

Don't Throw Your Heart Away: Patient Study 4

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Study Information

Hypotheses

Hypothesis 1 When transplant centers present information on their transplant success rate only, evaluators will respond by selecting hospitals with higher transplant success. However, if information presented on transplant outcomes is stratified by the number and quality of donors used, then participants will respond by selecting hospitals with higher organ acceptance rates rather than the hospital with higher transplant outcomes. Thus, preference for the non-selective transplant center (relative to the selective center) will be lower in condition 1 (baseline: combined transplant survival only), compared to condition 2. A higher proportion of participants will prefer the non-selective center over the selective center in condition 2, relative to condition 1. Hypothesis 2 The effect of information condition on choice will be mediated by ratings of the importance of getting a heart at all. That is, viewing information about stratified transplant survival will lead participants to think that the chance to "get a heart at all" is a more important factor in their decision, which will in turn be associated with higher preference for the non-selective hospital. Specifically, ratings of importance (0-100 continuous scale) for the item "likelihood of getting any heart" will be lower in condition 1 than in condition 2. Furthermore, ratings on this item will be associated with choice, such that higher ratings will be associated with choice of the non-selective center. A bootstrapped mediation analysis will test for an indirect effect. Hypothesis 3 The format of the report card stimuli (pictograph vs. SRTR) will not produce statistically different effects on choice. In order to test whether the effect sizes vary significantly, our logistic regression model will include binary predictor variables for transplant metric (0=combined, 1=stratified) and information format (0=pictograph format, 1=SRTR format). An interaction term (e.g. stratified*format) will be included in the model, such that a significant interaction effect would indicate that the effect size of the stratified metric report card in the SRTR condition is different from what we observe when using the pictographic format.

Design Plan

Study type

Experiment - A researcher randomly assigns treatments to study subjects, this includes field or lab experiments. This is also known as an intervention experiment and includes randomized controlled trials.

Blinding

- For studies that involve human subjects, they will not know the treatment group to which they have been assigned.

Is there any additional blinding in this study?

No response

Study design

We have a 2x2 between-subjects design in which participants are randomized to a transplant metric condition (control vs. stratified) and an information format condition (pictograph vs. SRTR). Please see the design-patient-srtr-osf.pdf document for details. Both transplant metric conditions display the number of hearts offered to each center, the number of hearts accepted by each center, and the number of transplants performed at each center (in a year), in addition

to the condition-specific metrics below. In the control condition, each center's outcome display features a single value for each of these three metrics. The stratified condition instead features a pair of values corresponding to each center's offers/acceptances/transplant survival rates for donor hearts of "optimal" or "adequate" quality. (1) Combined (control): "survival following transplant" metric is displayed as a survival rate/quintile score corresponding to all patients at the center who received transplants (2) Stratified (treatment): "survival following transplant" metric is displayed as a pair of survival rates/quintile scores corresponding to two distinct groups of transplant patients at the center: those who received optimal donor organs and those who received adequate donor organs. The information format varies based on how the transplant hospital statistics are organized when presented to participants on the choice screen. (1) The pictograph condition uses fractions and percents to convey center survival rates, along with pictograph "person" images corresponding to the numeric survival rate information. (2) The SRTR condition mimics the information format present on the SRTR public reporting website. In each condition, participants make a choice between two hospitals (one with an "open" or non-selective donor acceptance strategy, and another with a more selective donor acceptance strategy). The choice of hospital will be counterbalanced, such that each choice (open versus selective hospital) is equally likely to be presented as the choice on the top of the screen in each condition.

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Randomization

We will use simple randomization, where each participant will be randomly assigned to one of the four predetermined conditions. The Qualtrics randomizer function will be used for randomization into a condition.

Sampling Plan

Existing Data

Registration prior to creation of data

Explanation of existing data

No response

Data collection procedures

400 pre- or post-transplant patient participants and their family members will be recruited from online social media from transplant support groups. Inclusion criteria: Patient participants and family members will be asked to participate if they confirm the following inclusion criteria in the consent form. (1) 18 years of age or older (2) must read and understand the information in the consent form (3) must want to participate in the research and continue with the survey
Payment: Participants will be given the option to select a transplant-related charity to receive a \$1.50 donation (anonymously) if they complete the entire survey.

- [consent-patients-osf.pdf](#)
- [recruitment-patients-srtr-osf.pdf](#)

Sample size

Our target sample size is 350 participants. We expect that this will amount to approximately 87 participants per condition, although due to the nature of the randomization technique used (Qualtrics randomizer function), we may end up with slightly more or slightly less than 87 per condition. We will attempt to recruit up to 400, assuming that not all will complete the survey in its entirety.

Sample size rationale

A sample size of 87 per group was calculated to yield at least 90% power to detect a 25 percentage point difference between conditions (e.g., 40% vs. 65%) with $\alpha=0.05$ (GPower 3.1.9.4).

Stopping rule

We will stop data collection after the first of the following four scenarios is achieved: (1) April 1, 2021 and at least 400 responses collected (2) April 30, 2021 and at least 250 responses collected (3) May 20, 2021

Variables

Manipulated variables

Transplant Metric: We will manipulate how transplant center outcomes are presented. Different components of the same outcome statistics for two transplant centers will be varied over two different conditions: (1) Condition 1 ("combined" condition): view only combined transplant survival (e.g. transplant survival rate not stratified by number and quality of donor hearts accepted at each center) (2) Condition 2 ("stratified" condition): view only stratified transplant survival (e.g. transplant survival rate stratified into patients who received excellent donor organs and patients who received less than optimal donor organs) **Information Format:** The infographic condition uses fractions and percents to convey center survival rates, along with pictographs corresponding to the numeric information. The SRTR condition mimics the information format present on the SRTR public reporting website.

Measured variables

The outcome variable will be a binary choice between two hospitals: one with a selective donor-heart acceptance strategy and one with a non-selective donor heart acceptance strategy. Participants will respond to the question "Which Hospital do you consider to be higher performing? Please click on one of the two tables below to indicate which hospital is the better choice." Participants will choose between two outcome tables featuring the selective and non-selective hospital (counterbalanced, such that each of the two choices is equally likely to be presented at top of the choice scenario in each condition). The number of participants that choose each hospital will be the measured outcome variable used in analyses. On the next page of the survey, participants will respond to three mediator questions: "There are many reasons why one transplant hospital might outperform another. Which reasons were most important in your decision? Please move the slider to indicate how much you considered each of the reasons below (0=reason was not important, 100=reason was extremely important)." Participants will then move a slider bar (0-100) to indicate the importance of the following three items: (1) Patients were more likely to receive an excellent donor heart at the hospital I picked. (2) Patients were less likely to receive a marginal donor heart at the hospital I picked. (3)

Patients were more likely to receive any kind of heart at the hospital I picked. The third item (more likely to receive any kind of heart) will be the only variable that is included in the planned mediation analysis.

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Indices

No response

No files selected

Analysis Plan

Statistical models

To test Hypothesis 1, we will use a binomial logistic regression analysis. The two categorical independent variables will be 'stratified transplant metric' and 'information format'. The dependent variable is binary choice of hospital (open versus selective). • We will test whether the main effect of "stratified transplant metric" is statistically significant and in the predicted positive direction. To test Hypothesis 2, we will conduct a causal mediation analysis to determine whether information display had a mechanistic effect on hospital choice through our proposed mediator. We will estimate the average causal mediation effect (ACME), average direct effect (ADE), and the total effect. The ACME is the effect of the stratified metric on the outcome of hospital choice (selective vs. non-selective), is mediated through the hypothesized mediator (the importance of "getting any heart" at each hospital when considering the choice). The remaining effect of stratified display on hospital choice that is not mediated through the hypothesized mediator represents the ADE. The entire effect of the stratified display on hospital choice via the hypothesized mediator and the direct effect is the total effect. The proportion of the total effect that is accounted for by the ACME is called the proportion mediated.{Imai, 2010}. Analyses will be performed using the "mediation" package in R (The R Foundation for Statistical Computing).{Tingley, 2014}. We will generate 95% confidence intervals by using 1000 bootstrap simulations. The unstandardized point estimate of the ACME and its 95% confidence intervals will be interpreted. A significant ACME for "stratified transplant metric" would suggest that stratifying transplant survival by number and quality of accepted donors works via increasing the perceived importance of "getting any heart" to increase preference for the non-selective hospital. If the ACME is non-significant, we will identify where the causal path breaks down. To test Hypothesis 3, our logistic regression model will include binary predictor variables for transplant metric (0=combined, 1=stratified) and information format (0=pictograph format, 1=SRTR format). An interaction term (e.g. stratified*format) will be included in the model, such that a significant interaction effect would indicate that the effect size of the stratified metric report card in the SRTR condition is different from what we observe when using the pictographic format.

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Transformations

Logistic regression analysis: -The categorical predictor "transplant survival stratified" will be dummy coded (0=not stratified, 1=stratified), with 'not stratified' as the reference category. -The

categorical predictor "information format" will be dummy coded (0=pictograph format, 1=SRTR format), with 'pictograph' as the reference category. -The outcome variable "choice of hospital" will be dummy-coded (0=selective hospital, 1=non-selective hospital). The reference category is 'selective hospital'. Mediation analysis: -The categorical predictor "transplant survival stratified" will be dummy coded (0=not stratified, 1=stratified), with 'stratified' as the reference category. -The continuous mediator variable "get any heart" will be mean-centered for each analysis. -The outcome variable "choice of hospital" will be dummy-coded (0=selective hospital, 1=non-selective hospital). The reference category is 'selective hospital'.

Inference criteria

We will use the standard $p=0.05$ criteria for determining if the results are significantly different from those expected if the null hypothesis were correct.

Data exclusion

Two "attention check" questions are included (which match the questions from previous Heart Transplant Tradeoff studies with laypeople and medical trainees) to ensure that participants understand the match process and read the choice scenario information. Data analysis will be performed both with and without any respondents who miss both of the attention check questions. If the results differ, we will exclude respondents with two missed attention check questions in the official analysis.

Missing data

Participants will be excluded from analysis if they are missing any responses from the choice scenario, mediator rationale, or attention check questions.

Exploratory analysis

No response

Other

Other

No response