Projection in Surrogate Decisions About Life-Sustaining Medical Treatments

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To honor the wishes of an incapacitated patient, surrogate decision makers must predict the treatment decisions patients would make for themselves if able. Social psychological research, however, suggests that surrogates' own treatment preferences may influence their predictions of others' preferences. In 2 studies (1 involving 60 college student surrogates and a parent, the other involving 361 elderly outpatients and their chosen surrogate decision maker), surrogates predicted whether a close other would want life-sustaining treatment in hypothetical end-of-life scenarios and stated their own treatment preferences in the same scenarios. Surrogate predictions more closely resembled surrogates' own treatment wishes than they did the wishes of the individual they were trying to predict. Although the majority of prediction errors reflected inaccurate use of surrogates' own treatment preferences, projection was also found to result in accurate prediction more often than counterprojective predictions. The rationality and accuracy of projection in surrogate decision making is discussed.

Key words: advance directives, projection, end-of-life decision making

Near the end of life, people are often too sick to make medical decisions for themselves, requiring a surrogate decision maker.
the wisdom of current policy and law advocating the use of advance directives, the finding that surrogate decision makers have difficulty predicting others' treatment preferences even when supplied with substantial amounts of apparently relevant information suggests that additional factors may be operating to bias surrogates' substituted judgments.

Self-Based Biases in Surrogate Decision Making

Adhering to the substituted judgment standard requires surrogates to recognize the patient's right to receive only those treatments that the patient wants, regardless of surrogates' beliefs about what will best promote the patient's well-being (the so-called "best interest standard") or the understandable desire to provide every possible treatment for their loved one (Baergen, 1995). Social psychological research, however, has long reported the difficulty people have in separating their own traits, attitudes, and wishes from their perceptions of others (e.g., Heider, 1958; Holmes, 1968; Ross, Greene, & House, 1977). Specifically, one of the most well-replicated findings in the social perception literature is the tendency for people to overestimate the extent to which their own opinions and behavioral choices are shared by others (Krueger, 1998; Marks & Miller, 1987). This phenomenon has been referred to by many names—the false consensus effect (Marks & Miller, 1987; Ross et al., 1977), assumed similarity (Cronbach, 1955; Funder, Kolar, & Blackman, 1995), attributive or social projection (Holmes, 1968; Krueger & Clement, 1997)—and has been posited to result from a number of different cognitive and motivational forces (Krueger & Clement, 1997). At an empirical level, however, the phenomenon is simple and remarkably robust: People tend to "project" their own characteristics onto others, assuming that other people are likely to behave and believe as they themselves do.

The generality of projection across judgment domains suggests that surrogate decisions about life-sustaining treatments may show a similar tendency. Three studies have provided preliminary support for this prediction. Karel and Gatz (1996) found that adult children tended to cite the same factors as important (e.g., pain, mental capacity) when making treatment decisions for their parents as they previously had stated would be important in making their own medical decisions. Two problems with the study from the current perspective are that (a) children rated the factors they themselves would consider important in making decisions for an unspecified parent rather than predicting the factors their parent would consider important (a true substituted judgment task) and (b) children rated the importance of general factors in decision making rather than specific predictions about their parents' life-sustaining treatment preferences.

Neither of these problems is shared by a pair of studies by Schneiderman and colleagues (Schneiderman, Kaplan, Pearlman, & Teetzel, 1993; Schneiderman, Kaplan, Rosenberg, & Teetzel, 1997), which showed that physicians' predictions of their patients' preferences for specific life-sustaining treatments corresponded more closely to the physician's own preferences than they did with the actual preferences of the patients they were trying to predict. The Schneiderman et al. (1993, 1997) studies, however, leave two important issues unanswered. First, the fact that physicians demonstrate a projection bias does not mean that family members, with their longer and richer relationship with the patient, will show a similar tendency. Second, an issue that has not been well addressed in past research concerns the accuracy of projection as a strategy in surrogate decision making. Although it is tempting to assume that projection will always compromise the accuracy of substituted judgment, projection is neither entirely irrational nor necessarily detrimental to accurate judgment. In the absence of specific knowledge of the values or preferences of another, a reasonable default strategy is to use one's own preferences as a prediction guide (Dawes, 1990; Funder et al., 1995; Hoch, 1987). Moreover, because individuals often have trouble identifying and using relevant predictive information, projection can improve the accuracy of predictions in some instances (Hoch, 1987). This distinction between the psychological process of projection and its judgmental outcome (e.g., accurate or inaccurate prediction) becomes crucial when research on projection is imported to a context like end-of-life medical decision making, in which inaccurate interpersonal predictions can, quite literally, have life or death consequences.

In this article we report two studies in which we examined whether surrogate decisions about life-sustaining medical treatments are influenced by surrogates' own treatment preferences. Given the wealth of evidence documenting self-based judgment biases, we suspected that surrogates would be influenced by their own treatment preferences, even when they had available to them other relevant information on which to base their treatment predictions. A secondary goal of the studies was to examine the extent to which projection bias might contribute to the well-documented inaccuracy of surrogate's life-sustaining treatment predictions. Because past research has suggested a complicated relationship between projection and interpersonal accuracy, we tried to carefully consider the extent to which projection might detract from or enhance the accuracy of surrogate medical decisions.

Study 1

Given that children are often asked to be their parents' surrogate decision makers (Hayley, Stern, Stocking, & Sachs, 1996), Study 1 examined undergraduate students making surrogate decisions for a parent. Because we were interested in whether projection would occur even when surrogates had relevant information on which to base their treatment predictions, we had students and parents engage in a discussion of end-of-life issues prior to the prediction task. Finally, to more fully examine how the availability of relevant predictive information would affect projection, we manipulated the length of time between the discussion of parents' life-sustaining treatment preferences and the prediction task, suspecting that the greater the delay between discussion and prediction, the more pronounced projection would be.

Method

Participants. Participants were 60 undergraduate students (mean age = 19.8 years, range = 18–33 years) who volunteered to participate in exchange for class credit, and a parent of each (mean age = 46.8 years, range = 35–58 years). One student discontinued the interview because of emotional upset, and another student's data was dropped from analyses because of a learning disability. The majority of the dyads were composed of mothers and daughters (n = 38), followed by mother–son pairs (n = 9), father–daughter pairs (n = 7), and father–son pairs (n = 6). Interviews were conducted in a small university seminar room.

Discussion of parents' treatment preferences. Students and parents engaged in a structured discussion of the parents' life-sustaining treatment
preferences. Using an advance directive (the Health Care Directive; Emanuel, 1991) as a focus for discussion, we read six end-of-life scenarios to parents. As parents made treatment decisions for each scenario, they described the rationale used in making their decisions and students were prompted to raise any concerns or questions they had. Generally, this process lasted 15-30 min and produced considerable discussion between students and their parents.

**Life-sustaining treatment preferences and predictions.** Following this discussion, parents and students individually completed the Life-Support Preferences/Predictions Questionnaire (LSPQ; Ditto et al., 2001). The LSPQ was constructed on the basis of an extensive review of surrogate decision-making research to include nine realistic illness scenarios chosen to vary in their severity, nature of impairment, prognosis, and level of pain, as follows: the parent’s current health, Alzheimer’s disease, emphysema, coma with no chance of recovery (coma—no chance), coma with a very slight chance of recovery (coma—slight chance), stroke with no chance of improvement (stroke—no chance), stroke with a very slight chance of improvement (stroke—slight chance), terminal colon cancer with no pain (cancer—no pain), and terminal colon cancer with pain that requires constant medication (cancer—pain).

Parents were asked to imagine themselves in each of the nine scenarios and indicate their preference for receiving each of the following four medical treatments: (a) antibiotics if pneumonia complicated the scenario, (b) cardiopulmonary resuscitation (CPR) if cardiac arrest complicated the scenario, (c) gall bladder surgery if life-threatening gall bladder infection complicated the scenario, and (d) artificial nutrition and hydration (ANH) if inability to eat and drink complicated the scenario. ANH questions were omitted from the current health scenario because of the implausibility of parents requiring ANH in their current condition. Parents indicated their treatment preferences using a 5-point Likert scale ranging from 1 (definitely don’t want) to 5 (definitely want) treatment.

Students were instructed to imagine their parent in each scenario and respond “as if your parent’s physician was asking you ‘What do you think your parent would want done in this health condition?’” Students then indicated their own treatment preferences for the same health scenarios. Students completed these tasks either immediately following the discussion, 1 week later, or 4 weeks later (n = 20 per condition).

**Data reduction.** For each set of 35 judgments (four treatments in the eight illness scenarios, three treatments in the current health scenario) we created nine scenario indices (by averaging across treatment judgments for each scenario) and an overall index (by averaging all 35 judgments; Ditto et al., 2001). We created indices using both the full 5-point scale and dichotomized scale indices collapsing “definitely want,” “probably want,” and “unsure” responses into a want treatment category, and “definitely don’t want” and “probably don’t want” into a don’t want treatment category. Following past research, (Layde et al., 1995; Seckler, Meier, Mulvihill, & Cammer Paris, 1991; Uhlmann et al., 1988; Uhlmann, Pearlman, & Cain, 1989), we categorized “unsure” responses with “want treatment” responses because in most instances the clinical default is to provide treatment unless specifically refused. Assigning a value of 1 to “want” responses and 0 to “don’t want” responses produces a proportion want index when responses are averaged within each scenario (e.g., if a parent wanted three of four treatments in a scenario her score would be .75).

**Results.**

Neither the accuracy of student predictions nor any measure of projection differed on the basis of the gender of the student, the gender composition of the dyad, or across the three delay conditions. Accordingly, all results are reported collapsed across these factors.

**Parent preferences, surrogate preferences, and surrogate predictions.** At the group level, parents and students showed similar patterns of treatment preferences across the various scenarios (see Table 1), although there was a tendency for students to want significantly more treatment than their parents in three scenarios (coma—slight chance, cancer—no pain, cancer—pain; all ps < .05). Students’ predictions showed a consistent “overtreatment” bias, with students predicting that their parents wanted treatment sig-

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**Table 1**

<table>
<thead>
<tr>
<th>Scenario index</th>
<th>Parent preferences (n = 60)</th>
<th>Student preferences (n = 60)</th>
<th>Student predictions (n = 60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Current health</td>
<td>.99</td>
<td>.04</td>
<td>.98</td>
</tr>
<tr>
<td>Alzheimer’s disease</td>
<td>.63&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.41</td>
<td>.67&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Emphysema</td>
<td>.73&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.36</td>
<td>.80&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Coma—no chance</td>
<td>.17&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.30</td>
<td>.21&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Coma—slight chance</td>
<td>.42&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.42</td>
<td>.57&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Stroke—no chance</td>
<td>.50</td>
<td>.39</td>
<td>.45</td>
</tr>
<tr>
<td>Stroke—slight chance</td>
<td>.63&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.41</td>
<td>.64</td>
</tr>
<tr>
<td>Cancer—no pain</td>
<td>.48&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.40</td>
<td>.73&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cancer—pain</td>
<td>.30&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.38</td>
<td>.45&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Overall scenarios</td>
<td>.53&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.25</td>
<td>.61&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

*Note.* For all responses, means reflect the proportion of treatments wanted (0 = don’t want treatment, 1 = want treatment) averaged across treatments within scenarios. Different subscripts indicate that means within rows are significantly different at p < .05.

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1 Cronbach’s alphas for the scenario indices were all greater than .70, with the exception of the current health index, which ranged from .33 to .59. The low alphas for current health are likely an artifact of the lack of variance in individual variables as almost no participants refused treatment or predicted refusal of treatment in the current health scenario. Analyses using indices collapsing across treatment (e.g., CPR) produced results identical to those reported.
sificantly more often than they did in six of nine scenarios and overall (ps < .05).

**Predictive accuracy, projection, and parent–student agreement.** Student predictions were defined as “accurate” if for a given treatment decision the student predicted the same dichotomized response as his or her parent. This definition operationalizes predictive accuracy in the most clinically meaningful way because a surrogate’s ability to discern the strength of a patient’s treatment preference (e.g., between “probably want” and “definitely want”) is less relevant than their ability to make the general distinction between the preference to receive or forgo a particular treatment. Proportion accurate indices (analogous to the proportion want indices) were calculated for each scenario and over all 35 judgments.²

Consistent with past research, agreement between parents’ preferences and surrogates’ predictions was generally modest (M = .64), despite having recently engaged in a discussion about their parents’ end-of-life wishes (see Table 2). Although students were able to predict their parents’ preferences for treatment in the current health scenario quite well (M = .99), predictive accuracy in the eight illness scenarios never exceeded .70 and for five scenarios was under .60.

To examine the evidence for projection, we next computed the proportion agreement between students’ predictions and their own preferences on the basis of the dichotomized scale scores. As can be seen in Table 2, there was considerable agreement between students’ predictions and their own treatment preferences (Ms across scenarios ranged from .70 to .99, overall M = .78). Agreement between students’ predictions and their own preferences was higher than the agreement between students’ predictions and their parents’ preferences (i.e., the accuracy of students’ predictions) for every scenario, with the exception of current health (all ps < .05).

Finally, there was only moderate agreement between the students’ and parents’ treatment preferences (overall M = .64). With the exception of the current health and coma-no chance scenarios, the actual similarity between students’ and parents’ preferences was lower than the agreement between students’ predictions and their own treatment preferences (all ps < .05).

**Analysis of accuracy.** The fact that the agreement between students’ predictions and their own preferences (projection) was greater than both the agreement between students’ preferences and parents’ preferences (accuracy) and the agreement between students’ and parents’ preferences (actual similarity) implies that many of the prediction errors made by students were errors of projection. To examine this point, we conducted nine hierarchical regression analyses (using full scale score indices) (see Table 3). Using students’ predictions as the criterion variable, we first entered the parents’ treatment preferences to control for accurate decisions by the students. Reflective of the generally low level of surrogate accuracy, parents’ treatment preferences never accounted for a significant proportion of the variance in students’ predictions (R² ranged from .00 to .12). We next entered student preferences into the regression. Students’ own preferences predicted their surrogate decisions in each of the nine scenarios (ΔR² ranged from .17 to .60), indicating that after controlling for accurate decisions, students’ own treatment preferences were still a significant predictor of their predictions.

As a second way to address this issue, Table 4 presents the mean number of prediction errors made across all 35 treatment judgments categorized by the student’s preference for that treatment (want vs. don’t want) and the student’s prediction for that treatment (want vs. don’t want). A 2 × 2 repeated measures analysis of variance on these data reveals that student prediction errors fall into two main categories. First, a main effect for prediction, F(1, 59) = 17.66, p < .001, reveals that a greater number of errors occurred when students predicted that their parents wanted treat-

### Table 2

<table>
<thead>
<tr>
<th>Scenario index</th>
<th>Parent preferences and student predictions (n = 60)</th>
<th>Student preferences and student predictions (n = 60)</th>
<th>Parent preferences and student predictions (n = 60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current health</td>
<td>.99 .06</td>
<td>.99 .06</td>
<td>.98 .08</td>
</tr>
<tr>
<td>Alzheimer’s disease</td>
<td>.63 a .33</td>
<td>.75 b .33</td>
<td>.61 a .36</td>
</tr>
<tr>
<td>Emphysema</td>
<td>.69 a .36</td>
<td>.86 a .20</td>
<td>.67 a .33</td>
</tr>
<tr>
<td>Coma-no chance</td>
<td>.68 a .36</td>
<td>.80 a .28</td>
<td>.76 a .31</td>
</tr>
<tr>
<td>Coma–slight chance</td>
<td>.54 a .40</td>
<td>.70 a .35</td>
<td>.57 a .37</td>
</tr>
<tr>
<td>Stroke–no chance</td>
<td>.58 a .37</td>
<td>.74 a .35</td>
<td>.53 a .36</td>
</tr>
<tr>
<td>Stroke–slight chance</td>
<td>.56 a .38</td>
<td>.73 a .34</td>
<td>.57 a .37</td>
</tr>
<tr>
<td>Cancer-no pain</td>
<td>.56 a .35</td>
<td>.80 a .26</td>
<td>.57 a .32</td>
</tr>
<tr>
<td>Cancer–pain</td>
<td>.59 a .39</td>
<td>.73 a .34</td>
<td>.59 a .36</td>
</tr>
<tr>
<td>Overall scenarios</td>
<td>.64 a .17</td>
<td>.78 a .13</td>
<td>.64 a .16</td>
</tr>
</tbody>
</table>

**Note.** Different subscripts indicate that means within rows are significantly different at p < .05.

² All analyses reported were conducted using both full scale and dichotomized scale scores. As results were similar using both analytical strategies, we chose in most instances to report the dichotomized scale results because of their greater clinical relevance.
ment (an overtreatment error; $M = 4.45$) than when students predicted that their parents did not want treatment (an undertreatment error; $M = 1.75$). A significant Preference $\times$ Prediction interaction, $F(1, 59) = 38.44$, $p < .001$, however, suggests that a projection bias is operating simultaneously with the overtreatment bias. Students were more likely to make errors when their prediction for their parent matched their own preference. Post hoc comparisons revealed that when students predicted that their parent wanted treatment, more (overtreatment) errors occurred when students also wanted that treatment for themselves ($M = 6.20$) than when students did not want that treatment for themselves ($M = 2.70$, $p < .001$). However, when students predicted that their parent did not want treatment, more (undertreatment) errors occurred when students also did not want that treatment for themselves ($Ms = 2.48$ vs. $1.79$, $p < .01$). Although this interaction pattern clearly shows that a disproportionate number of errors made by students were errors of projection, this does not necessarily mean that projection is a relatively less accurate judgment strategy than is counterprojection. A better indicator of projection’s relative accuracy is the comparison of proportion of projective and counterprojective predictions that result in accurate surrogate judgments. In fact, when the proportion of correct-to-total predictions was calculated, projective predictions were found to have a somewhat higher probability of being correct ($M = .68$) than were counterprojective predictions ($M = .50$). This relative advantage of projection was more pronounced when students did not want the treatment in question ($Ms = .74$ vs. $.40$) than when students did want the treatment ($Ms = .67$ vs. $.59$).

**Discussion**

Study 1 yielded three key findings. First, consistent with past research (e.g., Sulmasy et al., 1998), we found that surrogates had considerable difficulty predicting accurately the treatment preferences of a close relative. Despite having talked in depth with their parents about end-of-life issues (in some cases only minutes before the prediction task), students correctly predicted their parents’ desire for life-sustaining treatment in only about 6 out of every 10 judgments.

Second, student predictions showed two independent sources of error. Students tended to overpredict their parent’s desire for treatment, frequently predicting that their parent would want a treatment that she or he did not want to receive. Whether this bias occurs because of a genuine overestimation of parents’ desire for treatment or because of a general reluctance to make what may be perceived as a more serious undertreatment error is unclear. Student predictions also showed clear evidence of projection. Students’ treatment predictions more closely resembled their own treatment wishes than they did the wishes of their parent. This tendency was consistent across medical scenarios, independent of the gender composition of the dyad, and was equally pronounced whether students made their predictions 4 weeks or just minutes after discussing end-of-life issues with their parents. These findings extend the results of Schneiderman et al. (1993, 1997) to surrogates decisions made by family members and suggest that projection is a robust phenomenon that occurs even when surrogates have other relevant information available to them on which to base their predictions (Krueger & Clement, 1994).

Finally, despite clear evidence that projection accounted for considerable error in students’ treatment predictions, the results of Study 1 also raise the important point that self-based prediction may not necessarily compromise the accuracy of surrogate decisions. Taking a simple view of projection as bias, one might assume that projective predictions would be more likely to be inaccurate than counterprojective predictions. To the contrary, Study 1 found the accuracy of projective predictions to be somewhat higher than that of counterprojective predictions. This was particularly true when the student did not personally want the treatment in question, probably because in this case projection counteracts a bias toward overtreatment.
Study 2

The obvious limitation of Study 1 is its use of a relatively small sample of college students as surrogate decision makers. The relative youth of the parent sample also made them unusual targets for consideration of their end-of-life medical wishes. Accordingly, in Study 2 we examined the generalizability of Study 1’s results by using data from a large field study concerning the end-of-life medical decisions of older adults and their self-designated surrogate decision makers.

Method

Participants. Study 2 reports data from the second wave of the Advance Directives, Values Assessment, and Communication Enhancement (ADVANCE) project, a three-phase, longitudinal study investigating psychological assumptions underlying the use of advance directives. Adults 65 years and older were recruited from six primary care practices in northeast Ohio (see Ditto et al., 2001, for details). Patients designated the person they would want to make medical decisions on their behalf, and this individual was also recruited to participate. Of the original 401 participating pairs, 361 (90%) completed the second wave of data collection. Interviews were conducted in the home of either the patient or the surrogate.

At the time of the second interview, patients ranged in age from 66 to 95 years (M = 73.7 years). Patients were predominantly European American (93%), with slightly more women (56%) than men. Only 47% of patients described their overall health as excellent or very good (34% described it as good and 19% as fair or poor). Surrogates ranged in age from 29 to 88 years (M = 62.7 years) and, like patients, were mainly European American (92%) and women (68%). Surrogates were primarily spouses (60%) or children (31%) of patients, and the pairs had relationships that were both long (M = 47.8 years) and close (mean perceived closeness was 4.7 on a 5-point scale for both patients and surrogates). Almost half (46%) of the patients reported having completed an advance directive prior to participation in the study.

Procedure. During the first wave of the study (M = 376 days prior to collection of the data discussed in this report), patients were randomly assigned to one of five advance directive conditions (see Ditto et al., 2001). At the second interview, the protocol for all participants was the same.

The methodology used in Study 2 was very similar to that described in Study 1 except that surrogate preferences and predictions were collected for only five of the LSPQ scenarios (current health, Alzheimer’s disease, coma—no chance, stroke—slight chance, and cancer—no pain).

Results

There were no significant differences in either the accuracy of surrogates’ predictions (Ditto et al., 2001) or surrogates’ use of their own treatment preferences across the five advance directive conditions. Results are reported for data collapsed across conditions.

Patient preferences, surrogate preferences, and surrogate predictions. As in Study 1, patients and surrogates had similar patterns of treatment preferences (see Table 5), although there was again a tendency for surrogates to want more treatment than patients (significant for current health, Alzheimer’s disease, coma—no chance, and overall; all ps < .05). Also consistent with Study 1, surrogates overpredicted patients’ desire for treatment (significant overall and for all five scenarios except Current health; all ps < .001).

Predictive accuracy, projection, and patient—surrogate agreement. Surrogates in Study 2 were somewhat more accurate in their predictions than were the students in Study 1 (overall M = .72, Ms ranged from .64 to .92, see Table 6). Once again, however, surrogates’ predictions were clearly related to their own treatment preferences (overall M = .80, Ms ranged from .74 to .94). Agreement between surrogates’ predictions and their own treatment preferences was higher than the agreement between surrogates’ predictions and patients’ treatment preferences for every individual scenario and overall (all ps < .01). Finally, although there was somewhat greater agreement between surrogates’ and patients’ preferences in Study 2 than in Study 1 (M = .70), the agreement between surrogates’ and patients’ preferences was still significantly lower than the agreement between students’ predictions and their own preferences overall and for every individual scenario except current health (p < .05).

Analysis of accuracy. Hierarchical regressions were again used to evaluate the predictive power of patients’ and surrogates’ own treatment preferences in surrogates’ decision making. Reflective of the greater surrogate accuracy in Study 2, patients’ treatment preferences were a significant predictor of surrogates’ predictions in every scenario (R² ranged from .12 to .15; see Table 7). After controlling for the predictive ability of patients’ treatment preferences, however, surrogates’ own preferences remained a

### Table 5

*Patient Preferences, Surrogate Preferences, and Surrogate Predictions: Study 2*

<table>
<thead>
<tr>
<th>Scenario index</th>
<th>Patient preferences (n = 361)</th>
<th>Surrogate preferences (n = 361)</th>
<th>Surrogate predictions (n = 361)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Current health</td>
<td>.93ₐ</td>
<td>.17</td>
<td>.96ₐ</td>
</tr>
<tr>
<td>Alzheimer’s disease</td>
<td>.44ₐ</td>
<td>.39</td>
<td>.52ₐ</td>
</tr>
<tr>
<td>Coma—no chance</td>
<td>.11ₐ</td>
<td>.27</td>
<td>.16ₐ</td>
</tr>
<tr>
<td>Stroke—slight chance</td>
<td>.48ₐ</td>
<td>.43</td>
<td>.50ₐ</td>
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<tr>
<td>Cancer—no pain</td>
<td>.35ₐ</td>
<td>.40</td>
<td>.39ₐ</td>
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<tr>
<td>Overall scenarios</td>
<td>.39ₐ</td>
<td>.27</td>
<td>.48ₐ</td>
</tr>
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</table>

*Note.* For all responses, means reflect the proportion of treatments wanted (0 = don’t want treatment, 1 = want treatment) averaged across treatments within scenarios. Different subscripts indicate that means within rows are significantly different at p < .05.
Table 6
Proportion Agreement Between Patient Preferences, Surrogate Preferences, and Surrogate Predictions: Study 2

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Patient preference and surrogate prediction (n = 361)</th>
<th>Surrogate preference and surrogate prediction (n = 361)</th>
<th>Patient preference and surrogate prediction (n = 361)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Current health</td>
<td>.92a</td>
<td>.16</td>
<td>.94b</td>
</tr>
<tr>
<td>Alzheimer's disease</td>
<td>.65c</td>
<td>.31</td>
<td>.75b</td>
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<tr>
<td>Coma—no chance</td>
<td>.79d</td>
<td>.31</td>
<td>.85b</td>
</tr>
<tr>
<td>Stroke—slight chance</td>
<td>.64e</td>
<td>.33</td>
<td>.74b</td>
</tr>
<tr>
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<td>.72f</td>
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<td>.80b</td>
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<td>Overall scenarios</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Different subscripts indicate that the means within rows are significantly different at \( p < .05 \).

significant predictor of their decisions in every scenario (\( \Delta R^2 \) ranged from .11 to .29).

Table 8 presents the mean number of prediction errors across all 19 treatment predictions, categorized by surrogates' preferences and predictions for each treatment. As in Study 1, surrogates made more errors when predicting that patients wanted treatment (\( M = 1.78 \)) than when predicting that patients did not want treatment (\( M = 0.85 \), \( F(1, 360) = 54.67, p < .001 \). Also similar to the results of Study 1, a significant Prediction \( \times \) Preference interaction, \( F(1, 360) = 100.77, p < .001 \), shows that a projection bias is operating with the overtreatment bias. When surrogates predicted that the patient wanted treatment, more errors occurred when surrogates also wanted treatment for themselves (\( M = 2.28 \)) than when they did not want treatment (\( M = 1.29, p < .001 \)), but when surrogates predicted the patient would not want to receive treatment, more errors occurred when they also indicated that they would not want to receive treatment (\( M = 1.28 \)) than when they did want to receive the treatment (\( M = 0.42, p < .001 \)). Calculation of correct-to-total predictions, however, again revealed that projective predictions had a higher probability of being correct (\( M = .76 \)) than did counterprojective predictions (\( M = .45 \)). This advantage of projection was again more pronounced when surrogates did not want the treatment (\( Ms = 0.82 \) vs. 0.29) than when surrogates did want the treatment (\( Ms = 0.71 \) vs. 0.54).

Predictors of projection. Because of the extensive nature of the ADVANCE data set, we were able to examine whether projection was associated with a wide variety of patient (e.g., age, gender, prior advance directive), surrogate (e.g., age, gender, perceived closeness with patient) and patient–surrogate relationship (e.g., gender and kinship composition, length of relationship) characteristics. Only surrogate age predicted the magnitude of projection. Younger surrogates showed a weak tendency (\( r = -.15, p < .01 \)) to project more frequently than older surrogates.

Discussion

The results of Study 2 closely replicated the results of Study 1 in a large sample of individuals for whom issues of medical treatment at the end of life were considerably more relevant than college students and their youthful parents. The only subtle difference in the results of the two studies was the somewhat higher level of predictive accuracy shown by surrogates in Study 2. It is
Finally, only a small proportion of even seriously ill patients other relevant information (Krueger & Clement, 1994) are high. Both accuracy motivation (Mullen, 1983) and availability of decisions about seriously ill individuals is virtually identical to challenges these intuitions. First, the accuracy of surrogate projection bias as a result of either (a) the enhanced motivation Sulmasy et al., 1998). Second, projection occurs even when discussions initiated by the illness. Past research, however, though no order effects were found in two studies of projection following their predictions of patients’ treatment preferences. Although the consistency of the results both within and across studies provides evidence for the generalizability of the projection phenomenon, two limitations should be acknowledged.

First, surrogates in both studies recorded their own preferences following their predictions of patients’ treatment preferences. Although no order effects were found in two studies of projection (H. L. Davis, Hoch, & Ragsdale, 1986; Hoch, 1987), false consensus research has generally found stronger effects when individuals estimate consensus prior to stating their own wishes (Mullen et al., 1985). An ideal design would have counterbalanced question order.

Second, the current studies did not examine surrogate decisions about individuals in the throes of serious illness. Decisions about seriously ill patients might be less likely to show projection bias as a result of either (a) the enhanced motivation to make accurate judgments in the context of serious illness or (b) extensive information conveyed during patient–surrogate discussions initiated by the illness. Past research, however, challenges these intuitions. First, the accuracy of surrogate decisions about seriously ill individuals is virtually identical to that found in decisions about healthy targets (Layde et al., 1995; Sulmasy et al., 1998). Second, projection occurs even when both accuracy motivation (Mullen, 1983) and availability of other relevant information (Krueger & Clement, 1994) are high. Finally, only a small proportion of even seriously ill patients report discussing their end-of-life wishes with their family or physician (Frankl, Oye, & Bellamy, 1989), and even if they do, research has shown discussion to be of questionable value in improving surrogate decisions (Ditto et al., 2001). Thus, although future research should examine projection in surrogate decisions about serious illness, there is considerable empirical support for the robustness of the effect.3

**Determinants of Projection**

Past research has suggested a number of factors that may contribute to the tendency for substituted judgments to be influenced by surrogates’ own treatment wishes. First, surrogates may fall prey to the well-documented false consensus bias (Marks & Miller, 1987) and may overestimate the extent to which people in general are likely to share their treatment preferences.

Alternatively, surrogates’ assumption of similarity may be more specifically focused on the loved one whose wishes they are trying to predict. This assumption of similar treatment wishes can be a conscious one (inferred from perceived similarity in other values and choices) or may occur with little awareness of the role of one’s own wishes in the process (Aron, Aron, Tudor, & Nelson, 1991; M. H. Davis, Conklin, Smith, & Luce, 1996; Krueger, 1998).

Finally, Batson, Early, and Salvarani (1997) distinguished between two different but often confused forms of perspective taking: imagining how another would feel in a situation versus imagining how you would feel if you were in that situation. Although it is the first strategy that represents true substituted judgment, surrogate decision makers may (again either consciously or unconsciously) rely on the latter strategy instead. Physicians, for example, have been found to both hold more negative views of life-sustaining treatment than do laypersons (Coppola, Danks, Ditto, & Smucker, 1998) and underestimate their patients’ desire for life-sustaining treatment (Coppola, Ditto, Danks, & Smucker, 2001; Uhlmann et al., 1988). Projection in this case may occur because physicians are expressing what they would want for themselves if they were in the patient’s situation rather than trying to imagine the patient’s true wishes. Notice that this is not an entirely unreasonable strategy in that patients, if supplied with physicians’ knowledge of the ineffectiveness and frequent adverse consequences of treatments like CPR, might come to share physicians’ disinterest in receiving these treatments. This analysis not only complicates discussions of the accuracy of projection as a prediction strategy (i.e., Is it possible for a surrogate’s projection to be more “correct” than a patient’s preference?) but also blurs the fundamental distinction made by ethicists between the substituted judgment and best interest standards (e.g., Buchanan & Brock, 1990; President’s Commission, 1983). As such, it serves as an apt

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3 It is important to note that even a study examining decisions about seriously ill patients requires generalization to the actual population of interest. Actual surrogate decision making applies only when a patient is so ill as to be decisionally incapacitated. As such, any issue dealing with the accuracy of surrogate decision making cannot be studied with the ideal patient population because the true preferences of an incapacitated individual can never be known. Even studies involving seriously ill patients must make the inferential leap that decisions about (and by) an individual still well enough to participate in a research study are similar to those that would occur if that individual were incapacitated and likely near death.

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Table 8

<table>
<thead>
<tr>
<th>Surrogate predictions</th>
<th>Wants treatment</th>
<th>Does not want treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Patient wants treatment</td>
<td>2.28</td>
<td>2.72</td>
</tr>
<tr>
<td>Patient does not want treatment</td>
<td>0.42</td>
<td>0.97</td>
</tr>
</tbody>
</table>
Projection and Accuracy

Understanding the relationship between bias and accuracy in interpersonal judgments has been one of the most vexing issues in the history of social psychology (Cronbach, 1955; Funder, 1987; Nisbett & Ross, 1980). Accordingly, the most difficult issue raised by the current studies is whether projection enhances or diminishes the accuracy of surrogates’ life-sustaining treatment predictions, and consequently, whether reliance on one’s own treatment preferences is a practice to be encouraged or discouraged in surrogate decision making.

Hoch (1987) suggested that the consequences of projection are most dependent on two factors: (a) the actual similarity between predictor and target, and (b) the availability of (and the predictor’s ability to utilize) other relevant information. A comparison of our two studies, for example, shows that the rate of projection is virtually identical in both (.78 vs. .80; see Tables 2 and 6). The poorer accuracy in Study 1 (.64 vs. .72) may simply be a function of the fact that parents’ and children’s preferences in that study were less similar (.64) than were patients’ and surrogates’ preferences in Study 2 (.70). As such, projection is likely to be a more reasonable strategy when predicting for loved ones in the context of a long, close relationship than when predicting for people from dissimilar backgrounds, such as physicians predicting the treatment wishes of patients.

Projection can also be a reasonable prediction strategy under conditions in which surrogates have little or no other predictive information available (Hoch, 1987; Krueger & Clement, 1997). If a person were forced to make decisions for a loved one without an advance directive or previous discussion of end-of-life wishes, data regarding what that person would want in the situation (i.e., the surrogates’ own preferences) are likely to provide some advantage over judgments based on no information (Dawes, 1989; Funder et al., 1995). Our data suggest that this may be particularly true in circumstances in which projection counteracts the tendency for family surrogates to overestimate their loved ones’ desire for treatment.

Even in the presence of potentially useful predictive information, projection may still be a relatively effective decision strategy to the extent that surrogates have difficulty transferring information (from an advance directive or past discussions of their loved one’s end-of-life wishes) to making specific treatment decisions (Gick & Holyoak, 1980; Hoch, 1987). In this sense, projection may be best conceptualized as similar to other judgmental heuristics found to characterize human judgment (e.g., Tversky & Kahneman, 1974). Heuristics are simple decision-making strategies that generally lead to accurate judgments, but because of their “shortcut” nature they can frequently result in error. Projection may be a similar strategy that, although normatively inaccurate, may still produce more accurate predictions than other (more exhaustive) strategies because of surrogates’ inability to effectively use other relevant information. The practical implications of this analysis are that any attempt to inform surrogate decision makers about the perils of projection may be counterproductive unless research can also identify ways to improve current methods of advance directive documentation to provide surrogates with information they can use effectively to predict their loved ones’ life-sustaining treatment wishes.

Conclusion

When illness or injury deprive individuals of decisional capacity, there is overwhelming consensus among ethicists, policy makers, and the medical community that medical decisions should be based on the standard of substituted judgment (Baergen, 1995; President’s Commission, 1983). Because substituted judgment is inherently a matter of interpersonal perception, it is troubling that policy development guiding end-of-life decision making has proceeded uniformed by basic social psychological research on judgmental bias and accuracy. In the current studies, surrogate judgments were frequently inaccurate and biased by the use of the surrogates’ own treatment preferences. The social psychological literature, of course, has documented many other biases in social perception as well as some sense of the conditions most conducive to accuracy in social judgment (Funder, 1995). In this literature may lie important clues for understanding the numerous difficulties faced by surrogate decision makers trying to honor the wishes of an incapacitated patient. This understanding, in turn, can contribute to the development of strategies to improve the accuracy of substituted judgment and the preservation of patient autonomy when individuals near the end of life must rely on the decision making of others.

This analysis was stimulated by the comments of an anonymous reviewer.

References


