Similarity, Agreement, and Assumed Similarity in Proxy End-of-Life Decision Making

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Medical decisions near the end of life are often made by proxies who can be inaccurate in their judgments of patient preferences. Given that accuracy in surrogate decision making is an important goal in end-of-life decision making, and in light of that previously seen levels of accuracy reflect substantial disagreement, error, or both, this study examined both relationship and individual factors that potentially affect surrogate accuracy. Specifically, this study examined similarity, agreement, and *assumed similarity*—a process whereby raters use their own traits and preferences to rate another person—in spousal ratings of end-of-life treatment. This study expands on previous research by examining the potential influence of relationship factors and assumed similarity on end-of-life decision making among a sample of newlyweds. Newly married couples ($n = 197$) completed self and spouse measures of hypothetical end-of-life preferences and scales assessing marital satisfaction, personality, and attitudes. Results indicate a moderate level of similarity on husband and wife self-rated end-of-life treatment preferences (rs = .18–.29) and a moderate level of agreement between self and proxy ratings (rs = .17–.41). The largest correlations were seen between self ratings and proxy ratings (e.g., husband self ratings and husband proxy ratings of wife preferences, rs = .46–.69), reflecting strong assumed similarity in proxy ratings. For wives, similarity with husbands on a few attitudinal variables (i.e., spirituality, moral strictness, and conservatism) influenced proxy accuracy. Recognizing the potential impact of personal preferences on proxy ratings, as well as the potential influence of relationship factors, may help improve proxy accuracy and end-of-life care for patients and families.

Keywords: proxies, end of life, decision making, couples, assumed similarity

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Medical decisions near the end of life are often made by proxies such as spouses, given that patients at this stage may be physically or cognitively unable to make such decisions on their own. One type of advance directive, durable power of attorney for health care, specifi-

cally allows patients to name an individual to make end-of-life decisions on their behalf. In addition, when a patient does not have a living will or prespecified list of treatment preferences, end-of-life decisions are left to the determination of family, physicians, and hospitals; if the patient is married, most states give responsibility to the spouse (American Medical Directors Association, 2003). Surrogate decision makers are called on to make decisions based on the principle of substituted judgment, that is, making a decision that patients would have made themselves (President's Commission for the Study of Ethical Problems in Medicine and Biomedical & Behavioral Research, 1982).

However, research has shown that proxies are often inaccurate in their judgments of patient

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preferences (Ditto et al., 2001; Moorman & Carr, 2008). Shalowitz, Garrett-Mayer, and Wendler (2006) in a review of surrogate accuracy, found an average agreement of 68% across 16 studies. In addition, they concluded that prior discussion of patient preferences and patient designation of a surrogate did not improve agreement between patient and surrogate preferences. In a descriptive, qualitative study of 50 experienced surrogate decision makers, Vig, Taylor, Starks, Hopley, and Fryer-Edwards (2006) examined themes that surrogates used in making decisions. Five common ideas emerged, including conversations on the topic, existing documentation of preferences, shared experiences that would help guide decisions, help from others, and surrogates' own values. Thus, although surrogates are presumed to act based on the principle of substituted judgment, Vig et al. (2006) found that only 66% of surrogates actually based their decisions on these conversations, whereas 28% relied on their own preferences, 18% sought input from others, 16% relied on shared life experiences, and several surrogates mentioned more than one basis for decision making.

Given that accuracy in surrogate decision making is an important goal in end-of-life decision making, and in light that previously seen levels of accuracy reflect substantial disagreement, error, or both, understanding factors that affect surrogate ratings is an important goal for clinicians and researchers. Two related fields of research may be particularly helpful for shedding light on the process of surrogate decision making, including the person perception literature on qualities of accurate judges of personality (e.g., Funder, 1995) and findings on the influence of marital factors on proxy bias and accuracy for judgments of partner traits (e.g., Overall, Fletcher, & Kenny, 2012). Extending findings from the field of person perception and personality psychology may improve our understanding of self–other agreement in end-of-life decisions by broadening the variables under consideration to determine influences on proxy accuracy. Within this literature, accuracy in ratings is referred to as *self–other agreement* and is measured through the correlation between one person's self ratings and another person's ratings of that same individual. It will be referred to as *agreement* throughout the article for clarity. In end-of-life treatment decisions,

agreement can be measured by the correlation between, for example, a wife's self-rating of treatment preferences and her husband's rating of her treatment preferences.

Within the person perception literature, *similarity,* or the correlation between one person's self ratings and another person's self ratings, is an important factor to consider in self–other agreement because it could impact agreement indirectly. Regardless of the rater's knowledge of the target's traits or preferences, an individual may rate a spouse's preferences with some accuracy simply by using their own preferences if the two share similar treatment preferences (Cronbach, 1955). This idea is based on the assumptions that (a) people tend to affiliate with similar people (e.g., shared values, personality) and (b) they tend to rate others as they would rate themselves. This first assumption, that we tend to affiliate with like-minded individuals, is referred to as *assortative mating*; however, minimal support has emerged for similarity on most personality and trait affectivity variables among married couples (Watson et al., 2004). Whether assortative mating explains agreement seen between spouses on proxy ratings for end-of-life treatment preferences has yet to be examined.

The second assumption, whereby a rater relies on self-knowledge to rate another person, is often referred to as *assumed similarity* (Watson, Hubbard, & Wiese, 2000; Weller & Watson, 2009). Within proxy decision making for end-of-life treatment, assumed similarity is the idea that surrogates would use their own preferences, either for the patient or for themselves, should the need arise for treatment, as a basis for making decisions for their loved one. As Fagerlin, Ditto, Danks, Houts, and Smucker (2001) discussed, this phenomenon is also referred to as the *false consensus effect, the self-based heuristic,* and *attributive or social projection*, and a few quantitative studies have observed this phenomenon in surrogate decision making (Marks & Arkes, 2008; Fagerlin et al., 2001), including three studies using spouses as proxies (Moorman, Hauser, & Carr, 2009; Lemay, Pruchno, & Field, 2006; Pruchno, Lemay, Field, & Levinsky, 2005). For example, Pruchno et al. (2005), in a sample of 291 dialysis patients and their spouses, found that proxy ratings were more related to spousal preferences for the patient than to patient self-preferences for end-of-life treatment.

Studies have demonstrated the phenomenon of assumed similarity in spouse proxies in two different ways: Pruchno et al. (2005) and Lemay et al. (2006) found that spousal preferences for patient treatment influence proxy ratings, whereas Moorman et al. (2009) reported that the spouse's own treatment preferences influence spouse proxy ratings (Moorman et al., 2009). In other words, whether a wife is rating her own personal preferences for treatment should she personally become ill or rating what she would hope her husband would choose should he need treatment, both of these factors influence what the wife believes the husband personally would choose for himself; we refer to both of these processes as assumed similarity in this article.

In addition to the phenomenon of assumed similarity, the field of person perception has examined personality traits that may influence proxy accuracy in ratings of others, yet very few reliable indicators other than intelligence have been identified (Ickes et al., 2000). This variability in findings may be due in part to comparisons across a variety of research designs (Ickes et al., 2000). One study (Letzring, 2008) has identified traits, including social skills and agreeableness as predictive of rater accuracy. Letzring concluded that the personality and behaviors of the judges helped to create a situation whereby more accurate ratings were possible, suggesting that both intrapersonal and interpersonal factors may contribute to the accuracy of proxy ratings.

Similarly, research on spousal and couple ratings has shown that relationship factors influence proxy accuracy; however, the nature of the influence on accuracy has been mixed. For example, research has found that satisfied couples are more likely to presume that their partners are similar to them on personality traits and values and demonstrate lower levels of accuracy in partner ratings because of this similarity bias (Murray, Holmes, Bellavia, Griffin, & Dolderman, 2002). This cognitive bias toward similarity may serve to promote a couple's sense of connection to one another and trust in the relationship. Only one study to our knowledge has examined marital factors (i.e., satisfaction) in relation to end-of-life proxy ratings (Lemay et al., 2006). Lemay et al. (2006) examined the impact of agreement and bias on marital factors in a sample of dialysis patients and their spouses. Results indicated that spouses reporting

greater marital satisfaction demonstrated a self-preference bias in their proxy ratings for their spouse patients, such that they used their own preferences to make decisions for their spouse (i.e., they showed evidence of assumed similarity).

In addition to this bias in ratings, Lemay et al. (2006) demonstrated that when spouses rate one another as more interested in life-sustaining treatment than they actually are, this may serve to influence marital satisfaction by demonstrating those spouses' abilities to "quell their doubts and fears" about their own partner's desire for continued life (Lemay et al., 2006). However, results of hierarchical linear modeling suggested that this bias also served to increase accuracy in proxy ratings. Thus, the role of relationship satisfaction in proxy accuracy is unclear and could depend, in part, on the types of proxy ratings that are being made (e.g., personality vs. end-of-life decisions). More generally, the process of surrogate ratings is far from understood and may be influenced by many factors such as assumed similarity, relationship satisfaction, spousal similarity, personality, and attitudes. Understanding influences on self–other agreement not only allows for improving accuracy at the end-of-life but also for improving end-of-life experiences for family members who are greatly affected by these circumstances.

Current Study

The purpose of this study was fourfold. The first goal was to describe the level of agreement and similarity in end-of-life treatment preferences in a newlywed sample. Second, although assumed similarity has been found in a few studies on married couples (Lemay et al., 2006; Moorman, Hauser, & Carr, 2006; Pruchno et al., 2005) this study examined whether or not this phenomenon could be observed in a newlywed sample as well. Two of the three previous studies on end-of-life decisions have been conducted among dialysis patients, who are predominately male, and their spouses, mostly female (Lemay et al., 2006; Pruchno et al., 2005). In addition, these two studies examined assumed similarity by asking spouses to rate what they thought their patient spouse would want for their end-of-life care, rather than examining what the raters would want for them-

selves, should they face the need for end-of-life treatment. The third goal of this research was to examine the influence of relationship factors, including satisfaction and similarity, on proxy ratings. Only one study to our knowledge has examined the influence of marital satisfaction on proxy accuracy among dialysis patients and their spouses (Lemay et al., 2006). The fourth goal, given the modest levels of surrogate accuracy–agreement observed previously, was to extend previous research on person perception to examine the potential influence of other psychological variables on proxy accuracy, including personality and attitudinal variables. This study expands on previous research by studying a relatively large sample (approximately 200 couples) and by including a variety of previously unexamined variables that could potentially influence individual rating processes. Very little research has explored other potential influences on surrogate accuracy, despite high levels of inaccuracy in end-of-life ratings. This large study with a wide range of potentially influential variables represents a unique opportunity to address this question and illuminate an important and incompletely understood process.

Newlywed couples were selected for the study based on several considerations. First, as stated previously, most states give the responsibility of surrogate decision making to spouses, if the patient has a spouse (American Medical Directors Association, 2003), and recent research has shown that spouse proxies are more accurate than adult children and other nonfamilial designated proxies (Parks et al., 2011). Furthermore, given the great room for improvement in proxy ratings, and given that married couples demonstrate higher levels of accuracy than other surrogates, it is valuable to explore potential aspects of their relationship that may explain accuracy. Finally, given that marriage typically triggers legal and financial changes, such as a name change for most women (Harbour, 2012) and increased access to health insurance coverage (Zuvekas & Taliaferro, 2003), the newlywed period may be an ideal time for reviewing living wills and advance directives as a couple. Taken together, these considerations suggest that recently married couples can provide an important and unique perspective on the nature and accuracy of proxy ratings.

Method

Participants

Newlywed couples were identified through court records of recent marriage licenses granted in a midwestern U.S. county and were invited to participate through the mail. Letters with postage-paid postcards were sent to approximately 2,094 couples inviting their participation in a study of attitudes and behaviors relevant to marriages, and 202 couples completed the study (9.6% participation). Spouses ranged in age from 20 to 80, with an average age of 32. The majority of participants were Caucasian (79%), followed by multiple or other ethnicities (4.2%), Hispanic (3.5%), African American (2%), Asian American (1.7%), and Native American (0.7%). In addition, 3.5% of participants identified as foreign born. The largest percentage of participants had a 4-year college degree (36.1%), followed by 1–3 years of college (25.2%), master's degree or comparable (11.6%), high school degree (11.4%), doctorate or comparable (2.7%), postdoctorate education or certification (0.2%), and grade school (0.2%). Most participants were employed at least part time (83%), and 7.7% reported being unemployed. The majority of participants reported a current religious affiliation of Christian (61.4%), followed by Agnostic or Atheist (13.1%), Jewish (1%), Islam (0.2%), and other (14.6%). Missing data resulted in percentages totaling less than 100 for ethnicity–race, education, employment, and religious affiliation, and resulted in a final $n = 197$ couples.

Spouses reported knowing one another an average of 6.1 years (range 0.75–42.25 years) and having dated an average of 4.1 years (range .25–19 years). Spouses had been married 9 months on average at the time of participation. Most participants had not been previously married (66.3%), whereas 26.2% reported that this was not their first marriage. The majority of spouses had lived together prior to marrying (72.3%), whereas 19.6% reported not living together prior to marriage. Most spouses did not have children (63.8%) at the time of the study, but 28.2% did report having children.

Measures

Hypothetical scenarios questionnaire. Participants completed a 19-item questionnaire

on end-of-life medical treatment preferences. The questionnaire included five hypothetical scenarios that reflected the individual's general health status; these scenarios involved (a) one's current health, (b) significant cognitive impairment, (c) severe stroke resulting in a coma, (d) injury resulting in serious physical impairment, and (e) terminal cancer. Participants read each scenario and then rated how interested they would be in receiving four potential treatments, should the need arise, including cardiopulmonary resuscitation (CPR), intravenous (IV) antibiotics, artificial nutrition, and mechanical ventilation for each scenario. For example, for current health, CPR, the questionnaire read:

> You are in your current health (the way you are feeling now). If your breathing or heartbeat stops, medical personnel would administer cardiopulmonary resuscitation, or CPR, which is the use of drugs and electric shock to start the heart beating and artificial breathing. Imagine that you would have approximately a 90% chance of surviving after receiving CPR and leaving the hospital. Please indicate whether or not you would want this treatment by circling your response from 1 to 5.

The scale anchors were 1 (*definitely yes*) and 5 (*definitely no*) for each of the four treatment options (see supplemental materials, appendix, for complete questionnaire and measure background). For one condition, severe stroke resulting in a coma, artificial nutrition was not a potential treatment as it was a part of the hypothetical scenario. Spouses completed a version of the questionnaire in which they rated their own preferences and subsequently completed an identical spouse version in which they indicated, if their spouses were in each hypothetical scenario, how interested their spouses would be in receiving each of the potential treatments on the same 1 to 5 scale. Scores were then recoded after data entry so that lower scores indicate less interest in life-sustaining treatment.

The following questionnaires were included in the study to test their potential role as predictors, moderators, or both, of proxy accuracy–agreement.

Quality Marriage Index (QMI; Norton, 1983). The QMI is a six-item self-report measure of marriage satisfaction that was validated in multiple samples (Norton, 1983). Spouses responded to items one to five (e.g., having a strong marriage) on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly*

agree). Item 6, where couples indicate their level of happiness, has a 10-point scale with anchors 1 (*very unhappy*), 5–6 (*happy*), and 10 (*perfectly happy*). Scores can range from 6 to 45 and ranged from 11 to 45 in this sample, with a mean of 40.5, which may reflect a ceiling effect. Cronbach's alpha for this sample was .91.

Big Five Inventory (BFI; John, Donahue, & Kentle, 1991). Spouses completed a self-version of the BFI, which is a 44-item questionnaire assessing five broad personality traits that repeatedly have emerged in both self and other ratings of personality. The BFI was included in this study to assess Agreeableness (e.g., forgiving) and Conscientiousness (e.g., reliable). These traits were selected given their conceptual connection to proxy ratings as well as previous research supporting the role of agreeableness in rater accuracy (Letzring, 2008). In theory, individuals who are more agreeable are more likely to go along with the wishes of others and to be more sensitive to—and considerate of—other's thoughts and feelings, which could apply to end-of-life preferences as well. Individuals who are conscientious are also more likely to be responsible and future oriented, possibly having discussions with loved ones about end-of-life planning.

Participants read each item and indicated how strongly they agreed with it on a 1 (*disagree strongly*) to 5 (*strongly agree*) scale. The BFI has been well validated in multiple samples (John, Naumann, & Soto, 2008), and each scale demonstrated good internal consistency reliabilities in this sample (.75 for Agreeableness and .78 for Conscientiousness).

Descriptive Choices Questionnaire (DCQ). The DCQ is a 30-item questionnaire that assesses various attitudinal and self-descriptive dimensions, four of which were included in this study given their potential relevance to end-of-life decisions: (a) conservative versus liberal, (b) nonreligious versus religious, (c) spiritually oriented versus not very spiritual, and (d) morally strict versus not so strict. For each of the domains of the DCQ, participants read each item (e.g., conservative [A] vs. liberal [B]) and then rated themselves on a 7-point scale ranging from 1 (*completely like A*; in this example, A = conservative) to 7 (*completely like B*; in this example, B = liberal).

Demographics. Participants also completed a 25-item questionnaire assessing demographics, family, and relationship information.

Procedure

All research was approved by the University's Institutional Review Board. Participants completed questionnaires as part of a 2-hr session in small groups of two to four couples. During this session, each member of the couple reviewed and signed consent documents with research assistants and subsequently completed several questionnaires individually, participated in an interactive task as a couple, and took part in a computer rating task—results from these latter two tasks are not reported here. Couples were seated together in a room, and spouses were instructed not to sit next to one another to ensure that responses were made independently.

Results

Mean Level Differences: Hypothetical Scenarios

The first set of analyses were to calculate the mean interest in treatments for each scenario (i.e., current health, cognitive impairment, severe stroke, physical impairment, and cancer), indicating the overall interest in receiving any

treatment given a particular health condition. Next, the mean interest in each treatment (i.e., CPR, mechanical ventilation, artificial nutrition, IV antibiotics) was calculated across all hypothetical scenarios, indicating the overall interest in any particular treatment. This allowed for the examination of any patterns across each hypothetical medical condition and each treatment. As seen in Table 1, column labeled 1, considerable variability was present across scenarios, with the overall means ranging from a high of 4.35 (current health) to a low of 2.48 (severe stroke). Thus, participants were much more interested in treatments related to changes in their current health and much less interested in treatments related to the severe stroke scenario. Overall means for treatments did not vary as much, with averages ranging from 3.07 (mechanical ventilation) to 3.42 (CPR and intravenous antibiotics). These results indicate that participants had stronger differential preferences regarding the type of scenario–medical condition rather than the type of treatment received across scenarios.

Husband and wife means were then calculated separately for both hypothetical conditions

Table 1
Hypothetical Scenarios and Treatment Means

| | 1 | | 2 | | 3 | | 4 | 5 | | 6 | | 7 |
| | Total sample | | Husband self ratings | | Wife self ratings | | | Husband rating wife | | Wife rating husband | | |
Variable	M	(SD)	M	(SD)	M	(SD)	Cohen's d^1	M	(SD)	M	(SD)	Cohen's d^2
Scenario												
Current health	4.35	0.53	4.33$_a$	0.69	4.36$_a$	0.67	−.04	4.62$_b$	0.51	4.49$_c$	0.69	.22
Cognitive impairment	3.20	0.88	3.22$_{ac}$	1.12	3.19$_a$	1.13	.03	3.58$_b$	1.05	3.39$_c$	1.04	.18
Severe stroke	2.48	0.96	2.54$_{ac}$	1.25	2.42$_a$	1.20	.10	2.91$_b$	1.25	2.69$_c$	1.12	.19
Physical impairment	3.12	0.96	3.14$_{ab}$	1.25	3.11$_a$	1.25	.02	3.43$_b$	1.06	3.29$_b$	1.11	.13
Cancer	2.99	1.04	2.98$_a$	1.32	3.01$_a$	1.34	−.02	3.13$_a$	1.21	3.00$_a$	1.20	.11
Overall M	3.23		3.24		3.22		.02	3.53		3.37		.16
Treatment												
CPR	3.42	0.73	3.44$_{ac}$	0.88	3.39$_{ac}$	0.94	.05	3.70$_b$	0.87	3.49$_c$	0.88	.24
Mechanical ventilation	3.07	0.79	3.09$_{ac}$	0.94	3.05$_a$	1.02	.04	3.43$_b$	0.87	3.21$_c$	0.90	.25
Artificial nutrition	3.13	0.83	3.16$_a$	1.00	3.11$_a$	1.08	.05	3.50$_b$	0.86	3.33$_c$	0.95	.19
Intravenous antibiotics	3.42	0.74	3.39$_a$	0.93	3.44$_a$	0.94	−.05	3.63$_b$	0.84	3.59$_b$	0.87	.05
Overall M	3.26		3.27		3.25		.02	3.57		3.41		.18

Note. $N = 394$. $n = 197$ for husband ratings and $n = 197$ for wife ratings. Under heading "4," Cohen's d is calculated as husband mean minus wife mean divided by the pooled *SD.* Under heading "7," Cohen's d is calculated as husband rating wife mean minus wife rating husband mean divided by the pooled *SD.* Husband and wife self- and spouse-rating means were compared within rows using paired *t* tests (i.e., columns under headings "2," "3," "5," and "6" were compared within rows). Means with different subscripts across each row are significantly different from one another ($p < .05$). Higher scores indicate more interest in life-saving measures.

and treatments (see Table 1, columns labeled 2 and 3) to examine any potential differences between spouses. As seen by the shared subscripts between columns labeled 2 and 3, no significant differences were found between husband self ratings and wife self ratings on mean treatment preferences, with means ranging from a low of 2.42 (severe stroke, for wives) to a high of 4.36 (current health, for wives) for overall scenario ratings. Thus, husbands and wives rated both scenarios–medical conditions and treatments fairly equally in terms of their preferences for treatment. This lack of differences is also reflected in Cohen's d (column labeled 4), calculated as the difference between husband mean and wife mean divided by the pooled SD, all of which are small in size (Cohen, 1992).

Next, mean proxy ratings across both conditions and treatments for husbands as proxies and wives as proxies were examined. As seen in Table 1, columns 5 and 6, several significant differences (using paired samples t tests) were seen between spouse–proxy ratings, with husbands generally rating their wives as more interested in life-sustaining treatments than wives rated their husbands. Significant differences between husbands as proxies and wives as proxies were seen for current health, cognitive impairment, and severe stroke scenarios. Significant differences were also seen between proxy ratings for CPR, mechanical ventilation, and IV antibiotics. Husband proxy ratings were significantly higher in each of these comparisons ($p < .05$), indicating that husbands rated their wives as more interested in life-sustaining treatment than wives rated their husbands. The largest differences, quantified by Cohen's d (column 7), were seen for mechanical ventilation (-0.25) and CPR (-0.24), which were still small (Cohen, 1992).

The last set of mean comparisons examined differences between self ratings and proxy ratings; these analyses revealed several significant differences (Table 1, columns labeled 2 and 3 vs. columns labeled 5 and 6). For example, mean husband self ratings were compared with husband proxy ratings across each scenario, as well as wife self ratings to wife proxy ratings across each scenario. Proxy ratings were significantly higher (indicating greater interest in treatment) than self ratings for several scenarios when comparing column 2 (husband self ratings) with column 5 (husband rating wife) and comparing column 3 (wife self ratings) with column 6 (wife rating husband). The general pattern indicates that when spouses responded as proxies, they rated spouse interest in life-sustaining treatment as significantly greater than their own interest in treatment. This significant difference between husband self and proxy ratings and wife self and proxy ratings was seen for every scenario and treatment with the exception of the cancer scenario, which showed no significant differences between self and proxy ratings.

In addition to comparing self and proxy ratings (columns labeled 2 and 3 vs. columns labeled 5 and 6), husband self ratings (column labeled 2) were compared with wife proxy ratings (column labeled 6) and wife self ratings (column labeled 3) were compared to husband proxy ratings (column 5). These comparisons allowed for examination of whether proxy ratings differed significantly from the corresponding self-rating on the same variable. Thus, mean scores in columns labeled 2, 3, 4, and 5 in Table 1 were each compared with one another in a series of paired sample t tests. Only a few significant differences were seen when comparing husband self ratings (column labeled 2) and wife proxy ratings (column labeled 6). Wife proxy ratings were not significantly different from husband self ratings, with a few exceptions including current health, artificial nutrition, and IV antibiotics. In these three exceptions, wife proxy ratings were significantly higher than husband self ratings; these results indicate that wives rated their husbands as being more interested in treatment than they actually were.

In contrast, the analyses of wife self ratings versus husband proxy ratings (column 3 vs. column 5) showed stronger effects; they were significantly different from one another across all scenarios and treatments with the exception of the cancer scenario, which, as stated above, did not vary significantly across any of the columns–ratings. In following with the pattern of higher proxy ratings, husband proxy ratings of wives were significantly higher than wife self ratings in all of these significant comparisons; consequently, we again see evidence that proxies believed that their spouses were more interested in treatment than they actually were.

Spousal Similarity, Agreement, and Assumed Similarity

Similarity between husbands and wives was examined through correlations between husband self ratings and wife self ratings of both scenarios–conditions and treatment options. As seen in Table 2, column 1, ratings ranged from .18 to .29 and all correlations were significant, indicating a moderate level of similarity in treatment preferences between spouses.

Agreement was examined through correlations between spousal–proxy ratings and self ratings (Table 2, columns labeled 2 and 3). These correlations were moderate in size (ranging from .17 to .41), indicating that spouses were somewhat accurate in their ratings of their spouses' preferences. Wife agreement correlations tended to be larger than husband agreement correlations, ranging from .26 to .41 (*M* *r*s = .31 and .38, across scenarios and treatments, respectively); in contrast, husband correlations ranged from .17 to .38 (*M* *r*s = .26 and .35, respectively). With the exception of the current health scenario, however, these correlations were not significantly different from one another using William's Hotelling modification (Kenny, Kashy, & Cook, 2006) for comparing correlations with a common variable (see Table 2, column 6).

To explore agreement more fully, difference scores were created for proxy ratings by first transforming preferences from the original 1 (*definitely yes*) to 5 (*definitely no*) scale to a 0 or 1 score. This was done by transforming values of 1, 2, or 3 (*not sure*) to a 1, indicating an interest in life-saving treatment, and transforming values of 4 or 5 to a 0, indicating no interest in life-saving treatment. It was decided to categorize the *not sure* responses into 1 (*interested in treatment*) given that, in an actual medical situation in which there was uncertainty over interest in treatment, family and providers would likely err on the side of caution and provide life-saving treatment. Once all self ratings and proxy ratings were dichotomized, difference scores were calculated by subtracting the proxy rating from the self-rating. The resulting values were: −1 = self rating was 0, spousal rating was 1; 0 = self rating and spousal rating were the same; or 1 = self rating was 1, spousal rating was 0, where −1 and 1 represented error. Figure 1 shows the distribution of

error and agreement; these results reveal a systematic bias, such that spousal ratings indicated an interest in treatment when self raters were not interested in treatment.

Assumed similarity was examined by correlating self ratings with the corresponding proxy ratings—for example, a husband's rating of his own preferences correlated with his rating of his wife's preferences (Table 2, columns labeled 4 and 5). The largest correlations were seen between these self-preferences for treatment and spouse–proxy preferences for treatment, which ranged from a low of .46 to a high of .69, with most correlations .60 or higher. Differences between agreement and assumed similarity correlations were tested for significance using the Williams modification to the Hotelling test for two correlations involving a common variable (Kenny, Kashy, & Cook, 2006). As seen in Table 2, every comparison was significant, demonstrating that the assumed similarity correlations (columns labeled 4 and 5) were significantly greater than the corresponding agreement correlations (columns labeled 2 and 3). These results indicate that proxy ratings actually are more strongly related to the rater's own treatment preferences than they are to the preferences of the person being rated.

Moderated Regression Analyses

The next set of analyses explored the potential role of relationship, personality, and attitudinal characteristics of proxies, as well as similarity between proxies and spouses on these variables, in predicting and moderating proxy accuracy through two groups of moderated regression analyses. To simplify these analyses, self- and proxy-rated treatment preferences were averaged across all scenarios for a single average score of treatment preference. The first group of moderated regression analyses examined several variables as potential predictors or moderators of proxy accuracy including marital satisfaction, time dated, agreeableness, conscientiousness, religiosity, spirituality, moral strictness, and conservativeness. Thus, the first set of analyses predicted self ratings from average proxy ratings, proxy characteristics (i.e., each of the eight variables stated above), and an interaction term between proxy ratings and proxy characteristics. Separate moderated regression analyses were run first in husbands and

Table 2
Correlations Between Husband, Wife, and Spouse Ratings

	1	2	3	4	5	6	7	8
	Similarity	Agreement		Assumed similarity		William's Hotelling t test		
						Column 2 vs. 3	Column 2 vs. 4	Column 3 vs. 5
Variable	Husband self & wife self	Husband rating wife & wife self	Wife rating husband & husband self	Husband rating wife & husband self	Wife rating husband and wife self			
Hypothetical scenario								
Current health	.23	.17	.39	.50	.62	−2.63**	−4.14**	−3.15**
Cognitive impairment	.22	.37	.32	.64	.60	0.60	−3.70**	−3.71**
Severe stroke	.22	.33	.30	.61	.61	0.36	−3.74**	−4.13**
Physical impairment	.18	.24	.29	.46	.63	−0.57	−2.62**	−4.45**
Cancer	.23	.19	.26	.63	.64	−0.81	−5.98**	−5.20**
M	.22	.26	.31	.57	.62	−0.59	−4.02**	−4.16**
Treatment								
CPR	.29	.36	.36	.67	.63	0.00	−4.59**	−3.87**
Mechanical ventilation	.29	.38	.41	.67	.63	−0.39	−4.30**	−3.19**
Artificial nutrition	.27	.30	.39	.67	.65	−1.12	−5.36**	−3.75**
Intravenous antibiotics	.24	.34	.35	.67	.69	−0.12	−4.68**	−4.91**
M	.27	.35	.38	.67	.65	−0.38	−4.65**	−3.88**

Note. $n = 197$. All correlations are significant at $p < .05$. William's modification to the Hotelling t test was run by comparing the assumed similarity and agreement correlations, or column 2 vs. column 4 and column 3 vs. column 5.
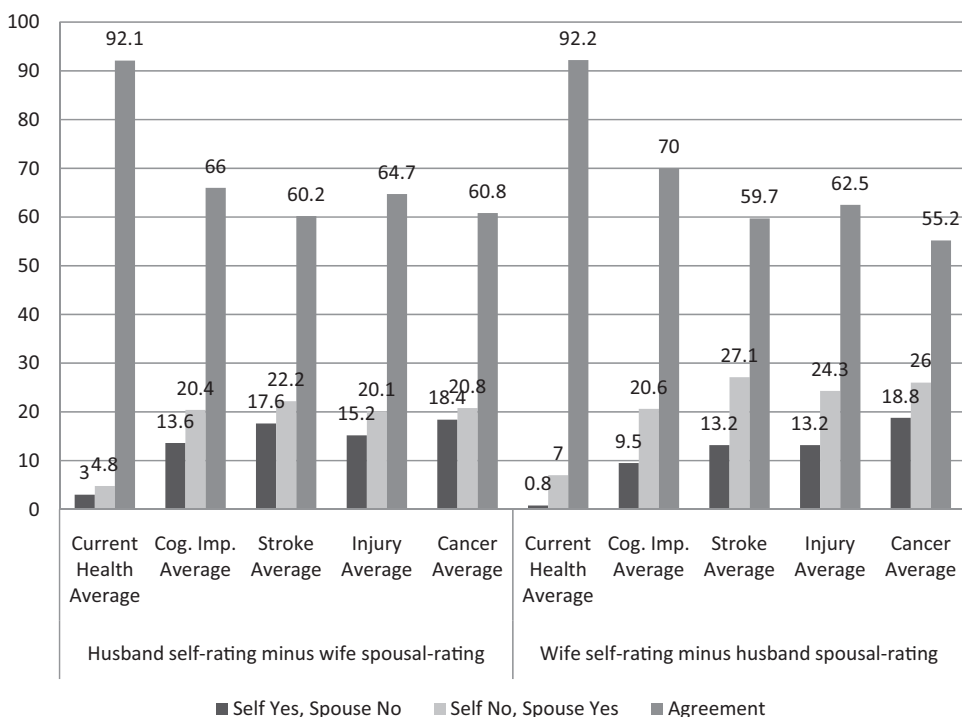** indicates t is significant, $p < .01$, two-tailed.

Figure 1. Percentage agreement between husbands and wives on hypothetical scenarios. $n = 197$. Values above bars are average percentage agreement, calculated as the difference between husband and wife ratings.

then in wives predicting average self ratings from average proxy ratings, proxy characteristics (i.e., each of eight variables stated above), and an interaction term between proxy ratings and proxy characteristics. Proxy ratings and proxy characteristics were entered at the first step, as well as proxy age, followed by the moderator variable at the second step. All predictor variables were centered based on the grand mean and moderators were created by multiplying the centered variables.

In these eight pairs of moderated regression analyses, proxy ratings were significant predictors of self ratings in each analysis (see supplemental materials, Table 2) with betas ranging from .304–.396 for husband proxies and .353–.417 for wife proxies (R^2s ranged from .157–.316). Of the eight proxy characteristics, there was one significant main effect for wives as proxies, wife marital satisfaction, such that wives with higher levels of marital satisfaction

had husbands who were more interested in end-of-life treatment ($\beta = .173$, $R^2 = .246$). Only one of the interaction terms across these eight pairs of analyses was significant, between husband proxy ratings and husband conservativeness ($\beta = -.168$, $R^2 = .229$). Probing this interaction for significant regions indicated that at lower levels of proxy-rated interest in life-sustaining treatment, less conservative husbands were more accurate in predicting their wives' treatment preferences than more conservative husbands. Thus, very little evidence emerged in these analyses to suggest that the proposed variables (marital satisfaction, time date, religiosity, spirituality, moral strictness, agreeableness, and conscientiousness) influenced proxy accuracy.

The second set of regression analyses examined the role of similarity in predicting self ratings by computing an absolute difference score as the moderator of agreement among the

following variables: marital satisfaction, agreeableness, conscientiousness, religiosity, spirituality, moral strictness, and conservativeness. Time dated was not included in these analyses given the very high level of spousal similarity on this variable. Separate moderated regression analyses were run first in husbands and then in wives predicting average self ratings from average proxy ratings, proxy and spouse characteristics (i.e., each of the seven variables stated above), and an absolute difference score between proxy and spouse characteristics. For example, to examine the potential role of differences in level of marital satisfaction on proxy accuracy for husbands, the following variables were entered into the equation: wife (proxy) age, wife self-reported marital satisfaction, husband self-reported marital satisfaction, absolute difference between husband and wife marital satisfaction, and wife (proxy) ratings of husband end-of-life treatment. Proxy age, proxy end-of-life ratings, proxy and spouse characteristics were entered at the first step, followed by the moderator variable (i.e., the absolute difference score) at the second step. All predictor variables with the exception of age were centered on the grand mean.

In this second set of moderated regression analyses, proxy ratings were again significant predictors of self ratings in each analysis (see supplemental materials, Table 3) with betas ranging from .340–.371 for husband proxies and .427–.466 for wife proxies (R^2s ranged from .189–.243). Of the seven proxy characteristics, there were two significant main effects for wives as proxies including husband marital satisfaction ($\beta = .209$) and husband agreeableness ($\beta = .170$), such that higher levels of marital satisfaction and agreeableness were associated with greater interest in end-of-life treatment for husbands (R^2s = .244 and .217, respectively). Three of the interaction terms (absolute difference scores) were significant for wives as proxies, including differences in spirituality ($\beta = -.142$), moral strictness ($\beta = -.130$), and conservativeness ($\beta = -.170$) with R^2s = .218, .234, and .243, respectively. These βs indicate that greater differences in husband and wife scores on these variables were associated with lower accuracy for wives as proxies but not for husbands as proxies. Differences between husbands and wives on the other four

variables (marital satisfaction, religiosity, agreeableness, and conscientiousness) did not affect accuracy in these analyses.

Discussion

This study examined similarity, agreement, and assumed similarity among 197 newlywed couples on a measure of hypothetical end-of-life treatment preferences. Examining mean treatment ratings between husbands and wives revealed interesting patterns. First, both husbands and wives differentiated their preferences more among scenarios (i.e., stroke, cancer, current health) rather than treatment options (i.e., CPR, artificial nutrition), indicating that the actual health condition generated more variation in preferences than the particular treatments potentially available to participants. As Lemay et al. (2006) also demonstrated, more severe conditions (i.e., poorer overall health) resulted in lower levels of interest in treatments, with the current health scenario generating the most interest in treatments, followed by cognitive impairment, physical impairment, cancer, and severe stroke. It appears the physical condition is much more significant to decision making than the nature of the treatment itself.

Husband and wife self ratings were generally quite similar across conditions and treatment options, with no significant mean level differences emerging between spouses. However, significant differences emerged in proxy ratings between spouses, with wives generally rating their husbands as less interested in treatment than husbands rated their wives, although the effect sizes were small. It is unclear why husbands and wives rated their spouses in this different manner although previous research has found that women utilize higher rates of health care services than men (Bertakis, Azari, Helms, Callahan, & Robbins, 2000). One possible explanation is that spouses used common gender stereotypes based on this established difference between men and women regarding health care utilization. However, this possibility does not explain that their actual preferences were not significantly different from one another.

Similarity correlations revealed a moderate amount of similarity within couples across scenarios and treatments. This finding provides some support for the notion of assortative mat-

ing and specifically for *positive assortment* (Watson et al., 2004), or couple similarity–positive correlations on a characteristic or trait. However, similarity correlations may also reflect base-rate utilization or typical treatment preferences, rather than unique similarity within couples.

In analyses of agreement, wives and husbands demonstrated comparable levels of agreement (with one exception: current health), suggesting that newlywed husbands and wives are moderately accurate at predicting their spouses' end-of-life treatment preferences. This finding supports the results of Moorman et al. (2009), who also failed to find significant gender differences in accuracy in proxy ratings. However, the largest correlations seen in these data were between self and proxy ratings, that is, the assumed similarity correlations (mean *r*s ranged from .57–.67; see Table 2). In other words, the strongest predictor of proxy ratings—across both husbands and wives—is the rater's own end-of-life treatment preferences. This finding also replicates results seen in other studies of proxy ratings (e.g., Fagerlin et al., 2001) but demonstrates this effect in a newlywed sample for the first time. This finding contributes to a growing body of research that has demonstrated this effect in self–other ratings among dating couples and friendship dyads (Watson et al., 2000), parents and children (Fagerlin et al., 2001), older adults and their designated proxies (Fagerlin et al., 2001), and older married couples (Moorman et al., 2009). The strong relative magnitude of the assumed similarity correlations in this research and the replication of this result across a variety of samples reiterate the importance of considering key influences on proxy preferences in determining end-of-life care.

Exploratory moderated regression analyses revealed a few interesting predictor variables including marital satisfaction for wives, and conservativeness for husbands. Wives with greater marital satisfaction had husbands with greater levels of interest in end-of-life treatment. One interpretation of this finding is that having a happy spouse may influence a person's level of commitment to his or her own life and the steps one is willing to take to preserve one's life. A significant interaction between husband conservativeness and husband proxy ratings re-

vealed that less conservative husbands were more accurate at predicting their wives' interest in life-sustaining treatment at lower levels of interest in treatment compared with more conservative husbands at higher levels of interest in treatment. One possible explanation for this finding is that more conservative ideologies are often associated with greater interest in life-sustaining treatment (Neumann, 2011), which could cause conservative husbands to inaccurately assume that wives are interested in treatment when, in fact, they are not.

Analyses of similarity revealed three significant predictors of accuracy for wives as proxies, but not for husbands as proxies, including differences in spirituality, moral strictness, and conservativeness. More specifically, these analyses revealed that greater differences between spouses on these three variables are negatively associated with accuracy for wives. The explanation for this difference between husbands and wives is unclear and warrants further exploration, but our results suggest that wives are more affected by these differences than are husbands.

These findings are clinically relevant to several issues in proxy ratings for end-of-life care that practitioners may consider when discussing this process with spouses, including the potential influence of gender on proxy ratings, the role of conservative attitudes, and the types of errors that spouses are more likely to make. We focus here on two key findings and their relevance to the process of end-of-life decision making. First, the assumed similarity finding in this study replicates previous research (e.g., Lemay et al., 2006) and suggests that assumed similarity may influence proxy ratings across many samples of married couples, across a broad range of hypothetical medical conditions and scenarios, and across genders. Although it is unclear whether this bias in judgment could be changed through teaching or some other form of targeted intervention (Moorman & Carr, 2008), it should be taken into consideration by practitioners and acknowledged with spouses and other family members. Further research could help to illuminate whether discussion of this bias with family members could improve accuracy and increase family members' understanding of patient preferences.

The other key finding from this research was the role of relationship satisfaction in preferences for end-of-life care among husbands, sug-

gesting that relationship factors may have a significant effect on end-of-life treatment preferences. In contrast to Lemay et al. (2006), no significant interactions emerged between marital satisfaction and proxy ratings. Future research should examine the potential role of marital satisfaction on accuracy of proxy ratings as well as preferences for end-of-life treatment.

Limitations

One major limitation of this study is that the sample is relatively young and presumably healthy, which makes these end-of-life issues seem less relevant. However, Fagerlin et al. (2001) demonstrated that surrogates for older, less healthy adults are only slightly more accurate than surrogates for generally healthy samples and that similar processes of assumed similarity are seen across samples. This suggests that, if possible, asking these questions among healthy samples reduces the burden of research in seriously ill samples. Moreover, as Fagerlin et al. (2001) pointed out, it is impossible to study these issues in individuals for whom it is most directly relevant (i.e., those who are incapacitated). In addition, the beginning of marriage may be an appropriate time to discuss these issues with a spouse, while also updating other important legal documents such as wills. Ideally, spouses and family members would continue to discuss treatment preferences with the onset of any significant changes in health status. However, families and couples may find discussing end-of-life issues particularly difficult when they become more salient, such as with a new diagnosis. Discussing one another's general preferences earlier in life may be easier to accomplish while still being related to later life decision making. However, research has also found that surrogate accuracy is not improved by discussing patient preferences in advance with the patient (Ditto et al., 2001), thus, suggesting that couples who likely have not yet discussed end-of-life treatments (e.g., newlyweds) may be as accurate as those who have done so.

It is also important to recognize that preferences for life-sustaining treatment can change over time and be influenced by factors such as changes in depression symptoms (Rosenfeld et al., 1996). Ditto et al. (2003), for example, found only moderate stability for hypothetical scenarios and preferences over time in older adults. McParland, Likourezos, Chichin, Castor, and Paris (2003) also found that nursing home resident treatment preferences changed over intervals of 12 and 24 months. Lockhart, Ditto, Danks, Coppola, and Smucker (2001) reported that even when preferences are simplified to the issue of which conditions are better versus worse than death, preferences show only moderate stability over nearly a 1-year period. Variation over time in preferences may also be explained by increased tolerance or exposure to demanding interventions, which could change perceptions of quality of life over time. Other patients, however, may realize with time and increased illness that they are less interested in life-sustaining interventions than they previously imagined.

As stated previously, given that marriage often leads to a change in insurance status (Zuvekas & Taliaferro, 2003) and legal documents (i.e., name changes for wives; Harbour, 2012), the newlywed period may be an ideal time for reviewing living wills and advance directives as a couple. It is also worth pointing out that end-of-life decisions potentially can occur at any age, so that newlyweds will sometimes be forced to confront them, perhaps with very little advance warning.

In addition to the general age of the sample, this research is also limited in its racial–ethnic representation as well as educational level. End-of-life decisions affect families of all ethnic–racial and socioeconomic groups and further work is needed that includes more representative samples.

Future Research

As stated above, a number of future directions are suggested from these findings, such as reexamining assumed similarity and the role of relationship satisfaction in additional samples facing end-of-life treatments. In addition, although such research is difficult to conduct, it is important to continue to conduct research on these processes as they are unfolding in medical settings (e.g., Marks & Arkes, 2008) and longitudinally (e.g., Lockhart et al., 2001; McParland et al., 2003). Future work would also benefit

from qualitative examinations of proxy ratings at the end of life to identify common themes guiding the decision process (e.g., Vig et al., 2006). Finally, the process of end-of-life decision making greatly affects family members and spouses, and further work should help clarify the needs of family members in order to improve both the process of decision making as well as the overall experience for family members (e.g., Rabow, Hauser, & Adams, 2004).

Conclusion

It is likely that there is no single best time at which to assess end-of-life treatment preferences other than when the choice is presented. As such, it is important to study other variables that may affect preferences for end-of-life treatment such as relationship, attitudinal, and personality characteristics. Results of this study on associations between individual difference characteristics and treatment preferences provide novel and interesting findings that may help patients, families, and providers in understanding end-of-life decision making. Data such as these could be used to illuminate basic relationships between individual characteristics and medical treatment preferences to be called on when families or providers are unsure of patient preferences. In addition to seeking ways to improve surrogate accuracy, end-of-life decision making may be enhanced by looking toward individual traits that are significantly, reliably associated with treatment preferences and are easily rated by others.

To summarize, newlywed spouses share a moderate level of agreement in their preferences for end-of-life treatment and show a moderate level of accuracy in predicting one another's preferences. However, proxy ratings were most strongly correlated with self ratings, indicating that assumed similarity has a substantial impact on proxy end-of-life treatment preferences. Recognizing the potential impact of personal preferences on end-of-life treatments may help improve proxy accuracy in medical decision making and improve end-of-life care. Ethically, accuracy has been the primary goal for surrogate decision making. However, the findings of this study indicate that other factors signifi-

cantly impact hypothetical surrogate decision making and suggest that we may need to look beyond accuracy to create positive outcomes for patients and family members facing end-of-life decisions.

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