Perspectives on Computational Research

Literature Review: A Perceptual Map of the Decision-Making

HyungJin Cho

Literature Review

What is decision-making? The etymology of the English word *decision* has the root from the Latin word *decisio* which means to cut off, meaning making a decision is about selecting choices. To understand decision-making, the current study categorized numerous examples of decisions. It is expected that to find distinct types of decisions and harness this knowledge to achieve an appropriate approach for the unique types of decisions. For example, in comparative perspective, deciding a product to purchase is made more rationally whereas deciding a person to marry is made more emotionally. Is a voting more like a shopping or a dating? Depending on the type of decision voting is included in, the strategy for influencing the voter's decision could be different. If a voting is relatively a rational decision, the strategy should be to stress the content of policies. On the other hand, if a voting is an emotional decision, the strategy should be to manage the tone of voice. The major goal of the current study is to structure the categorization of decisions so that we can establish a proper strategy for a decision accordingly.

In Oxford English dictionary (1989) 'decision-making' is defined as "the action or

process of making decisions, especially important ones". Cadwallader (1975) described decision-making as "the cognitive process of selecting from among alternatives". Ariely & Zakay (2001) illustrated decision-making as "one of the most important mechanisms for active fast adjustments". They defined decision-making as "the ability to react to information in the environment, and to take one of a few different action alternatives in order ultimately to better the organism". Bazerman & Moore (2008) describes 'judgment' to "the cognitive aspects of the decision-making process". Hogarth (1987) defines 'choice' as the outcome from the combination of judgments. Considering the diverse definitions of decision-making, judgment, and choice, the current study mainly focused on the decisions people have made in their life. This excluded the hypothetical decisions people have merely imagined in their minds.

Previous studies have highlighted the intricate process of arriving at the best possible outcome. Researchers presented eight key elements to achieve an effective decision-making: problem, objectives, alternatives, consequences, tradeoffs, uncertainty, risk tolerance, linked decisions (Hammond, Keeney, & Raiffa, 2015) and proposed a rational model of decision-making process: defining the problem, identifying the criteria, weighing the criteria, generating alternatives, rating each alternative on each criterion, and computing the optimal decision (Bazerman, & Moore, 2008). Other past work has applied analytic hierarchy process model to account for decision-making processes (Saaty, 2008).

Other types of studies have outlined decision-making in a specific domain or an issue. Researchers has shown context dependency in legal decision-making (Kelman, Rottenstreich, & Tversky, 1996), the role of expectations in business decision-making (Cyert, Dill, & March, 1958), and shared decision-making in the medical field (Moumjid et al, 2007). Other past work has focused on particular topics and found that making decisions impairs self-control

(Vohs et al, 2014), manipulating sense of connectedness with future identity changes intertemporal choices (Bartels & Urminsky, 2011), having an experience leads an underestimation toward subsequent risky choices (Hertwig et al, 2004), and nudging the environment by having presumed consent as a default increases donation decisions (Johnson & Goldstein, 2004).

The other studies have researched the characteristics of decision-making that differentiate decisions. Previous research by Milkman and collegues (1756) has shown that changing the environment can improve decision-making in the realm of System 1 dominant choices. A dual process theory suggests two cognitive pathways consisted of a fast, autonomic, intuitive, and emotional process called System 1 and a slow, controlled, reasoning, and logical process called System 2. The researchers proposed a strategy to change the environment rather than to change decision maker's thinking from System 1 to System 2 for the decisions susceptible to implicit attitudes or stereotype such as gender and race. This research establishes that there is variability in the types of decisions and each has its optimal strategy based on the type of decision. The current study attempts to expand the dimension from rational vs. emotional to other characteristics which are reviewed in past papers as a factors having an effect on decision-making. The characteristics measured for each decisions includes four Ws and one H (what, when, where, who, how), motives (rational or emotional), valence (positive or negative), frequency (frequent or infrequent), period (weekly, monthly, or yearly), times (a few or many), duration (short-term or long-term), respond time (quick or delayed), procrastination (weak or strong), risk (low-risk or high-risk), impact (low-impact or high-impact), identity (reflecting self or not reflecting self), influence (individual or social), variety (limited options or multiple options), finance (financial or non-financial), ethic (moral or amoral). It is expected to find essential characteristics in decision-making that makes

decisions perceived significantly different.

Past research by Russell (1979) has shown that emotions can be categorized using factor analysis. The researcher measured level of similarity between emotions by collecting surveys. With the similarity matrix of emotions, the researcher visualized it as a map that preserves the distances using a statistical method called multidimensional scaling. Researchers found that two dimensions appear from the map emotions are plotted on: valence (how positive or negative the emotional experience is) and arousal (how active or inactive the emotional experience is). This research illuminates how mapping the emotions can further our understanding of emotion. The current study also utilized factor analysis to extract underlying dimensions that classify decisions. By adopting this method, it is expected to find the structure and relationship of decisions by generating a map of various decisions.

Past researches suggest that there are different types of decisions retaining distinct characteristics and propose a way to analyze it by utilizing visualization. The present study seeks to establish a categorization of decisions using multiple approaches. It is expected that the classification of decisions not only further the understanding of the nature of decision-making, but also shed light on the right approach to each category.

References

Decision-making. (1989). In Oxford English dictionary online (2nd ed.), Retrieved from http://www.oup.com

Cadwallader, M. (1975). A behavioral model of consumer spatial decision making. Economic Geography, 51(4), 339-349.

Ariely, D., & Zakay, D. (2001). A timely account of the role of duration in decision making. Acta psychologica, 108(2), 187-207.

Bazerman, M. H., & Moore, D. A. (2008). Judgment in managerial decision making.

Hogarth, R. M. (1987). Judgement and choice: The psychology of decision. John Wiley & Sons.

Hammond, J., Keeney, R., & Raiffa, H. (2015). Smart choices: A practical guide to making better decisions. Harvard Business Review Press.

Plous, S. (1993). The psychology of judgment and decision making. Mcgraw-Hill Book Company.

Hardman, D., & Hardman, D. K. (2009). Judgment and decision making: Psychological perspectives (Vol. 11). John Wiley & Sons.

Hastie, R., & Dawes, R. M. (2010). Rational choice in an uncertain world: The psychology of judgment and decision making. Sage.

Saaty, T. L. (2008). Decision making with the analytic hierarchy process. International journal of services sciences, 1(1), 83-98.

Kelman, M., Rottenstreich, Y., & Tversky, A. (1996). Context-dependence in legal decision making. The Journal of Legal Studies, 25(2), 287-318.

Cyert, R. M., Dill, W. R., & March, J. G. (1958). The role of expectations in business decision making. Administrative Science Quarterly, 307-340.

Moumjid, N., Gafni, A., Bremond, A., & Carrere, M. O. (2007). Shared decision making in the medical encounter: are we all talking about the same thing?. Medical Decision Making, 27(5), 539-546.

Vohs, K. D., Baumeister, R. F., Schmeichel, B. J., Twenge, J. M., Nelson, N. M., & Tice, D. M. (2014). Making choices impairs subsequent self-control: a limited-resource account of decision making, self-regulation, and active initiative.

Bartels, D. M., & Urminsky, O. (2011). On intertemporal selfishness: How the perceived instability of identity underlies impatient consumption. Journal of Consumer Research, 38(1), 182-198.

Hertwig, R., Barron, G., Weber, E. U., & Erev, I. (2004). Decisions from experience and the effect of rare events in risky choice. Psychological science, 15(8), 534-539.

Johnson, E. J., & Goldstein, D. G. (2004). Defaults and donation decisions. Transplantation, 78(12), 1713-1716.

Kahneman, D. (2003). Maps of bounded rationality: Psychology for behavioral economics. The American economic review, 93(5), 1449-1475.

Milkman, K. L., Chugh, D., & Bazerman, M. H. (2009). How can decision making be improved?. Perspectives on psychological science, 4(4), 379-383.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: attitudes, self-esteem,

and stereotypes. Psychological review, 102(1), 4.

Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2007). The Implicit Association Test at age 7: A methodological and conceptual review. Automatic processes in social thinking and behavior, 265-292.

Russell, J. A. (1979). Affective space is bipolar. Journal of personality and social psychology, 37(3), 345.

Russell, J. A., & Pratt, G. (1980). A description of the affective quality attributed to environments. Journal of personality and social psychology, 38(2), 311.

Russell, J. A., Ward, L. M., & Pratt, G. (1981). Affective quality attributed to environments: A factor analytic study. Environment and behavior, 13(3), 259-288.

Russell, J. A., & Bullock, M. (1985). Multidimensional scaling of emotional facial expressions: similarity from preschoolers to adults. Journal of Personality and Social Psychology, 48(5), 1290.