# An Initial Investigation into Choice Archetypes:

*How Do People Prefer to Make Choices In Situations of Varying Significance?*

April Dawn Kester & Robyn Perry

This research is a pilot project that aims to understand how people prefer to narrow a set of options down to one under varying conditions. Our approach was informed by a broad collection of literature from the field of Behavioral Economics. In particular, our hypotheses took inspiration from the notions of single-option aversion, the paradox of choice, and the challenge of cognitive overwhelm in decisions involving choosing one from a set of many options.

We set out to test the hypothesis that individuals consistently prefer a particular decision-making process, given a particular level of decision significance. Our project aims to understand whether, under certain conditions, we will see consistency in how individuals like to arrive at a decision.

We call the decision-making processes *choice archetypes* (see A), and we vary the significance of the decision being made in order to test this hypothesis. We have rated our choice scenarios on a "significance" scale.

We expected that participants would exhibit consistent preferences for decision scenarios of similar significance on our scale. However, we speculated that participants would change their preference with respect to scenarios far apart on the scale (very insignificant decisions versus very significant decisions). We believe that there may be socioeconomic factors that are correlated with the choice archetypes that participants select.

We limited the set of possible choice archetypes to **only those decisions that individuals make for themselves** to filter out complicating social variables related to how they make choices that affect others. In the end, it was complicated to actually determine whether any of the decisions were of similar significance to respondents. We realized that the significance level of questions would vary dramatically with individuals' idiosyncratic beliefs about the world, their current socioeconomic standing and class upbringing, and other unanticipated variables.

As a result, our questions and analysis focus on two predictor variables in particular to consider whether any patterns emerge for individuals presented with different types of decisions based on variables we expected to be related. We developed a set of "choice archetypes", with which we attempt to cover the variety of approaches to narrowing down a set of options that individuals might take.

The choices are 1) defer to a trusted friend/expert, 2) be shown 2 of the total options, choose between them, and do it again until you've narrowed the options to 1, 3) see all of the options at once and make a decision, or 4) postpone the decision. This is not a validated scale, but one in

development. This project contributes to the public understanding of such a scale, and its ability to operate as a decision-making spectrum. Our design envisioned the options as ordinal, such that each choice archetype represented a point on the scale between willingness to engage in taxing cognitive work to narrow down a large set of options and unwillingness to do so. Our suspicion is that the order, from least cognitively taxing to most, is as follows:

1) postpone the decision, 2) defer to a trusted person, 3) be shown 2 of the total options, choose between them, and repeat until done, and 4) see all of the options simultaneously.

We've developed a categorical variable which maps to each of the choice archetypes and asked questions about different types of choices, from getting medical treatment to choosing ice cream flavors to buying a new car (see the attached report for the survey itself and questions).

We aimed to see how individuals' scores on the maximizer/satisficer scale plays into this, as well as their working memory.

It bears mentioning that our dataset also includes a personality score using the OCEAN scale, demographic data including age, income, race, and number of children. Thus far, we have not run analyses on these additional data and will set that aside for the moment.

Our hypotheses are as follows:

**1a. There will be a general preference for choice archetype 4 (seeing all options) among respondents.**

The rationale behind this hypothesis is that individuals typically opt themselves into situations where they'll be able to choose from larger sets of options. Though they typically end up more satisfied with their ultimate when choosing among fewer items, people don't opt into choice-limited situations if free to choose *more choice.*

**1b. People who are maximizers will often choose to see all the options at once.**
We went further with the first hypothesis to speculate that those who reveal themselves to be maximizers -- for a refresher, those who tend to evaluate choices with great vigor and a greater willingness to engage a higher degree of cognitive strain for the best possible outcome -- will, even more frequently than the general population, tend towards choice archetype 4.

**2. People who have a taxed working memory** (as demonstrated by errors on working memory test) **are less likely to choose seeing all options, and more likely to postpone the decision or defer to an expert.**
Based on what we know about operating with a taxed working memory, we also speculated that individuals who demonstrate such a strain will tend to reduce any additional cognitive strains. We expected that these individuals would tend towards either deferring to someone else (choice

archetype 1) to help with their decision-making, and/or postponing decisions altogether (choice archetype 4).

**3. People who choose a certain choice archetype** (e.g. deferring to an expert) **will choose a similar choice architecture for similarly significant decisions** (for buying a house or deciding about disease treatment, they'll make the same choice; for buying ice cream or cereal, they'll make the same choice).

## Method

We carried out our project by surveying Mechanical Turk respondents, who have been shown to be fairly representative of the U.S. population. We administered a survey that respondents took between 5 and 20 minutes to complete. We used several validated scales, including OCEAN, the Maximizer-Satisficer scale, and a standard demographic questionnaire. We developed 11 choice archetype questions which we varied in terms of significance.

**Working Memory Capacity Scores**
Participants were displayed 7 numbers in rapid succession and asked to repeat them.  Participant responses were compared to the correct response using the Damerau-Levenshtein distance. Average scores were then calculated for the three attempts. These scores ranged from 0-4, 0 being a correct response.
SCRIPT ← link

## Initial Findings

**Understanding Choice & Maximizer-Satisficer Scores**
Considering our hypotheses in order, individuals did opt for Choice Archetype 4 much more often. Provided our respondents fairly represented the larger population, this suggests that they generally prefer the ability to see all options simultaneously, as shown in Table 1. Table 2 shows that the majority of respondents also chose choice archetype 4 most commonly throughout their responses.

**Table 1.**
**Total Responses from 152 Respondents to 11 Questions**

| 1.  Postpone decision | 2.  Defer to expert | 3.  See 2 options at time | 4.  See all options |
|---|---|---|---|
| 110 | 288 | 285 | 989 |

**Table 2.**
**Respondents Who Chose 1, 2, 3, or 4 Majority of the Time**

| 1. Postpone decision | 3. Defer to expert | 4. See 2 options at time | 5. See all options |
|---|---|---|---|
| 4 | 16 | 11 | 131 |

To test hypothesis 1a, we ran an ANOVA on the Max-Sat scores for respondents' most frequent answer across the 11 questions (for example, someone responding with a 2 more than any other choice archetype is considered a 2 for this analysis). There was no significant variance relative to the Max-Sat scores in this analysis. It's possible that this is not the best proxy for overall decision-making tendency across all the questions, but it was one way to take an aggregate measure relative to all of the questions for each respondent.

To test hypothesis 1b, in which we expected maximizers to be more likely than the rest of the group to choose choice archetype 4, we ran an analysis of variance (ANOVA) to determine whether there was a significant difference in Max-Sat scores across respondents for each choice type for each question. Our results are shown in the table below. Only the car question yielded a statistically significant value (p-value = 0.0036). The practical significance of this difference registered as medium ($\omega^2$ = 0.052). (Note that suggested interpretations for $\omega^2$ are small (.01), medium (.06), and large (>.14).) The findings don't support our hypothesis.

## Understanding Choice & Working Memory

We estimated a multinomial logistic regression (MLR) on the data. The outcome variable is choice archetype, which we call postponing, deferring, eliminating, scrutinizing, in order from least cognitively taxing to most. The predictor variables are working memory (WM) and maximizer/satisficer (MS), both continuous variables.

SCRIPT ← link

After removing respondents who did not complete parts of the survey our sample size is n=153.

The model was examined with additional parameters, reported anxiety level, age, number of children - with no significant improvement to the deviance difference.

```
Likelihood ratio tests of Multinomial Models

Response: temp_2
                          Model Resid. df Resid. Dev   Test    Df   LR stat.   Pr(Chi)
1                     avg_score       423   343.2206
2           score_5 + avg_score       420   343.1524 1 vs 2     3 0.06817892 0.9953610
3 score_5 + avg_score + D9 + D7       414   341.3796 2 vs 3     6 1.77282015 0.9393621
>
> |
```

We estimated a multinomial logistic regression for each choice question setting "postpone" as our base line and as a matrix of choice questions using a multivariate model.  There was very little significance in our predictor variables for either method.  In a few cases an increase in the avg_score (which corresponds to a decline in working memory capacity) decreased the log odds of choosing an alternate choice option over the baseline of postponement. This is consistent with our hypothesis of correlation between working memory capacity and preferring choice options that are less cognitively depleting.

RESULTS ← link

These are the means of the max-sat scores of the groups of respondents whose most common scores were 1, 2, 3, and 4, respectively.

## Preliminary Conclusions

As a result of our initial analysis, we found support for the hypothesis that working memory may influence how individuals prefer to make choices. We did not find support for our maximizer-satisficer theory.

Ideally, we'd like to submit our data to further analysis for a more thorough understanding of all that it might reveal to us. Thus far, it has stretched our data analysis and quantitative methods expertise to their limits, so we pause with the analysis in the state you see here.

In the course of this project, we recognized the challenges inherent in asking respondents to imagine themselves in a scenario and communicate about how they would perform in that scenario. This design could be susceptible to a lack of external validity -- even an honest respondent may not really know how she'd prefer to make a choice in certain real-world scenarios, as much as she might try to imagine it clearly.

We suggest a follow-up experiment that assesses individuals' actual choice archetype preferences, and repeats the analysis using the maximizer-satisficer scale as well as the working memory test.

We would also like to understand individuals' satisfaction in accordance with different choice archetypes. We suspect that individuals will often opt for more choices, and for viewing them simultaneously, but will often experience greater satisfaction after having submitted to a pairwise elimination process for a large set of options.

Please see the attached appendix for a copy of the survey and answer results. Find visualizations of our initial data analysis in the associated Notebook Viewer here:

http://nbviewer.ipython.org/gist/nyborrobyn/87d5f8247eb4820096c0