values indicated better situations, the average rating for quality of sex was 5.42 ( $SD = 3.12$ ), 5.83 for males and 5.04 for females during Wave I. At Wave II, the average rating for the sexual



aspect of participants' lives was 4.64 ( $SD = 3.10$ ), 4.85 for males and 4.34 for females. As illustrated by a paired samples t-test, quality of sex decreased significantly for participants from Wave I to Wave II ( $t(1046) = 9.04, p < 0.001$ ).

Finally, for the interest in sex variable that was assessed on a scale of 1 to 10 with 10 meaning more thought or effort put into sex, the average interest in sex for participants was 5.66 ( $SD = 2.99$ ), 6.27 for males and 4.04 for females, at Wave I. At Wave II of the study, the average level of interest in sex was 4.73 ( $SD = 3.10$ ), 5.44 for males and 4.04 for females. As illustrated by a paired samples t-test, the interest in sex variable also significantly decreased over time for participants ( $t(1065) = 10.13, p = 0.00$ ).

## **5.2 The Effect of Subjective Age and Aging Attitudes on Older Adult Sexuality**

### *5.2.1. Effect of Subjective Age and Aging Attitudes on Sexual Activity (Number of Sex Partners)*

Regression analyses for the effects of subjective age and aging attitudes on number of sex partners can be found in **Table 2**. Model 1 regression analyses for number of sex partners showed that age was negatively associated with number of sex partners. As such, the older participants were, the fewer sex partners they were reporting. Being female was also negatively associated with number of sex partners, meaning that women were reporting fewer sex partners than men. Married study participants also reported a higher value for number of sex partners than single participants. Furthermore, the number of sex partners reported by participants significantly increased as reported income level increased.

Self reported health status was also significantly positively associated with number of sex partners, indicating that the healthier a person is, the more sex partners he or she is reporting.

**Table 2.** Unstandardized coefficients for regression models showing association of demographics, subjective age and aging expectations and their interaction with gender on number of sex partners

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	B	SE	B	SE	B	SE	B	SE	B	SE
Constant	.30***	.07	.30***	.07	.30***	.07	.30***	.07	.30***	.07
Age	-.01***	.00	-.01***	.00	-.01***	.00	-.01***	.00	-.01***	.00
Gender (Female)	-.11***	.03	-.11***	.03	-.11***	.03	-.11***	.03	-.11***	.03
Marriage	-.01***	.02	.00***	.02	.00***	.02	.00***	.02	.00***	.02
Education	.02	.01	.02	.01	.02	.01	.02	.01	.02	.01
Income	.16***	.04	.17***	.04	.17***	.04	.17***	.04	.17***	.04
Employment	.01	.04	.00	.04	.00	.04	.00	.04	.00	.04
Aches	-.04	.03	-.03	.03	-.03	.03	-.03	.03	-.03	.03
Diabetes	-.06	.07	-.06	.07	-.06	.07	-.06	.07	-.06	.07
High Blood Pressure	-.03	.04	-.02	.04	-.02	.04	-.02	.04	-.02	.04
Self-rated Health	.05**	.02	.04*	.02	.04*	.02	.04*	.02	.04*	.02
# Sex Patners T1	.29***	.03	.29***	.03	.29***	.03	.29***	.03	.29***	.03
Age ID T1	--		.00	.00	.00	.00	.00	.00	.00	.00
Age ID T2	--		.00	.00	.00	.00	.00	.00	.00	.00
Aging Expectations	--		.01	.01	.01	.01	.00	.01	.00	.01
Age ID T2 X Age Exp	--		--		.00	.00	.00	.00	.00	.00
Age ID T2 X Fem	--		--		--		.00	.00	.00	.00
Age Exp X Fem	--		--		--		.01	.01	.01	.02
AgeIDT2XAgeExpXFem	--		--		--		--		.00	.00
Adjusted R <sup>2</sup>	.29		.30		.30		.29		.29	

$n = 1,114$ ; \*  $p < .01$ ; \*\*  $p < .001$ , \*\*\*  $p < .001$

Lastly, the Wave I variable for number of sex partners is strongly associated with the Wave II value, indicating that more sex partners a participants report at time one, the more they will report at time two.

Model 2 incorporates the aging variables of interest, subjective age at time one, subjective age at time two, and aging expectations or how one feels about getting older. In this case, neither subjective age nor aging expectations is significantly correlated with number of sex partners. As such, how old participants feel and how they feel about getting older does not impact the number of sex partners they will have.

After examining the main effects, Models 3, 4, and 5 include the addition of the interaction terms subjective age by aging expectations, subjective age by gender, aging expectations by gender, and a three way interaction of subjective age by aging expectations by gender. For the outcome variable number of sex partners, none of the interaction terms was statistically significant. The primary rationale for testing the subjective age by aging attitudes interaction was to see if aging attitudes acted as a buffer if subjective age was associated with less sexual activity, but neither the main effects nor a significant interaction was found. The rational for testing interactions with gender was to determine if the impact of subjective age and aging attitudes on sexual behaviour differed for women and men, and the lack of statistically significant interactions with gender suggests that there are no gender differences.

### *5.2.2 Effect of Subjective Age and Aging Attitudes on Frequency of Sex*

Regression analyses for the effects of subjective age and aging attitudes on frequency of sex can be found in **Table 3**. Model 1 regression analyses for frequency of sex showed that age was negatively associated with number of sex partners. As such, the older participants were, the more often they had with someone in the last six months. The Wave I variable for frequency of

**Table 3.** Unstandardized coefficients for regression models showing association of demographics, subjective age and aging expectations and their interaction with gender on frequency of sex

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	B	SE	B	SE	B	SE	B	SE	B	SE
Constant	2.01 ***	0.30	1.97 ***	0.30	1.97 ***	0.30	1.95 ***	0.30	1.95 ***	0.30
Age	0.03 **	0.01	0.03 **	0.01	0.03 **	0.01	0.03 **	0.01	0.03 **	0.01
Sex	0.00	0.11	0.01	0.11	0.01	0.11	0.01	0.11	0.01	0.11
Marriage	0.30	0.16	0.30	0.16	0.30	0.16	0.29	0.16	0.29	0.16
Education	-0.05	0.06	-0.05	0.06	-0.05	0.06	-0.04	0.06	-0.05	0.06
Income	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02
Employment	-0.01	0.15	0.02	0.15	0.02	0.15	0.03	0.15	0.02	0.15
Aches	0.07	0.12	0.06	0.12	0.06	0.12	0.06	0.12	0.07	0.12
Diabetes	0.08	0.28	0.07	0.28	0.07	0.28	0.06	0.28	0.06	0.28
High Blood Pressure	0.08	0.15	0.07	0.15	0.07	0.15	0.06	0.15	0.07	0.15
Self-rated Health	-0.02	0.06	-0.02	0.06	-0.02	0.06	-0.02	0.06	-0.01	0.06
Frequency of Sex T1	0.43 ***	0.04	0.44 ***	0.04	0.44 ***	0.04	0.44 ***	0.04	0.44 ***	0.04
Age ID T1	--		0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
Age ID T2	--		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Aging Expectations	--		0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
Age ID T2 X Age Exp	--		--		0.00	0.00	0.00	0.00	0.00	0.00
Age ID T2 X Fem	--		--		--		0.00	0.01	0.00	0.01
Age Exp X Fem	--		--		--		-0.04	0.05	-0.01	0.07
AgeIDT2XAgeExpXFem	--		--		--		--		0.00	0.01
Adjusted R <sup>2</sup>	.22		.22		.22		.21		.21	

$n = 745$ ; \*  $p < .05$ ; \*\*  $p < .01$ , \*\*\*  $p < .001$

sex was also strongly associated with the Wave II value, indicating that more sex participants reported having at time one, the more sex they were likely to report having at time two. None of the other sociodemographic variables included in Model 1 were significantly associated with frequency of sex.

Model 2 incorporated the aging variables of interest, subjective age at time one, subjective age at time two, and aging expectations. In this case, neither subjective age nor aging expectations were significantly correlated with frequency of sex. As such, how old participants felt and how they felt about getting older did not impact how often people had sex. After examining the main effects, Models 3, 4, and 5 included the addition of the interaction terms subjective age by aging expectations, subjective age by gender, aging expectations by gender, and a three way interaction of subjective age by aging expectations by gender. For the outcome variable frequency of sex, none of the interaction terms was statistically significant. The primary rationale for testing the subjective age by aging attitudes interaction was to see if aging attitudes acted as a buffer if subjective age was associated with less frequent sexual activity, but neither the main effects nor a significant interaction was found. The rationale for testing interactions with gender was to determine if the impact of subjective age and aging attitudes on frequency of sex differed for women and men, and the lack of statistically significant interactions with gender suggested that there were no gender differences.

#### *5.2.4 Effect of Subjective Age and Aging Attitudes on Quality of Sex*

Regression analyses for the effects of subjective age and aging attitudes on quality of sex can be found in **Table 4**.

Model 1 regression analyses for quality of sex showed that age was negatively associated with quality of sex. As such, the older participants were, the lower their reported quality of sex.

**Table 4.** Unstandardized coefficients for regression models showing association of demographics, subjective age and aging expectations and their interaction with gender on quality of sex

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	B	SE	B	SE	B	SE	B	SE	B	SE
Constant	2.04 ***	0.46	1.96 ***	0.45	1.94 ***	0.45	1.95 ***	0.46	1.95 ***	0.46
Age	-0.03 **	0.01	-0.03 **	0.01	-0.03 **	0.01	-0.03 **	0.01	-0.03 **	0.01
Sex	-0.28	0.18	-0.24	0.18	-0.24	0.18	-0.24	0.18	-0.24	0.18
Marriage	0.37	0.23	0.38	0.23	0.39	0.23	0.40	0.23	0.41	0.24
Education	0.11	0.10	0.14	0.10	0.14	0.10	0.14	0.10	0.14	0.10
Income	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.04
Employment	0.17	0.22	0.11	0.22	0.12	0.22	0.13	0.22	0.14	0.22
Aches	-0.56 **	0.20	-0.53 **	0.19	-0.53 **	0.19	-0.53 **	0.20	-0.53 **	0.20
Diabetes	-0.58	0.41	-0.53	0.40	-0.54	0.40	-0.55	0.40	-0.56	0.40
High Blood Pressure	-0.07	0.23	-0.04	0.23	-0.05	0.23	-0.04	0.23	-0.04	0.23
Self-rated Health	0.21 *	0.10	0.18	0.10	0.18	0.10	0.18	0.10	0.17	0.10
Quality of Sex T1	0.41 ***	0.03	0.41 ***	0.03	0.41 ***	0.03	0.41 ***	0.03	0.41 ***	0.03
Age ID T1	--		0.02	0.01	0.02	0.01	0.02	0.01	0.02 ***	0.01
Age ID T2	--		-0.03 **	0.01	-0.03 **	0.01	-0.04 **	0.01	-0.04 **	0.01
Aging Expectations T1	--		0.10 **	0.04	0.10 **	0.04	0.06	0.05	0.05	0.05
Age ID T2 X Age Exp	--		--		0.00	0.00	0.00	0.00	0.00	0.01
Age ID T2 X Fem	--		--		--		0.02	0.02	0.01	0.02
Age Exp X Fem	--		--		--		0.08	0.07	0.05	0.10
AgeIDT2XAgeExpXFem	--		--		--		--		0.00	0.01
Adjusted R <sup>2</sup>	.25		.26		.26		.26		.26	

$n = 1,071$ ; \*  $p < .05$ ; \*\*  $p < .01$ , \*\*\*  $p < .001$

Aches and stiffness in joints was also significantly negatively associated with quality of sex, indicating that the sexual aspect of life was rated lower for people who were experiencing achy or stiff joints. Lastly, the Wave I variable for quality of sex was strongly associated with the Wave II value, indicating that people who report a higher quality sexual aspect of life at time one were likely to report a higher quality sexual aspect of life at time two.

Model 2 incorporated the aging variables of interest, subjective age at time one, subjective age at time two, and aging expectations. Controlling for subjective age at time one, subjective age at time two was significantly negatively correlated with quality of sex. This means that as people felt older relative to their actual age, quality of sex decreased. Aging expectations were also significantly positively associated with quality of sex, meaning that participants who held positive attitudes towards getting older at Wave I were more likely to have better quality of sex at Wave II. As such, how old participants felt and how they felt about aging impacted the quality of the sexual aspect of their lives.

After examining the main effects, Models 3, 4, and 5 included the addition of the interaction terms subjective age by aging expectations, subjective age by gender, aging expectations by gender, and a three-way interaction of subjective age by aging expectations by gender. For the outcome variable quality of sex, none of the interaction terms was statistically significant. The primary rationale for testing the subjective age by aging attitudes interaction was to see if aging attitudes acted as a buffer if subjective age was associated with quality of sex, but even though the main effects for the variables were found, the interaction was not significant. The rationale for testing interactions with gender was to determine if the impact of subjective age and aging attitudes on quality of sex differed for women and men, and the lack of statistically significant interactions with gender suggests that there are no gender differences.

### *.2.5 Effect of Subjective Age and Aging Attitudes on Interest in Sex*

Regression analyses for the effects of subjective age and aging attitudes on interest in sex, explored by asking participants about the thought/effort they put into sex, can be found in **Table 5**.

Model 1 regression analyses for interest in sex showed that age was negatively associated with interest in sex. As such, the older participants were, the less thought and effort they put into sex. Being female was also significantly negatively associated with interest in sex, indicating that females were less likely to report putting thought or effort into sex. Marriage was positively correlated with interest in sex, meaning that married people were more likely to put thought and effort into their sex. Self-rated health was also associated with interest in sex, with healthier people being more likely to report putting thought or interest into sex. Lastly, the Wave I variable for interest in sex was strongly associated with the Wave II value, indicating that people who reported putting thought or interest into sex at time one were more likely to report putting thought or effort into sex at time two.

Model 2 incorporates the aging variables of interest, subjective age at time one, subjective age at time two, and aging expectations. Controlling for subjective age at time one, subjective age at time two was significantly negatively correlated with interest in sex. This means that as people reported feeling older relative to their actual age, the thought and effort they put into sex decreased. Aging expectations were not significantly correlated with interest in sex. As such, how old participants felt did impact their interest in sex but how they felt about getting old did not.

After examining the main effects, Models 3, 4, and 5 included the addition of the interaction terms subjective age by aging expectations, subjective age by gender, aging expectations by gender, and a three way interaction of subjective age by aging expectations by



**Table 5.** Unstandardized coefficients for regression models showing association of demographics, subjective age and aging expectations and their interaction with gender on interest in sex

Variables	Model 1		Model 2		Model 3		Model 4		Model 5	
	B	SE	B	SE	B	SE	B	SE	B	SE
Constant	2.01 ***	0.45	2.01 ***	0.45	2.03 ***	0.45	2.00 ***	0.45	1.99 ***	0.45
Age	-0.06 ***	0.01	-0.07 ***	0.01	-0.07 ***	0.01	-0.07 ***	0.01	-0.07 ***	0.01
Sex	-0.87 ***	0.18	-0.87 ***	0.18	-0.87 ***	0.18	-0.88 ***	0.18	-0.88 ***	0.18
Marriage	0.60 **	0.22	0.63 **	0.22	0.63 **	0.22	0.62 **	0.22	0.63 **	0.22
Education	0.10	0.10	0.11	0.10	0.11	0.10	0.11	0.10	0.11	0.10
Income	0.06	0.04	0.06	0.04	0.06	0.04	0.07	0.04	0.07	0.04
Employment	0.25	0.22	0.16	0.22	0.15	0.22	0.17	0.22	0.17	0.22
Aches	-0.35	0.19	-0.29	0.19	-0.29	0.19	-0.28	0.19	-0.29	0.19
Diabetes	-0.32	0.40	-0.25	0.39	-0.24	0.39	-0.27	0.39	-0.28	0.39
High Blood Pressure	-0.15	0.22	-0.09	0.22	-0.09	0.22	-0.09	0.22	-0.09	0.22
Self-rated Health	0.21 *	0.10	0.16	0.10	0.16	0.10	0.16	0.10	0.16	0.10
Interest in Sex T1	0.37 ***	0.03	0.36 ***	0.03	0.36 ***	0.03	0.36 ***	0.03	0.36 ***	0.03
Age ID T1	--		0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
Age ID T2	--		-0.03 **	0.01	-0.03 **	0.01	-0.04 **	0.01	-0.04 **	0.01
Aging Expectations T1	--		0.06	0.04	0.06	0.04	0.06	0.05	0.05	0.05
Age ID T2 X Age Exp	--		--		0.00	0.00	0.00	0.00	0.01	0.01
Age ID T2 X Fem	--		--		--		0.03	0.02	0.02	0.02
Age Exp X Fem	--		--		--		-0.01	0.07	-0.06	0.09
AgeIDT2XAgeExpXFem	--		--		--		--		-0.01	0.01
Constant										
Adjusted R <sup>2</sup>	.29		.30		.30		.30		.30	

$n = 1,084$ ; \*  $p < .05$ ; \*\*  $p < .01$ , \*\*\*  $p < .001$

gender. For the outcome variable interest in sex, none of the interaction terms were statistically significant. The primary rationale for testing the subjective age by aging attitudes interaction was to see if aging attitudes acted as a buffer if subjective age was associated with interest in sex. However, although the main effects for subjective age were found, the interaction was not significant. The rationale for testing interactions with gender was to determine if the impact of subjective age and aging attitudes on interest in sex differed for women and men, and the lack of statistically significant interactions with gender suggests that there are no gender differences.

## 6.0 Discussion

Based on previous research about mid to late life sexuality and subjective age and aging attitudes (Lindau & Garilova 2010; Mock & Eibach, 2011), this study used a nationally representative sample of older American adults to explore the way that subjective age and aging attitudes impact four dimensions of older adult sexuality: number of sex partners, frequency of sex, quality of sex, and interest in sex. The theory of self-concept was used to guide inquiry into the relationship between subjective age, aging attitudes and the sexual activity outcome variables.. As it is already known that age influences sexuality (Lindau et al., 2007), the theory of self-concept prompts inquiry into personal attitudes towards ageing, specifically, how people feel about getting older and whether or not they feel their actual age, and whether those personal attitudes also impact sexuality outcomes.

Consistent with other research (Lindau et al., 2007; Lindau & Garilova, 2010), this study found that age was significantly correlated with all four outcome facets of sexuality. However, the hypothesized effects of subjective age and aging attitudes on all four sexual aspect outcome variables were not found, which is surprising considering that in the literature, age is considered to be a significant player due to its impact on personal well-being (Lindau et al., 2007).

Furthermore, because subjective age and aging attitudes are known to influence mental and physical well-being, it was hypothesized that some sort of relationship would exist (Mock & Eibach, 2011). However, there is no literature that addresses the direct effects of mental well being on sexuality, and perhaps future research could consider exploring that direct connection.

This study did find that subjective age and aging attitudes impact the subjective sexuality variables quality of sex and interest in sex. However, the behavioural variables number of sex partners and frequency of sex were not affected. Though unexpected, this result shows that the

attitudinal age variables influence only the attitudinal sexuality variables. This may suggest that the effects of subjective age and aging attitudes on mental well being may be enough to decrease quality of sex and interest in sex, but not strong enough to actually alter behaviour. This could be particularly true because the behavioural outcome variables that were explored rely on another person, whereas the attitudinal variables are individual. As such, this study contributes to the growing research on the self-concept theory, in that feeling older may affect intention through their significant correlation with thought and interest in sex. If that is the case, the findings of this study may contribute to the growing literature that less favorable attitudes toward aging can contribute to poorer well being in later life through their impact on quality of and interest in sex (Levy, 2003). It would be useful for future research to explore the impact on quality of sex and interest in sex on subjective age, aging attitudes, well being and longevity, since current research normally only looks at frequency of sex or number of orgasms on longevity (Palmore 1982; Smith, Frankel, & Yarnell, 1997)

In terms of sociodemographic variables, gender was a significant factor influencing number of sex partners and interest in sex, with females having less sex partners and being less likely to put thought or effort into sex. However, the interaction terms that were examined including gender were not significant, indicating that gender is not likely to have a modifying effect on subjective age, aging expectations, or the subjective age by aging expectations interaction term, with any of the four outcome variables. Income had an effect only on the outcome variable number of sex partners and education was not significantly associated with any of the outcome variables.

This study also builds on Lindau & Garilova's (2010) article that calls for the exploration of whether good physical health promotes positive sexual attributes. This study did find that

higher self-rated physical health was associated with number of sex partners, quality of sex, and interest in sex. Furthermore, ache and stiffness in joints was negatively associated with quality of sex.

### *6.1.1 Strengths and Limitations*

The MIDUS study is a nationally representative study of older American adults. The fact that the sample is representative means that there is a potential to generalize these findings across the American adult population. The MIDUS study also recruited participants by random digit dialing, which decreases the likelihood of selection bias among potential the participants. Furthermore, as the response rate for the self-administered survey and telephone questionnaires were both over 75%, the response rate is considered exceptional for phone surveys. This is also the first study to look at the association between subjective age and aging attitudes on sexuality. The longitudinal nature of this study also permits analysis that can be used to explore potential cause and effect relationships between variables.

There are some limitations of the study that should be considered and addressed in future research. The definition of sex in this study was broad, and included causal, intermittent, and regular partnerships under one umbrella, limiting the possibility to look further at different kinds of sexual relationships among older adults. Furthermore, the study does not include any questions about societal views of senior sexuality which could be important given the highly successful marketing campaign for Viagra that occurred between the two waves of the study, potentially altering people's attitudes and beliefs about their own sexuality and older adult sexuality in general. Lastly, there are no questions in the MIDUS on safer sex or condom use, which would have been an interesting aspect to explore along with the behavioural sexuality variables. Furthermore, as outlined by Mock and Eibach (2011), the MIDUS question about

subjective age was worded so that participants may not have realized that they could still choose their own age if that's how they felt. This may have encouraged participants to report a subjective age that was different from the chronological age even if they did not feel a discrepancy. Mock & Eibach (2011) note, however, that participant generally reported feeling younger than they actually were, which is consistent with other research that uses a question that has used a question that includes the "same age" option (Ruben & Bernsten, 2006). Therefore, the findings of this study should still be comparable with other subjective age research. Future research should also consider separating psychological and physical subjective age for a more interesting correlation with the subjective aspects of sexuality (Montepare, 1996). Finally, because of the study population, these findings may be of limited generalizability outside of North American culture.

## **7.0 Conclusion**

In conclusion, the present findings illustrate the importance of subjective aging factors on quality of sex and interest in sex for older adults. People who feel better about aging and who feel younger than their actual age are more likely to rate the quality of the sexual aspects of their lives positively and are also more likely to put thought and effort into their sex lives. There is no impact of how old one feels or how one feels about aging on number of sex partners and frequency of sex, the behavioural variables that were measured. Although the current study provides some new insight into the topic of older adult sexuality, more research is required to fully understand the factors that contribute to older adult sexual behaviour and how it relates to overall well being.

## References

- Abraham, C., Sheeran, P., Henderson, M. (2011) Extending social cognition models of health behaviour. *Health Education Research*, 26(4), 624-637.
- Brim, O.G., Ryff, C.D., & Kessler, R.C. (2004). The MIDUS national survey: An overview. In O.G. Brim, C.D. Ryff, & R.C. Kessler (Eds.), *How healthy are we?: A national study of well-being at midlife* (pp.1-36). Chicago: University of Chicago Press.
- Brim, O.G., Baltes, P.B., Bumpass, L.L., Cleary, P.D., Featherman, D.L., Hazzard, W.R., (1996). *National survey of midlife development in the United States (MIDUS), 1995–1996*. Boston, MA: Harvard Medical School, Department of Health Care Policy.
- Cronbach, L.J., & Furby, L. (1970). How we should measure “change”—Or should we? *Psychological Bulletin*, 74, 68–80.
- Cross, S.E., Markus, H.R. (1990) The willful self. *Personality and Social Psychology Bulletin*, 16(4), 726-742.
- Diener, E., Suh, E.M., Lucas, R.E., & Smith, H.L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, 125(2), 276-302.
- Health Canada. (2006) It’s Your Health: Seniors and Aging: Sexual activity. (Catalogue No: H13-7/15-2006E-PDF, ISBN, 0-662-43979-1)
- Holahan, C. J., & Moos, R. H. (1981). Social support and psychological distress: A longitudinal analysis. *Journal of Abnormal Psychology*, 90, 365–409.
- Karlovsky, M., Lebed, B., & Mydlo, J. H. (2004). Increasing incidence and importance of HIV/AIDS and gonorrhea among men aged  $\geq 50$  years in the US in the era of erectile dysfunction therapy. *Scandinavian Journal of Urology and Nephrology*, 38(3), 247-252.
- Jacobs, R.J., & Kane, M.N. (2009) Theory-based policy development for HIV prevention in racial/ethnic minorities and older women. *Journal of Women & Aging*, 21, 19-32.
- Laumann, E.O., Glasser D.B., Neves, R.C.S., & Moreira, E.D. (2009) A population-based survey of sexual activity, sexual problems and associated help-seeking behavior patterns in mature adults in the United States of America. *International Journal of Impotence Research*, 21(3), 171-178.
- Levy, B.R. (2003) Mind Matters: Cognitive and physical effects of aging self-stereotypes. *Journal of Gerontology: PSYCHOLOGICAL SCIENCES*, 58B (4), P203-P211.
- Levy, J.A., Ory, M.G., & Crystal, S. (2003) HIV/AIDS interventions for midlife and older adults: Current status and challenges. *Journal of Acquired Immune Deficiency Syndromes*, 33, S59-S67



- Lindau, S.T., Schumm, L.P., Laumann, E.O., Levinson, W., Muirheartaigh, C.A., & Waite, L.J. (2007). A study of sexuality and health among older adults in the United States. *New England Journal of Medicine*, 357(8), 762-774.
- Lindau, S.T., & Garilova, N. (2010). Sex, health, and years of sexually active life gained due to good health: evidence from two US population based cross sectional surveys of aging. *British Medical Journal*, 340, c810.
- Linsk, N. (2000) HIV among older adults: Age-specific issues in prevention and treatment. *The AIDS Reader*, 10, 430-440.
- Mairs, K. (2010). The lifestyles and sexual health of Canadian Snowbirds. *University of Waterloo*.
- Markus, H., & Wurf, E. (1987) The Dynamic Self Concept: A social psychological perspective. *Annual Review of Psychology*, 39, 299-337.
- Markus, H.R., & Herzog, A.R (1991) The role of self-concept in aging. *Annual Review of Gerontology and Geriatrics*, 11, 110-143.
- Mock, S.E., & Eibach, R.P. (2011). Aging attitudes moderate the effect of subjective age on psychological well-being: Evidence from a 10-year longitudinal study. *Psychology & Aging*, 26, 979-986.
- Montepare, J.M. (1996) Actual and subjective age related differences in womens' attitudes towards their bodies across the lifespan. *Journal of Adult Development*, 3(3), 171-182.
- Nicolosi, A., Edward, O., Laumann, D. B., Glasser, M, Moreira, E.D., Paik, A., & Gingell, C. (2004) Sexual behaviour and sexual dysfunctions after age 40: The global study of sexual attitudes and behaviours. *Urology*, 64(5), 991-997.
- Onder, G., Penninx, B., Guralnik, J.M., Jones, H., Fried, L.P., Pahor, M., et al. (2003) Sexual satisfaction and risk of disability in older women. *Journal of Clinical Psychiatry*, 64, 1177-1182
- Palmore, E.B. (1982) Predictors of the longevity difference: a 25-year followup. *Gerontologist*, 22(6), 513-518
- Rubin, D.C., & Berntsen, D. (2006). People over forty feel 20% younger than their age: Subjective age across the lifespan. *Psychonomic Bulletin and Review*, 13, 776-780.
- Ryff, C., Almeida, D.M., Ayanian, J. S., Carr, D. S., Cleary, P. D., & Coe, C. (2006). *Midlife development in the United States (MIDUS II), 2004-2006*. Madison: University of Wisconsin, Survey Center.
- Savasta, AM. (2004). HIV: Associated transmission risks in older adults – An integrative review

of the literature. *Journal of the Association of Nurses in AIDS care*, 15(1), 50-59

Smith G.D., Frankel, S., & Yarnell, J. (1997) Sex and death: Are they related? *British Medical Journal*, 315(7123), 1641.

Waltz, T. (2002) Cronos, dirty old men, sexy seniors: Representations of the sexuality of older persons. *Journal of Aging and Identity*, 7(2), 99-112.

Westerhof, G. J., & Barrett, A.E. (2005). Age identity and subjective well-being: A comparison of the United States and Germany. *Journal of Gerontology: Social Sciences*, 60B, 129-136.

Williams, E., & Donnelly, J. (2002) Older Americans and AIDS: Some guidelines for prevention. *Social Work*, 47(2), 105-110.