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Decision-making styles in a real-life decision: Choosing a college major

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Abstract

Undergraduate students were surveyed at the beginning stages of a potentially life-framing decision: choosing a college major. We investigated the relationships among individual difference variables (decision-making styles, planning proclivities, and epistemological orientations), cognitive measures of performance (e.g., amount of information gathered and considered); and affective reactions to, and descriptive ratings of, the decision-making process. There were few significant relationships between individual differences and performance measures. However, there were significant relationships found between individual differences measures and affective reactions to, or descriptive ratings of, the decision-making process. We suggest that stylistic measures have their effects in the way individuals frame the decision-making process rather than in the way they go about gathering or structuring information.

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Keywords: Decision-making styles; Decision-making; Individual differences; Affective reactions to decisions

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1. Decision-making styles in a real-life decision: Choosing a college major

Anecdotally, people are said to approach decisions in different ways. Some emphasize an objective, detached manner, gathering much information and performing explicit analyses. Others see themselves as more holistic and intuitive. Some operate autonomously, while others rely on others' input to navigate the process. Some people approach decision-making tasks with a more spontaneous manner, in contrast to those who are much more deliberative and intentional. Other individuals try to avoid the process entirely. These individual differences are thought to be independent of cognitive abilities such as intelligence, and more related to motivational or personality differences.

Many proposals have been offered for dimensions of decision-making style (Berzonsky & Ferrari, 1996; Blustein & Phillips, 1990; Niles, Erford, Hunt, & Watts, 1997). We adopted the proposal of Scott and Bruce (1995), due to its encompassing of other taxonomies and empirical validation. Their survey instrument assesses five distinct stylistic dimensions: *rational* (characterized by a thorough search for and logical evaluation of alternatives), *intuitive* (characterized by a reliance on hunches and feelings), *dependent* (characterized by a search for advice and direction from others), *avoidant* (characterized by attempts to avoid decision-making), and *spontaneous* (characterized by a sense of immediacy and a desire to complete the process quickly). They tested their survey instrument not only with undergraduates, but also with military officers and graduate students. A subsequent and independent assessment of the psychometric properties of their instrument confirmed the existence of the five styles identified by Scott and Bruce (Loo, 2000).

Decision-making styles constitute a subset of broader cognitive styles, defined generally as the way people deploy their intellectual abilities, or the manner in which they approach cognitive tasks (Rayner & Riding, 1997; Sternberg, 1997). A common dimension of difference in many of the learning style, thinking style, and decision-making style investigations is the contrast between rational and intuitive approaches. The former connotes approaching a task objectively, unemotionally, analytically, and thoroughly; the latter, personally, emotionally, holistically, and drawing on one's feelings (Klaczynski, 2001; Stanovich & West, 2000).

However, much of the literature on decision-making styles has been limited to self-report measures of general decision-making, unconnected to specific decisions made. That is, respondents are asked to describe how they typically make decisions, instead of being observed as they actually face a specific decision. This approach neglects the possibility that people may perform very differently when they face very different kinds of decisions. Payne, Bettman, and Johnson (1993) asserted the *adaptive decision maker hypothesis*, the idea that individuals adopt different strategies when they face different decisions.

Some work has been reported investigating the effects of individual differences in episodes of decision-making. Parker and Fischhoff (2005) have recently reported preliminary work on the construction of an aggregate measure of decision-making competence (DMC), which the authors conceive of as a specific cognitive ability measure. Lauriola, Russo, Lucidi, Violani, and Levin (2005) report on a large-scale study of personality variables as they predict decision-making performance on a variety of framing tasks, constructed to be as similar as possible to everyday risky health decisions, such as whether or not a person with a specific blood pressure level should or should not take a new experimental medication or consume more vitamin E. In another study, Levin and colleagues (Levin, Huneke, & Jasper, 2000) studied students with either high or low

need for cognition (NFC) as they engaged in a hypothetical information search task investigating which of a set of notebook computers to purchase. In all of these studies, the actual decision-making studied was hypothetical in nature; that is, the decision makers were not actually making a decision that had relevance for their own goals and future. Although hypothetical decision-making may predict real-world decision-making, (the Parker & Fischhoff study presents some modest relationships with risky behaviors) there is good reason to be skeptical of an automatically direct correspondence between the two (Galotti, 1989).

Thus, a gap in the current literature seems to be investigating whether and at what points individuals with reportedly different decision-making styles perform differently when making *actual decisions*. Some work relevant to this question has begun. Friedrich (1987), for example, found that college students who perceived little internal control over their vocations sought less information, generated fewer alternatives, and considered fewer pros and cons of each alternative in their search for a summer job, relative to students who perceived themselves to have more control over their occupations and careers. But more work is needed in this vein.

Past research on real-life decision-making has focused upon the phase of process known as decision structuring, a process during which the individual creates a “short list” of options and considers (implicitly or explicitly) the criteria to be used in evaluating those options (Galotti, 2002). Different decision-making theorists have emphasized the importance of this phase of decision-making (Beach, 1993, 1998; Byrnes, 1998), and Scott and Bruce (1995) expected decision-making stylistic differences to show up in these phases, which were the reasons we chose to focus upon them in the current study.

We looked to see first whether people with different approaches to decision-making reported considering different numbers of criteria or options, or consulting a different number of information sources. We refer to these collectively as “performance measures”. We expected to see some performance differences as a function of decision makers’ individual differences. In particular, we expected that students who reported themselves as more “rational” or “planful” would describe considering more options and/or more criteria, and/or consulting more information in making this decision. In contrast, we expected students who described themselves as more avoidant or “spur-of-the-moment” to report considering fewer options or criteria, and consulting fewer information sources.

Decision-making styles may be too specific a level of individual differences to examine. For this reason, we chose to incorporate additionally two broader individual differences constructs. One relates to the individual’s tendency to plan ahead and to schedule and budget resources (Simons & Galotti, 1992). The idea here is that decision makers who have more proclivity to plan may be better able to negotiate the complex decision-making process of selecting an appropriate college major, as they presumably would more intentionally allocate time and other resources to this process. We expected planfulness to correlate with rationality, given the overlapping nature of the two constructs.

We also included a measure of two epistemological orientations, which are spontaneously adopted approaches to learning and knowledge (Belenky, Clinchy, Goldberger, & Tarule, 1986/1997). The rationale for this inclusion is that epistemological orientation may capture broad differences in the ways in which people acquire and evaluate the information they use in decision-making. So-called *separate knowing* involves a detached, analytical evaluation of information. It often involves an adversarial tone, playing “devil’s advocate”, or critical thinking. In contrast, *connected knowing* involves a deliberate bias in favor of an argument, plan, or other set of knowledge; an attempt to find out “what is right” about it, a sympathetic view that emphasizes understanding a position prior to evaluating it. We expected separate knowing to correlate with

rationality, and connected knowing to correlate with intuitiveness, again because of the overlapping nature of the two constructs.

The college major decision is an interesting one to investigate for many reasons. First, it is a potentially life-framing decision that many students struggle with (Galotti, 1999; McDaniels, Carter, Heinen, Candrl, & Wieberg, 1994). The decision is also rich—several sources of information are potentially available, and it affords a wide variety of approaches. For example, students can talk with other students who already have declared their majors, consult their professors and/or academic advisors, read through departmental web sites, attend departmental or program functions, or confer with specially trained undergraduate student advisors. Students can also turn to parents or other relatives for input, and can choose to reflect on their own values, previous experiences, career or lifestyle goals.

A third desirable aspect of studying this decision is that it is on a known timetable, allowing investigators to pinpoint with some degree of accuracy how far away a student is from making a final choice. Although different students report themselves as actually making their final choice at different times, the policy of the college at which these students were enrolled is to prevent a formal declaration of the major until the final trimester of the sophomore year. The reasoning here is that by compelling students to wait, the institution encourages them to reflect on their options, to seek out relevant advice and other information, and to make a well reasoned choice.

The major decision is one that many students make independently, and for some of them, it is the first major long-term planning decision they face autonomously or at least have a great deal of voice in. Thus, the study of this decision is one that captures a cohort of people who are all relatively inexperienced at making important life choices.

Lastly, previous work (Galotti, 1999) established that this decision is one students are highly motivated to make. Indeed, given the nature of the decision and the decision makers, one might expect the decision-making performance to be as close to ideal as real-life decision-making can be: Highly motivated and well-educated decision makers, in an environment offering much information and an extended timetable, with a plethora of advice available from many sources.

College undergraduates were recruited in the winter of their first year of college, when they were approximately 15 months away from explicitly declaring their major. They were surveyed about the options under consideration, the criteria they were using and the relative importance of each criterion, their affective responses to the process, their characterization of their approaches to the process, and the information sources they had consulted or were planning to consult. They also filled out three surveys assessing their decision-making style, their tendency to plan ahead, and their epistemological orientation. Although students were several months away from a formal declaration, previous work (Galotti, 1999) had suggested that at this point in time most students were actively involved in thinking about the decision and gathering information, and that the *number* of options and criteria under consideration was unlikely to change much over the course of a year.

2. Method

2.1. Participants

One hundred and thirty-three students (95 female) from Carleton College participated. Carleton is a coeducational residential liberal arts college enrolling approximately 1900 full-time

students with approximately 20% students of color. Participants were recruited through campus mailings and notices. Each participant received a \$2.00 gift certificate.

2.2. Materials

All instruments were written surveys that were completed in a given sequence in a single session at the participant's own pace. They were as follows:

2.2.1. Free-response questions

Open-ended questions were provided to the participants to capture themes that may not have been presented in the other surveys. These responses will not be included in this report.

2.2.2. Reactions to decision-making survey

This survey, adapted from Galotti (1999) asked participants to rate their agreement with statements describing affective reactions to making this specific decision or statements describing approaches to making this specific decision. Ratings were made on a seven-point scale ('1' = "not at all"; '7' = "completely"). Sample items included: "How certain are you that you are making the right decision?"; "How much are you using specific criteria to make this decision?"¹

2.2.3. Decision-making styles survey

This survey, adapted from Scott and Bruce (1995),² asked the participants to rate agreement with statements about how they make decisions in general. The 30 statements contain six items forming five different scales, each purporting to measure a distinct approach to decision-making: rational, intuitive, dependent, avoidant and spontaneous. Example items pertaining to these respective scales are the following: "I make decisions in a logical and systematic way", "When I make decisions I tend to rely on my intuition", "I often need the assistance of other people when making decisions", "I avoid making important decisions until the pressure is on", and "I generally make snap decisions". Responses were rated '1' ("strongly disagree") through '7' ("strongly agree"). Scott and Bruce (1995) reported internal reliabilities for the five scales on their original instrument as having the following ranges in four validation studies: Rational, .77–.85; Intuitive, .78–.84; Avoidant, .93–.94; Dependent, .68–.86; Spontaneous, .87.

2.2.4. Attitudes toward thinking and learning survey (ATTLS)

The ATTLS (Galotti, Clinchy, Ainsworth, Lavin, & Mansfield, 1999) also used a seven-point scale rating agreement (strongly disagree to strongly agree). It presented statements embodying either a connected knowing (henceforth CK) or separate knowing (henceforth SK) epistemological orientation. Examples of the two kinds of statements include "When I encounter people whose opinions seem alien to me, I make a deliberate effort to "extend" myself into that person, to try to see how they could have those opinions" and "I like playing devil's advocate—arguing

¹ This instrument and all other instruments are available from the first author.

² One item was added to their rational scale, as it appeared to be missing from their published article. In addition, we added one additional item to each of the five scales to improve internal reliabilities. Thus, the scale we used contained 30 items, including the 24 items Scott and Bruce (1995) published.

the opposite of what someone is saying”. Internal reliabilities for the two scales ranged from .76 to .81 for the Connected Knowing Scale, and .83 for the Separate Knowing Scales (Galotti et al., 1999).

2.2.5. *Planning survey*

The planning survey (Simons & Galotti, 1992) presented statements about the participant’s self-reported use of planning strategies and organization of information. A sample statement is “I write down appointments and meetings on a calendar”. Responses were rated on a five-point scale (‘1’ = *never*; ‘5’ = *always*). The internal reliability for the scale in the validation study was .88.

2.2.6. *Factors and options worksheet*

This survey, adapted from previous research (Galotti, 1995, 1999) was used to provide a systematic way for the participants to describe the options under active consideration, as well as the criteria the participant reported using to evaluate those options. The worksheet presented the participant with a grid containing ten columns of blanks. In the second column participants were asked to list the criteria by which they were evaluating their major options (e.g., career opportunities, requirements). Each criterion was rated for its importance on a 10-point scale, ‘10’ = “extremely important”, ‘1’ = “not very important” and these weights were placed in the first column. Once all of the criteria were weighted, the weights of the criteria were folded over so they were not visible to the participant.

At the top of the third through tenth column the students were asked to list the majors they were currently considering. Then, the participant rated the major options on how well they fulfilled each of the criteria using a 10-point scale.

2.3. *Procedure*

Participants were handed a packet of surveys. The free-response questions were always completed first, so that responses to other surveys would not contaminate these answers. The Reactions to Decision-making survey always came last, so that responses to it would not affect other measures. The order of all other instruments was counterbalanced across participants as a precaution against possible order effects.

Participants completed the measures in small groups and worked independently through each of the surveys administered. The participants were asked to wait when they arrived at the Factors and Options Worksheet (because of its relative complexity) and the whole group received a detailed explanation of what information to put in which columns.

3. Results

We first computed internal reliabilities for all scales used. For the Decision-Making Styles Survey, the internal reliabilities (computed with coefficient alpha) were .77, .82, .87, .81, and .87 for the Rational, Intuitive, Avoidant, Dependent, and Spontaneous scales, respectively. For the Attitudes Toward Thinking and Learning Survey, the internal reliabilities were .71 and .76 for the CK and SK scales, respectively. The internal reliability for the planning scale was .79. All of these val-

ues were deemed acceptable to very good, and consistent with previously reported values in the literature.

We next examined intercorrelations among the various stylistic measures, presented in Table 1. Both CK and SK scores correlated moderately with rational decision style scores. Unsurprisingly, CK scores were correlated with Intuitive decision style scores, given the overlapping definitions of the two constructs. Rational decision style scores were strongly correlated with planning scores ($r = .49$), indicating that students who saw themselves as logical and systematic were also likely to report themselves as planning ahead and budgeting resources. Rational decision style scores were negatively correlated with both avoidant and spontaneous style scores, reinforcing the intuition that rationality precludes both avoidance and impulsiveness. Intercorrelations among the five decision style scores replicated those reported by Scott and Bruce (1995) and Loo (2000).

Although none of the correlations was over .50, we decided to attempt to reduce the data by performing a factor analysis of the eight individual difference measures, using principal components extraction. Examination of eigenvalues and the scree plot suggested extraction of four factors. Examination of individual variable factor loadings (those above .45, considered a “fair” magnitude; Tabachnick & Fidell, 1996), led to the designation of following names for the four factors, which together accounted for 74.41% of the variance.

The first factor, named “Future Orientation” (eigenvalue 2.12, accounting for 26.45% of the variance) had the following variables loading on it (with the factor loadings as indicated): Spontaneous decision-making style, $-.52$; Avoidant decision-making style, $-.58$; Rational decision-making style, $.84$; and Planning score, $.76$. The second factor, “Empathic Intuition” (eigenvalue 1.53, accounting for an additional 19.11% of the variance), had the following variables loading on it: Connected Knowing, $.70$; Spontaneous decision-making style, $.53$; Intuitive decision-making style, $.62$. The third factor was named “Reliance on Others” (eigenvalue 1.25, accounting for an additional 15.59% of the variance), had the following variables loading on it: Spontaneous decision-making style, $-.47$; Dependent decision-making style, $.80$. Finally, the fourth factor extracted was dubbed “Objective Detachment” (eigenvalue 1.06, accounting for an additional

Table 1
Intercorrelations among individual differences variables

	CK	SK	Plan	Rat	Int	Avo	Dep
SK	.10	–					
Plan	.12	.14	–				
Rat	.30***	.31***	.49***	–			
Int	.22*	–.00	.09	.14	–		
Avo	.06	–.02	–.35***	–.29***	–.08	–	
Dep	.14	–.15	.07	.11	–.01	.29***	–
Spo	.14	.05	–.27**	–.35***	.31***	.25**	–.10

$n = 130$ – 133 , depending on the specific correlation.

CK = connected knowing score; SK = separate knowing score, Plan = planning score, Rat, Int, Avo, Dep, Spo = rational, intuitive, avoidant, dependent, and spontaneous decision style scores, respectively.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

13.27% of the variance). The variables loading on this factor were: Separate Knowing, .78; and Intuitive decision-making style, $-.49$. We thus created four new variables by multiplying the factor loadings reported above by the scores on the original eight individual difference variables, reducing the number of individual differences variables from eight to four.

3.1. Structural measures of decision-making

We examined the number of options (possible college majors) under consideration, the number of factors or criteria students reported using to decide among options, and the number of information sources students reported relying on in making their “major” decision. The first two measures were taken from the Factors and Options Worksheets described earlier; the third was tabulated from the students’ responses to the free-response questions. We also calculated a measure called “decision map size”, by multiplying the number of options under consideration by the number of factors reported. This measure was intended to gauge how many pieces of information a student would have to work with, given their own “layout” of the decision.

No student reported having made a final decision regarding their major. Overall, the students reported 4.78 possible majors under consideration ($SD = 1.53$), 5.90 criteria or factors being used to assess the options ($SD = 1.93$), and 2.59 information sources consulted ($SD = 1.56$). Moreover, the mean size of decision map was 28.43 ($SD = 14.85$). These results generally replicate those reported in an earlier study (Galotti, 1999).

We correlated these four measures with the four individual differences measures described above. Only one of the 16 correlations calculated yielded a statistically significant relationship, that between Future Orientation and the number of options under consideration ($r = -.23$; $p < .05$). Thus, there appear to be few if any reliable relationships between individual differences measures and the amount of information gathered or considered.

3.2. Descriptions of and affective responses to the decision-making process

We began by analyzing the mean ratings participants gave to the 15 items on the *Reactions to Decision-Making Survey*. To reduce the data, we again performed a factor analysis of the 15 ratings, using principal components extraction. Examination of eigenvalues and the scree plot suggested extraction of three factors. Examination of individual variable factor loadings (those above .45), led to the designation of the following names for the three factors, which together accounted for 51.57% of the variance.

The first factor, named “Positive Response to the Decision-Making Process” (eigenvalue 4.01, accounting for 26.71% of the variance) had the following ratings loading on it (with the factor loadings as indicated): Certainty of decision, .74; Comfort with the process, .77; Feeling rushed in decision, $-.60$; Stressfulness of the process, $-.69$; Satisfaction with information obtained, .65; Independence in making decision, .46; Enjoyment of process, .75; Difficulty of process, $-.49$; Ruling out options due to one or few criteria, $-.47$. The second factor, designated, “Intentional Decision-Making (eigenvalue 2.46, accounting for an additional 16.43% of the variance), had the following variables loading on it: Use of specific criteria, .63; Emphasis on future consequences, .67. The third factor was named “Self-Reliance” (eigenvalue 1.26, accounting for an additional 8.43% of the variance), had the following variables loading on it: Independence in mak-

Table 2
Individual differences in affective and descriptive rating composite measures

	Positive response to decision-making process	Intentional approach to making this decision	Self-reliance in making this decision
Future orientation	.23**	.41***	.12
Empathic intuition	.08	.11	.17 ⁺
Reliance on others	−.26**	.17 ⁺	−.19*
Objective detachment	.14	.05	−.02

$n = 128$ – 133 , depending on the specific correlation or rating scale.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

⁺ $p < .10$.

ing decision, .51; Use of intuition, .61. We thus created three new variables by multiplying the factor loadings reported above by the scores on the original 15 ratings, reducing the number of ratings of the process variables from 15 to three.

We correlated the individual differences composite variables with these new composite ratings variables, and present the results in Table 2. It shows that of the 12 correlations correlated, four were statistically significant. In particular, Future Orientation correlated positively with reporting a positive affective response to the decision-making process, and positively with reporting an intentional approach to it. Reliance on Others, in contrast, correlated negatively with reporting a positive response to the decision-making process, and negatively with self-reliance in making this decision (as expected).

4. Discussion

The major question in this study is whether and where in this specific decision-making process individual differences have an effect. Our data suggest that the effects occur not in the way information is gathered or structured, but rather in the ways one responds affectively to the process or sees oneself as approaching it. Individual differences scores did not correlate with structural measures of decision-making, such as the number of options considered, the number of criteria used, or the number of information sources consulted. These data suggest that students who report themselves to have very different approaches to decision-making report themselves to gather and consider the same amount of information as they face this important decision.

Decision-making styles seem not to affect either the information-gathering or decision-structuring phases of decision-making as previously hypothesized (Scott & Bruce, 1995). Where then, might they have an effect? We speculate that decision-making styles may affect the way individuals conceptualize decisions—perhaps in how they see a specific decision in a larger context (if, in fact, they do). Students in this study seemed to differ with respect to the degree to which they extrapolated the consequences of their decision into the future, or to their principles and values. On this account, stylistic differences would be more likely to affect an earlier phase of the process, that of setting goals. Goal setting is widely viewed as an important component of the decision-making

process (Bandura, 2001; Byrnes, 1998; Galotti, 2002). However, exactly how goals are established and what role they play in actual episodes of decision-making has yet to be fully described.

Different styles have different connotations as well. Being “rational” seems clearly better, from a normative standpoint, than being “avoidant” or “dependent” or even “spontaneous”. It remains to be seen, however, whether in fact the different styles do predict better long-term satisfaction with decision outcomes.

Different people approach decisions in different ways. But in our study, the differences do not show up in information-gathering or decision-structuring phases of the process, as predicted. It remains to be seen whether individual differences emerge in earlier, and broader phases of decision-making, as decision makers set their goals and make plans to implement them, or if instead, the different approaches have their effects only in the way people describe and conceptualize the decisions, and react to the process. Alternatively, less important or intentional decisions may show different results. We call for a wider set of real-life decision-making processes to address these important questions.

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