# BRIEF REPORT

# The Role of Patients' Ability to Pay, Gender, and Smoking History on Public Attitudes Toward Cardiac Transplant Allocation: An Experimental Investigation

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This study assessed public attitudes toward organ allocation through vignettes that were varied by patient's ability to pay (insured or uninsured), gender, and smoking history (current, former, or never). Participants were 681 adults contacted at a state driver's license office who read a vignette about a heart transplant candidate and subsequently rated their likelihood and priority of offering transplantation. Results revealed main effects for patient smoking history exclusively. Post hoc analyses for likelihood of offering transplantation revealed that participants gave higher ratings for never smokers than current smokers. For priority of transplantation, analyses revealed higher ratings for never smokers than for both former smokers and current smokers. Results suggest that public opinion about organ allocation may include the consideration of smoking history but not ability to pay or gender.

Key words: organ allocation, cardiac transplantation, smoking, health policy

Cardiac transplantation has achieved its aims of demonstrating relatively low mortality rates and producing desirable quality of life for most patients (Hosenpud, Bennett, Keck, Fiol, & Novick, 1997; Jones, Taylor, Downs, & Spratt, 1992). Currently, the growth of transplantation in the United States rests primarily on organ availability via organ donation rates. Because transplant candidates are dependent on the general public to provide life-saving donor organs, public attitudes regarding organ allocation may be critical components for consideration in organ allocation and health policy. If health policy resembles public opinions about

organ distribution, the public may view organ donation favorably and may be more likely to donate. The current study examines how the general public would allocate organs if they were given the responsibility of organ allocation comparable to multidisciplinary transplant teams who currently perform this task.

Transplant teams often consider candidates with the idea of suitability for and ability to benefit from transplantation. Ideally, empirically established predictors of transplantation outcomes could guide clinical decision making across biopsychosocial variables. However, the patient characteristics that would compose a profile of a desirable candidate for transplantation may not be easily established. Further, such characteristics may vary based on national health policy (Olbrisch & Levenson, 1991). Levenson and Olbrisch (1993) surveyed a U.S. national sample of cardiac, liver, and kidney transplant teams and found that 5.6% of cardiac transplant candidates were rejected on psychosocial grounds versus 22.8% on medical grounds.

The current study sought to examine three potentially important pretransplantation psychosocial variables including the patient's ability to pay, gender, and smoking history. Levenson and Olbrisch (1993) found that of cardiac transplant programs surveyed, a 4.1% mean evaluation refusal rate and a 3.2% mean surgery refusal rate were reported based on financial grounds. Results showed that 43.6% of cardiac transplant programs consider current cigarette smoking an absolute contraindication to transplant, and 50.3% of programs consider cigarette smoking in the past 6 months at least a relative contraindication. Although Levenson and

Olbrisch did not report data on the basis of gender, differences in renal transplant allocation by gender were found previously (Kjellstrand, 1988). These results indicate that transplant team members may believe, to some extent, that organ allocation should be mediated by health-compromising behaviors and individual characteristics.

Several studies have used experimental designs to examine public attitudes about organ donation and allocation. For example, Harris, Jasper, Shanteau, and Smith (1990) used vignette methodologies to examine issues related to next-of-kin donation decisions. More recently, Rodrigue, Hoffman, Park, and Sears (1998) used a vignette design and found that participants rated higher likelihood and priority for liver transplant candidates with no alcohol use history compared with those with a significant alcohol-use history. The study indicates that college students may consider health-compromising behavior in their attitudes toward liver allocation. The generalizability of this finding to the general public and to other personal responsibility issues remains unclear. Therefore, the present study assessed public attitudes about heart transplantation allocation in a community sample.

## Overview and Hypotheses

The current study used vignettes that varied according to the patient's ability to pay (insured or uninsured), gender, and smoking history (current, former, or never). We tested the following hypotheses. First, participants would rate higher likelihood and priority for transplantation for never smokers versus former smokers versus current smokers. Second, participants would rate higher likelihood and priority for those whose insurance would cover the cost of transplantation versus those with no insurance. Finally, participants would give the highest priority to men and women who have never smoked and have insurance that would cover the cost of transplantation.

## Method

### Participants

The sample was composed of community members at an urban driver's license office; of the 808 people who were asked to participate, 681 participants met all inclusion criteria (84% participation rate). Inclusion criteria were that the participant was at least 18 years of age and verbally consented to participate. The sample was 50.3% male, 65.9% Caucasian (21.0% African American, 13.1% other ethnic minority), and participants ranged in age from 18–85 years (45.1% ages 18–25, $M = 30.7$). Most participants had some college education (68.2%), were single (58.4%; 35.1% married, 6.5% divorced), and were employed full time (52.7%; 20.6% were unemployed, 20.5% employed part time, 2.1% retired, 4.1% homemaker). Thirty-seven percent were current smokers. The median family income was $30,000. Of the total sample, 29.8% had signed donor cards prior to participation in the study. Chi-square analyses revealed that compared with Caucasians (11% declined), African Americans (30% declined) were more likely to decline participation, $\chi^2(1, N = 678) = 39.12, p < .001$.

To determine the possibility of unintentional biased sampling by treatment condition, we conducted chi-square analyses on gender, marital status, ethnicity, smoking status, and organ donor status, and an analysis of variance (ANOVA) on age. These demographic variables were tested by condition. Analyses indicated that only Participant Smoking Status × Patient Smoking Status was significant, such that a greater proportion of current smokers were randomized into the never smoker condition than into the former or current smoker condition $\chi^2(2, N = 667) = 9.75, p < .01$.

### Materials and Procedures

On entering the driver's license office, two Caucasian female researchers approached adults and asked them to participate in the study via informed consent procedures. After giving verbal consent, participants completed a demographic questionnaire that included the participant's age, gender, ethnicity, and current smoking status and were randomly assigned to read 1 of 12 case vignettes about a person in need of a heart transplant. Vignettes varied according to the patient's ability to pay (insured or uninsured), gender, and smoking history (never smoker, former smoker, or current smoker). After reading the vignette, on a 5-point Likert-type scale participants answered (a) "Considering the scarcity of donor organs and the previous case description, how likely would you be to offer transplantation?" and (b) "What level of priority do you think this patient should be given for transplantation?" See Table 1 for the vignette statements used to distinguish each condition of the manipulation. One case vignette (unable to pay, female, current smoker) was as follows:

> Susan is a 56 year-old woman who lives in Florida. She has been married for 30 years and has two children, ages 24 and 26, and three grandchildren, ages six months, two, and five. Until recently, Susan has been employed full time. Her husband is retired.
>
> Susan has not been able to work lately because she has heart disease. She suffered a heart attack at age 51, and has had several heart surgeries in the past five years. Susan, who was once lively and productive, has suffered a severe decline in her quality of life due to her weak heart; she can no longer work, help with much housework, or play with her grandchildren.
>
> Physicians have shown that engaging in unhealthy behaviors such as smoking increases one's susceptibility to heart disease. Susan has been smoking cigarettes for 25 years, and has never successfully quit. In fact, Susan's physicians have

Table 1
*Vignette Statements for Each Condition*

| Condition | Relevant Statement |
|---|---|
| Able to pay | Susan has private insurance that would pay for the transplant and her medications. |
| Unable to pay | Susan has no insurance, and past medical bills have already depleted her financial resources; therefore, the cost of her transplantation would be paid for by publicly funded Medicare. |
| Current smoker | Susan has been smoking for 25 years, and has never successfully quit. In fact, Susan's physicians have determined that her heart disease is likely due to her smoking habit. |
| Former smoker | Susan had smoked cigarettes for 25 years, but has been smoke-free for ten years now. Nevertheless, Susan's physicians have determined that her heart disease is likely due to her smoking habit. |
| Never smoker | Because Susan is a non-smoker and has a healthy diet, her physicians have determined that her heart disease is likely due to hereditary factors. |

*Note.* Gender variations included the use of the name Susan or John and appropriate pronouns.

determined that her heart disease is likely due to her smoking habit.

At this time, the only medical treatment that is likely to have a lasting benefit for Susan is heart transplantation. This procedure would require that Susan undergo an intensive operation, during which doctors would remove her diseased heart and replace it with a heart from a deceased organ donor. She would have to be hospitalized for two weeks after the operation. Also, she would need to live near the hospital for two months after discharge, so that physicians could closely monitor her medical status. To prevent her body from rejecting her new heart, she would have to take medications every day for the rest of her life. Susan has no insurance, and past medical bills have already depleted her financial resources, therefore, the cost of her transplant and medications would be paid for by publicly funded Medicare. Susan is motivated to pursue transplantation, in hopes that it will extend her life and improve her life quality. Without transplantation, Susan's heart could fail any day.

## Results

### Likelihood of Offering Transplantation

We used a 2 (ability to pay) × 2 (patient gender) × 3 (patient smoking history) between-subjects ANOVA to analyze ratings for likelihood of offering transplantation. See Table 2 for group means and standard deviations. Analyses indicated no interaction effects; however, a significant main effect of patient smoking history was found, $F(2, 658) = 4.59$, $p < .05$. Post hoc Scheffé tests showed a significant difference between ratings for never smokers and current smokers ($p < .05$), but no significant differences between ratings for former and never, or former and current smokers. A Cohen's $d$ effect size of .29 was found for the smoking history effect, with a magnitude of 11%.

### Priority of Offering Transplantation

We used a 2 (ability to pay) × 2 (patient gender) × 3 (patient smoking history) between-subjects ANOVA to analyze ratings for priority of offering transplantation. See Table 2 for group means and standard deviations. Analyses indicated no interaction effects; however, an effect for patient smoking history was found, $F(2, 655) = 8.06$, $p < .001$. Post hoc Scheffé tests revealed significant differences between ratings for both never smokers and former smokers ($p < .05$), and never smokers and current smokers ($p < .05$),

but no difference between ratings for former and current smokers. A Cohen's $d$ effect size of .09 was found for the effect between never and former smokers, with a magnitude of 3.5%. An effect size of .33 was found for the effect between never and current smokers, with a magnitude of 13%.

### Rater Characteristics

We examined the effects of rater characteristics through a series of follow-up analyses using analyses of covariance (ANCOVA). For both likelihood and priority for transplantation, a 2 (ability to pay) × 2 (patient gender) × 3 (patient smoking history) between-subjects ANCOVA was conducted, controlling for the effects of age, ethnicity (Caucasian/African American), gender (female/male), organ donor status (have signed a donor card/have not signed a donor card), and current smoking status (current smoker/current nonsmoker).

For likelihood for transplantation, only organ donor status was a significant covariate, $F(1, 521) = 55.78$, $p < .001$, such that organ donors rated higher likelihood across factors. Similar to the ANOVA procedures presented above, there were no significant interactions on between-subjects factors. A main effect for patient smoking history was found, $F(2, 531) = 4.62$, $p < .05$, such that significant differences emerged between ratings for current smokers and never smokers, whereas ratings for former smokers were not significantly different from either group. A Cohen's $d$ effect size of .29 was found, with a magnitude of 11%.

For priority for transplantation, ethnicity, $F(1, 519) = 24.17$, $p < .001$, and current smoking status, $F(1, 519) = 8.64$, $p < .01$, were significant covariates, such that African Americans and current smokers rated higher priority across factors. Again, there were no significant interactions between factors. A main effect for smoking history was found, $F(2, 519) = 8.44$, $p < .001$, such that ratings for never smokers were significantly different from those for both former smokers and current smokers, but former and current smoker ratings were not significantly different. A Cohen's $d$ effect size of .28 was found between never and former smokers, with a magnitude of 11%. An effect size of .43 was found between never and current smokers, with a magnitude of 17%.

## Discussion

The current study investigated public attitudes about organ allocation in cardiac transplantation, with regard to patient smoking history, gender, and ability to pay. Our results indicated that participants were statistically significantly more likely (11%) to offer cardiac transplantation to those who had never smoked than those who were current smokers. This effect was found even when controlling for the effects of participant age, ethnicity, gender, organ donor status, and personal smoking status. Contrary to our hypotheses, however, likelihood ratings for former smokers did not differ significantly from those for either never smokers or current smokers. These results suggest that the public may

Table 2
*Mean Likelihood and Priority Ratings*

| Variable | Likelihood[a] | | | Priority[b] | | |
|---|---|---|---|---|---|---|
| | M | SD | n | M | SD | n |
| Current smoker | 3.28 | 1.37 | 219 | 3.56 | 1.22 | 218 |
| Former smoker | 3.43 | 1.44 | 222 | 3.66 | 1.10 | 222 |
| Never smoker | 3.67 | 1.29 | 229 | 3.96 | 0.99 | 227 |
| Female | 3.50 | 1.34 | 340 | 3.72 | 1.13 | 338 |
| Male | 3.43 | 1.41 | 330 | 3.75 | 1.11 | 329 |
| Insured | 3.48 | 1.39 | 335 | 3.77 | 1.11 | 334 |
| Uninsured | 3.45 | 1.36 | 335 | 3.69 | 1.13 | 333 |

[a]Five-point Likert-type scale ranging from 1 (*very unlikely*) to 5 (*very likely*). [b]Five-point Likert-type scale ranging from 1 (*very low priority*) to 5 (*very high priority*).

be uncertain about the likelihood of offering transplantation to persons who previously engaged in a known risk behavior, cigarette smoking, which may have precipitated the need for cardiac transplantation; yet, the public is more definitive about assigning current smokers likelihood ratings 11% lower than those for former smokers. Nonetheless, our data does not allow for determination of whether the public is forgiving toward former smokers or is simply unsure of the role of a smoking history in evaluation for cardiac transplantation.

In terms of priority for transplantation, the public gave ratings to never smokers that were statistically significantly higher than current smokers (13%) and statistically significantly higher than former smokers (3.5%). Effects were increased when we controlled for the effects of participant age, ethnicity, gender, organ donor status, and personal smoking status, such that ratings for never smokers were 17% higher than current smokers, and 11% higher than former smokers. These results are consistent with a previous study by Rodrigue et al. (1998), in which participants gave higher priority and likelihood ratings to liver transplant candidates with no alcohol use history than those with alcohol use history. Together, these studies suggest that the public may view health-compromising behaviors as potentially important determinants in the allocation of scarce organs.

The difference in effects between the likelihood and priority ratings is potentially interesting for future studies. Although analyses revealed that likelihood ratings for former smokers were not significantly different from those for current or never smokers, priority ratings for former smokers were significantly different from those for never smokers. These results suggest that the likelihood and priority ratings are tapping potentially different aspects of public opinion. It may be that likelihood discriminates between those whom the public would or would not place on the waiting list, whereas priority discriminates between those to whom the public would give the first organs available and those whom the public would have wait longer for transplantation. If this supposition is true, then the results suggest that the public is much more likely to place never smokers on the transplant waiting list than current smokers, but the collective public is unsure of whether or not they would place former smokers on the waiting list. Assuming that all are added to the waiting list, the public would choose to offer transplantation to never smokers before former and current smokers, though former smokers would not systematically receive transplantation before current smokers.

Some rater characteristics did affect likelihood and priority ratings, such that likelihood ratings varied by organ donor status, and priority ratings varied by ethnicity and personal smoking status. In terms of ethnicity, although Caucasians and African Americans did not differentially rate the likelihood of offering transplantation, African Americans rated higher priority for transplantation than Caucasians. It is difficult to definitively interpret this post hoc finding, however, this difference may underlie why African Americans have demonstrated a lower rate of organ donation, such that the current system of organ allocation may not be perceived as universally equitable. African Americans ap-

pear to believe that all individuals who need a transplant should be given a high priority for transplantation but they are as equally unsure as Caucasians of the likelihood of actual transplantation. In contrast, it was not surprising that current smokers gave higher priority across groups, as they may be less likely to discriminate on the basis of smoking history because they themselves are current smokers and would likely not want to be discriminated against if they were in need of a heart transplant.

Our study demonstrated that the public does not consider the patient's ability to pay or the patient's gender in determining the likelihood and priority of transplantation. Previous research has shown that the public desires fairness and would like to provide transplantation to all patients (Ubel & Loewenstein, 1996). This ideality was attempted in the state of Oregon in 1987, when the state legislature mandated Medicaid reimbursements for transplantation. On realizing that the Medicaid costs of a typical transplantation were limiting resources for many low-income mothers and children, the public became concerned about the manner that the state was allocating health care resources (Kaplan, 1993). As events in Oregon demonstrated, the public may desire transplantation for all citizens while simultaneously expecting that customary levels of other healthcare resources be maintained. The absence of effects regarding gender is consistent with Rodrigue et al. (1998), in which college students showed no difference in likelihood or priority for transplant by gender and these findings were supported in the current study.

The current study has two major strengths that provide unique views of public opinions about organ allocation. First, we used experimental methodology with vignettes that allowed for the systematic comparison of specific transplant candidate attributes by the public. Vignette methodology is an effective, highly adaptable format for additional hypothesis testing and is easily replicable by other researchers (Alexander & Becker, 1978; Burstin, Doughtie, & Raphaeli, 1980; Jasper, Harris, Lee, & Miller, 1991). Second, the use of the driver's license office is an innovative approach to organ allocation and donation research. This partnership of researchers with the driver's license office and the division of motor vehicles allowed for strategic sampling, since individuals are given the option of signing donor cards at the driver's license office. Additionally, the driver's license offices provide a broad, ethnically diverse community sample for research. Our experience suggests that psychologists interested in studying organ donation should consider collaboration with state officials in divisions of motor vehicles and driver's license offices.

The results of the current study should be considered within the context of a few limitations. First, although the driver's license office provided a broad, community-based sample, the study was conducted in a university city composed largely of college students, and therefore, the sample included a larger percentage of young adults with at least some college education. Nonetheless, the participants covered a wide age range, and minority groups were well represented. Second, a written case vignette may not fully capture participants' attitudes about transplantation candi-

dates. Video representations or in vivo interactions with transplant candidates would warrant more complex procedures but may produce more realistic results. Third, although the dependent variables provide some information regarding public attitudes about allocating organs, these variables do not replicate fully the decision-making process that transplant teams undergo when faced with allocation decisions. In the future, a measure including additional items may allow for a richer understanding of these constructs.

Despite these limitations, this study adds to previous literature suggesting that the public may consider health-compromising behaviors as important variables in making organ allocation decisions. Although we would not recommend that public opinions drive allocation decisions entirely, this study was based on the premise that public attitudes about allocation may relate to donation decisions, and, therefore, policymakers may want to consider public opinions when creating health policy. Future research examining organ allocation beliefs should examine additional psychosocial factors used by transplantation teams such as exercise habits, medical compliance, and history of specific mental health problems. Experimental investigations of public attitudes toward organ allocation may provide a more thorough understanding of the public's desires, which could be integrated into public health policy. In the future, this informed policy process could potentially influence organ donation rates and allow more individuals to benefit from these life-saving procedures.

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