Perspectives on Computational Research

Methods and Initial Results: A Perceptual Map of the Decision-Making

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Method

Data

One hundred seventeen people were recruited through Amazon MTurk to participate in a survey constructed using Qualtrics. Participants who failed to complete the entire survey (n=19) were excluded from analysis. The final sample included 98 participants with 64 men and 34 women. The age of participants ranged from 21 to 68 years (M = 36.82, SD = 10.75). Age was non-normally distributed, with skewness of 0.94 (SE = 0.24) and kurtosis of 0.11 (SE = 0.48). The demographic characteristics of the participants are summarized in Table 1.

Table 1. Descriptive Statistics of Participants' Demographics

	Frequency (%)					Mean	SD
Age	20s	30s	40s	50s	60s	36.82	10.75

27 (28%)	38 (39%)	18 (18%)	10 (10%)	5 (5%)	

	Male	Female				
Gender	64 (65%)	34 (35%)				

	European American	African American	Asian American	Two or more races	n/a		
Ethnicity	72 (73%)	11 (11%)	7 (7%)	3 (3%)	5 (5%)		

	High school graduate	Some college	Associate's degree	Bachelor's degree	Master's degree	Professional degree	Doctoral degree
Education	13 (13%)	20 (20%)	24 (24%)	31 (32%)	8 (8%)	1 (1%)	1 (1%)

Procedure

Ninety eight participants completed a survey that they had agreed to spend around 45-60 minutes doing in exchange for a monetary reward of $9. Informed consent about the study's purpose, task, risks, and confidentiality was provided by all study participants. The survey was composed of five major sections.

In the first part of the survey, participants were asked to freely list ten decisions they have made in their life. Then, in the second part, participants rated how one decision is similar to another on a 5-point scale ranging from 1 (*very low*) to 5 (*very high*) for each pair of decisions. For example, if a participant listed '*deciding a product to purchase*', '*deciding a person to marry*', '*deciding a candidate to vote for*', … in the list, then the similarities between '*deciding a product to purchase*' and '*deciding a person to marry*', '*deciding a product to purchase*' and '*deciding a candidate to vote for*', '*deciding a person to marry*' and '*deciding a candidate to vote for*', … were measured. Since the similarity between '*deciding a product to purchase*' and '*deciding a person to marry*' and the similarity between '*deciding*

a person to marry' and '*deciding a product to purchase*' may be rated differently, participants were randomly assigned to one of two conditions which presented the pairs in opposite order. Altogether, there are 45 unique similarity ratings for the pairs of 10 decisions.

After scoring perceived similarity between two decisions, for the third part, participants answered to what extent they agreed with statements that described characteristics of decisions they have made on a 5-point scale ranging from 1(*strongly disagree*) to 5 (*strongly agree*). Twenty two questions about characteristics of decision-makings are selected. For example, '*This decision is usually made emotionally*", "*This decision is a choice between positive options*", … were presented to measure the characteristics of decisions (see Appendix A for a full list).

In the fourth part of the survey, participants were asked to list two decisions each for the suggested characteristics. Twenty nine questions are used for making a list of decisions based on characteristics. These questions included questions such as '*Please list two decisions people make only a few times in a lifetime*', '*Please list two decisions that you have not yet made, but you expect to be making in the future*' (see Appendix B for a full list). After listing decisions in accordance with offered characteristics, participants had chance to freely list extra decisions that are different from the decisions they listed above.

Finally, in the last part, a part of *Need for Closure Scale* (Webster & Kruglanski, 1994) measuring decisiveness was presented. Also, participants answered question which measured their preference for simplicity vs. complexity. Demographics which included age, gender, ethnicity, and education were collected.

Results

To assess the unique effects of difference in each decision characteristics on perceived distance between decisions, a multiple linear regression analysis was conducted to simultaneously regress the distance between decisions on the difference in twenty two decision characteristics (i.e., '*This decision is usually made emotionally*", "*This decision is a choice between positive options*"). Difference in decision characteristics was determined by calculating the absolute difference between reported characteristics ratings. Distance between decisions was scored by reversing reported similarity scores between decisions which was rated on a 5-point scale (1 becomes 5, 2=4, 3=3, 4=2 and 5=1).

A multiple linear regression was based on cluster-robust standard errors by participants, since among the total of 4410 decisions, each participant made 45 similarity evaluations. The full model, which included all twenty two characteristics of decision, significantly predicted the perceived distance between decisions, $R^2 = .13$, $F(22, 4387) = 31.28$, $p < .001$. This indicates 13% of the variance of the perceived distance between decisions was explained by the twenty two characteristics of decision.

It was also discovered that five of the twenty two characteristics had a statistically significant effect on the perceived distance, in the multiple regression controlling for the other characteristics. Specifically, the perceived distance between decisions was predicted by the level of difference between decisions in emotional characteristic, $B = .085$, $t(4387) = 4.014$, $p < .001$, long-term characteristic, $B = .076$, $t(4387) = 3.537$, $p < .001$, high-risk characteristic, $B = .081$, $t(4387) = 3.702$, $p < .001$, high-impact characteristic, $B = .110$, $t(4387) = 4.037$, $p < .001$, and financial characteristic, $B = .106$, $t(4387) = 5.502$, $p < .001$ (see Table 2 for a summary of the regression analysis).

Table 2. Summary of Linear Regression Analysis Assessing the Unique Effects of Each Decision Characteristic Predicting Distance between Decisions

Characteristics	Distance between Decisions		
	B	*SE B*	*p*
(Intercept)	3.068	0.095	< .001
"What"	0.045	0.020	0.023
"When"	0.025	0.021	0.217
"Where"	0.037	0.013	0.003
"Who"	0.041	0.018	0.025
"How"	-0.017	0.023	0.454
Rational	-0.004	0.030	0.886
Emotional	0.085	0.021	< .001
Positive	0.050	0.026	0.053
Negative	-0.023	0.029	0.431
Frequent	0.051	0.029	0.078
Per week	0.017	0.029	0.559
Per month	-0.052	0.033	0.118
Per year	0.042	0.019	0.024
Short-term	-0.029	0.020	0.155
Long-term	0.076	0.021	< .001
Time-consuming	0.014	0.024	0.573
Procrastination	0.013	0.028	0.650
High-risk	0.081	0.022	< .001
High-impact	0.110	0.027	< .001
Social	0.040	0.024	0.090
Variety	0.053	0.023	0.022
Financial	0.106	0.019	< .001

Another multiple linear regression analysis was performed using only the characteristics that were statistically significant in the first model. The five characteristics were measured by the ratings agreeing for the following statements: '*This decision is usually*

made emotionally', '*This is a long-term decision for the future*', '*This decision involves high risk*', '*This decision has a high impact on your life*', and '*This is a financial decision*'. The second model significantly predicted the perceived distance between decisions, $R^2 = .11$, $F(5, 4404) = 107.5$, $p < .001$. Thus, the five characteristics accounted for 11% of the variance of the perceived distance between decisions. All five characteristics had unique effect on the perceived distance. Particularly, the perceived distance was significantly predicted by the perceived the level of difference between decisions in emotional characteristic, $B = .106$, $t(4404) = 4.910$, $p < .001$, long-term characteristic, $B = .081$, $t(4404) = 3.868$, $p < .001$, high-risk characteristic, $B = .109$, $t(4404) = 4.897$, $p < .001$, high-impact characteristic, $B = .127$, $t(4404) = 5.126$, $p < .001$, and financial characteristic, $B = 0.123$, $t(4404) = 6.214$, $p < .001$ (see Table 3 for a summary of the regression analysis).

Table 2. Summary of Linear Regression Analysis Assessing the Unique Effects of Selected Characteristics of Decision Predicting Distance between Decisions

Characteristics	Distance between Decisions		
	B	*SE B*	*p*
(Intercept)	3.318	0.076	< .001
Emotional	0.106	0.022	< .001
Long-term	0.081	0.021	< .001
High-risk	0.109	0.022	< .001
High-impact	0.127	0.025	< .001
Financial	0.123	0.020	< .001