Sexual Desire in Later Life

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*There has been relatively little research on sexuality in later life, particularly among persons over 60 years of age. The existing literature consists of studies of small samples, much of it from a biomedical perspective. This literature suggests that age, hormone levels, specific illnesses, and various medications negatively affect sexual functioning in older persons. This study reports results from a survey of a large sample (*N *= 1,384) of persons age 45 and older that included measures of a variety of biological, psychological and social factors that potentially influence sexual functioning. We report bivariate and multivariate analyses conducted separately for women and men. We find that the principal influences on strength of sexual desire among women are age, the importance of sex to the person, and the presence of a sexual partner. Among men, they are age, the importance of sex to the person, and education. In this sample of the population of older persons, attitudes are more significant influences on sexual desire than biomedical factors.*

Human sexuality is generally an understudied area of scientific investigation, and researchers have been particularly neglectful of the study of sexuality in the aging population. Since the number of elderly persons in the U.S. doubled from nearly 17 million in 1960 to 35 million in 2000, and is projected to reach 53.7 million by 2020 (United States Bureau of the Census, 2002), this topic takes on particular importance.

Much of the prior research reflects a biological or medical perspective on human sexuality. It assumes that as people age, physical changes, hormonal changes, or chronic illnesses reduce or eliminate sexual desire and sexual behavior. This literature reflects the general trend toward the medicalization of human sexual functioning, which has accelerated in the past 20 years (Tiefer, 2004). It overlooks psychological and social influences on sexuality.

A Biopsychosocial Perspective

In contrast, what is needed is a biopsychosocial perspective, one that combines biological, psychological, and socio-environmental factors (DeLamater, 2002). Any approach to the study of human sexuality that stresses only one dimension, such as biology or sociology, is counterproductive (Rossi, 1994). This paper applies such a model to the understanding of sexual desire in women and men over the age of 45. The components of the model are listed in Figure 1.

Among the biological influences are the hormonal and vascular systems and illnesses and associated treatments. Important psychological influences include sexual information, sexual attitudes, and mental health. Within the category of relational influences, the availability of a partner is a prerequisite for partnered sexual activity. Income is also relevant as an index of access to resources related to health, such as living standard.

We believe that biological factors provide a necessary but not sufficient condition for sexual functioning. In addition to biological capability, the person must have knowledge and attitudes supportive of sexual activity. The availability of a partner also influences sexual expression.

The purpose of this study is to examine how levels of sexual desire are associated with these biopsychosocial factors. We first discuss sexual desire. Next, we review the literature on the relationship between the biospychosocial influences and sexual desire. Then we will present data from a survey of a representative sample of 1,384 persons age 45 or older. The variables in our analyses include age, illnesses, and medication use; attitudes, expectations, and

Figure 1. Biopsychosocial Model of Sexuality

- *Biological Influences*
  - Hormonal system
  - Vascular system
  - Illness/treatment
- *Psychological Influences*
  - Sexual information
  - Attitudes toward sexual expression
  - Mental Health
  - Depression/Treatment
- *Social Influences*
  - Availability of a partner
    - Length of relationship
    - Quality of relationship
  - Income

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knowledge; and presence or absence of a sexual partner, education and household income. In particular, we wanted to determine whether sexual desire declines with age, and, if it does, identify which of these factors are the main influences. We are especially interested in the impact of attitudes, which reflect the influence of cultural values and stereotypes.

Sexual Desire

There is no universally accepted definition of sexual desire. Often it is confused with other aspects of human sexuality. In fact, sexual desire can be associated with sexual behavior but is simultaneously separate from it.

Theorists and researchers in the area of sexual desire have used two main frameworks. The first and most common assumes that sexual desire is an innate motivational force (i.e., an instinct, drive, need, urge, appetite, wish, or want). The second framework emphasizes the relational aspects of sexual desire, conceptualizing desire as one factor in a larger relational context.

As early as 1886, von Krafft-Ebing (1886/1965) discussed sexual desire as a powerful "physiological law" that arose jointly from cerebral activity (e.g., using the imagination) and the pleasurable physical sensations associated with this cerebral activity. Freud, too, conceived of sexual desire as a biological fact, an innate, motivational force. Following in their footsteps, Kaplan (1977, 1979) stated that sexual desire is an appetite or drive that motivates us to engage in sexual behavior. Like other drives, such as hunger, sexual desire is regulated by the avoidance of pain and the seeking of pleasure, and it is produced by the activation of a specific neural system in the brain.

Other researchers choose to define sexual desire not as a biological force but as a cognitive or emotional experience, such as wishing or longing (Everaerd, 1988; Schreiner-Engel, Schiavi, White, & Ghizzani, 1989). According to Heider (1958), desire is a motivational state that arises from within the person and that represents the person's own wish or want. Desire is therefore a subjective, psychological condition that is not necessarily reflected in an individual's actual or potential actions.

The aforementioned theorists and researchers emphasize the intra-individual nature of sexual desire. That is, some innate biological need arising from within the body (and considered by some to be subject to learning and socialization processes) produces a subjective state of sexual desire that impels the individual to seek out or become receptive to sexual objects and experiences.

Other investigators, however, view desire as an externally generated phenomenon. Desire is located in the partner rather than in oneself since it is a feeling of being drawn to the other (Verhulst & Heiman, 1979). Sexual desire originates from an external source of stimulation located within the desired object rather than from some need arising within the desiring individual.

Levine (1987), however, argues that sexual desire is generated and influenced by both internal and external events. According to his model, sexual desire is a personal, subjective experience that is defined as "the psychobiologic energy that precedes and accompanies arousal and tends to produce sexual behavior" (p. 36). Levine believes that desire is best viewed as the product of an interaction among (a) the neuroendocrine system, which yields a biologically-based sexual drive; (b) the cognitive processes that generate the wish to behave sexually; and (c) the psychologically based, motivational processes that result in the willingness to behave sexually.

In this paper, we have operationalized sexual desire in the terms of cognitive events (sexual thoughts, sexual fantasies). Our concept of sexual desire is not associated with any overt sexual activity. We believe that thoughts and fantasies represent motivational aspects of sexual experience and therefore may serve as indirect measures of sexual desire (Sherwin, 1988).

Biological Influences

Age. Kinsey, Pomeroy, and Martin (1949) stated that of the eleven factors that are significant in understanding human sexuality, none seemed more important than age. Sexual behavior in women and men declines steadily from adolescence into older age, and to a lesser extent there is diminution in sexual desire (Maurice, 1999). Some researchers report that older adults continue to be interested in sex as long as poor health does not affect their sexual desire. In particular, aging does not appear to have any effect on female sexual desire (Masters, Johnson, & Kolodny, 1994).

However, Levine (1998) concludes that sexual desire for both women and men changes considerably in older ages. McKinlay and Feldman (1994) reported that in their study of men ages 40 to 70, sexual desire and frequency of sexual thoughts and dreams decreased with age. In Schiavi's study (1999) of healthy men ages 45 to 74 years who were living in stable sexual relationships, sexual desire decreased as age increased. Others have also found that sexual interest declines in aging women (Hällström & Samuelsson, 1990; Osborn, Hawton, & Gath, 1988). One cause of these conflicting results may be variation in the measure of sexual desire employed. Another may be the failure to take into account the influence of other relevant factors.

Hormones. A second biological factor is sex hormones. It appears that sexual desire is influenced by androgens in men and by estrogens and androgens in women (American College of Obstetricians and Gynecologists, 2000). As one ages, there are many changes in the production and functioning of sex hormones (Morley, 2003). Women experience an almost complete cessation of the production of estradiol (principal estrogen) by the ovaries at the time of menopause; before menopause the ovaries produce 95% of estradiol (Sherwin, 1992). In the absence of estrogen, atrophic changes of the vagina occur. Decreased estrogen levels can also result in diminished vaginal lubrication, which, in turn, might cause discomfort or pain during

intercourse (Maurice, 1999). Thus, cessation of sexual activity in older women may reflect the fact that intercourse is painful rather than a decline in sexual desire. In men, testosterone levels decline gradually from age 40 to age 70; the total decline in free testosterone is typically 30 percent (Schiavi, 1999).

Studies suggest that testosterone is associated with increased levels of sexual desire and enjoyment of sex in some post-menopausal women (Sarrel, 1999; Sarrel, Dobay, & Wiita, 1998; Sherwin, Gelfand, & Brender, 1985). According to several researchers, sexual desire in women is, in biological terms, more dependent on androgen levels than on estrogen levels (Anonymous, 2002; Masters et al., 1994; Vander, Sherman, & Luciano, 2001). In women, approximately 50% of testosterone is made in the adrenal glands, with the other half being produced by the ovaries during the reproductive years (Anonymous, 2002). The cessation of ovarian function that accompanies menopause does not significantly reduce the levels of androgens reaching the brain (Masters et al., 1994). In contrast to the supposed importance of androgen levels, others say that receptor number and sensitivity are more important. Even though testosterone replacement therapy (TRT) is being prescribed for sexual difficulties, data regarding its efficacy, especially in affecting sexual desire, is inconclusive at this time (American College of Obstetricians and Gynecologists, 2000; Anonymous, 2002).

Illness. Chronic disorders, such as cardiovascular disease, diabetes, arthritis, and cancer, may have negative effects on sexual functioning and response (Maurice, 1999; Schiavi, 1999). These diseases impair sexual function both directly, by acting on physiological mechanisms (by interfering with the endocrine, neural, and vascular processes that mediate sexual response) and reproductive structures, and indirectly, by limiting total body function.

Cardiovascular diseases, such as myocardial infarction, hypertension, and peripheral vascular insufficiency (atherosclerosis), are commonly associated with sexual response problems (Schiavi, 1999). Many studies have reported a loss of sexual drive in as few as 10% to as many as 70% of patients after myocardial infarction (Papadopoulos, 1989). Studies on sexual behavior after a stroke report decreased levels in sexual desire (Angeleri, Angeleri, Foschi, Giaquinto, & Nolfe, 1993; Boldrini, Basaglia, & Calanca, 1991). There are, however, methodological issues to be considered in evaluating the results of these studies, including the lack of consideration of (a) age effects and (b) the level of sexual function and desire prior to infarction. Further, all of the cited research involved treated patients, confounding the effects of disease and treatment.

Hypertension is prevalent among older adults, and it is also associated with peripheral vascular disease, myocardial infarction, and stroke (Schiavi, 1999). Although there are numerous studies on the sexual consequences of antihypertension treatment, there are few on sexual functioning in persons with these illnesses who are not receiving treatment (Schiavi).

Diabetes mellitus, which has vascular effects on blood vessels, is one of the most frequent systemic disorders associated with sexual problems in aging adults (Masters et al., 1994; Schiavi, 1999). Schiavi, Stimmel, Mandeli, and Rayfield (1993) found that diabetic men, screened for nondiabetic pathology, show decreased levels of sexual desire compared to age-matched healthy controls. The duration of the disease (insulin-dependent or noninsulin-dependent diabetes) and type of treatment do not appear to be significantly related to the occurrence of sexual problems (Schiavi). On the other hand, Masters et al. (1994) contend that men with diabetes do not have decreased levels of sexual desire.

Sexual functioning and response in diabetic women have been studied less extensively. However, it has been found that diabetic neuropathy, a condition that affects the nerve supply to the pelvis, can cause impaired sexual desire in women (Masters et al., 1994). Unfortunately, there are few controlled studies of the psychology of sexual dysfunction in those with diabetes (Bancroft & Gutierrez, 1996).

Arthritis in aging adults is a major cause of discomfort and disability. It has often been assumed that those with arthritis have sexual difficulties, but this has seldom been systematically investigated (Schiavi, 1999). One study of males (mean age 58) reported that there were decreased levels of sexual desire in the arthritic patients in comparison to the control group of non-arthritic men (Blake, Maisiak, Kaplan, Alarcon, & Brown, 1988).

Prostate disease occurs frequently in aging men. It is the second most prevalent cancer, present in almost 90% of men ages 80 and older, and the second most common cause of death from cancer (Masters et al., 1994; Schiavi, 1999). Sexual dysfunction is a common complication of this disease and its treatment (Jakobsson, Loven, & Hallberg, 2001). Fortunately, nerve-sparing prostatectomy has been proven to have positive effects on the sexual functioning of patients (Gralnek, Wesells, Cui, & Dalkin, 2000). Even though nerve-sparing operations can often provide preservation or recovery of sexual functioning, recovery also depends on the age of the patient (Catalona & Basler, 1993; Miyao et al., 2001). Moreover, conclusions are limited by insufficient information about sexual response and functioning prior to surgery, other diseases, and medications (Schiavi).

Medications. Numerous prescription drugs have adverse effects on sexual functioning, including antidepressant and anti-hypertension medications. Moreover, adverse drug effects have been reported much more frequently in the aging population than in the general population (Wade & Bowling, 1986). Gender differences should also be examined. The use of prescribed medications and the rate of adverse effects of drug therapy are consistently higher in female than male elderly populations (Schiavi, 1999).

Many prescription drugs cause sexual side effects. However, knowledge is limited by inadequate information on the specifics of drug action, such as how drugs are dis-

tributed, metabolized, excreted, and targeted in older persons, especially women. Medications may influence sexual responses, which include desire, by nonspecific effects on general well-being, energy level, and mood (Schiavi, 1999).

Drugs for the treatment of high blood pressure represent the single largest medication group responsible for sexual side effects. These drugs include alpha-blockers, diuretics, and calcium 2 channel blockers (Masters et al., 1994). Previous studies have shown that the incidence of drug-induced sexual dysfunction increases as men take increasing dosages of anti-hypertensive drug treatments (Levine, 1998).

Drugs used to treat psychiatric disorders can also cause sexual side effects. Antipsychotic medications, tricyclic antidepressants, monoamino-oxidase (MAO) inhibitors, and sedative drugs may contribute to decreasing levels of sexual desire (Schiavi, 1999; Segraves, 1989). However, among drugs used to treat psychiatric illnesses, the selective serotonin reuptake inhibitors (SSRIs) are perhaps the major culprit with regard to diminished sexual desire. The effects of SSRIs on sexual functioning seem strongly dose-related and are also connected to the tendency for SSRIs to accumulate over time (Rosen, Lane, & Menza, 1999).

Psychological Influences

Psychological factors are major determinants of the intensity of sexual desire. Yura and Walsh (1983) state that attitudes, knowledge, and expectations of one's self and one's sexual partner impact personal behavior. Sexual attitudes, knowledge, and sexual experiences in earlier years are closely interwoven with sexual desire (Butler, Lewis, Hoffman, & Whitehead, 1994). Negative attitudes toward sex among older women and men are common (Story, 1989). In part, these attitudes reflect America's youth-oriented culture. American popular culture equates sex appeal with the characteristics of a youthful body, such as a firm body and smooth skin (Levy, 1994). Another contributor is the emphasis on reproduction. In populations where the primary purpose of sexual intimacy is seen as reproduction, it is considered inappropriate for a post-menopausal woman to continue to be sexually active (Deacon, Minichiello, & Plummer, 1995; Levy; Story). We are especially interested in the relative impact of such attitudes on sexual desire.

Sexuality is socially and culturally constructed (Irvine, 1990; Masters et al., 1994; Stock, 1984; Tiefer, 1991, 2004). Culture provides a set of expectations, beliefs, and attitudes about sexuality, and women and men draw on these to attach meaning to their experiences. In the U.S., aging women and men's sexuality is influenced by a cultural environment that is fraught with both ageism and sexism (Abu-Laban, 1981; Sanford, 1998; Shaw, 1994). Sociocultural factors work to minimize or deny the existence or value of sexuality for older persons (Gott & Hinchliff, 2003). Cole (1988) describes her sample of menopausal-aged women as having a sense of "despair about their lives [because they were] holding an image - perhaps a male image, or a youthful image - of how sex is supposed to be."

The images available in U.S. society about sexuality and the aged are negative. Sex is seen as unseemly, even unnatural in the old. One elderly gentleman contended, "We're supposed to be asexual, and those who refuse to be so are branded dirty old men"(Stock, 1999, p. 51). The media bombards us with a plethora of sexual images, mainly those of young, energetic people. The sexuality of older women and men is rarely portrayed in a positive light (Brown, 1989; Levy, 1994). These images influence many older people's beliefs, leading to the conclusion that sex is only for the young and beautiful (Hillman & Stricker, 1994). These stereotypes and myths set in motion a self-fulfilling prophecy. Older people may withdraw from any form of sexual expression and ignore or suppress sexual desire because it is "sick," "unsuitable," or "wrong." According to Sloane (1993), many older women and men do feel asexual.

Health care providers may contribute to the silence surrounding sexuality in aging by not talking with their aging and elderly patients about sexuality issues (Fallowfield, 2002; Stead, Fallowfeld, Brown, & Selby, 2001). Some doctors do talk to their older patients about sexuality. In fact, some prescribe sexual education classes as a form of sex therapy. In a study by White and Catania (1982), the experimental groups (ages 60 to 83 years) showed significant increases in sexually permissive attitudes after attending educational classes that included information on physical, social, and psychological aspects of sexuality and aging.

Aging women and men with inadequate knowledge of sex and sexuality may be vulnerable to faulty expectations and concerns about performance (White & Catania, 1982). There is a widespread assumption that vaginal intercourse is the only "real sex" (Blank, 2000); therefore, if the person, by reason of dysfunction or disease, is unable to have intercourse, he or she may lose interest in sex. To meet the challenge of maintaining sexual activity during the aging process, couples have to make love with what they have. Hands and mouths are reliable; penises and vaginas are not. However, it is common for couples to end their sexual lives together because one or both partners believe that an erection is necessary to "get the job done" or see non-coital sex as immoral or perverse (Blank; Cogen & Steinman, 1990; Levine, 1998).

Relational Influences

The presence or absence of a sexual partner is an extremely important factor in understanding differing levels of sexual desire and activity among aging women and men. Many people consider sexual intimacy to be only or most appropriate in marriage (Levy, 1994). Many older persons are not married or no longer live with a spouse. There are 26.6 million men and 33 million women over 55; only 74% of the men and 50% of the women are married and living with a spouse (Smith, 2003). This gap in the living situation of men and women increases with age.

Marriage is the most common social arrangement within which normative sexual activity takes place (Rossi,

1994; Schiavi, 1999). Thus, the death of a spouse usually leads to the cessation of sexual behavior (Rossi). Women tend to marry older men, which is a main reason that women are more likely to be widowed. Women outlive their mates, often by a decade or more (Sanford, 1998). As a result, 40% of older women live alone, compared with 16% of older men (AARP, 1997).

According to Masters et al. (1994), many older women who are without a sexual partner for an extended amount of time drift into a state of sexual disinterest. "This is often a way of coping psychologically with their circumstances: by turning off their interest in something they don't have and see little likelihood of getting, they prevent themselves from becoming frustrated or depressed" (Masters et al., p. 479).

For those who do have a sexual partner, monotony in sexual relationships, such as predictability of sexual activities and over-familiarity with the partner, may also contribute to a loss in sexual desire (Levy, 1994). As the length of the marital relationship increases, habituation to sex with one's partner increases and frequency of sexual activities declines. Norms that limit sexual activities to marriage, combined with the habituation effect, may cause early diminution of sexual desire (Call, Sprecher, & Schwartz, 1995). One study on the relationship between women's menopausal status and sexual desire found that women who were of menopausal status had lower sexual desire compared to when they were in their 40s (No women were on hormone replacement therapy or had a surgical menopause, and all had a partner.) (Avis, Stellato, Crawford, Johannes, & Longcope, 2000). Past research also found that married women who reported lower levels of desire were more likely to agree that interest in sex declines with age, and were more likely to say that they were less aroused now than when they were in their 40s (Avis et al., 2000).

On the other hand, the results of the Duke studies (Pfeiffer, Verwoerdt, & Davis, 1972; Verwoerdt, Pfeiffer, & Wang, 1969) found that marital status had little effect on sexual interest. In data from the Consumers Union survey on sex and aging involving 4,246 men and women over the age of 50, the majority of happily married women and men rated sex as important in marriage, while 54 percent of unhappily married wives rated sex as being "of little importance" (Brecher & Editors, 1984). These results suggest that satisfaction with the relationship may be an important influence on desire; results such as those reported by Avis may reflect marital unhappiness rather than loss of desire.

Sex is important for many unmarried older adults, too (Masters et al., 1994). Some fulfill their desire for sexual intimacy within a long-term committed relationship. We have little information about the sexual activity of older persons who live alone.

Household income is potentially an important social factor. Other things equal, an individual or couple with a higher income has access to health care and activities that may maintain general physical and mental health. Better health, in turn, is likely to be associated with sexual desire. The problem of decreased to almost nonexistent sexual desire is significantly more common in women of lower social class (Garde & Lunde, 1980; Hawton, Gath, & Day, 1994; Osborn et al., 1988). This may be due to a lack of sex education, to either age or social class, or to negative attitudes held by the women and their partners.

METHOD

Study Population and Procedure

The American Association of Retired Persons' (AARP) *Modern Maturity* Sexuality Survey was a mail survey completed by 1,384 women and men ages 45 and older. The survey was designed by the editorial staff of *Modern Maturity* and the AARP Research Group, with the assistance of Dr. John McKinlay of the New England Research Institute and NFO Research. A commercial data collection agency, NFO maintains a consumer panel of 565,000 individuals who are broadly representative of the population of the United States and who have agreed to participate in surveys. From this consumer panel, NFO drew a representative sample of 3,450 persons ages 45 and older. This sample was balanced to nationally representative quotas using the Current Population Survey.

Of the sample, 2,206 eligible persons were contacted by telephone and informed about the survey. Potential respondents were told that "the purpose of the study is to better understand the role of sexuality in the lives of mid-life and older persons." They were also given the usual assurances of confidentiality. On March 8, 1999, surveys were mailed to the 1,709 men and women who agreed to participate (77% of those contacted). Each questionnaire was sent with a $1 cash incentive to encourage completion and return of the questionnaire. By March 22, 1999, 1,384 participants had returned completed surveys (81% of those who were sent the survey, 62% of those contacted). The final data were weighted to reflect Census estimates for age and gender of the over-45 population. The margin of potential sampling error for the final sample (745 women and 639 men) is +/- 2.6%.

The following research questions were addressed in this study:

1. What influences are related to low sexual desire in older women and men?
2. What biopsychosocial factors are the primary influences related to decreasing sexual desire?

Measure

Level of sexual desire. Level of sexual desire was measured by two questions: "How frequently do you feel sexual desire? This feeling includes wanting to have sexual experiences, planning to have sex, and feeling frustrated due to lack of sex," and "How frequently do you have sexual thoughts, fantasies, or erotic dreams?" Each question was answered using an 8-point scale from 1 (*more than once a day*) to 8 (*not at all*). We created an index of desire by computing the average of the numeric responses to these two items. If the participant answered neither item,

no score was computed. The reliability (alpha) of this scale was .86 for men and .87 for women.

Illnesses. Illnesses were measured by a list of 8 illnesses prefaced by the request to "Indicate which of the[se] conditions you have been diagnosed with." Four of the illnesses listed were chosen by 10% or more of the sample. Diabetes, high blood pressure, and arthritis met the 10% criterion for both women and men. The fourth illness included for women was depression, and the fourth illness included for men was an enlarged prostate. We constructed a summary measure of the number of these four illnesses reported by each respondent. Also, each person who reported being diagnosed with an illness was asked whether she or he was currently receiving treatment for that illness; answers were recorded as (Y/N).

Medications. Medications were selected from a list comprised of 11 items. The questionnaire asked the respondent, "In the past two weeks, have you taken any of the following prescription drugs?" Respondent reports (Y/N) of taking the medication were correlated with desire; four medications were correlated significantly ($p < .01$) with desire for women, and 2 medications were correlated significantly for men.

Attitudes toward sex. Attitudes toward sex were measured with a series of nine Likert scale attitude items. The items are listed on Table 1. Potential responses for each item ranged from 1 (*strongly agree*) to 5 (*strongly disagree*). We conducted factor analyses of the responses to these nine items separately for women and for men. The results are shown in Table 1. In each analysis, three factors attained eigenvalues greater than one, but the third had no items that attained loadings of .50 or greater. Looking at the remaining factors, for both men and women, factor 1 includes items f, g, and h, which assess the respondent's attitudes about sex for the self; the reliability (alpha) of the scale for women is .833, and for men, .829. Item e attained a loading of .51 in the analysis for women, but only .30 in the analysis for men; it was not included. We used the three items to create a mean score for each participant, provided that the participant had answered at least two of the three items. Factor 2 includes items a, b, and c, which assess attitudes toward sex in relationships; the reliability (alpha) of the scale is .748 for women and .79 for men. We used the three items to create a mean score for each participant, provided that the participant had answered at least two of the three items. The two factors explained 44% of the variance in the analysis for men and 48% in the analysis for women.

Household income. Household income was reported by each respondent. The resulting distributions for men and women were divided into quartiles. The distributions of reported income differed for women and men. For women the household income categories are as follows: 1 = $7,500-$19,999; 2 = $20,000-$37,499; 3 = $37,500-$74,999; 4 = $75,000-$175,000+. For men the household income categories are as follows: 1 = $7,500-$14,999; 2 = $15,000-$29,999; 3 = $30,000-$59,999; 4 = $60,000-$175,000+.

Table 1. Factor Analysis of Sexual Attitude Items

Item	Gender			
	Men (n = 618)		Women (n = 683)	
	1	2	1	2
a. Sexual activity is important to my overall quality of life.	-.267	.811	-.481	.588
b. Sexual activity is a critical part of a good relationship.	-.104	.898	-.266	.803
c. Sexual activity is a duty to one's spouse/partner.	.068	.560	-.137	.464
d. Sexual activity is a pleasurable, but not necessary, part of a good relationship.	.218	-.004	.121	.000
e. Sex becomes less important to people as they age.	.361	.025	.506	-.072
f. I do not particularly enjoy sex.	.789	-.116	.867	-.120
g. I would be quite happy never having sex again.	.845	-.174	.857	-.217
h. Sex is only for younger people.	.693	-.108	.695	-.156
i. People should not have a sexual relationship if they are not married.	.276	-.029	.287	.012

Note. Analyses using SPSS 9.0, maximum likelihood extraction, verimax rotation, pairwise deletion.

RESULTS

Demographic Characteristics

Table 2 displays basic demographic characteristics of the sample. Men are more likely to be employed than women. The sample is primarily European-American. About 56% of the men and 64% of the women are married and living with a partner. In order to assess the representativeness of the sample, we compared the age and relationship status distribution for the (weighted) sample with that of the United States population ages 45 and older (United States Bureau of the Census, 2002). Two differences were noted. Men ages 45 to 54 in the sample were less likely to be married and

Table 2. Demographic Characteristics of the Sample

	% Women (n = 740)	% Men (n = 636)
Employment Status		
Full time	28.4	45.7
Part time	13.6	8.4
Retired	40.0	41.7
Not employed	18.0	4.1
Race		
White	87.4	88.9
Black	10.9	8.9
Asian	1.2	1.9
Relationship Status		
Married/living with partner	64.4	56.4
Separated	1.7	0.7
Divorced	11.5	9.8
Widowed	16.1	22.1
Never married	3.7	8.0

more likely to be widowed, as were women over 75. Differences in the other cells were generally less than 4%.

Sexual Desire

Responses to the two items used to measure sexual desire were combined to form an index as described earlier. The average desire score for men was 2.82 (SD = 1.53, n = 627), and the average for women was 3.0 (SD = 1.46, n = 709), with a score of 1 indicating high desire. Note that men on average report slightly higher levels of desire than women.

Age

The results show that there is a strong positive relationship between increasing age and low levels of sexual desire for both women and men. To allow for cross-gender comparison, we divided the distributions of desire scores for men and for women into groups. For women, the "low desire group" represents 22.9% of women; all have a desire score of 8. The "high desire group" for women represents 22.2% of women; their desire scores range from 1 to 3.5, inclusive. For men, the "low desire group" represents 21% of men; their desire scores range from 6.0 to 8.0, inclusive. The "high desire group" represents 26.9% of men; their desire scores range from 1.0 to 1.5, inclusive. The relationships between age and desire for men and for women are displayed in Table 3. The percentage of men and women attaining low scores on desire increases from less than 5 percent at ages 45 to 49, to 59 percent or more at ages 80 to 84. The correlation between sexual desire (index score) and age (continuous) is .51 for women (p < .000, n = 704), and .52 for men (p < .000, n = 625).

Illness

High blood pressure is significantly related to low levels of sexual desire for both women and men. Nearly the majority of women and men who have been diagnosed with high blood pressure have desire scores in the lowest groups. As noted earlier, each person reporting an illness was asked whether he or she was currently being treated. We can measure the effect of treatment by comparing the percentage of those diagnosed with high blood pressure who attain low scores on desire with those who were diagnosed and treated who attain low scores. There was a slight decrease in the percentage of women and men with a very low level of desire who have been diagnosed and treated. The correlation between hypertension and desire was small but significant: .12 among men (p < .01) and .15 among women (p < .01).

Among men, we found that diagnosis of an enlarged prostate was related to low levels of desire (r = .14, p < .01). Again, the correlation is small but significant. Comparison of desire score distributions before and after treatment showed little change.

Diagnoses of diabetes, arthritis, and depression were not significantly related to levels of sexual desire for women. A diagnosis of diabetes was not significantly related to levels of sexual desire for men.

Table 3. The Relationship Between Age and Sexual Desire by Gender

Age	Women (n = 704)		Men (n = 620)	
	Low desire	High desire	Low desire	High desire
45-49 years	2.60	43.80	3.10	33.33
50-54 years	8.80	32.46	3.77	20.75
55-59 years	11.36	25.00	11.00	26.00
60-64 years	23.26	13.85	18.29	4.89
65-69 years	26.92	10.26	21.13	5.63
70-74 years	46.05	7.90	38.00	2.00
75-79 years	49.12	5.26	27.08	2.08
80-84 years	85.29	2.94	50.00	3.85
85-89 years	73.30	0.00	50.00	0.00
90-94 years	100.00	0.00	—	—

Note. Values expressed as percents of total. For women, low desire = the bottom 22.9% of the desire distribution and high desire = the top 22.2% of the distribution. For men, low desire = the bottom 20.7% of the distribution and high desire = the top 26.3% of the distribution.

Medications

Regular use of four medications is significantly related to low levels of sexual desire in women. These prescription medications include anticoagulants, cardiovascular medications, medications to control elevated cholesterol, and medications for hypertension. The correlations are small, ranging from .13 to .19. Among men, only reports of taking anticoagulants and medications for hypertension are significantly related to low levels of sexual desire; the correlations are .17 and .14, respectively.

Attitudes Toward Sex

The correlations of the two attitude indices with sexual desire are shown in Tables 4 and 5, for women and men. For women, scores on the index of attitudes about sex in relationships (items a, b, and c) are significantly correlated with desire; women who strongly agree that sexual activity is important to their quality of life and their relationships attain high desire index scores (r = .19, p < .000.), reflecting low desire. With regard to the second index, women who strongly agree that they do not enjoy sex and that they would be happy never having sex again have lower desire index scores (r = -.57, p < .000.), reflecting high desire. The results are similar for men, with correlations of .31 and -.47, respectively. These correlations are substantial and significant for both men and women.

We can gain insight into the interrelations of attitudes and desire by looking at the endorsement of the attitude items by men and women with the highest and lowest scores on desire. Sixty percent of women who have desire scores in the lowest group (23% of the sample) disagree or strongly disagree that "sexual activity is important to my overall quality of life," whereas less than 2% of these women agree or strongly agree with this statement. Seventy percent of women who score in the highest group on desire (23% of the sample) agree or strongly agree that

Table 4. Correlations between Health Measures, Sexual Attitudes, and Sexual Desire, Women (*N* = 745)

	Medications					Partner	Illnesses				Desire	Attitude subscales
	Thin Blood	Heart	Cholesterol	Blood Pressure	Nervous Condition		Diabetes	Blood Pressure	Arthritis	Depression		Relationship
Medications												
Heart	.45**											
Cholesterol	.24**	.22**										
Blood Pressure	.22**	.22**	.28**									
Nervous Condition	.04	.03	.02	.04								
Partner	-.12**	.13**	.04	.17**	-.01							
Illnesses												
Diabetes	.18**	.15**	.17**	.20**	.01	-.09*						
Blood Pressure	.20**	.18**	.27**	.91**	.03	-.19**	.21**					
Arthritis	.10**	.11**	.08	.15**	.14**	-.14**	.11**	.17**				
Depression	-.01	-.03	-.05	-.05	.70**	-.03	.02	-.04	.18**			
Desire	.16**	.19**	.13**	.15**	.04	-.41**	.02	.14**	.05	-.01		
Attitude subscales												
Relationship	.01	.02	.01	-.02	.00	.15**	.04	-.02	-.03	-.01	.19**	
Self	-.12**	-.12**	-.09*	-.12**	-.03	.25**	.00	-.13**	-.06	-.03	-.57**	.06

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

"sexual activity is important to my overall quality of life," whereas a little more than 7% of these women disagree or strongly disagree with this statement.

This trend is similar for men. Most men who score in the lowest group of desire (21% of the sample) disagree that "sexual activity is important to my overall quality of life," and most men who score in the highest group of desire (27% of the sample) are more likely to agree with this statement.

Nearly 98% of women with scores in the highest group of desire disagree or strongly disagree that "sex is only for younger people." Surprisingly, 42% of women who score in the lowest group of desire disagree or strongly disagree that "sex is only for younger people." Nearly 97% of men who score in the highest group of desire disagree or strongly disagree that "sex is only for younger people." More than 75% of the men who score in the lowest group of sexual desire also disagree or strongly disagree that "sex is only for younger people."

Partner Presence / Marital Status

The survey included a categorical measure of marital status and a question asking whether the respondent had a sexual partner. All of the married persons answered "yes"

Table 5. Correlations between Health Measures, Sexual Attitudes, and Sexual Desire, Men (*N* = 639)

	Medications					Partner	Illnesses				Desire	Attitude subscales
	Thin Blood	Heart	Cholesterol	Blood Pressure	Nervous Condition		Diabetes	Blood Pressure	Arthritis	Prostate		Relationship
Medications												
Heart	.42**											
Cholesterol	.37**	.27**										
Blood Pressure	.34**	.35**	.34**									
Nervous Condition	.15**	.18**	.11**	.10*								
Partner	-.03	-.01	.05	.07	-.00							
Illnesses												
Diabetes	.10*	.18**	.21**	.14**	-.01	-.06						
Blood Pressure	.28**	.30**	.31**	.86**	.09*	.10*	.19**					
Arthritis	.21**	.28**	.08	.15**	.19**	-.04	.08*	.16**				
Prostate	.24**	.20**	.10*	.08*	.04	-.09*	.04	.08*	.12**			
Desire	.17**	.05	.04	.14**	.02	-.19**	.04	.12**	.11**	-.14**		
Attitude subscales												
Relationship	.04	-.01	.00	-.04	.01	-.17**	.00	.00	-.01	.03	.31**	
Self	-.10*	-.04	-.04	-.12**	-.05	.21**	-.05	-.10**	-.11**	-.07	-.47**	-.06

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

to the latter, as did an additional 1.7 percent of women and 3.5 percent of men. We used the sexual partner measure, recognizing that in most cases the partner is a spouse. The data presented in Table 6 show that there is a marked difference in the percentage of aging men and women who have a sexual partner.

For women, having a sexual partner is highly related to the level of sexual desire. (See Table 4.) The correlation is -.41 ($p < .01$), indicating that women who have a partner attain lower desire scores, reflecting higher levels of desire. For men, the correlation is much smaller, -.19 ($p < .01$). Thus, the relationship between desire and having a partner is much stronger for women.

The impact of a partner on one's sexual desire depends in part on the characteristics of the partner. Each participant who reported having a partner was asked whether the partner had any physical or emotional limitations "which restrict your sexual activity." We constructed an index of both presence and limitations (Y/N) of partner; a score of 1 indicates a partner with no limitations, a score of 2 indicates presence of a partner with limitations, and 3 indicates no partner. The average desire scores for women are 5.19, 5.72, and 7.06, respectively (univariate ANOVA, $F = 91.67$, $p < .000$, $df = 2$). Pairwise comparisons indicate that each is significantly different from the other two ($p < .004$). The average scores for men are 3.78, 3.84, and 4.85, respectively (ANOVA, $F = 14.02$, $p < .000$, $df = 2$). Pairwise comparisons indicate that the score for men with no partner is significantly different from the means of the other two groups ($p < .001$). The relationship is much stronger for women (partial $Eta^2 = .189$) than for men (partial $Eta^2 = .045$).

Household Income

The data show that household income is negatively correlated with sexual desire scores both in women ($r = -.35$, $p < .000$) and in men ($r = -.28$, $p < .000$). Thus, older persons with greater income experience higher levels of desire.

In summary, the bivariate results indicate that among women, age, high blood pressure, prescription medications, negative attitudes toward sexuality, absence of a sexual partner, and low household income are correlated with low sexual desire. The substantial correlates (>.40) are age, attitudes, and presence of a partner. Thus, medical/biological, psychological and relational factors are related to desire. We conducted regression analyses with sexual desire as the outcome variable and all of the variables listed above as predictors. We used two-stage models, entering the biomedical and relational factors in step 1 and entering attitudes in step 2. We noted in the Introduction our view that biological factors are necessary but not sufficient explanations of desire. The biopsychosocial model suggests that psychological and social factors will explain variance beyond that explained by biology. We are especially interested in attitudes, which are largely socially constructed and reflect the influence of culture. The results for women are displayed in Table 7.

Among women, the following predictors were significantly ($p <.000$) associated with desire in step 1: presence of a sexual partner, education, age, number of medications taken regularly, and number of diagnosed illnesses. The adjusted R^2 for Model 1 is .348. When the two attitude indices are added, the variables that were significant in step 1 remain significant, with the exception of education, and the attitude indices are also highly significant ($p < .000$). The results suggest that attitudes mediate the effect of education. The adjusted R^2 for Model 2 is .585, indicating that inclusion of attitudes substantially increases the variance explained. The change in R^2 is highly significant ($F = 189.74$, $p <.00$). The largest coefficients are associated with attitudes toward sex for self, age, attitudes toward sex in relationships, and having a sexual partner. Thus, attitudes are substantially related to sexual desire in women, and there is an effect of age that is not explained by illnesses or medications taken regularly. Having a partner is also associated with having greater desire.

Among men, the bivariate results indicate that age, high blood pressure, enlarged prostate, anticoagulants and medications for hypertension, presence of a sexual partner,

Table 6. Presence of a Sexual Partner by Age and Gender

Age	% Women (n = 737)	% Men (n = 635)
45-49 years	83.12	83.46
50-54 years	76.72	82.08
55-59 years	71.13	88.24
60-64 years	65.91	87.80
65-69 years	50.62	73.61
70-74 years	40.48	74.51
75-79 years	27.12	79.25
80-84 years	21.05	44.83
85-89 years	0.00	57.14
90-94 years	25.00	—

Table 7. Regression, Lack of Sexual Desire, Women (n = 673)

Model	Variables	β	p
1			
	Has a sexual partner	-.26	.00
	Surgically postmenopausal	.02	.64
	Household income	-.04	.18
	Educational attainment	-.13	.00
	Age	.35	.00
	Number of medications taken	.17	.00
	Number of illnesses diagnosed	-.15	.00
2			
	Has a sexual partner	-.13	.00
	Surgically menopausal	.05	.05
	Household income	.04	.10
	Educational attainment	-.04	.11
	Age	.25	.00
	Number of medications taken	.10	.00
	Number of illnesses diagnosed	-.10	.00
	Attitude: Self	-.44	.00
	Attitude: Relationship	.19	.00

Note. R^2 Model 1 = .35; R^2 Model 2 = .59. The change is significant, $p < .001$.

negative attitudes toward sexual activity, and income were all negatively correlated with reported sexual desire. The substantial correlates (>.40) are age and attitudes. In step 1 of the regression analysis, only two variables were significantly ($p < .000$) associated with desire: education and age. Older men and men with less education reported lower desire. Presence of a sexual partner, number of medications, and number of diagnosed illnesses were not associated with desire. The adjusted R^2 is .313. In Model 2, both attitude indices are associated with desire ($p <.000$), and the adjusted R^2 increases to .478. The change in R^2 is significant ($F = 94.79$, $p <.00$); results are displayed in Table 8. Thus, attitudes are also substantially related to sexual desire in men, and there is an effect of age that is not explained by illnesses or medications taken regularly. However, having a partner is not associated with having greater desire among men.

Discussion

This study explored biopsychosocial factors, including age, illness, medication use, attitudes, marital status, presence or absence of a sexual partner, and household income, in relation to sexual desire in a representative sample of women ($n = 745$) and men ($n = 639$) over the age of 45.

Age

The results indicate that age is significantly associated with desire, net of the effect of other variables studied. The relationship is stronger among men ($\beta = .35$) than among women ($\beta = .26$). These results are consistent with previous findings (Hällström & Samuelsson, 1990; Kontula, 2002; Levine, 1998; Maurice, 1999; McKinlay & Feldman, 1994; Osborn et al., 1988; Schiavi, 1999). Sexual desire decreases as women and men age. However, sexual desire does not decrease as fast as popular belief dictates. In our study, it is not until age 75 or older that the majority of women and almost a majority of men report a low level of sexual desire.

Table 8. Regression, Lack of Sexual Desire, Men ($n = 609$)

Model	Variables	β	*p*
1			
	Has a sexual partner	-.07	.05
	Household income	-.05	.146
	Educational attainment	-.20	.00
	Age	.47	.00
	Number of medications taken	-.02	.63
	Number of illnesses diagnosed	-.01	.86
2	Has a sexual partner	.03	.34
	Household income	-.04	.18
	Educational attainment	-.152	.00
	Age	.356	.00
	Number of medications taken	-.04	.296
	Number of illnesses diagnosed	.013	.74
	Attitude: Self	-.27	.00
	Attitude: Relationship	.25	.00

Note. R^2 Model 1 = .32; R^2 Model 2 = .48. The change is significant, $p < .001$.

Illnesses and Medications

Although being diagnosed with some illnesses and reports of taking medications to lower cholesterol were negatively correlated with desire, these predictors were not significant in the regression analyses for men. These predictors were significant in the analyses for women, although the standardized coefficients are not large. Women who report taking a greater variety of medications in the two weeks prior to the survey have lower desire scores ($\beta = .11$). Women who report having been diagnosed with more illnesses also have lower desire scores ($\beta = .12$). Note that relatively few participants report taking those medications thought to affect desire. Although these drugs, such as drugs for high blood pressure, may substantially affect those who take them, their use is not widespread. Thus, biological factors have a modest effect on female sexual desire.

Attitudes Toward Sex

Negative attitudes toward sex are correlated with low sexual desire. In the regression analyses, rating sex as important to one's self was associated positively and substantially with desire (for men, $\beta = -.27$, for women $\beta = -.44$), controlling for age. Rating sex as important to one's relationships was also a significant predictor of desire (for men, $\beta = .25$; for women $\beta = .19$) The effects of attitudes are larger than the effects of any other predictor included in our analyses except age.

Education

Education was significantly related to desire for both men and women in Step 1 of the regression. When attitudes are added in Step 2, it is no longer significantly related for women and the β in the male analysis is smaller. We believe that attitudes mediate much of the relationship between education and desire. Greater education may undermine the negative stereotypes of sexual expression by older persons.

Presence of Partner

Even though sexual desire remains intact in healthy older persons, they need a partner, especially an interested partner, in order to continue partnered sexual activities, and for some, to continue having sexual desire. The absence of a partner or an interested partner can be an obstacle for many. In our study, having a partner is a significant predictor of desire among women but not among men. More than 78% of the women who have a low level of sexual desire are without a sexual partner, and more than 83% of the women with a high level of sexual desire have a partner. Also, 84% of the men with a high level of desire have a partner. What is surprising is that the majority of men with a low level of desire have a partner. Also, whether the partner has limitations that affect the respondent's sexual activity is related to reports of desire by women but not by men. These results suggest that a woman's desire is attuned to her relationship context, but a man's desire is not.

These results provide some order to the scattered findings of past research. Across this sample of persons 45 and older, the principal influences on sexual desire are age and the importance of sex to the person. For women, having a partner, taking medications and being diagnosed with illnesses also play a modest role. These results suggest that stereotypes of older persons as not interested in sexual intimacy are wrong. They also suggest that negative attitudes about sexual activity among older persons need to be challenged so that future cohorts are not influenced by such attitudes. It is particularly important that health care professionals not convey negative attitudes to older patients. Finally, we should scrutinize economic and residential arrangements for the elderly and structure them to facilitate rather than hinder intimate relationships.

More generally, given the set of questions asked, the results provide little support for an exclusively medical model of sexuality among the aging. In our results, the most significant influences are psychological (attitudes) and relational (the presence of a partner). These results are based on a large sample of men and women ages 45 and older. Although the completion rate of 62% of those contacted may be a limitation, the age and marital status of those who returned questionnaires closely parallel the national population.

Limitations/Further Research

Our literature review identified several influences on the sexual desire and functioning of older persons. The one set of influences discussed for which we do not have measures is hormones. Ideally, future research should not only collect comprehensive survey data of the type reported here, but also measure levels of estrogen and testosterone on at least a subsample of participants.

Another area for further research is the study of preexisting sexual difficulties and earlier sexual experiences. Understanding a subject's sexual history will give researchers a stronger basis for predicting current sexual functioning, which will help to weave a more complete picture.

An important limitation is the racial homogeneity of the sample. Our data do not include enough non-Caucasian participants to investigate links between race and sexual desire. Even though race is usually strongly correlated with socio-economic and education status, we believe that it is low socio-economic and education status, and *not* race, that may play a culpable role in low sexual desire. Within different races exist different cultures. Cultures provide different ideologies, definitions, and attitudes for framing sexual functioning and experiences. This is also an area of research that needs to be expanded.

A potentially important limitation is the fact that measures of diagnosed illness and of medications taken are self-report. Bias due to failure to remember may be a factor, particularly among the elderly. In this study, such bias should be less influential on reports of medication taken, since the questions asked about medications taken in the two weeks prior to the survey. Research linking respondents' self-reports to their pharmaceutical records in relation to measures of sexual functioning would be a desirable, albeit difficult, next step.

As important as quantitative research is, it offers only limited insights into the complex world of psychological, social, and cultural meanings of sexual functioning. Qualitative research methods are necessary to complement quantitative methods in order to learn how older people think about sexuality. In addition, qualitative research needs to be done on the differences and similarities of sexual desire in men and women. Several of our findings suggest that there are important differences in sexual desire between women and men.

References

Abu-Laban, S. (1981). Women and aging: A futurist perspective. *Psychology of Women Quarterly, 6*, 85–99.

American Association of Retired Persons. (1997). *A profile of older Americans: 1996*. Washington, DC: Author.

American College of Obstetricians and Gynecologists. (2000). Androgen treatment of decreased libido. ACOG Committee Opinions, *96* (5 part 1), 1–2.

Angeleri, F., Angeleri, V., Foschi, N., Giaquinto, S., & Nolfe, G. (1993). The influence of depression, social activity, and family stress on functional outcome after stroke. *Stroke, 24*, 1478–1483.

Anonymous. (2002). Women's hormones: Testosterone, the other female hormone. *Harvard Women's Health Watch, 10*(1), 4–5.

Avis, N., Stellato, R., Crawford, S., Johannes, C., & Longcope, C. (2000). Is there an association between menopause status and sexual functioning? *Menopause, 7*(5), 297–309.

Bancroft, J., & Gutierrez, P. (1996). Erectile dysfunction in men with and without diabetes mellitus: A comparative study. *Diabetes Medicine, 13*, 84–89.

Blake, D., Maisiak, R., Kaplan, A., Alarcon, G., & Brown, S. (1988). Sexual dysfunction among patients with arthritis. *Clinical Rheumatology, 72*, 50–60.

Blank, J. (Ed.). (2000). *Still doing it: Women and men over 60 write about their sexuality*. San Francisco: Down There Press.

Boldrini, P., Basaglia, N., & Calanca, M. (1991). Sexual changes in hemiparetic patients. *Archives of Physical Medicine and Rehabilitation, 72*, 202–207.

Brecher, E. M., & the Editors of Consumer Reports Books. (1984). *Love, sex and aging: A Consumer's Union report*. Boston, MA: Little, Brown & Company.

Brown, L. (1989). Is there sexual freedom for our aging population in long-term care institutions? *Journal of Gerontological Social Work, 13*, 75–90.

Butler, R., Lewis, M., Hoffman, E., & Whitehead, E. (1994). Love and sex after 60: How to evaluate and treat the sexually active woman. *Geriatrics, 49*(11): 33–42.

Call, V., Sprecher, S., & Schwartz, P. (1995). The incidence and frequency of marital sex in a national sample. *Journal of Marriage and the Family, 57*(3), 639–652.

Catalona, W., & Basler, J. (1993). Return of erections and urinary continence following nerve sparing radical retropubic prostatectomy. *Journal of Urology, 150*(3), 905–907.

Cogen, R., & Steinman, W. (1990). Sexual function and practice in elderly men of lower socioeconomic status. *Journal of Family Practice, 31*, 162–166.

Cole, E. (1988). Sex at menopause: Each in her own way. *Women and Therapy, 7*, 159–168.

Deacon, S., Minichiello, V., & Plummer, D. (1995). Sexuality and older people: Revisiting the assumptions. *Educational Gerontology, 21*, 497–513.

DeLamater, J. (2002, June). *Sexuality across the life course: A biopsychosocial perspective.* Paper presented at the Midcontinent and Eastern regions meet-

ing of the Society for the Scientific Study of Sexuality, Big Rapids, MI.
Everaerd, W. (1988). Commentary on sex research: Sex as an emotion. *Journal of Psychology and Human Sexuality*, *1*, 3–15.
Fallowfield, L. (2002, October). *Sexual and psychosocial concerns*. Paper presented at the meeting of the European Society for Medical Oncology (ESMO), Nice, France.
Garde, K., & Lunde, I. (1980). Social background and social status: Influence on female sexual behavior. A random sample of 40-year-old Danish women. *Maturitas*, *2*, 225–240.
Gott, M., & Hinchliff, S. (2003). Sex and aging: A gendered issue? In S. Arber, K. Davidson, & J. Ginn (Eds.), *Gender and aging: Changing roles and relationships*. Buckingham: Open University Press.
Gralnek, D., Wessells, H., Cui, H., & Dalkin, B. (2000). Differences in sexual function and quality of life after nerve sparing and nonnerve sparing radical retropubic prostatectomy. *Journal of Urology*, *163*(4), 1166–1169.
Hällström, T., & Samuelsson, S. (1990). Changes in women's sexual desire in middle life: The longitudinal study of women in Gothenburg. *Archives of Sexual Behavior*, *19*, 259–268.
Hawton, K., Gath, D., & Day, A. (1994). Sexual function in a community sample of middle-aged women with partners: Effects of age, marital, socioeconomic, psychiatric, gynecological, and menopausal factors. *Archives of Sexual Behavior*, *23*(4), 375–395.
Heider, F. (1958). *The psychology of interpersonal relations*. Hillsdale, NJ: Lawrence Erlbaum.
Hillman, J., & Stricker, G. (1994). A linkage of knowledge and attitudes toward elderly sexuality: Not necessarily a uniform relationship. *The Gerontologist*, *34*(2), 256–260.
Irvine, J. (1990). *Disorders of desire: Sex and gender in modern American sexology*. Philadelphia, PA: Temple University Press.
Jakobsson, L., Loven, L., & Hallberg, I. (2001). Sexual problems in men with prostate cancer in comparison with men with benign prostatic hyperplasia and men from the general population. *Journal of Clinical Nursing*, *10*(4), 573–582.
Kaplan, H. (1977). Hypoactive sexual desire. *Journal of Sex and Marital Therapy*, *3*, 3–9.
Kaplan, H. (1979). *Disorders of sexual desire and other new concepts and techniques in sex therapy*. New York: Simon & Schuster.
Kinsey, A., Pomeroy, W., & Martin, C. (1949). *Sexual behavior in the human male*. Philadelphia, PA: W. B. Saunders.
Kontula, O. (2002, November). *Human sexuality and aging: An empirical study.* Paper presented at the annual meeting of the Society for the Scientific Study of Sexuality, Montreal, Canada.
Levine, S. (1987). More on the nature of sexual desire. *Journal of Sex & Marital Therapy*, *13*, 35–44.
Levine, S. (1998). *Sexuality in mid-life*. New York: Plenum Press.
Levy, J. (1994). Sex and sexuality in later life stages. In A. S. Rossi (Ed.), *Sexuality across the life course* (pp. 287–309). Chicago: University of Chicago Press.
Masters, W., Johnson, V., & Kolodny, R. (1994). *Heterosexuality*. New York: Harper Collins.
Maurice, W. (1999). *Sexual medicine in primary care*. New York: Mosby.
McKinlay, J. & Feldman, H. (1994). Age-related variations in sexual activity and interest in normal men: Results from the Massachusetts Male Aging Study. In A. S. Rossi (Ed.), *Sexuality across the life course* (pp. 261–285). Chicago: University of Chicago Press.
Miyao, N., Adachi, H., Sato, Y., Horita, H., Takahashi, A., Masumori, N., et al. (2001). Recovery of sexual function after nerve-sparing radical prostatectomy or cystectomy. *International Journal of Urology*, *8*(4), 158–164.
Morley, J. (2003). Hormones and the aging process. *Journal of the American Geriatrics Society*, *51*(7 Supplement), S333–S337.
Osborn, M., Hawton, K., & Gath, D. (1988). Sexual dysfunction among middle and old aged women in the community. *British Medical Journal*, *296*, 959–962.
Papadopoulos, C. (1989). Coronary artery disease and sexuality. In *Sexual medicine: Vol. 10. Sexual aspects of cardiovascular disease* (pp. 1–22). New York: Praeger.
Pfeiffer, E., Verwoerdt, A., & Davis, G. (1972). Sexual behavior in middle life. *American Journal of Psychiatry*, *128*, 82–87.
Rosen, R., Lane, R., & Menza, M. (1999). Effects of SSRIs on sexual function: A critical review. *Journal of Clinical Psychopharmacology*, *19*(1), 67–85.
Rossi, A. S. (Ed.). (1994). *Sexuality across the life course*. Chicago: University of Chicago Press.
Sanford, W. (Ed.). (1998). *Our bodies, ourselves for the new century*. New York: Simon & Schuster.
Sarrel, P. (1999). Psychosexual effects of menopause: Role of androgens. *American Journal of Obstetrics and Gynecology*, *180*(3), S319–S324.
Sarrel, P., Dobay, B., & Wiita, B. (1998). Estrogen and estrogen-androgen replacement in postmenopausal women dissatisfied with estrogen-only therapy: Sexual behavior and neuroendocrine responses. *Journal of Reproductive Medicine*, *43*(10), 847–856.
Schiavi, R. (1999). *Aging and male sexuality*. Cambridge: Cambridge University Press.
Schiavi, R., Stimmel, B., Mandeli, J., & Rayfield, E. (1993). Diabetes mellitus and male sexual function: A control study. *Diabetologia*, *36*, 745–751.
Schreiner-Engel, P., Schiavi, R., White, D., & Ghizzani, A. (1989). Low sexual desire in women: The role of reproductive hormones. *Hormones and Behavior*, *23*, 221–234.
Segraves, R. (1989). Effects of psychotropic drugs on human erection and ejaculation. *Archives of General Psychiatry*, *46*, 275–284.
Shaw, J. (1994). Aging and sexual potential. *Journal of Sex Education and Therapy*, *20*, 134–139.
Sherwin, B. (1988). A comparative analysis of the role of androgen in human male and female sexual behavior: Behavioral specificity, critical thresholds, and sensitivity. *Psychobiology*, *16*, 416–425.
Sherwin, B. (1992). Menopause and sexuality. *Canadian Journal of Obstetrics/Gynecology & Women's Health Care*, *4*, 254–260.
Sherwin, B., Gelfand, M., & Brender, W. (1985). Androgen enhances sexual motivation in females: A prospective, crossover study of sex steroid administration in the surgical menopause. *Psychosomatic Medicine*, *47*, 339–351.
Sloane, E. (1993). *Biology of women*. Milwaukee, WI: Delmar Publishers.
Smith, D. (2003). *The older population in the United States: March 2002* (Series P20: Population Characteristics, No. 546). Washington, DC: United States Census Bureau, Current Population Reports.
Stead, M., Fallowfield, L., Brown, J., & Selby, P. (2001). Communication about sexual problems and sexual concerns in ovarian cancer: Qualitative study. *British Medical Journal*, *323*, 836–837.
Stock, R. W. (1999, September-October). Lost and found. *Modern Maturity*, *42*(5), 50–53.
Stock, W. (1984). Sex roles and sexual dysfunction. In C. S. Widom (Ed.), *Sex roles and psychopathology* (pp. 311–328). New York: Plenum.
Story, M. (1989). Knowledge and attitudes about the sexuality of older adults among retirement home residents. *Educational Gerontology*, *15*(5), 515–526.
Tiefer, L. (1991). Historical, scientific, clinical and feminist criticisms of "The Human Sexual Response Cycle" model. *Annual Review of Sex Research*, *2*, 1–24.
Tiefer, L. (2004). *Sex is not a natural act, and other essays*, 2nd ed. Boulder, CO: Westview Press.
United States Bureau of the Census. (2002). Current Population Report, P-20–547. Retrieved June 30, 2004 from http://www.census.gov/population/www/socdemo/hh-fam/cps2002.html.
United States Bureau of the Census. (2004). *Statistical abstract of the United States, 2001*. Retrieved June 18, 2004 from http://www.census.gov/prod/2002pubs/01statab/stat-ab01.html.
Vander, A., Sherman, J., & Luciano, D. (2001). *Human physiology: The mechanisms of body function* (8th ed). Boston: McGraw-Hill.
Verhulst, J., & Heiman, J. (1979). An interactional approach to sexual dysfunctions. *American Journal of Family Therapy*, *7*, 19–36.
Verwoerdt, A., Pfeiffer, E., & Wang, H. (1969). Sexual behavior in senescence, II. Patterns of sexual activity and interest. *Geriatrics*, *24*, 137–154.
von Krafft-Ebing, R. (1886/1965). *Psychopathia sexualis*. New York: Putnam.
Wade, B., & Bowling, A. (1986). Appropriate use of drugs by elderly people. *Journal of Advanced Nursing*, *11*, 47–55.
White, C., & Catania, J. (1982). Sexual interest, attitudes, knowledge, and sexual history in relation to sexual behavior in the institutionalized aged. *Archives of Sexual Behavior*, *11*, 11–21.
Yura, H., & Walsh, M. (1983). *Human needs and the nursing process*. Norwalk, CT: Appleton-Century-Croft.

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