Pre-analysis Plan for Study of Conjoint Design

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The goal of the study is to determine how the number of attributes offered to respondents in a conjoint experiment affects the quality of responses. In particular, we are interested in how adding uncorrelated attributes affects the responses and effects of a set of fixed attributes that are always included in the conjoint because of increased survey satisficing.

The experiment has two stages. Stage 1 of the experiment is designed to identify uncorrelated and correlated attributes. Stage 2 of the experiment examines how adding uncorrelated attributes affects the inferences for included attributes.

Stage 1:

Design:

Respondents see a conjoint table with a hypothetical candidate that is described by the following four fixed attributes as shown in the example table below:

Please carefully read the description of the candidate below. You will then be asked a number of questions about this candidate.

ATTRIBUTE	CANDIDATE 1
Position on Same-Sex Marriage	Favors same-sex marriage
Party Affiliation	Republican
Age	42
Position on Health Care	Government should do less

The values of the fixed attributes are independently randomly assigned. The order of the attributes is also randomized by respondent.

Respondents are then confronted with a series of questions about so called filler attributes. In particular, respondents are asked to guess the likely value of other filler attributes for that hypothetical candidate. These questions are as follows:

If you had to guess, what would you say this candidate's highest level of education is?

- High school degree

- College degree
- College degree from Ivy League university

If you had to guess, what would you say this candidate's annual income is?
- $75,000
- $180,000
- $290,000

If you had to guess, what prior experience does the candidate have in elected office?
- None
- Governor
- Senator

If you had to guess, what would you say this candidate's marital status is?
- Single
- Married
- Divorced

If you had to guess, who would you say this candidate's famous relative is?
- Franklin Pierce
- Chester Arthur
- John Tyler
- Zachary Taylor

If you had to guess, which elementary school would you say this candidate attended?
- Washington School
- Jefferson School
- Madison School

If you had to guess, what would you say this candidate's favorite highway is?
- Route 71
- Route 73
- Route 77
- Route 79

If you had to guess, what would you say this candidate's favorite vacation spot is?
- Crystal Lake
- Twin Lake
- Spring Lake
- Long Lake

If you had to guess, how many children do you think the candidate has?
- 0
- 1
- 2
- 3

If you had to guess, what would you say this candidate's previous occupation was?
- Business owner
- Lawyer
- High school teacher
- Car dealer

If you had to guess, what would you say this candidate's gender is?

- Male
- Female

If you had to guess, would you say this candidate previously served or did not serve in the U.S. military?
- Did not serve
- Served

If you had to guess, what would you say this candidate's race/ethnicity is?
- White
- African American
- Asian
- Hispanic/Latino

If you had to guess, what would you say this candidate's political ideology is?
- Liberal
- Conservative

If you had to guess, what would you say this candidate's position on immigration is?
- Deport all unauthorized immigrants who are in the country illegally
- Allow unauthorized immigrants to stay but do not allow them to be citizens
- Allow all unauthorized immigrants to become citizens

If you had to guess, what would you say this candidate's position on gun control is?
- Protect all Americans' right to have guns
- Restrict ownership of some guns

The order of the filler attribute questions is randomized by respondent. Each respondent evaluates four profiles in this way.

The survey will be fielded to a sample size of 2,500 respondents via Amazon Mechanical Turk (MTurk). Eligibility to take the survey will be restricted to U.S.-based MTurk Workers who have had at least 10 HITs approved and at least an 80% HIT approval rate.

Analysis:

We will regress the filler attribute responses on the full set of fixed attributes (one dummy for each value with one left out reference category) one at a time. For each filler response question we will dichotomize the outcome variable by splitting the answer options into all possible groupings (e.g. for four-level outcome variables, there are seven different groupings). For all the regressions we will then compute differences in the probability of selecting a particular dichotomized value versus the all other values across all pairwise comparisons of the levels of each fixed attribute.

We will define a filler attribute as “uncorrelated” with the fixed attributes if all estimated effect sizes associated with all dichotomizations of that filler attribute are below 0.05 in absolute value. We consider the amount of correlation associated with an effect of 0.05 or lower to not be substantively large enough to lead to a meaningful amount of masking when this attribute is included in the conjoint table in stage 2.

We expect some of the filler attributes to be declared as uncorrelated (e.g. favorite highway) and some declared as correlated for comparison (e.g. political ideology).

Result: List of uncorrelated and correlated filler attributes.

Stage 2:

Design:

Respondents will see a conjoint table with two hypothetical candidates as in the example below and are asked to rate and rank the two candidates.

Example with K=3 uncorrelated filler attributes

	Candidate A	**Candidate B**
Age	42	72
Position on Health Care	Government should do less	Government should do less
FILLER ATTRIBUTE	Random level	Random level
FILLER ATTRIBUTE	Random level	Random level
Position on Same-Sex Marriage	Supports same-sex marriage	Opposes same-sex marriage
Party affiliation	Democrat	Republican
FILLER ATTRIBUTE	Random level	Random level
Your Choice:	○	○

Each respondent is randomly assigned to one of K+1 conditions where K is the number of uncorrelated filler attributes identified in stage 1. In the control condition, the conjoint table just includes the fixed attributes from stage 1. For the treatment conditions, the conjoint table randomly adds 1, 2, 3, …, K uncorrelated filler attributes as additional rows to the conjoint table. The uncorrelated filler attributes used in each table are randomly drawn from the list of K uncorrelated filler attributes.

Each respondent rates 15 comparisons of candidates. For each condition the values of all the attributes for all candidate profiles are independently randomly assigned. The order of the attributes is also randomly assigned by respondent. There will be 200 respondents per condition.

Analysis:

Fixed attributes cannot mask the effects of uncorrelated filler attributes, and hence, adding any uncorrelated filler attribute should not change the effects of the fixed attributes as the result of masking. Instead, any changes in the effects of the fixed attributes should be the result of survey satisficing that increases due to the increased number of attributes. We will therefore determine the degree of satisficing by comparing the effect sizes of the fixed attributes across the experimental conditions. For this we will, for each experimental condition, compute the coefficient of determination for the four fixed attributes (i.e. partial R^2) from a linear least squares regression of the ranking/rating outcome on the full set of included attributes (fixed and filler). For the fixed attributes, dummy variables are created for all levels of each attribute except for a reference level. For the filler attributes, dummy variables are created for all levels of each attribute and the reference level indicates that an attribute is missing for the respondent. We will regress the outcome on all of these dummy variables. We will then compare the coefficients of determination across the experimental conditions. For these comparisons, we will run tests of equality using the nonparametric bootstrap for statistical inference, with bootstrap resampling performed at the respondent level.

Conjoint Attributes

Conjoint Attributes – Fixed

- Party affiliation: Democrat, Republican
- Position on health care: government should do more, government should do less
- Position on same-sex marriage: support same-sex marriage, oppose same-sex marriage
- Age: 42, 54, 72

Conjoint Attributes – Potential Filler

- Ideology: liberal, conservative
- Position on immigration policy: deport all unauthorized immigrants who are in the country illegally, allow unauthorized immigrants to stay but do not allow them to be citizens, allow all unauthorized immigrants to become citizens
- Position on gun control: protect all Americans' right to have guns, restrict ownership of some guns
- Education: high school degree, college degree, college degree from Ivy League university
- Annual income: $75k, $180k, $290k
- Prior elected office: none, governor, senator
- Marital Status: single, married, divorced
- Occupation: business owner, lawyer, high school teacher, car dealer
- Gender: male, female
- Military: did not serve, served
- Race: white, African American, Asian American, Hispanic/Latino
- Famous relative: Franklin Pierce, Chester Arthur, John Tyler, Zachary Taylor
- Elementary school: Washington School, Jefferson School, Madison School
- Favorite highway: Route 71, Route 73, Route 77, Route 79
- Vacation spot: Crystal Lake, Twin Lake, Spring Lake, Long Lake
- Children: 0, 1, 2, 3