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## An Assessment of Social Diffusion in the Respecting Choices Advance Care Planning Program

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### Abstract

This study examines the potential social diffusion effects of the Respecting Choices® advance care planning program, administered in La Crosse, Wisconsin since 1991. The program produces educational materials for patients, trains facilitators to help patients prepare for end-of-life, and ensures that advance directives are connected to patients' medical records. Using data from a survey of more than 5,000 white Wisconsin high school graduates in their mid-60s, we found that participants who were living in the La Crosse area were significantly less likely than their peers living elsewhere to have executed a living will or appointed a health care power of attorney. This pattern may reflect psychological reactance, where individuals reject a message or lesson when they perceive compliance as a threat to their autonomy. There was no evidence of social diffusion effects; participants who lived in the La Crosse region themselves or who had social network members residing in the area were no more likely than those with no known ties to the region to have engaged in advance care planning. Future studies should explore the processes through which individuals learn and share with others their knowledge of advance care planning.

### Introduction

At the end of life, most chronically ill older adults experience physical discomfort, limited mobility, and impaired cognitive functioning (Field & Cassel, 1997). Those who are mentally incapacitated and have not made plans for their own end-of-life care may receive unwanted, costly, and invasive medical interventions (e.g., Detering, Hancock, Reade, & Silverster, 2010; Silveira, Kim, & Langa, 2010), or the withdrawal of treatments they desired (Lambert et al., 2005). Treatment preferences may be expressed verbally to a care provider or legally designated advocate. They also may be conveyed in writing via an advance directive, a legal document that enables competent adults to express their preferences for care that would be given to them if they were unable to speak for themselves (e.g., in a persistent vegetative state). The use of advance directives has been promoted by health care professionals and national medical organizations since the late 1970s, following

state court decisions in California, New Jersey, Massachusetts and Florida (Hampson & Emanuel, 2005).

Despite strong encouragement by health care organizations and policy makers, only one-third to one-half of all adults in the United States have completed advance directives (Hopp, 2000; U.S. Department of Health and Human Services, 2008). However, rates of completion increase with advancing age and with declining health. Recent studies find rates as high as 50 to 60 percent among samples of older adults (Carr & Khodyakov, 2007; Silveira et al., 2010), and as high as 70 percent among recent decedents who had non-traumatic (i.e., not sudden) deaths (e.g., Teno, Gruneier, Schwartz, Nanda, & White, 2007).

Recent national education initiatives such as the National Health Care Decisions Day initiative, started in 2006 by the American Nurses Association (2010), are based on the important premise that education and access to information on advance care planning will increase the use of advance directives, especially among relatively young and healthy persons. Practitioners have developed a variety of interventions to promote knowledge and use of such practices (e.g., Pearlman, Starks, Cain, & Cole, 2005; Ratner, Norlander, & McSteen, 2001). Multiple studies document the effectiveness of such interventions, where persons who were randomly assigned to a treatment group have higher levels of advance care planning than persons who were not exposed (e.g., Briggs, Kirchoff, Hammes, Song, & Colvin, 2004).

An important yet under-explored question is whether the effects of intervention programs pertaining to end-of-life planning transcend individual participants, and “spread” to their families, friends, and neighbors. Recent research in public health has shown that health behaviors – including diet, exercise, alcohol consumption, and contraceptive use - spread through networks of family, friends, and coworkers (Smith & Christakis, 2008). It is plausible that end-of-life planning behaviors also may be diffused among social networks of older adults. The present study will examine whether an intervention designed to increase rates of advance care planning affects the planning behavior of (a) residents of the region in which the intervention is offered, and (b) members of the social networks of persons who reside in the region in which the intervention is offered. These two types of social diffusion could potentially enhance the cost-effectiveness of government-funded end-of-life consulting sessions, if the material conveyed is spread to one's network members. Therefore, investigating the potential reach of such interventions is an important aspect of evaluation research.

### **Social Networks and Health Behaviors**

Public health interventions promote behavior change through education and social influence (Abraham & Michie, 2008). Some interventions, especially those aimed at adolescents and young adults, are explicitly designed to change one's ideas about which behaviors are normative (e.g., quantity and frequency of alcohol consumption) (Lewis & Neighbors, 2006). Peer counselors, matched to intervention recipients on race, class, and gender, are more effective than standard medical providers at inducing health behavior change (Malchodi et al., 2003).

However, most interventions are not designed to affect targets beyond the immediate recipient, nor do they use recipients as agents in delivering the intervention to others in their naturally-occurring social networks (Valente, 2002). Yet a handful of studies have documented that the effects of a health intervention can spread beyond the participant (Zimmerman, Gerace, Smith, & Ben-ezra, 1988; Gorin et al. 2008). For example, Gorin and colleagues (2008) randomly assigned 357 subjects to receive a weight-loss intervention, and then tracked the body weight of both the participants and their spouses. Both participants in

the intervention and their spouses lost significantly more weight than participants (and spouses) in the control group. The primary mechanism was that the spouse modeled the eating behaviors of the study participant.

Consistent with these results, social psychological studies examining the spread of health behaviors in social networks find that diet, exercise, alcohol consumption, physician visits, and smoking, spread through systems of acquaintances over time (Ashida, Wilkinson, & Koehly, 2010; Christakis & Fowler, 2007, 2008; Rosenquist, Murabito, Fowler, & Christakis, 2010). However, the spread of health behaviors through social networks is not due to social influence alone. Naturally-occurring social networks, such as friendship groups, marriages, and sibships, are not composed of random members; rather, persons who are similar are more likely to marry or befriend one another than are persons who are different (de Klepper, Sleebos, van de Bunt, & Agneessens, 2010). Thus, although spread of health behaviors is partly due to social influence, it is also partly spurious, due to shared environment and shared personal characteristics (Noel & Nyhan, 2010). However, even critics of the “contagion” literature note that regardless of the causal mechanism, intervention researchers should take advantage of the fact that health behaviors are strongly associated with the behaviors of one's social peers (Cohen-Cole & Fletcher, 2008). Thus, we assess whether the effects of an end-of-life planning intervention diffuse through a network of family, friends, and neighbors.

### Respecting Choices®

Respecting Choices® (RC) is a comprehensive advance care planning intervention developed by the La Crosse [Wisconsin] Area Medical Centers' Task Force on Advance Directives. It was launched in 1991 in the Gundersen Lutheran and Franciscan Skemp health systems in southwestern Wisconsin. RC has three integrated components: (1) patient educational materials – including an information card, booklet, planning guide, and video – are routinely available at local health facilities; (2) trained advance care planning facilitators assist persons with advance care planning when requested; (3) practices within the health care organizations enable health care providers to easily obtain, store, and retrieve advance directives when and where they are needed.

RC has been remarkably effective in the La Crosse, WI region. An early evaluation examined the death certificates and medical records of all 540 adult decedents who had been residing in a five zip code region around the city of La Crosse and died there between April 24, 1995 and March 31, 1996 (Hammes & Rooney, 1998). Eighty-five percent had a written advance directive and 95% of these documents were available in the decedent's medical record. Additionally, three clinical trials have recruited patient/surrogate dyads from specialty (e.g., renal dialysis) clinics in La Crosse (Briggs et al., 2004; Kirchhoff, Hammes, Kehl, Briggs, & Brown, forthcoming; Song, Kirchhoff, Douglas, Ward, & Hammes, 2005). Participants were randomly assigned to receive RC or standard care, and RC resulted in more accurate surrogate knowledge of patient care preferences.

In this study, we examine indirectly the effectiveness of RC using a serendipitous data source: the Wisconsin Longitudinal Study (WLS). The WLS is a sample of more than 5,000 white men and women who graduated from Wisconsin high schools in 1957 and who are now in their early 70s. The 2004 wave of the WLS included a detailed series of questions about participants' formal and informal advance care planning. Thus, the WLS permits the examination of two questions about the social diffusion of RC. First, does residing in geographic proximity to health care centers offering the RC program affect the likelihood that one participates in end-of-life planning? Second, does being the friend or family member of a person who resides in close proximity to health care centers offering RC affect the likelihood that one will participate in planning? RC may have a broad reach, where

persons who receive the intervention share information about advance care planning with social network members who have not received RC directly themselves.

## Method

### Participants

The Wisconsin Longitudinal Study (WLS) began as a random sample of 10,317 men and women who graduated from Wisconsin high schools in 1957. Nearly all were born in 1939, and the graduates were surveyed at ages 18 (1957), 36 (1975), 54 (1993), and 65 (2004). Among 9,025 living graduates, 7,265 (80%) participated in a 2004 telephone survey. Most (78%) were married, and 3,890 spouses completed parallel telephone surveys. The WLS does not represent all strata of the U.S. population. All primary sample members are non-Hispanic white high school graduates. However, the sample is representative of a majority of Americans in this cohort: In 2004, 68.2% of 65- and 66-year-old American men and women were white non-Hispanic high school graduates (U.S. Census Bureau, 2004).

### Procedure

In 2004, a randomly selected 70% subsample of graduates was administered a series of questions about end-of-life planning. (Topical modules were given to random subsamples to reduce the overall length of the survey.) If the graduate received the module, his or her spouse also received the module. Additionally, *all* graduates living in health referral region 448 in 1993 and/or 2004 were administered the end-of-life module (Dartmouth Institute for Health Policy and Clinical Practice, 2010). A health referral region, as defined by the Dartmouth Atlas of Health Care, is a market for tertiary care that contains at least one major hospital and a minimum population of 120,000 persons. Health referral region 448 encompasses the geographic area served by the Gundersen Lutheran Health System and Franciscan Skemp Healthcare, the two original sites of the RC programs. Our analytic sample includes the 5,106 graduates who completed the end-of-life module, 2,750 of whom are married to spouses who also completed the module.

### Dependent Variables

RC focuses on comprehensive advance care planning rather than the completion of a single component, such as a living will. Therefore, we examine a range of outcomes, each capturing a distinct aspect of advance care planning. We consider five dependent variables: executing a living will, appointing a durable power of attorney for health care (DPAHC), holding discussions about treatment preferences, knowing one's spouse's preferences for treatment of cognitive impairment at the end of life, and knowing one's spouse's preferences for treatment of physical pain at the end of life.

**Living will**—Participants were asked “Do you have a living will or advance directive? These are written instructions about the type of medical treatment you would want to receive if you were unconscious or somehow unable to communicate.” Responses were coded 0 (*does not have living will*) or 1 (*has living will*).

**DPAHC**—Participants were asked “Have you made any legal arrangements for someone to make decisions about your medical care if you become unable to make those decisions yourself? This is sometimes called a durable power of attorney for health care.” Responses were coded 0 (*does not have DPAHC*) or 1 (*has DPAHC*).

**Informal discussions**—Participants were asked whether they had “made plans about the types of medical treatment you want or don't want if you become seriously ill in the future.”

If they had, they were asked if they had discussed these plans with anyone. Responses were coded 0 (*did not hold a discussion*) or 1 (*held a discussion*).

**Spousal congruence**—Two items assessed the spouse's end-of-life treatment preferences in two hypothetical illness scenarios. The topic was introduced with the statement, “Suppose you had a serious illness today with very low chances of survival.” Then, spouses were asked, “First, what if you were mentally intact, but in severe and constant physical pain? Would you want to continue all medical treatments or stop all life-prolonging treatments? Second, what if you had minimal physical pain, but had limited ability to speak, walk, or recognize others? Would you want to continue all medical treatments or stop all life-prolonging treatments?” Two parallel items (i.e., “Suppose your spouse had...”) assessed the graduate's prediction of his or her spouse's preferences. The response options were “Continue all treatment so I could survive (staying alive is most important to me no matter what)” and “Stop all treatment to prolong my life (for me, quality of life is more important than length of life).” Some respondents volunteered, “I don't know.”

These items were cross-classified to create a binary dependent variable for each scenario (i.e., pain and cognitive impairment). If both spouse and graduate reported that the spouse would prefer to continue treatment or to stop treatment in the scenario, they were coded 1 (*congruent*). All other combinations of reports (including cases in which both partners responded, “I don't know”) were coded 0 (*not congruent*).

### Independent Variables

**Access to Respecting Choices**—The key independent variable is potential access to the RC program. We propose that residence in health referral region 448 indicates potential access to RC. Most Americans seek regular and specialty care in close proximity to their homes. Analysis of data from 2001 U.S. National Household Travel Survey found that the average distance traveled for a health care visit was 10.2 miles (Probst, Laditka, Wang, & Johnson, 2007). Thus, it is plausible that persons who reside in a particular health referral region will also seek care there.

We created three mutually exclusive categories of exposure to the RC program: residential access, social access, and no access. Participants who lived in health referral region 448 in 1993 and/or 2004 are presumed to have potential *residential* access; their local health facilities offer RC should they wish to participate. Participants who attended one of the six high schools in La Crosse, WI in 1957 and/or had at least one sibling who resided in health referral region 448 in 1993 and/or 2004 – but did not live there themselves at either time – are coded as having potential *social* access: They could learn about end-of-life planning through social ties who participated directly in the program. Participants who did not live in health referral region 448 in either 1993 or 2004 and had no observed social contacts there are coded as having *no known* access to the RC program.

### Analytic Plan

Binary logistic regression models were estimated to evaluate the effects of potential exposure to RC on each of the five dichotomous outcome measures. That is, the tests evaluated whether the odds that a person engaged in each planning activity or could accurately name their spouse's treatment preferences differed significantly across the three categories of exposure, with “*no known access*” serving as the reference category. Sociodemographic characteristics (gender, marital status, parental status, and educational attainment), physical health (self-rated health, recent hospital admission, perceived life expectancy, and presence of serious chronic illness), experiences with end-of-life issues (death of a parent or spouse), and values and attitudes (religious affiliation, death avoidance,

and control over health decisions) were controlled, because these factors are associated with the likelihood of end-of-life planning (Carr & Khodyakov, 2007) and knowledge of one's spouse's preferences (Moorman & Carr, 2008).

Seventy-eight percent of participants provided complete data on the control variables. To address concerns about missing values, multiple imputation by chained equations was conducted on the control variables using the Stata macro written by Royston (2005). The final estimates presented for multivariate analyses are the result of combining findings from across the five imputed datasets using the Stata macro “micombine” written by Royston. Estimates obtained through listwise deletion did not vary appreciably from the estimates presented here. Regression results obtained through listwise deletion are available upon request.

## Results

### Descriptive statistics

Descriptive statistics for all variables are presented in Table 1. Two hundred participants (4%) had potential residential access to RC, 104 participants (2%) had potential social access, and 4,802 participants (94%) had no known access. Slightly over half (54%) of WLS participants were women, and most (78%) were currently married. Nearly all (94%) were parents, with the typical participant having 3 or 4 children. Over half (56%) had no education past high school. Health was good; 10% rated their health as fair or poor, 12% had been admitted to the hospital in the past year, and 25% had had a serious illness (cancer, heart disease, or stroke). Over a quarter (28%) had experienced the death of a parent or spouse in the past ten years. Nearly half (45%) were of a mainline Protestant religious faith, and 38% were Roman Catholic. There were few statistically significant differences among the three access groups. Most notably, those with potential social exposure and no known exposure had higher educational attainment than those with potential residential exposure.

Rates of planning were high: 55% of participants had a living will, and 52% had appointed a DPAHC. Three-quarters had discussed their preferences with someone. Among married participants, 76% knew their spouse's care preferences in the hypothetical cognitive impairment scenario, and 61% knew their spouse's preferences for care in the hypothetical physical pain scenario.

### Multivariate analyses

Logistic regression models are presented in Table 2. Persons who had potential residential exposure to RC were significantly *less* likely than those with no known exposure to have appointed a DPAHC or to have executed a living will. We found no evidence of suppression effects as the unadjusted results did not change appreciably when we controlled for sociodemographic or attitudinal characteristics. We found no evidence for social diffusion; persons who had potential social exposure did not differ significantly from persons with no known exposure, with respect to any of the five outcome measures.

### Supplementary analyses

We conducted supplementary analyses to assess whether exposure effects were detected only for those subgroups who had the greatest need for end-of-life planning – those in poorest health. We re-estimated logistic regression models for each of the five outcomes, limiting the analytic sample to the 1,717 participants who rated their physical health as fair or poor, or had at least one overnight hospital stay in the last year, or had been diagnosed with a serious illness (cancer, heart disease, and/or stroke). In this subsample, only 77 had potential residential exposure to RC, and only 33 had potential social exposure, so the



statistical power to detect significant effects was weak. Nonetheless, as in the full sample, ill members of the residential exposure group were significantly less likely than ill persons in the other groups to have appointed a DPAHC. As with the full sample, we found no statistically significant effect of social exposure on any of the five outcomes. Thus, even when considering this more specific subsample who were more likely to have considered end-of-life issues and to have sought treatment at one of the RC cites (or neighboring health care sites), there is still no evidence for social diffusion.

## Discussion

The WLS data provided us a novel opportunity to assess whether the effectiveness of Respecting Choices®, a LaCrosse, Wisconsin-based end-of-life planning program, would diffuse among a cohort of white high-school graduates in their mid-60s. Overall rates of planning were high in our sample, consistent with levels found in other large national samples of older adults born in the late 1930s (Silveira et al., 2010). The key finding was that persons who resided in the La Crosse region had significantly *lower* odds of performing the two formal aspects of advance care planning; having a living will (OR = 0.71) and appointing a DPAHC (OR = 0.64). Further, we did not find evidence for diffusion of effects through social networks; persons in the social exposure group were not significantly different from those in the no exposure group.

## Potential Explanations

It is surprising that persons who resided in the potential residential exposure regions had significantly *lower* rates of advance care planning than their counterparts in either the social exposure or no exposure categories. We offer two speculative interpretations of this finding. First, persons who reside in or around the LaCrosse region may well be aware of the RC intervention, but may perceive that the program is not targeted at them. Rather, they may view the program as best-suited for older adults at the end of life, rather than young-old healthy persons. In their assessment of RC in LaCrosse, Hammes and Rooney (1998) found the median age of death was 80 years of age and the median time before death for an advance directive to be signed was 1.2 years. Thus, relatively healthy persons in their mid-60s may view themselves as not the appropriate target for the educational intervention, instead believing that they have plenty of time in the future to make such preparations. Similarly, health care providers who have limited time to spend with each patient may hold the most in-depth and interactive conversations with those whom they perceive to be most in need of such information (e.g., Barclay & Maher, 2010).

Second, persons residing in this area may be particularly susceptible to psychological reactance. Psychological reactance is an aversive emotional response to regulations or impositions that impinge on one's freedom and perceived autonomy (Brehm & Brehm, 1981; Wicklund, 1974). Researchers have found that this reaction is especially common when individuals feel obliged to adopt a particular opinion or engage in a specific behavior. We suspect this reaction may be particularly strong when individuals are forced to confront a reality that is potentially difficult, distressing, or identity-threatening: one's own mortality (Neimeyer, 2005).

Reactance has been found to provoke behaviors that oppose the rules or courses of action that were imposed and encouraged (Buller, Borland, & Burgoon, 1998). For example, interventions to reduce alcohol consumption tend to be less effective if clients manifest signs of reactance (Miller, Lane, Deatrick, Young, & Potts, 2007). It is possible that even persons who did not have direct contact with the RC may still have developed an aversive response to such programs, given the very high level of visibility and publicity RC enjoyed, including news reports claiming that La Crosse, Wisconsin is the “best place to die” (Shapiro, 2009).

We acknowledge that our interpretation is highly speculative; still, we encourage researchers to evaluate whether advance planning programs are effective (or potentially counter-productive) when delivered to an audience who may not yet be emotionally or cognitively ready to engage in such behaviors.

The second main finding of our study is that we find no evidence of a diffusion effect. However, please note that we have no evidence against a diffusion effect: Due to the possibility of Type II statistical error (a false negative), we cannot conclude with any certainty that a diffusion effect does not occur. We do offer three speculative explanations for the similarity between those with social and no potential exposure. First, our sample is limited to a “young-old” group of persons ages 64–65; this sample may not yet be old enough to be thinking about, preparing for, and discussing their end-of-life treatment options. As noted above, the median age of death was 80 for participants in the RC program (Hammes & Rooney, 1998). Older age, even within the population aged 65 and older, is positively associated with having planned for the end of life (Black, Reynolds, & Osman, 2008). For example, rates of advance directive use were roughly 70 percent among samples of recently deceased persons who died in old age of non-traumatic or non-sudden causes (e.g., Teno et al., 2007). Persons exposed to RC or other end-of-life planning interventions may be more likely than their unexposed peers to complete planning when their concerns about such issues are imminent. For persons in their early 60s, the effects of the intervention may not emerge until many years into the future.

Second, unlike health behaviors such as smoking or drinking alcohol, end-of-life planning is neither visible nor performed in public. Individuals may model the dining habits or exercise regimens of their significant others, because these activities are part of everyday life. By contrast, conversations about end-of-life issues and particularly one's own terminal illness are more private activities, which may occur among close significant others – if at all. For diffusion effects to occur, individuals would need to tell other members of their social network about their advance care planning or preferences; however, research shows persuasively that even close relatives and DPAHCs often do not know the wishes of older adults (Shalowitz, Garrett-Mayer, & Wendler, 2006). Death denial is often cited as an obstacle to advance care planning and also to open discussion about death, especially in the United States (Zimmermann, 2007). The degree to which death denial actually exists is open for debate, but the possibility exists that lack of conversation about end-of-life prevents knowledge about planning from diffusing through social networks.

Third, an intervention may require an explicit emotional or social networking element in order to induce diffusion. Public health campaigns that induce modest levels of fear and that provide a clear-cut plan for taking steps to allay these fears are more effective than campaigns that do not; perhaps these emotional calls to action also serve as calls to influence others (Witte & Allen, 2000). Change occurs in some health behaviors (e.g., condom use) when interventions involve people who are trained to deliver health messages to their peers (Webel, Okonsky, Trompeta, & Holzemer, 2010). That is, for some practices, skilled, trained educators may be more effective at transmitting a message than a peer or significant other who lacks expertise. This may be particularly true in the case of advance care planning, which may require some medical or legal knowledge, or access to a health or legal professional to assist with the completion of relevant documents (Sabatino, 2010; Wright et al., 2008).

## Limitations

Our analysis has a number of limitations that may weaken the persuasiveness of the findings. First, it is possible that individuals categorized in the “no known exposure” or “potential social exposure” categories were exposed to RC or some other advance care



planning intervention, as these programs have become increasingly common since the late 1990s. National programs such as National Health Care Decisions Day (NHCDD; ANA 2010) and media attention in the wake of the Terri Schaivo controversy have been found to enhance awareness of advance care planning among Americans (Ditto et al., 2006). Overall rates of planning in the WLS were quite high, suggesting this possibility.

Second, the WLS sample represents a single birth cohort of white high school graduates, thus we cannot ascertain whether hypothesized diffusion effects would operate differently among persons with lower levels of education, non-whites, or persons belonging to different birth cohorts. Third, the WLS did not obtain direct information on whether a participant received the RC intervention or knew someone who had. Rather, the study investigators took advantage of a unique data source to assess whether those who resided in the intervention region during the time period following the intervention had elevated levels of end-of-life planning, compared to their counterparts residing elsewhere.

Finally, our analysis focused on single-item behavioral indicators of whether one engaged in planning or had knowledge of their spouse's preference. We did not explore the processes through which one learned about or initiated advance care planning. Qualitative approaches, including open-ended interviews and focus groups, may be particularly effective for revealing the ways that adults learn about advance care planning, from whom they learn, and the extent to which others' behaviors and experiences shape one's own practices and preferences.

## Conclusions

Despite these limitations, our analysis is the first we know of to explore the potentially far-reaching effects of a site-specific educational intervention targeting advance care planning. Further, our analytic sample has several strengths; a large, nonclinical sample; extensive information about participants' sociodemographic characteristics, physical health, experiences with end-of-life issues, and values and attitudes; and information about social networks through which health information could diffuse.

Although we find no evidence for (or against) a possible diffusion of the knowledge and information transmitted to patients during an individually-targeted advance care planning intervention, we remain optimistic about the potential reach and impact of such interventions. Recent studies have found that decedents who had participated in end-of-life planning had significantly lower Medicare costs in the last six months of life, were more likely to have had their wishes followed, and had family members who suffered less stress and anxiety than decedents who had not planned (Detering, Hancock, Reade, & Silvester, 2010; Hamlet et al., 2010). If similar financial, practical, and psychological benefits could be achieved for network members of recent decedents, then such interventions would have particular appeal for policy makers. We hope our research serves as a springboard for future studies of the ways that health interventions may affect individuals beyond the intended targets, and identifying conditions under which such interventions are counterproductive, or rejected by potential targets.

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## References

- Abraham C, Michie S. A taxonomy of behavior change techniques used in interventions. *Health Psychology*. 2008; 27(3):379–387. doi: 10.1037/0278-6133.27.3.379. [PubMed: 18624603]
- American Nurses Association. National Health Care Decisions Day: Your decisions matter. 2010. [homepage]. Retrieved from <http://www.nationalhealthcaredecisionsday.org/Welcome.htm>
- Ashida S, Wilkinson AV, Koehly LM. Motivation for health screening: Evaluation of social influence among Mexican American adults. *American Journal of Preventive Medicine*. 2010; 38(4):396–402. doi: 10.1016/j.amepre.2009.12.028. [PubMed: 20307808]
- Barclay S, Maher J. Having the difficult conversations about the end of life. *British Medical Journal*. 2010; 341:646–648. doi: 10.1136/bmj.c4862.
- Black K, Reynolds SL, Osman H. Factors associated with advance care planning among older adults in southwest Florida. *Journal of Applied Gerontology*. 2008; 27(1):93–109. doi: 10.1177/0733464807307773.
- Brehm, JW.; Brehm, SS. *Psychological reactance: A theory of freedom and control*. Academic Press; San Diego, CA: 1981.
- Briggs LA, Kirchoff KT, Hammes BJ, Song M, Colvin ER. Patient-centered advance care planning in special patient populations: A pilot study. *Journal of Professional Nursing*. 2004; 20(1):47–58. doi: 10.1016/j.profnurs.2003.12.001. [PubMed: 15011193]
- Buller DB, Borland R, Burgoon M. Impact of behavioural intention on effectiveness of message features: Evidence from the family sun safety project. *Human Communication Research*. 1998; 24:433–453.
- Carr D, Khodyakov D. End-of-life health care planning among young-old adults: An assessment of psychosocial influences. *Journals of Gerontology: Social Sciences*. 2007; 62B:S135–S141.
- Christakis NA, Fowler JH. The spread of obesity in a large social network over 32 years. *New England Journal of Medicine*. 2007; 357(4):370–379. [PubMed: 17652652]
- Christakis NA, Fowler JH. The collective dynamics of smoking in a large social network. *New England Journal of Medicine*. 2008; 358(21):2249–2258. [PubMed: 18499567]
- Cohen-Cole E, Fletcher JM. Is obesity contagious? Social networks vs. environmental factors in the obesity epidemic. *Journal of Health Economics*. 2008; 27:1382–1387. doi: 10.1016/j.jhealeco.2008.04.005. [PubMed: 18571258]
- The Dartmouth Institute for Health Policy and Clinical Practice. *The Dartmouth Atlas of Health Care*. 2010. [online database]. Retrieved from <http://www.dartmouthatlas.org>.
- Degenholtz HB, Rhee Y, Arnold RM. Brief communication: The relationship between having a living will and dying in place. *Annals of Internal Medicine*. 2004; 141(2):113–117. [PubMed: 15262666]
- de Klepper M, Sleenbos E, van de Bunt G, Agneessens F. Similarity in friendship networks: Selection or influence? The effect of constraining contexts and non-visible individual attributes. *Social Networks*. 2010; 32:82–90. doi: 10.1016/j.socnet.2009.06.003.
- Detering KM, Hancock AD, Reade MC, Silvester W. The impact of advance care planning on end of life care in elderly patients: Randomised controlled trial. *BMJ (Clinical Research Ed.)*. 2010; 340:c1345. doi: 10.1136/bmj.c1345.
- Ditto PH, Hawkins NA, Pizzaro DA. Imagining the end of life: on the psychology of advance decision making. *Motivation and Emotion*. 2006; 27(2):481–502. doi: 10.1007/s11031-006-9017-x.
- Field, M.; Cassel, C. *Approaching death*. National Academy Press; Washington, D.C.: 1997.
- Gorin AA, Wing RR, Fava JL, Jakicic JM, Jeffery R, West DS, the Look AHEAD Home Environment Research Group. Weight loss treatment influences untreated spouses and the home environment: Evidence of a ripple effect. *International Journal of Obesity*. 2008; 32:1678–1684. doi: 10.1038/ijo.2008.150. [PubMed: 18762804]
- Hamlet KS, Hobgood A, Hamar GB, Dobbs AC, Rula EY, Pope JE. Impact of predictive model-directed end-of-life counseling for Medicare beneficiaries. *The American Journal of Managed Care*. 2010; 16:379–384. [PubMed: 20469958]
- Hammes BJ, Rooney BL. Death and end-of-life planning in one Midwestern community. *Archives of Internal Medicine*. 1998; 158:383–390. [PubMed: 9487236]

- Hampson LA, Emanuel EJ. The prognosis for changes in end-of-life care after the Schiavo case. *Health Affairs*. 2005; 24(4):972–975. doi: 10.1377/hlthaff.24.4.972. [PubMed: 16012137]
- Hopp F. Preferences for surrogate decision makers, informal communication and advance directives among community-dwelling elders: Results from a national study. *The Gerontologist*. 2000; 40:449–57. [PubMed: 10961034]
- Kirchhoff KT, Hammes BJ, Kehl KA, Briggs LA, Brown RL. Impact of a disease-specific planning intervention on surrogate understanding of patient goals for future medical treatment. *Journal of the American Geriatrics Society*. forthcoming.
- Lambert HC, McColl MA, Gilbert J, Wong J, Murray G, Shortt SED. Factors affecting long-term care residents' decision-making processes as they formulate advance directives. *The Gerontologist*. 2005; 45:626–33. [PubMed: 16199397]
- Lewis MA, Neighbors C. Social norms approaches using descriptive drinking norms education: A review of the research on personalized normative feedback. *Journal of American College Health*. 2006; 54(4):213–218. [PubMed: 16450845]
- Malchodi CS, Oncken C, Dornelas EA, Caramanica L, Gregonis E, Curry SL. The effects of peer counseling on smoking cessation and reduction. *Obstetrics & Gynecology*. 2003; 101(3):504–510. doi: 10.1016/S0029-7844(02)03070-3. [PubMed: 12636954]
- Miller CH, Lane LT, Deatrick LM, Young AM, Potts KA. Psychological reactance and promotional health messages: The effects of controlling language, lexical concreteness, and the restoration of freedom. *Human Communication Research*. 2007; 33:219–240. doi: 10.1111/j.1468-2958.2007.00297.x.
- Moorman SM, Carr D. Spouses' effectiveness as end-of-life health care surrogates: accuracy, uncertainty, and errors of overtreatment or undertreatment. *The Gerontologist*. 2008; 48:811–19. [PubMed: 19139254]
- Neimeyer R. From death anxiety to meaning making at the end of life: recommendations for psychological assessment. *Clinical Psychology: Science and Practice*. 2005; 12:354–357. doi: 10.1093/clipsy/bpi036.
- Noel, H.; Nyhan, B. The “unfriending” problem: The consequences of homophily in friendship retention for causal estimates of social influence. 2010. [online working paper]. Retrieved from [http://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1014&context=pnconfs\\_2010](http://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1014&context=pnconfs_2010)
- Pearlman RA, Starks H, Cain KC, Cole WG. Improvements in advance care planning in the Veterans Affairs System: Results of a multifaceted intervention. *Archives of Internal Medicine*. 2005; 165:667–674. [PubMed: 15795344]
- Probst JC, Laditka SB, Wang JY, Johnson AO. Effect of residence and race on burden of travel for care: Cross-sectional analysis of the 2001 U. S. National Household Travel Survey. *BMC Health Services Research*. 2007; 7:40. doi: 10.1186/1472-6963-7-40. [PubMed: 17349050]
- Ratner E, Norlander L, McSteen K. Death at home following a targeted advance-care planning process at home: The kitchen table discussion. *Journal of the American Geriatrics Society*. 2001; 49(6): 778–781. [PubMed: 11454117]
- Rosenquist JN, Murabito J, Christakis NA, Fowler JH. The spread of alcohol consumption behavior in a large social network. *Annals of Internal Medicine*. 2010; 152(7):426–433. [PubMed: 20368648]
- Royston P. Multiple imputation of missing values: Update of ICE. *STATA Journal*. 2005; 5:527–536.
- Sabatino CP. The evolution of health care advance planning law and policy. *The Milbank Quarterly*. 2010; 88(2):211–239. doi: 10.1111/j.1468-0009.2010.00596.x. [PubMed: 20579283]
- Shalowitz DI, Garrett-Mayer E, Wendler D. The accuracy of surrogate decision-makers: A systematic review. *Archives of Internal Medicine*. 2006; 166:493–497. [PubMed: 16534034]
- Shapiro, Joseph. Why this Wisconsin city is the best place to die. National Public Radio. Nov 16.2009 2009.
- Silveira MJ, Kim SY, Langa KM. Advance directives and outcomes of surrogate decision making before death. *The New England Journal of Medicine*. 2010; 362(13):1211–1218. [PubMed: 20357283]
- Song M, Kirchhoff KT, Douglas J, Ward S, Hammes BJ. A randomized, controlled trial to improve advance care planning among patients undergoing cardiac surgery. *Medical Care*. 2005; 43(10): 1049–1062. [PubMed: 16166875]

- Teno JM, Gruneir A, Schwartz Z, Nanda A, Wetle T. Association between advance directives and quality of end-of-life care: A national study. *Journal of the American Geriatrics Society*. 2007; 55(2):189–194. doi: 10.1111/j.1532-5415.2007.01045.x. [PubMed: 17302654]
- U.S. Census Bureau. Educational Attainment of the Population 15 Years and Over, by Single Years of Age, Sex, Race, and Hispanic Origin. U.S. Government Printing Office; Washington, DC: 2004.
- U.S. Department of Health and Human Services. Advance directives and advance care planning: Report to Congress. 2008. [online report]. Retrieved from <http://aspe.hhs.gov/daltcp/reports/2008/ADCongRpt.htm>
- Valente, TW. Evaluating health promotion programs. Oxford University Press; New York, NY: 2002.
- Webel AR, Okonsky J, Trompeta J, Holzemer WL. A systematic review of the effectiveness of peer-based interventions on health related behaviors in adults. *American Journal of Public Health*. 2010; 100(2):247–253. doi: 10.2105/AJPH.2008.149419. [PubMed: 20019321]
- Wicklund, RA. Freedom and reactance. Lawrence Erlbaum; Potomac, MD: 1974.
- Witte K, Allen M. A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education and Behavior*. 2000; 27(5):591–615. doi: 10.1177/109019810002700506. [PubMed: 11009129]
- Wright AA, Zhang B, Ray A, Mack JW, Trice E, Balboni T, Prigerson HG. Associations between end-of-life discussions, patient mental health, medical care near death, and caregiver bereavement adjustment. *The Journal of the American Medical Association*. 2008; 300(14):1665–1673. doi: 10.1001/jama.300.14.1665.
- Zhang B, Wright AA, Huskamp HA, Nilsson ME, Maciejewski ML, Earle CC, Prigerson HG. Health care costs in the last week of life: Associations with end-of-life conversations. *Archives of Internal Medicine*. 2009; 169:480–488. doi: 10.1001/archinternmed.2008.587. [PubMed: 19273778]
- Zimmerman RS, Gerace TA, Smith J, Ben-ezra J. The effects of a worksite health promotion program on the wives of fire fighters. *Social Science and Medicine*. 1988; 26:537–543. [PubMed: 3353762]
- Zimmermann C. Death denial: Obstacle or instrument for palliative care? *Sociology of Health and Illness*. 2007; 29(2):297–314. doi: 10.1111/j.1467-9566.2007.0049. [PubMed: 17381818]

**Table 1**  
Distribution of Measures across Categories of Exposure to Respecting Choices®

	Total Sample			Residential Exposure <sup>a</sup>		Social Exposure <sup>b</sup>		No Exposure <sup>c</sup>		F statistic <i>df</i> = 2)	Significant subgroup differences
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)				
Has living will	.55	.46	.57	.55					3.18*		ac
Appointed DPAHC	.52	.41	.58	.53					5.63**		ab, ac
Held discussion	.74	.70	.72	.74					.65		
Spousal congruence, cognitive impairment <sup>†</sup>	.76	.79	.72	.76					0.49		
Spousal congruence, pain <sup>†</sup>	.61	.60	.57	.61					0.24		
<i>Sociodemographic Characteristics</i>											
Female	.54	.54	.50	.54					0.32		
Never married	.04	.05	.02	.04					1.01		
Formerly married	.18	.21	.13	.18					1.23		
Has 1–2 children	.33	.28	.41	.33					2.86		
Has 3–4 children	.44	.47	.37	.44					1.66		
Has 5 or more children	.17	.16	.16	.17					0.06		
Education: 13–15 years	.17	.10	.13	.17					3.45*		ac
Education: 16+ years	.27	.19	.38	.27					6.97***		ab, ac, bc

	Total Sample		Residential Exposure <sup>a</sup>		Social Exposure <sup>b</sup>		No Exposure <sup>c</sup>		F statistic $df = 2$	Significant subgroup differences
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)				
<i>Physical Health</i>										
Self-rated health (0 = excellent/very good/good; 1 = fair/poor)	.10	.14	.06	.10					3.23*	ab
Hospital admission in past year (0 = no; 1 = yes)	.12	.14	.13	.12					0.68	
Perceived chances of living another 20 years (0 = no chance; 10 = certain)	5.84 (2.73)	5.51 (3.04)	5.91 (2.69)	5.86 (2.71)					1.38	
Has serious illness (cancer, heart problem, and/or stroke)	.25	.27	.21	.25					0.53	
<i>Experience with End-of-Life Issues</i>										
Parent or spouse died in past 10 years, no/little pain in final weeks	.17	.14	.19	.17					0.52	
Parent or spouse died in past 10 years, moderate/severe pain in final weeks	.11	.12	.16	.10					1.90	
<i>Values and Attitudes</i>										
Mainline Protestant	.45	.56	.49	.45					4.80**	ac
Conservative Protestant	.05	.04	.06	.05					0.51	
Other religious affiliation	.04	.02	.02	.04					1.65	
No religious affiliation	.08	.07	.14	.08					2.78	
Death avoidance scale (1 = not avoidant; 6 = highly avoidant)	3.15 (1.25)	3.11 (1.29)	2.84 (1.19)	3.16 (1.25)					3.19*	bc
Physician control over health (1 = self control; 5 = physician control)	2.14 (0.74)	2.29 (0.72)	2.09 (0.67)	2.14 (0.74)					4.03*	ac



	Total Sample		Residential Exposure <sup>a</sup>		Social Exposure <sup>b</sup>		No Exposure <sup>c</sup>		<i>F</i> statistic ( <i>df</i> = 2)	Significant subgroup differences
	Mean ( <i>SD</i> )	<i>N</i>	Mean ( <i>SD</i> )	<i>N</i>	Mean ( <i>SD</i> )	<i>N</i>	Mean ( <i>SD</i> )	<i>N</i>		
<i>N</i>		5,106	198	104	104	4,793				

*Note.* Means and standard deviations are presented for continuous measures; proportions are shown for categorical measures. One-way ANOVAs were used to assess mean differences; post-hoc comparisons were conducted to evaluate which subgroup differences were statistically significant. Significant subgroup differences are denoted as *ab*: residential vs. social exposure; *ac*: residential vs. no exposure; *bc*: social vs. no exposure.

<sup>†</sup> Computed only for currently married respondents whose spouses participated in the survey.

\* *p* .05,

\*\* *p* .01,

\*\*\* *p* .001

**Table 2**

Binary Logistic Regressions Predicting End-of-Life Planning Outcomes

	Living Will	DPAHC	Informal Discussion	Spousal Congruence, Cognitive Impairment	Spousal Congruence, Pain
	Odds Ratio (95% C.I.)	Odds Ratio (95% C.I.)	Odds Ratio (95% C.I.)	Odds Ratio (95% C.I.)	Odds Ratio (95% C.I.)
Residential exposure to Respecting Choices	0.71* (0.53–0.96)	0.64** (0.48–0.86)	0.89 (0.64–1.23)	1.17 (0.70–1.97)	0.94 (0.61–1.45)
Social exposure to Respecting Choices	0.96 (0.64–1.42)	1.15 (0.77–1.73)	0.80 (0.51–1.25)	0.76 (0.44–1.34)	0.81 (0.49–1.33)
$\chi^2$ -df	180.24; 22	159.25; 22	258.86; 22	54.72; 20	21.70; 20
N	4,945	4,954	4,965	2,722	2,721

Note. Participants in the reference category had no access to RC. Regressions control for sociodemographic characteristics (gender, marital status, parental status, and educational attainment), physical health (self-rated health, recent hospital admission, perceived life expectancy, and presence of serious chronic illness), experiences with end-of-life issues (death of a parent or spouse), and values and attitudes (religious affiliation, death avoidance, and control over health decisions). Spousal congruence regressions include only currently married respondents whose spouses participated in the survey.

\*  $p$  .05,

\*\*  $p$  .01,

\*\*\*  $p$  .001,