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Dyadic influences on self-rated health among older adults

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Dyadic influences on self-rated health among older adults

by

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ABSTRACT

Self-rated health is deemed a parsimonious and multi-dimensional indicator of overall health, predictive of mortality. The current study evaluated personal as well as spousal predictors of self-rated health in older adults given the influence of partners over the life course. Hierarchical regression analyses assessed individual and dyadic (spousal) predictors of self-rated health for 552 couples from the Iowa version of the Established Populations for Epidemiological Studies of the Elderly (EPESE). Individual predictors of education, depressive symptoms, and number of chronic conditions were predictive for both husbands and wives. No spousal variables were significant. Further analyses should be employed to test for interactional effects of spouses on self-rated health.

INTRODUCTION

Self-rated health is a subjective tool that is a parsimonious and powerful indicator of overall health among older adults. Prior studies demonstrate its ability to predict functional and cognitive impairment, as well as mortality above and beyond objective analysis or physician assessment (Mossey & Shapiro, 1982; Stalbrand et al., 2007). Self-rated health is likely a multi-dimensional concept, and identification of factors that are strongly associated with self-ratings of health is beneficial for identifying risks for health-related problems and mortality. Prevention and intervention efforts related to these risk factors may be critical to promoting and maintaining or improving health.

Theory suggests that successful aging includes the components of low risk and occurrence of disease, high levels of cognitive and physical functioning, and active engagement in life (Rowe & Kahn, 1997). The current study references the theory of successful aging as a basis for investigating the relations of self-rated health with activities of daily living (ADLs), cognitive status, chronic health conditions, depression, and social engagement. The influence of social partners is often an overlooked factor contributing to an individuals' physical health. Thus, this study contributes to the literature by examining dyadic (spousal) influences on these variables. Of specific interest was whether the components of self-rated health differed for men and women and the relative degree of self and spousal influence on self-rated health. Previous literature aids in the development of these research aims.

LITERATURE REVIEW

Self-rated health is an important indicator of overall health status for older adults. This section describes the importance of self-rated health for older adults, related constructs, and demographic and gender related differences. The spousal influence of self-rated health is analyzed at the dyadic level given the unique relationship of marriage across the lifespan.

Self-rated Health

While doctors can administer a battery of tests to assess physical health, most researchers have neither the time nor the resources for such assessments. Self-rated, or subjective, health is typically assessed via a single question such as "Compared to others your age, how would you rate your health?" The usual response choices fall within a four-point Likert scale including Excellent, Good, Fair and Poor. Despite being a single-item measure, self-rated health has proven to be a useful, parsimonious tool in predicting several important indicators, especially among older adults.

A single item gauging self-rated health can predict mortality among the elderly (Idler & Benyamini, 1997; Bond, Dickinson, Matthews, Jagger, & Brayne, 2006; Mossey & Shapiro, 1982; Stalbrand et al., 2007). For instance, in an epidemiologic study of older adults, Blazer (2008) found significant odds ratios for mortality depending on self-rated health scores. Specifically, in comparison to those who rated their health as "excellent," a person rating their overall health as "good" was 2.69 times more likely to die after a three-year follow up, persons with ratings of "fair" were 7.26 times more likely to die, and participants with "poor" ratings were 19.56 times more likely to die (Blazer, 2008).

Self-rated health may be a better predictor of mortality compared to physicians' analyses. Mossey and Shapiro (1982) found that for older adults, age 65 and older, the

relationship between self-rated health and mortality is independent of objective health status (e.g., number of chronic conditions, hospitalizations). The study included over 3,000 older adults who were followed over a seven-year period and examined the influence of subjective and objective ratings of health and the prediction of mortality. Objective health status was determined using a composite of physician's ratings. When controlling for objective health, poor self-rated health was still a significant predictor of early (OR = 2.92) and late (OR = 2.77) mortality.

Several studies demonstrate the relation between self-rated health and physical determinants of objective health. However, subjective and objective health assessments do not overlap completely. Past research suggests that subjective health is independent of a person's level of objective health status (Mossey & Shapiro, 1982). Self-rated health is distinct from objective measures, such as clinical and functional assessments and psychosocial status, such as depression and positive or negative affect (Walker, Maxwell, Hogan, & Ebly, 2004).

The meaning of subjective health may vary between individuals and qualitative analyses are a purposeful way to address this question. By asking participants to explain what influenced their ratings of self-rated health, such as "Tell me why you say that", an insight in to the relative importance of indicators can be observed. For example, if their rationale is based on chronic diseases or physical functioning, those characteristics are important indicators for assessing health in older adults. Krause and Jay (2004) used this type of qualitative approach and found self-rated health to be a multi-dimensional concept, including factors beyond disease and functional ability such as depressive symptoms and loneliness.

While studies demonstrate that self-rated health is a good predictor of overall health status, the reverse has not been shown. In previous research, a single item able to predict self-rated health has been elusive and it appears that self-rated health is a multi-dimensional construct (Shooshtari, Menec, & Tate, 2007). Despite difficulty, identifying specific factors linking objective and subjective health is beneficial for treatment and identifying those who are at risk for cognitive, physical, and mental declines. The next section addresses these components of successful aging.

Predictors of self-rated health.

In reviewing the extant literature examining predictors of self-rated health, several categories of predictors emerge. These predictors include themes in concordance with the successful aging theory developed by Rowe and Kahn (1997). This model suggests that successful aging includes three components: low disease and disability, high cognitive and physical functioning, and active engagement in life. Use of this theory, as well as previously published literature, provides a basis for selecting possible predictors of self-rated health.

The first factor, physical and functional health, includes predictors such as functional status (Leinonen, Heikkinen, & Jylha, 2001; Reyes-Gibby, Aday, & Cleland, 2001; Scott, Macera, Cornman, & Sharpe, 1997) or, more specifically, activities of daily living (Kivinen, Halonen, Eronen, & Nissenen, 1998), physical inactivity (Leinonen, Heikkinen, & Jylha, 2001; Bailis, Segall, & Chipperfield, 2003), and difficulty walking (Jylha, Guralnik, Balfour, & Fried, 2001) that predict negative self-rated health. In addition, other physiological indicators such as low body mass index (BMI: Goldman, Glei, Chang, 2004; Bailis, Segall, & Chipperfield, 2003), diagnosis of cancer (Molarius & Janson, 2002), presence of chronic disease (e.g., heart disease; Reyes-Gibby, Aday, & Cleeleand 2001;

Kivinen, Halonen, Eronen, & Nissenen, 1998), and chronic pain (Reyes-Gibby, Aday, & Cleeleand, 2001) were also identified as predictors of self-reported health.

The second factor is demonstrated by a link between mental health and self-assessments of health. Benyamini, Idler, Leventhal, and Leventhal (2000) found that positive indicators, such as current mood, had stronger, independent effects on self-assessments of health ($r = .49$) than functional ability, medication use, and negative affect. In additional research, positive affect showed a larger association with self-rated health than negative affect (Winter, Powell-Lawton, Langston, Tuckdeschel, & Sando, 2007) which is highly correlated with depression. Depression, another indicator of mental health, has also been shown to have a significant relationship with self-rated health (Kivinen, Halonen, Eronen, & Nissenen, 1998), in that depressive symptomatology was independently associated with self-rated health even after controlling for physical illness and functional disability among community-dwelling older adults (Muslant, Ganguli & Seaberg 1997; Han, 2002).

Finally, social activities are also found to be related to self-rated health and mortality. Leinonen, Heikkinen & Jylha (2002) investigated social activities among older adults in regards to a sum of hobbies, or a hobby index, and change in self-rated health status over a five year period. Those who reported "good" health at both time points reported the greatest number of social activities, while those who reported "bad" health at both time points also reported engagement in significantly fewer social activities. In addition, those whose status went from "good" to "bad" evinced a decline in social activity status.

Cognition, or cognitive impairment, is another dimension linked to self-rated health among older adults (Bond, Dickinson, Matthews, Jagger, & Brayne, 2006). A strong relationship was found in that those who reported better self-rated health were less likely to

develop cognitive impairment, with the unadjusted odds ratio for fair and poor self-rated health being 1.7 (95% CI: 1.4-2.1) and 2.7 (95% CI: 1.8-3.9). Even in those individuals identified with mild to moderate cognitive impairment, self-rated health remained a significant predictor of mortality (Walker, Maxwell, Hogan, & Ebly, 2004).

Gender differences in self-rated health.

In reporting self-rated health, gender differences have a mixed influence in the literature. On one hand, some studies fail to find gender differences in the mean level of self-rated health (Leinonen, Heikkinen, & Jylha, 1998), relation with mortality (Benyamini, Blumstein, Lusky, & Modan, 2003) or among responses of "poor" self-rated health (Bath, 2003). However, other research suggests a stronger association between self-rated health and survival among women as compared to men (Spiers, Jagger, Clarke, & Arthur, 2003). One possible explanation for this finding may be the rapid decline in physical health commonly experienced among men before death (Grant, Piotrowski, & Chappell, 1995). Radley, Grove, Wright, and Thurston (2000) assessed a sample of individuals who had suffered a heart attack and examined the relationship between self-rated health and mortality. The results indicated that age and physical health explained the relationship for men, whereas mental health and activity explained the relationship for women. Such findings suggest that self-rated health is predicated on different models for men and women (Brunner, 2006). Consistent with other findings, women may be more likely to be affected by multiple factors beyond physical health (e.g., mental health, social ties; Benyamini, Leventhal, & Leventhal, 2000).

Spousal Influences

   Theories of concordance and its effects.

   Marital status is one factor that has captured the interest of some researchers interested in health status, given that the majority of people get married in their lifetime (Hippisley-Cox, Coupland, Pringle, Crown, & Hammersly, 2002). Health concordance, or congruence, is of particular interest. Congruence among spouses has been observed across various health-related variables including: alcohol consumption, cardiovascular diseases (Meyler, Stimpson, & Peek, 2007, Stimpson & Peek, 2005), cognitive traits (Gruber-Baldini, Shaie, & Willis, 1995), depressive symptoms, and some cancers (Stimpson & Peek, 2005; Hippisley-Cox, Coupland, Pringle, Crown, & Hammersly, 2002). One goal for many researchers is to explain this concordance among couples.

   One explanation for congruence of health behavior is the shared resource theory, which suggests that the collective environment of married people includes mutual health risks and benefits. These can be either beneficial or detrimental to health depending on the environment or health behaviors of the spouse (Smith & Zick, 1994). This theory pertains to older adults, since a large percentage of married individuals are likely to have spent a majority of their life with the same spouse and have been exposed to the same risk factors or benefits for a longer period of time. Therefore, older adults who have had to the chance to live longer with their spouses are more likely to be similar than individuals who are newly married.

   In contrast, behavior geneticists propose that genes controlling health behaviors are already in place and the concordance of health behaviors in married partners is due to assortative mating. The assortative mating theory suggests that individuals choose partners

with similar traits, such as physical characteristics, cognitive abilities, and personality dispositions (Epstein & Guttmann, 1984; Vandenberg 1972; Caspi & Herbener, 1990). This implies that spouses are already similar from the start of marriage (Pike & Plomin, 1997). In case of either theory, concordance among spouses is acknowledged. The practical application of concordance is important when influence is beneficial or harmful to either partner.

Many studies have concluded that in general, marriage is beneficial to health. Compared to those who are unmarried, married individuals tend to have better health practices, less morbidity, and a lower mortality risk (Burman & Margolin, 1992). In addition, a meta-analysis by Manzolia, Villarib, Pironec, and Bocciab (2006) found that support from the spouse was a significant protective factor against total mortality in 26 studies, with an overall relative risk (RR) for mortality in married individuals compared to unmarried individuals being 0.88 (95%CI: 0.85–0.91).

However, the social influence and shared environment provided within the context of marriage does not necessarily translate into positive health outcomes. Couples also demonstrate a higher concordance of specific diseases, such as diabetes and hypertension (Hippisley-Cox et al., 2000; Macken, Yates, & Blancher, 2000), as well as negative health behaviors, such as increased alcohol consumption and smoking (Juri, Wen, Li, Zhen, Yan, Xian, Ga, & Shu 2006; Meyler, Stimpson, & Peek, 2007). Marital dissatisfaction has been linked to negative health consequences including higher stress and cortisol levels, which can be damaging to the immune system (Heffner et al., 2004). This relationship between dissatisfaction and health is an example of the sociological mechanisms of marriage which influence the biological responses. Given the tremendous influence that spouses have on each

other's lives, the degree of congruence in health-related behavior and functioning over time is an important question that may have an impact on health.

Implications of partner influence.

Concordance of health among spouses has several important implications, one of which is the identification of mechanisms and consequences of marital relationships. Research examining congruence of spouses on health-related variables such as mental health has only occurred fairly recently in the literature (Meyler, et. al., 2007) and is especially lacking for older adults. Another weakness is that the literature on couples is limited, with little information regarding simultaneous dyadic influences on health (Cutrona, 1996) and most of this information is from the care giving literature on health status in relation to stress for married adults (Berg & Upchurch, 2007).

The importance of looking at dyadic interactions in relation to health variables among older adult spouses is that studies show both a concordance between health behaviors as well as partner influence on health status. In a study of older Mexican American spouses, researchers found that the self-rated health of husbands and wives predicted that of their partners (Peek, Stimpson, Townsend, & Markides, 2006). Although no specific self-rated health factors were examined, the results suggest that both objective and subjective spousal indicators are important to include when analyzing the health status of an individual. With that in mind, the aim of this study was to investigate the relationship of specific health-related variables, assessed at both individual and spousal levels, as predictors of individual self-reported health.

Measuring spousal influence.

In examining the influences that couples have on each other, one must assume interdependence among the partners, or the effects that interacting persons have on each other (Kelley, 1982). Kelley posits that this interaction occurs when one person's emotions, cognition, or behavior affect that of their partner (1978). For instance, one might assume that the depressive symptoms exhibited by one person may affect the depressive symptoms of their partner. A central theme of measurement for a couple, or dyad, is non-independence. This means that two scores from a dyad should be more similar to or different from two scores from people not in the dyad (Kenny, Kashy, & Cook, 2006).

To examine the impact of partner influence, Cook and Kenny (2005) propose the Actor Partner Independence Model (APIM; Kenny, 1996). This model was designed to measure interdependence within couples or others within close relationships (See Figure 1). The model shows that each member of the dyad has a score on a causal variable (X1 and X2) as well as a score on the outcome variable (Y1 and Y2). The two X scores are allowed to be correlated as are the two Y scores. Horizontal paths between X and Y variables are considered "actor" or individual effects. Cross paths from X1 to Y2 and X2 to Y1 are considered "partner" effects (Kenny 1996).

This model is a useful guide to determine both individual and spousal influences in the case of self-rated health. For example, the actor paths would indicate the influence of wives' factors on their own self-rated health, and the same for the husbands. By looking at the partner paths, we would be able to determine the influence of different spousal variables on both husband and wives' scores for self-rated health. The use of the actor-partner model will help explain these interactions.

Figure 1. Actor Partner Interdependence Model
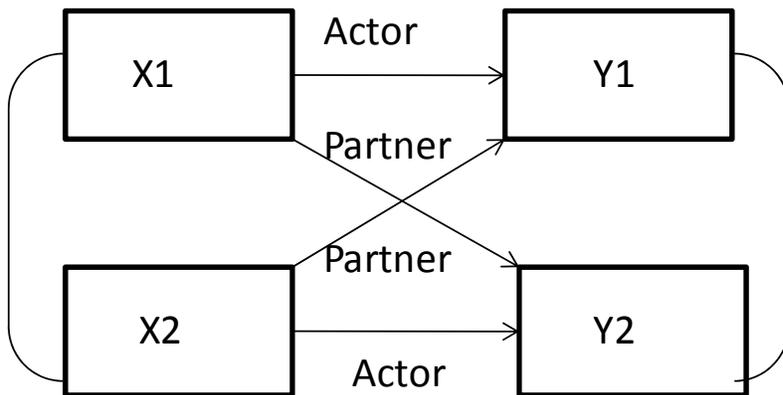
Current Study

Given previous literature indicating the importance of self-rated health, it is a useful tool in assessing an individuals' health status. However, further research needs to examine the factors related to individual ratings, specifically in relation to improvement or decline. The mutual influence of dyadic relationships on health may aid in the investigation of important indicators of self-rated health. The current study explored predictors of self-rated health for both male and female partners, as well as the influence which spouses have on each other's self-rated health. The present study adds to the literature by examining dyadic (spousal) influences on self-rated health, as the influence of social partners is often an overlooked aspect. Of specific interest was whether the components of self-rated health differ for men and women as well as the relative degree of self and spousal influence on self-rated health. Hypotheses were: 1) Regression analyses for men and women will differ, with men placing more importance on physical health and disease; while women more so on mental health and social involvement, and 2) male predictors of self-rated health will include more spousal variables than women.

METHOD

Procedure

The study used existing data from the Established Populations for Epidemiologic Studies of the Elderly (EPESE; 1981-1993:ICPSR 9915), which was a longitudinal study conducted in four locations: East Boston, Massachusetts; Iowa and Washington Counties, Iowa; New Haven, Connecticut; and north central North Carolina. The EPESE data are available through the National Archive of Computerized Data on Aging (NACDA) housed at the Inter-University Consortium for Political and Social Research (ICSPR). Approval in the analyses of this dataset was granted by the Iowa State University Internal Review Board.

The current study focused exclusively on the population from rural Iowa and Washington Counties, Iowa, which included non-institutionalized persons 65 years and older identified through Area Agencies on Aging. A baseline survey questionnaire was conducted in 1981, in which researchers collected data via one of three methods (i.e., face-to-face or telephone interviews with participants, proxy interviews; Cornoni-Huntley et al., 1986, 1990).

Participants

The baseline data collection for this study included 3,673 older adults (80 % response rate). Methods for data collection involved in-home interviews, of which 3,097 completed, while the remaining were either telephone or proxy interviews. The age range of the total baseline population spanned 65-96 years, with an average age of 74.24 years (SD = 7). Although inclusion of married couples was not an original purpose of the study, many couples were later identified in the data.

From the overall baseline sample, 827 couples (*N*= 1,654 individuals) in which both spouses participated in the study were identified. In a conservative approach to dealing with missing data, both individuals in the dyad were required to have complete data for all measures required for analysis. If either spouse was missing data, the dyad was not included in the final sample. As a result, the final sample consisted of 552 dyads (See Results section for missing data). For spouses, the average male age was 74.24 years and the average female age was 71.95 years. Females averaged significantly more years of education than men (M_{female} = 11.20; M_{male} = 10.24), while both men and women reported similar averages for self-rated health (M_{male} = 2.10, M_{female} = 2.09; See Table 1).

Measures

Self-rated health.

The primary dependent variable within the current study was self-rated health. During the interview, participants answered the following question; "Compared to other people your own age, would you say that your general health is excellent, good, fair, or poor?" Within the current sample, scores ranged from 1 (excellent) to 5 (very poor), thus lower scores indicated better self-rated health. The observed range was 1-5 for both husbands and wives (See Table 2 for list of complete measures).

Demographic characteristics.

Demographic variables of age and education attainment were used for analyses. Both are continuous scale variables.

Table 1. *Demographic Characteristics for Couples (N =552).*

	Males (n = 552)	Females (n = 552)
Age	74.24	71.95
Years of Education*	10.24	11.20
Self-rated Health	2.09	2.10

Note: Self-rated health scale: 1(Excellent) - 5(Poor).
A significant sex difference was observed for Education.
(*p < .05).

Table 2. *Predictor Variables for Self-rated Health Regression Analyses.*

(1) Demographics	Predictor	
Age	Age in years (continuous)	
Education	Highest grade completed (continuous)	
(2) Physical and Cognitive Functioning		
Number of Health Events/Conditions	Sum of chronic conditions/events (i.e., myocardial infarction, stroke, cancer, diabetes, hypertension, hip fracture, and Parkinson's Disease). Each condition was scored as 1 = had condition/event, 0 = never had at any time. Possible scores ranged from 0-7; higher scores indicate more conditions.	(Bagiella, Hong, & Sloan, 2005)
Activities of Daily Living	Sum of 7 questions regarding functional abilities. Possible responses for each item were "no help" = 1 "some help" = 2 and "unable to do on my own" = 3. Higher scores indicate greater functional problems with possible scores ranging from 7-21.	(Katz, Downs, Cash, & Grotz, 1970)
Mental Status Questionnaire	Sum of 10 questions. Each question was dichotomized so that 0 = "correct" and 1= "incorrect" or "don't know". Higher scores indicate greater impairment.	(Kahn, Goldfarb, Pollack, & Peck, 1960; Bagiella, Hong, & Sloan, 2005)
(3) Social Engagement & Mental Health		
Social Activities	Single question asking "are you a member of any clubs or organizations such as church, related groups, labor unions, farm organizations, social or recreational groups?" Answers were scored as 1= "yes" 2= "no".	(See Bagiella, 2005)
CES-D	Ten items assessing depressive symptomotology were common to all sites of the EPESE. Scores were dichotomized so that "rarely" or "never" = 0 and "ever" experiencing depressing symptoms = 1. Scores ranged from 0 to 10.	(Radloff, 1977; Bagiella, Hong, & Sloan, 2005)

Note: Analogous spousal variables were included for steps 4-6 of the regression.

Functional status.

Functional status was measured by Activities of Daily Living (ADLs; Katz, Downs, Cash, & Grotz, 1970), which included questions assessing functional ability across seven domains ranging from personal hygiene to shopping for groceries. Possible responses for each item were "no help" = 1 "some help" = 2 and "unable to do on my own" = 3. Higher scores indicated greater functional problems with possible scores ranging from 7-21. The observed range was 7-13 for females (M = 7.12) and 7-15 for males (M = 7.17) indicating that the population was fairly healthy in terms of functional abilities. The estimate of internal consistency for the composite ADL score within this sample was .79, demonstrating adequate reliability of the measure.

Chronic conditions/events.

A sum of seven self-reported chronic conditions or events was created, with values of occurrence of a chronic disease or event listed as "1" and never having chronic condition or event given a value of "0". Consistent with prior research, the selected conditions deemed most relevant included myocardial infarction, stroke, cancer, diabetes, hypertension, arthritis, and Parkinson's disease (Bagiella, Hong, & Sloan 2005). Possible scores ranged from 0-7, with higher scores indicating a greater number of reported conditions or events. The observed range for chronic conditions was 0-5 for both males and females. Consistent with the ADL assessment, this range indicated this sample to be relatively high functioning.

Mental health.

Depression was measured by the CES-D, a self-report index of depressive symptoms developed by the Center for Epidemiologic Studies (Radloff, 1977). This assessment is comprised of 20 statements describing symptoms such as "I felt sad", or absence of a

symptom of depression or morale (e.g. "I was happy" and "I enjoyed life"). Each question

provided three response options, which is a slight modification from the original CES-D

assessment. Respondents indicated their level of endorsement of each symptom during the

previous week. Values for each response ranged from: 1 (Hardly ever), 2 (Some of the time)

or 3 (Most of the time; White, Kohout, Evans, Cornoni-Huntley, & Ostfeld, 1986). While

twenty items were recorded for CES-D symptoms, 10 items were common to all four cites of

the EPESE (See Appendix A & Table 3; Bagiella, 2005). Responses were dichotomized so

that "hardly ever" was represented with a value of "0" and responses of "some of the time"

or "most of the time" were represented with a "1". Possible CES-D scores ranged from 0-10,

with higher scores indicating greater depressive symptomotology. The observed range was

1to 9 for males and 1 to 10 for females, indicating a high functioning sample. The internal

consistency for this dichotomized measure ($\alpha = .65$) was slightly lower than reported

consistencies ($\alpha = .86-.89$; Lynch & Georgy, 2002) of the CES-D measure with similar

populations.

Cognition.

Cognitive status was assessed via the Mental Status Questionnaire (MSQ; Kahn,

Goldfarb, Pollack, & Peck, 1960). The MSQ was derived from a previous instrument by

Kahn and Goldfarb (1960) and is similar to Pfeiffer's Short Portable Mental Status

Questionnaire (Pfeiffer, 1975). Ten questions assessed mental status and consistent with prior

research, scores were calculated as the sum of incorrect answers (White, Kohout, Evans,

Cornoni-Huntley, & Ostfeld, 1986).

In the current study, question nine (what is your street address) was answered only if

participants did not have a telephone number to provide in response to question eight.

Answers for number nine were automatically counted as correct for those individuals who did not answer question eight. Also, all those who answered question eight correctly were automatically given credit for question nine so that no missing data resulted in the composite score. Scores were dichotomized so that each item had a possible score of 0 for "correct" or 1 for "don't know or refuse", then summed. Higher scores indicated greater cognitive impairment. Possible scores range from 0 to 10, with the observed range for men equal to 0-10 and 0-8 for women. The reliability of this dichotomized measure ($\alpha = .55$) within the current sample was slightly lower than previous reported internal consistencies for similar cognitive tests, such as the SPMSQ ($\alpha = .89$; Foreman, 1987).

Social activities.

Social activity involvement was measured by the variable Group Membership. Values indicate: 1 = group involvement, 2 = no group involvement (Bagiella et al., 2005).

RESULTS

The presentation of results is divided into several sections consisting of preliminary

analysis, missing data, and hierarchical regression, and interpretation of study aims.

Preliminary Analyses

Preliminary analyses were conducted to examine distributional normality, identify

outliers, and check for multicollinearity. Table 3 depicts statistics reflecting the distribution

values for the variables of interest. Overall, normality was observed for almost all variables

showing acceptable ranges for skewness and kurtosis (-2 to 2 for skewness and kurtosis;

Tabachnick & Fidell, 1996). However, higher levels were noted for ADLs and cognition.

Results indicate that a majority of the people received scores for ADLs around 7 (no

functional impairment) and scores for cognition around 0 (no cognitive impairment). In terms

of multicollinearity, correlations between measures were modest ($r < .30$) (see Table 4). This

represents low multi-collinearity between predictor variables suggesting less overlap between

measures, therefore increasing power.

Intraclass correlations.

Spousal scores demonstrated significant similarity for education ($r = .41$), group

membership ($r = .28$), sum of conditions ($r = .14$), and depressive symptoms ($r = .10$).

However, low intraclass correlations were found for self-rated health ($r = .00$), Mental Status

Questionnaire ($r = -.01$) and ADL s ($r = -.03$) (See Table 4).

Table 3. *Skewness, Kurtosis, and Observed Ranges for Selected Variables*

	Husbands			Wives		
	Skewness	Kurtosis	Range	Skewness	Kurtosis	Range
Age	0.53	-0.27	65-92	0.85	0.23	65-89
Education	0.86	1.09	3-25	0.14	-0.15	3-21
Self-rated health	0.54	0.06	1-5	0.45	0.41	1-5
Grp. membership	0.35	-1.88	1-2	0.44	-0.92	1-2
ADL problems	7.68	66.13	7-15	5.13	28.67	7-13
# conditions	0.98	1.13	0-5	0.94	0.78	0-5
MSQ errors	2.38	8.81	0-10	2.28	7.67	0-8
CES-D	1.24	0.83	1-9	0.86	0.02	0-10

NOTE: Acceptable ranges for skewness and kurtosis= -2 to 2.
CES-D = Depressive symptomotology, MSQ = Mental Status Questionnaire,
ADL = Activities of daily living.

Table 4. *Correlations between Predictor Variables*

	Edu.	SRH	ADL	Gp. Mem.	# Cond.	CES-D	MSQ
1. Education	**.41****	.16**	-.01	.27**	.02	-.09*	-.14**
2. SRH	.14**	**.00**	.08	.08	-.31**	.26**	.09*
3. ADL	.08	.05	**-.03**	.03	.04	.14**	.04
4. Group Member	.23**	.06	-.05	**.28****	-.09	.09*	-.20**
5. # Condition	.03	-.28**	.09	.08	**.14***	.09*	.00
6. CES-D	-.12**	.31**	.05	.03	.09*	**.10***	.09*
7. MSQ errors	-.14**	.12**	-.03	-.07	.04	.00	**-.01**

Note. Bolded diagonal represents spousal intraclass correlations. Values below diagonal are husbands' values; values above diagonal are wives' values. SRH = self-rated health, ADL = Activities of Daily Living, CES-D = depressive symptomotology, MSQ = Mental Status Questionnaire.
** p < .01, * p< .05.

Cross Correlations.

Cross correlations for couples were also examined. Husbands' education was inversely related to wives' self-rated health ($r = -.14$, $p <.01$), group membership ($r = -.17$, $p <.01$), and cognitive errors ($r = .13$, $p <.01$). Husbands' number of conditions and wives' cognitive errors ($r = .14$, $p <.01$), and husband physical limitations inversely related to wives' number of conditions ($r = -.15$, $p <.01$; See Table 5).

Missing Data

After conservative requirements for participation were enacted, 275 couples were excluded from the study. Descriptive statistics for the final sample were compared to the excluded sample. On average, males and females for the excluded sample reported similar age ($M_{female} = 73.00$ $M_{male} = 75.60$) education ($M_{female} = 11.20$; $M_{male} = 10.24$), and self-rated health ($M_{female} = 2.23$; $M_{male} = 2.24$) compared to the sample selected for final analyses (See Table 2).

Comparing the excluded sample to the sample selected for the study, the only significant difference in sample means for the variables was CES-D, with the included sample ($M_{female} = 3.88$; $M_{male} = 3.39$) reporting slightly lower depressive symptomotology than the excluded sample ($M_{female} = 4.13$; $M_{male} = 3.75$) and MSQ (cognition), with means for the selected sample ($M_{female} = 0.80$; $M_{male} = 0.92$) reporting fewer cognitive errors than the excluded sample ($M_{female} = 2.00$; $M_{male} = 3.00$). However, the number participants missing data for those two measures is likely explained by the difference in reported means (See

Table 5). There were no other notable differences in scores for included and excluded couples.

Hierarchical Regression Analyses

Separate regressions were conducted for males and females. Self-rated health was the outcome, or dependent variable, with the relative utility of six steps of predictors examined. The first three steps focused on self or "actor" effects, whereas steps 4-6 focused on spousal or "partner" effects. The first step included individual demographic predictors of age and education level. Step two included individual predictors for number of conditions as well as physical (ADLs) and cognitive (MSQ) functioning. Individual predictors for social engagement and mental health (number of social group affiliations and CES-D) were the third step. Steps 4-6 included analogous spousal variables for the same variables. Predictors for steps 1-3 addressed research aim one, namely the utility of individual predictors of self-rated health for older adults. The spousal variables in steps 4-6 addressed research aim two, looking at the differences in significant spousal variables for each gender. Final models of hierarchical regression analyses were significant for both husbands and wives ($p = .000$).

Table 5. *Cross Correlations for Couples*

	EDU m	SRH m	Gr.member m	ADL m	CES-D m	MSQ errorsm	# Conditionm
EDU f	.41**	-.03	-.17**	.06	.02	-.02	.05
SRH f	-.14**	.00	.08	.02	.04	-.03	.03
Gr. member f	-.17**	.06	.28**	-.06	.05	.04	-.03
ADL f	-.02	-.02	-.07	-.03	.00	-.04	-.02
CES-D f	-.08	-.06	.05	.00	.10*	-.00	.04
MSQ errors f	-.13**	.07	.03	-.06	.00	-.01	.14**
#Condition f	-.03	.06	-.02	-.15**	.05	.08	.03

Note: (f) indicates wife predictors and (m) indicates husband predictors.
**p<.01, *p<.05.

Table 6. *Comparison of Included and Excluded Couples in Final Sample*

| | Included Couples (*N*=552) | | | | Excluded Couples (*N* = 275) | | | |
| | Females | | Males | | Females | | Males | |
	Mean	SD	Mean	S.D.	Mean	N	Mean	N
Age	71.95	4.93	74.24	5.61	73.03	76	75.60	73
Education	11.20	2.70	10.24	3.11	10.79	75	10.00	73
Self-rated Health	2.09	0.75	2.10	0.82	2.23	73	2.24	73
ADL total	7.17	0.71	7.12	0.71	7.30	75	7.40	76
# Conditions	0.95	0.95	0.97	0.94	0.96	74	1.03	75
CES-D	3.88	1.83	3.39	1.69	4.13	8	3.75	4
MSQ errors	0.80	1.16	0.92	1.30	2.00	10	3.00	4
Group Member	1.27	0.44	1.41	0.49	1.53	75	1.75	76

Note: CES-D = depressive symptomotology, MSQ = Mental Status Questionnaire, ADL = Activities of daily living.

Research Question 1: Importance of individual predictors for self-rated health.

In testing for significant predictors of self-rated health, hierarchical regression analyses for both husbands and wives evinced similar predictors (See Tables 6 and 7). The variables of education (β = -.11, p <.05), number of chronic conditions (β = -.30, p <.001) and CES-D (β = .21, p <.001) were significant predictors for wives as well as husbands (β = -.11, p <.05) (β = .26, p <.001) (β = .25, p <.001) in the final model. The addition of steps two and three to husbands' and wives' regression models explained a significant amount of the variance (r^2=.18, p <.001). No difference in predictors resulted for husbands and wives.

Research Question 2: Importance of spousal predictors for self-rated health.

The addition of steps four through six in the hierarchical regression represented spousal influence. However, no spousal variables were found to be significant predictors of self-rated health in the final model for husbands or wives. Additionally, steps four through six did not add significant amount of explained variance to the models (See Tables 6 and 7). Inferences to these results will be discussed in the following section.

Table 7. *Hierarchical Regression Analysis Predicting Wives' Self-rated Health*

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Education	-.16***	-.16***	-.14**	-.11**	-.11*	-.11*
Age	.04	.00	.00	.03	.03	.03
# conditions		.32***	.30***	.30***	.30***	.30***
ADL problems		.06	.04	.03	.03	.04
MSQ errors		.06	.04	.04	.04	.04
Group Member			.02	.02	.02	.01
CES-D			.22***	.22***	.22***	.21***
(S) SRH				-.04	-.03	-.04
(S) # conditions					-.01	-.01
(S) ADL problems					.00	.00
(S) MSQ errors					-.04	-.04
(S) Grp. member						.05
(S) CES-D						.02
$R^2=$	.03	.14	.18	.18	.18	.19
$R^2\Delta=$		.11***	.05***	.01	.00	.00

Note: (S) indicates spousal variables. Values are standardized regression coefficients.
CES-D = Depressive symptomotology, MSQ = Mental Status Questionnaire, ADL = Activities of daily living,
SRH = Self-rated Health.
 *** p<.001, ** p<.01, * p<.05

Table 8. *Hierarchical Regression Analysis Predicting Husband's Self-rated Health*

Variable	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Education	-.14**	-.11**	-.11**	-.12**	-.12*	-.11*
Age	.00	-.03	-.03	-.05	-.05	-.05
# conditions		.29***	.27***	.27***	.26***	.26***
ADL problems		.06	.05	.05	.05	.05
MSQ problems		.08	.04	.04	.05	.04
Group Member			.05	.05	.05	.05
CES-D			.26***	.26***	.26***	.25***
(S) SRH				-.03	-.04	-.04
(S) # conditions					.01	.01
(S) ADL problems					-.01	-.01
(S) MSQ problems					.06	.06
(S) Grp. member						.01
(S) CES-D						.01
$R^2=$	.02	.11	.18	.18	.18	.18
$R^2\Delta=$		.10***	.06***	.00	.00	.00

Note: (S) indicates spousal variables. Values are standardized regression coefficients.
CES-D = Depressive symptomotology, MSQ = Mental Status Questionnaire, ADL = Activities of daily living, SRH = Self-rated Health.
 *** p<.001, ** p<.01, * p<.05.

DISCUSSION

Study Aims

The purpose of this study was to examine potential predictors of self-rated health scores among older adult spouses. Given the impact that spouses have on each other's health habits, it was important to identify significant predictors of self-rated health. The first research aim was to compare the significant predictors of self-rated health for husbands and wives. We expected that husbands and wives would differ in the specific predictors of self-rated health (SRH), with mental health and social functioning predictive of wives' SRH and chronic disease and functional impairment predicting husbands' SRH. The second research aim was to examine spousal influence on self-rated health scores. We expected wives would exhibit greater spousal impact on their husband's SRH compared to the impact that husbands' characteristics would have on their wives' SRH.

Contrary to expectations, hypotheses were not supported by the results. Individual predictors of self-rated health were similar for both males and females, in that number of chronic conditions, depression, and education were significant predictors. The first hypothesis stated that males and females were expected to differ on significant predictors of self-rated health, specifically that women were more likely to have mental health as a predictor and men more likely to have chronic conditions as a predictor. However, mental health (CES-D) was predictive for both husbands and wives.

The second hypothesis predicted that husbands would have more spousal predictors than wives. This hypothesis was also not supported as spousal variables were not significant for either spouse. Additional factors (e.g., spousal dissimilarity and

measurements for selected predictors) may provide insight to why spousal factors were not significant predictors of self-rated health in this study.

Spousal Influence

One possible factor in why spousal variables were not significant predictors in the regression models was that couples showed dissimilarity in preliminary analyses. Looking at intraclass correlations is one way to assess spousal congruence. The intraclass correlations in the preliminary analyses of this study were relatively low ($M = 0.14$; Range = 0.00-0.41). The intraclass correlation for self-rated health, the main variable of interest, was the lowest ($r = 0.00$). Intraclass correlations for other predictor variables were also low compared to previous research. For example, Butterworth and Rogers (2005) found significant spousal concordance on mental health indicators ($r = 0.25$), with a higher concordance for those in long-term relationships. This is much higher than the intraclass correlation of mental health from the study sample ($r = 0.10$).

The intraclass correlation for spousal cognitive status was low as well ($r = -0.01$). According to results from the Epidemiology of Vascular Aging Study (participants ages 59-71) the intraclass correlation for couples on the Mini-mental Status Exam (MMSE) was notably larger ($r = 0.28$; Dufouil & Alperovitch, 2000). Similar analyses were conducted by Daugherty, Margrett, Caskie, Abraham, & Russell (2009) to examine spousal influence on cognitive status with the Hispanic EPESE. Spousal correlations were much higher on health related variables, including self-rated health ($r = .50$). Results revealed significant spousal predictors for husbands' MMSE, but no spousal predictors were significant in the model predicting wives' MMSE.

Various inferences can be made about why there was dissimilarity among the couples. In looking at the Actor-partner model, the intraclass correlation assumes that couples have shared variance among different factors (Kenny & Cook, 1999). Low intraclass correlations indicate that there is variance between partners. One possibility as to why spouses were not very congruent is that residence was not taken into account. If one spouse was in poor health, they might have resided in a nursing home while the other spouse was at home. Living in the same residence was not a prerequisite to being considered a couple. A second possibility could be that as long as one spouse was in good health, they were able to support the other spouse. Having a higher functioning spouse may help individuals maintain their functioning into later life (Gruber-Baldini, Schaie, & Willis, 1995). While low intraclass correlations are likely a factor explaining why spousal influence was not significant in the regression analyses, additional factors should still be addressed.

Methodological Issues

A second possible factor in why the spousal influences were not significant could be methodological. For example, many variables were used in the regression analyses. The theory of successful aging (Rowe & Kahn) was used as the basis for including predictors of self-rated health in the regression analyses. Even though low multicollinearity was observed for the measures, they might not have been the most reliable representation of each category of the theory. One possibility would be the use of multiple measures to create latent variables for each category; however an ample amount of measures was not available for each measure. If available, a factor analysis would

indicate which variables were strongly related to the different components of the theory,

leading to better interpretation of and linkage to self-rated health.

Sample Uniqueness

Overall, the couples analyzed in the study reported "good" to "fair" health.

However, one might expect average ratings of health to range from "good" to "excellent"

due to the low ratings of chronic conditions and functional disabilities (ADLs) for the

sample. This sample is assumed to be homogeneous in the fact that all participants are

from two rural Iowa counties and predominantly white. An alternative hypothesis is the

rural nature in which the participants grew up. Having a physically demanding way of

life, such as farming, could be a protective factor for functional health. Some participants

may still be working in occupations, such as farming, that are a family business.

Regardless, comparing results from this data set to comparable studies indicates that there

may be a unique factor among this sample.

Limitations

Several limitations should be considered when interpreting findings from the

current study. First, the data set used for this study was not intended to be a study of

couples; therefore useful variables such as marital quality or satisfaction were not

assessed. A second limitation was the inclusion of altered measures. The scoring on the

CES-D and MSQ were altered from the original scales. Both of these measures were

dichotomized with fewer questions, yielding smaller ranges. Lower internal consistencies

were observed compared to previous studies, resulting in reduced power in the regression

analyses. If the measures for this sample contained all items with accurate scales, we may

have seen more individual and spousal predictors of self-rated health.

Another limitation to the study was the amount of missing data. In taking a conservative approach to selecting for dyads in the study sample, one ramification was ensuing potential bias. Both spouses required complete data in order to be in the final sample. Even though a spouse may have complete data, they may not be analyzed due to the incompleteness of their partner. While the size of the sample was much smaller than the original number of couples, the final data set still consisted of a large number of couples ($N = 552$). Additionally, comparisons between data for excluded and included participants showed that no major differences occurred for selected variables (See Table 5).

Additional limitations could be cohort and regional effects. The data were collected for this study in 1981, therefore considerable time has passed. If the same study was employed nearly 30 years later, there could be different results. Advancements in health services, treatment, and prevention may mean that people are generally healthier in old age, or living longer while managing their health problems. Regional effects may also be considered due to the fact that participants were from two rural Iowa counties. The sample was overwhelmingly White and highly educated, and therefore not representative of all older adults living in the United States. Comparing analyses with participants from different geographical areas with greater urbanization and ethnic diversity may yield different results.

Future Directions

Given the longitudinal nature of the data set, future directions include examination of the utility of significant predictors over time in order to determine whether they play a significant role for individuals in future waves. An example of this

would be to look at change in self-rated health status across two or more time points. Identifying predictors that were associated with a change in health status would be important to monitor in older adults. Changes in spousal health variables could also be monitored for future time points if their partner develops a decline in self-rated health status.

Also, grouping couples into different categories for self-rated health may yield different results. For instance, couples who are not similar in ratings of self-rated health (excellent and poor) may have different types of trajectories over time than those who have similar ratings of health (good and good). Having one spouse reporting poor self-rated health may put the other spouse at greater risk for decline in self-rated health or other health-related variables. The rate in which spouses change could also be monitored, meaning what is the relative risk for poor self-rated health at each successive time point.

Additionally, the use of statistical methods other than hierarchical regression analyses may be advantageous in looking at spousal influence on self-rated health. For instance, structural equation modeling can allow for testing whether or not two partner effects differ significantly for men and women by constraining the two effects to be equal and noting the degree to which the model fit worsens (Kenny, Kashy, & Cook, 2006).This technique would also allow for the creation of latent variables to represent the constructs of the successful aging theory, possibly increasing the relationship to self-rated health.

Conclusion

Prior research suggests self-rated health is a useful tool in the gauging overall health and predicting mortality in older adults. The purpose of this research was to

identify individual predictors of self-rated health, as well as dyadic influence on these ratings. Based on previous literature, expectations were that models for men and women would differ. In addition, husbands were expected to exhibit more significant spousal variables as predictors for self-rated health than wives.

Although the hypotheses were not supported by the results, it is important to note that significant predictors of depressive sypmtomotology (CES-D), number of chronic conditions, and education were predictive of self-rated health. Previous literature supports the use of these variables as predictors of self-rated health (Kivinen et al., 1998; Reyes-Gibby et al., 2001; Han, 2002); however differences were expected for gender (Brunner, 2006). Not all components of the successful aging theory were found to be significant predictors; choosing different variables to represent those components may further support the theory and its link to self-rated health. Knowing that depression and the number of chronic conditions are important predictors of self-rated health is particularly useful for identifying risk factors of poor self-rated health. Idler, Kasl, & Lemke (1990) found that for this particular sample poor ratings of health were a major risk factor for mortality

Early prevention and intervention related to risk factors (i.e., depressive symptoms, chronic conditions) may be critical to promote and maintain self-rated health. Researchers and practitioners dealing with adults in this demographic (i.e., rural older adults) may find these results useful to assist identification of possible declines in self-rated health. While no spousal variables were found to be significant predictors of self-rated health, partner influence should not be overlooked. If one partner's decline in functional health influenced decline in the other partner, it would substantially affect the

structure of caregiving as well as the long-term care utilization (Meyler, Stimpson, & Peek, 2007). Future studies can employ these concepts (i.e., self-rated health, couple influence) to monitor individuals and couples in order to foreshadow changes in objective indicators for physical or mental health.

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APPENDIX A.

Items of the CES-D which were Common to all Four EPESE Sites

1. I felt depressed
2. I felt that everything I did as an effort
3. My sleep was restless
4. I was happy
5. I felt lonely
6. People were unfriendly
7. I enjoyed life
8. I felt sad
9. I felt that people disliked me
10. I could not get going

APPENDIX B.

Items of the Mental Status Questionnaire

1. How old are you?
2. When were you born?
3. What is the date today?
4. What day of the week is it?
5. Who is the president of the US?
6. Who was the president before him?
7. What is your mother's maiden name?
8. What is your telephone address?
9. What is your street address?
10. Subtract 3 from 20, and keep subtracting.