Unpacking decision domains

Commentary on "Domain-specific preferences for intuition and deliberation in decision making"

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Abstract

Opposing the idea that individual preferences for decision styles (intuitive vs. deliberative) are relatively stable across decision domains, Pachur and Spaar (2015) show that individuals prefer different decision styles depending on the domain of the decision (e.g., mate choice vs. buying electronics). In this commentary, we seek to expand upon these results by considering why individuals might favor one style over another across different domains. Drawing upon previous work, we suggest that the characteristics related to the structure of the environment (i.e., pattern of information available) and individual-based factors (e.g., expertise, importance of decision, risk perception) can help distinguish different decision domains. Moreover, we suggest that these differences can help uncover how different decision domains engender different decision styles.

Unpacking Decision Domains

In "Domain-specific preferences for intuition and deliberation in decision making" by Pachur and Spaar (2015), the authors hypothesize that individual preferences for decision styles (intuitive vs. deliberative) might vary across decision domains, and as a function of the person's self-perceived expertise within domains. To test this, participants were given a survey designed to capture tendencies for intuition vs. deliberation (adapted from Betsch & Iannello, in preparation) across six domains of everyday decision making. The survey also asked participants to report their expertise in making decisions within each of the domains. The results show that mean preferences for adopting an intuitive and deliberative decision style vary across domains (with a higher tendency for intuition within the domains of mate choice, clothing choice, and restaurant choice, a higher tendency for deliberation within the domains of buying electronic devices and choosing a doctor, and a null difference in decision style tendency for choosing a vacation destination). Additionally, the authors report high variability of decision style preferences for individuals across domains, as well as across individuals within each domain. This variability is partially explained by individuals' self-reports of expertise for each domain, with a preference for intuition being positively correlated with self-reported expertise. As the authors conclude, these findings echo Simon's (1987) argument that an effective decision maker chooses adaptively between the intuitive or analytic approach depending on the nature of the task at hand.

Environmental structure and the environment-organism interaction

In the current commentary, we explore the following question: What are the underlying differences between decision domains that elicit tendencies toward different decision styles? We suggest that the taxonomy of decision task characteristics proposed by Hammond and colleagues (e.g., Hammond, Hamm, Grassia, & Pearson, 1987) can provide a useful starting point for analyzing the environmental structure of everyday decision domains. This taxonomy includes (1) number of cues, (2) measurement of cues (i.e., objective and reliable vs. inferred), (3) distribution (i.e., variability) of cue values, (4) redundancy among cues, (5) decomposition of the task (i.e., how easily the task can be simplified), (6) degree of certainty, (7) relation between cues and criterion, (8) weighting of cues in the environmental model, (9) availability of organizing principle, (10) display of cues (simultaneous vs. sequential), and (11) time period for decision making. In general, the taxonomy of task characteristics espoused by Hammond et al. follows a Brunswikian systems approach (Brunswik, 1957), which suggests that decision making or behavior in general can be seen as a function of the interaction between the properties of the organism and the environment. This approach fits well with the results of Pachur and Spaar (2015) since they show that decision styles vary in accordance with expertise: an important interaction between the organism and its decision environment.

Another related approach to characterizing decision domains follows the notion of *ecological rationality* (e.g., Todd & Gigerenzer, 2012), which suggests that strategy choice is not only a function of the task characteristics (e.g., availability and usefulness of information, number of decision alternatives), but likewise born out of the constraints of the decision maker's capacity (e.g., perceptual, attentional, and memory limitations). Todd and Gigerenzer (2012) suggest *uncertainty* and *redundancy* as important characteristics of the environment. Both uncertainty and redundancy can be described in terms of cue *validities* (i.e., the strength of the cue's predictive relationship with the criterion) for cues available when solving a decision task. For instance, the decision domain for a judgment can be assumed to exhibit high uncertainty if the cues hold weak relationships with the decision criterion. In other words, even if there is a plethora of information available to use as cues for a given judgment, if the validities of these cues are low, the decision maker will face a high level of uncertainty. Additionally, a decision domain is assumed to feature high redundancy if the relevant cues are highly correlated. That is, some of the cues are redundant if their relationship with the decision criterion is captured by, and interchangeable with, another cue. According to this framework, simple heuristics that rely on

only one cue tend to be effective in environments with moderate to high uncertainty (Hogarth & Karelaia, 2007) and moderate to high redundancy (Dieckmann & Rieskamp, 2007; for an overview see Gigerenzer & Gaissmaier, 2011). Indeed, within the judgment and decision-making literature, there is evidence that people adapt their choice of strategy to characteristics of the environment (e.g., *redundancy*, Dieckmann & Rieskamp, 2007; *variability of cue validities*, Rieskamp & Otto, 2006; or *task complexity*, Hoffmann, von Helversen, & Rieskamp, 2016), and to their mental capacities (e.g., *memory ability*, Hoffmann, von Helversen, & Rieskamp, 2014; or *processing capacity*, Mata, Schooler, & Rieskamp, 2007).

Expertise and other individual-based factors

Experience and expertise are both important individual-based factors that relate to understanding decision styles. Importantly, it is not experience alone that makes the expert: The findings of Pachur and Spaar (2015) suggest that the frequency of decisions within a particular domain cannot be the only factor that determines differences in self-reported expertise (p. 309). As the authors point out, these findings coincide with Hogarth (2001), who distinguished between "kind" and "wicked" environments (see also Shanteau & Thomas, 2000). Robust learning, and hence the development of expertise, develops in environments where feedback is accurate, timely, and readily available.

Meaningful differences among decision domains can also be understood by observing the performance of experts. In which domains do experts perform well, and in which do experts hover just above chance? From this perspective, Shanteau (1992; 2015) provides a useful framework for characterizing decision domains based on factors that are assumed to increase expert performance, such as stable stimuli (static vs. dynamic), decisions about physical systems (vs. behavioral systems), expert agreement on relevant cues, predictability of context, error tolerance, repetition, available feedback, a decomposable problem, and use of decision aids. An important pattern that emerges from Shanteau's characterization of domains is that the domains in which experts perform best are typically computer-aided or relatively "friendly" environments (e.g., Shanteau & Thomas, 2000) because the cue-criterion relationships are easily detected, stable over time, or perhaps bolstered with feedback.

In addition to task characteristics related to the environmental structure of information available and how expertise may emerge depending on the particular environmental structure, other work has focused on separating out more individual-based (or situational) factors such as

risk preference, risk perception, or gender (e.g., Sitkin & Pablo, 1992; Blais & Weber 2001). Additionally, within another commentary of Pachur and Spaar's paper, Szászi (in press) discusses the importance of disentangling the influence of domain-specific preferences and expertise upon the tendency for people to adopt different decision styles. Related to individual-based factors, Pachur and Spaar (2015) conducted a pretest to gauge the subjective importance of different decision domains along with individuals' subjective expertise. The purpose of this pretest was to create a selection of domains that varied based on importance and expertise. As mentioned below, we suggest that further work could seek to manipulate factors such as importance or risk perception within a particular decision scenario. For example, while holding the decision options and available information constant (e.g., deciding among vacation destinations), one could manipulate the importance of the decision (e.g., choosing a honeymoon vacation vs. a weekend trip).

Incorporating and manipulating domain characteristics

It is worth noting that specifying the properties of everyday decision domains is not an easy task, especially when one considers that, despite the objective properties of the environment, individuals vary in how information is attended, represented, and used for decision making. Thus, we do not eschew the broad-level survey approach adopted by Pachur and Spaar. However, for future efforts, we suspect that their approach can be bolstered in at least three ways. First, instead of asking participants to imagine a recent decision from a particular domain, more specific decision scenarios can be presented. This would help to minimize the variability of the decision scenarios imagined by participants, which have varying environmental characteristics. For example, within the domain of purchasing clothing, one participant might imagine buying socks while another might imagine buying a wedding dress. Second, presenting more specific decision scenarios also affords researchers the opportunity to manipulate characteristics of the decision task. Thus, it is likely the case that decision styles vary, not only across different domains, but also *within* domains, depending on certain characteristics. Third, we also suggest expanding the survey instrument to include questions regarding the available knowledge (e.g., uncertainty or redundancy) about a particular decision scenario. For instance, after presenting participants with a decision scenario, one might ask them to list certain cues they would use to make their decision. The structure of the environment in relation to possible cues and their respective validities is well explored for some decision tasks, such as inferring the

population size of cities (e.g., Goldstein & Gigerenzer, 2002). It would also be worthwhile to structure other everyday decision domains along these lines (e.g. defining what might be possible cues, what their weights are, how much variance there is in the cues' values across options, and how much variance there is in the average payoffs of different strategies).

Comparing decision domain characteristics: Choosing a mate and buying a computer

We now consider which task characteristics might be informative for the pattern of results across the decision domains used by Pachur and Spaar (2015). While reporting equal levels of experience in both domains, it was found that mate choice led to the highest self-reported rate for adopting an intuitive decision style, whereas purchasing electronics led to the highest self-reported rate for adopting a deliberative decision style. Why is this so? These decision domains are likely highly different in terms of environmental structure and personal meaning for the participants. Regarding the environmental structure, much work has focused on identifying the important factors for mate choice (see Miller & Todd, 1998, for a review). Within the domain of mate choice, studies have revealed a wide array of subtle, sometimes non-linear, interacting, and dynamic cues from different areas (e.g., cultural, physical, personality) that are potentially integrated for decision making. Because of this complex pattern of information, we suspect, in general, a high level of uncertainty within the domain of mate choice. Contrasting with mate choice, when purchasing electronics it is often the case that the specifications of decision alternatives are readily available (for instance, on a website) and the usefulness of these cues is often well defined (e.g., computer processing speed or memory capacity). Thus, it is likely that there is far less uncertainty within the decision domain of purchasing electronics compared to mate choice. Additionally, related to the situational or individual-based factors, the importance of choosing a mate is presumably higher than purchasing electronics. Thus, even with only importance and uncertainty included as additional self-report measures, meaningful patterns would likely emerge across decision domains.

Conclusion

What, other than differences in expertise, might be driving the differences of decision styles across domains? There are many possible avenues for following up on the results of Pachur and Spaar (2015) to investigate this. We suggest that efforts to characterize different decision scenarios, between and within domains, according to the environmental structure and

individual-based factors can help illuminate why individuals adopt certain decision styles for different decisions.

References

Betsch, C., & Iannello, P. (in preparation). A unified scale to assess individual differences in intuition and deliberation (USID).

Blais, A. R., & Weber, E. U. (2001). Domain-specificity and gender differences in decision making. *Risk Decision and Policy, 6*, 47-69.

Brunswik, E. (1957). Scope and aspects of the cognitive problem. In H. Gruber, K. R. Hammond, & R. Jessor (Eds.), *Contemporary approaches to cognition* (pp. 5-31). Cambridge, MA: Harvard University Press.

Dieckmann, A., & Rieskamp, J. (2007). The influence of information redundancy on probabilistic inferences. *Memory & Cognition, 35*, 1801–1813.

Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision making. *Annual Review of Psychology, 62*, 451-482.

Goldstein, D. G., & Gigerenzer, G. (2002). Models of ecological rationality: the recognition heuristic. *Psychological Review, 109*, 75-90.

Hammond, K. R., Hamm, R. M., Grassia, J., & Pearson, T. (1987). Direct comparison of the efficacy of intuitive and analytical cognition in expert judgment. *Systems, Man and Cybernetics, IEEE Transactions on Systems, Man, and Cybernetics, SMC-17*, 753-770.

Hoffmann, J. A., von Helversen, B., & Rieskamp, J. (2014). Pillars of judgment: How memory abilities affect performance in rule-based and exemplar-based judgments. *Journal of Experimental Psychology: General, 143*, 2242-2261.

Hoffmann, J. A., von Helversen, B., & Rieskamp, J. (2016). Similar task features shape judgment and categorization processes. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. Advance online publication. http://dx.doi.org/10.1037/xlm0000241

Hogarth, R. M. (2001). *Educating intuition*. Chicago: University of Chicago Press.

Hogarth, R.M., & Karelaia, N. (2007). Heuristic and linear models of judgment: matching rules and environments. *Psychological Review, 114*, 733–58.

Mata, R., Schooler, L. J., & Rieskamp, J. (2007). The aging decision maker: Cognitive aging and the adaptive selection of decision strategies. *Psychology and Aging, 22*, 796-810.

Miller, G. F., & Todd, P. M. (1998). Mate choice turns cognitive. *Trends in Cognitive Sciences, 2*, 190-198.

Pachur, T., & Spaar, M. (2015). Domain-specific preferences for intuition and deliberation in decision making. *Journal of Applied Research in Memory and Cognition, 4,* 303-311.

Rieskamp J., & Otto P. E. (2006). SSL: A theory of how people learn to select strategies. *Journal of Experimental Psychology: General, 135,* 207–236.

Shanteau, J. (1992). Competence in experts: The role of task characteristics. *Organizational Behavior and Human Decision Processes, 53,* 252-266.

Shanteau, J. (2015). Why task domains (still) matter for understanding expertise. *Journal of Applied Research in Memory and Cognition, 4,* 169-175.

Shanteau J., Thomas R. P. (2000). Fast and frugal heuristics: What about unfriendly environments? *Behavioral and Brain Sciences, 23,* 762–763.

Simon, H. A. (1987). Making management decisions: The role of intuition and emotion. *The Academy of Management Executive, 1,* 57-64.

Sitkin, S. B., & Pablo, A. L. (1992). Reconceptualizing the determinants of risk behavior. *Academy of Management Review, 17,* 9-38.

Szászi, B. (in press) The role of expertise and preference behind individuals' tendency to use intuitive decision style. *Journal of Applied Research in Memory and Cognition.*

Todd, P. M., Gigerenzer, G., & the ABC Research Group (2012). *Ecological rationality: Intelligence in the world.* New York, NY: Oxford University Press.