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Decision Styles and Rationality: An Analysis of the Predictive Validity of the General Decision-Making Style Inventory

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Abstract

This study investigates the relationship between the five decision-making styles evaluated by the General Decision-Making Style Inventory, indecisiveness, and rationality in decision making. Using a sample of 102 middle-level managers, the results show that the rational style positively predicts rationality in decision making and negatively predicts indecisiveness, whereas the avoidant style positively predicts indecisiveness.

Keywords

rationality, decision-making styles, indecisiveness

The General Decision-Making Style Inventory (GDMSI; Scott & Bruce, 1995) is one of the most widely used measures for decision-making styles in the judgment and decision-making literature. The inventory assesses five distinct styles: rational (thorough information search and logical evaluation of alternatives), intuitive (reliance on gut feelings and hunches), dependent (advice seeking and reliance on others), avoidant (a tendency to escape and avoid decision situations), and spontaneous (a tendency to make fast and speedy decisions; Scott & Bruce, 1995). The original study (Scott & Bruce, 1995) as well as subsequent research (Loo, 2000; Sadler-Smith, 2011) has extensively addressed the psychometric qualities of the inventory.

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However, thus far the studies using GDMSI in relation to judgment and decision making have not shown consistent effects (or associations) of the five styles with decision outcomes or other variables relevant for judgment and decision making, in particular rationality.

Several studies explored the association between the five decision styles with information search behaviors in real-life decisions. Galotti and Tinkelenberg (2009) asked a sample of parents of kindergartners to participate in a simulated decision task of selecting a school to place their kids in the first grade. Although the authors hypothesized that the amount of information considered in decision making is positively related to the rational style and negatively related to the dependent, avoidant, and spontaneous styles, they found that the avoidant style correlated positively with the number of sources used to collect information and with the number of criteria used in the decision process as well as negatively with the number of options considered. Galotti et al. (2006) used a modified version of the GDMSI (they added one item to each of the five scales to improve internal reliability) and reported positive correlations between the rational style and cognitive engagement (decision planning, separate knowing, and connected knowing) in real-life decisions. Crossley and Highhouse (2005) found that individuals scoring high on the rational and intuitive styles reported higher job satisfaction as well as more satisfaction with the job search process. Finally, Sager and Gastil (1999) reported that in small group settings, group members' preference for consensual decisions correlated positively with their score on the rational and dependent decision-making styles. Therefore, although information search is an important facet of rationality in decision making (as it is related to maximizing preferences, values and utilities; Shafir & LeBoeuf, 2002), we have no clear picture as to which of the five styles predicts information search in decision situations.

Research conducted by Parker, de Bruin, and Fischhoff addressed the relation between the five decision-making styles and decision-making competences. One of their studies shows that the rational style is positively related to general decision-making competence and to avoidance of negative decision outcomes (de Bruin, Parker, & Fischhoff, 2007), whereas another study failed to replicate these results (Parker, de Bruin, & Fischhoff, 2007). Their Adult Decision-Making Competence measure (Parker & Fischhoff, 2005) uses modified items from the heuristics and biases literature to evaluate the extent to which respondents are sensitive to a wide range of such heuristics and biases. Their instrument, however, is mostly focused on intra-individual consistency as an indicator of decision competence. This consistency view, however, does only partially cover the notion of rationality (Shafir & LeBoeuf, 2002). A decision maker can be—systematically—less sensitive to framing effects; this means that his/her choices are noncontradictory but not necessary more rational.

We understand rationality as a reduced sensitivity to decision-making biases, heuristics, and paradoxes or the general capability of a decision maker to make logically correct choices or choices consistent with a normative ideal (Curşeu, 2006; Shafir & LeBoeuf, 2002). A scale evaluating rationality in this conceptualization was

introduced by Curşeu (2006). The scale is based on a similar logic as Adult Decision-Making Competence (modified experimental tasks used in the heuristics and biases literature), yet the respondent is also offered the chance to choose a normatively correct answer. As a consequence, the scale allows the evaluation of rationality as the accuracy of answers in relation to a normative ideal. Moreover, an indecisiveness score can be computed by summing up the number of times the respondent chooses ''I cannot decide,'' an additional answer category added to each of the decision tasks. No proper investigation of the relation between the rational style and rationality in decision making has been conducted so far. Our aim is to address this relation. We hypothesize that rationality is positively correlated with the rational style, whereas indecisiveness is positively correlated with the avoidant and dependent styles and negatively with the rational decision style.

Method

Participants

These hypothesized relations were tested in a sample of 102 mid-level managers (26 women) with an average age of 41.72 years (ranging from 28 to 54 years) enrolled in an MSc program at a Dutch business school.

Instruments

These managers were asked to complete a survey that included the 25 items of GDMSI (Scott & Bruce, 1995) and the 10 modified decision tasks from Curşeu (2006). The items of the GDMSI were translated into Dutch and checked for consistency through back-translation from Dutch to English. Rationality in decision making was evaluated with 10 items used in previous research to evaluate sensitivity to three heuristics and biases: the framing effect (2 items), representativeness bias (6 items), and Ellsberg's paradox (2 items). The decision-making tasks were formulated as multiple-choice items. The normative correct choice and an extra option on indecisiveness (''I cannot decide'') were used in the alternative choice set. Examples of the tasks are presented in the appendix. The summed score of normative correct answers to the 10 items was used as an index of rationality in decision making, while a summed score of the times of the option ''I cannot decide'' was selected was used as an indicator of indecisiveness.

Results

The descriptive statistics and correlations for the scales used in the study are presented in Table 1. The internal consistency reliability of the five scales of the GDMSI is adequate. Cronbach's alpha coefficients are also presented in Table 1.

To have an indication on how the factorial structure of the GDMSI varies across samples, we replicated the analyses reported in Loo (2000), and we conducted an

Table 1. Means, Standard Deviations, Reliabilities, and Correlations

	Mean	*SD*	1	2	3	4	5	6	7	8
1. Gender	0.26	0.44								
2. Age	41.72	6.05	.07							
3. Rational	3.52	0.63	−.15	−.05	(.78)					
4. Intuitive	3.63	0.57	−.03	.11	−.18	(.81)				
5. Dependent	3.03	0.71	.06	−.12	−.08	−.14	(.80)			
6. Avoidant	2.28	0.82	.21*	−.08	.00	−.18	.49**	(.90)		
7. Spontaneous	2.56	0.54	.06	−.18	−.10	.25*	−.14	−.09	(.73)	
8. Rationality	3.76	1.59	−.20*	.02	.31**	−.02	−.09	−.26**	−.00	(.46)
9. Indecisiveness	1.47	1.22	.03	−.02	−.30**	−.11	.31**	.31**	−.17	−.22*

Note: Gender is coded as 1 = *female* and 0 = *male* (the Mode for gender is 0). Cronbach's alpha are presented in parentheses; for rationality the coefficient is rather low. However, Cronbach's alpha is not a dependable estimator of reliability for scales with discrete components.
**$p < .01$. *$p < .05$.

Table 2. Results of the Confirmatory Factor Analysis for General Decision-Making Style Inventory

Model	χ^2 (*p*)	*df*	CMIN/*df*	RMSEA	CFI	TLI
Five-factor model (no covariates)	487.77 (000)	275	1.77	.09	.79	.76
Five-factor model (with covariates)	434.72 (.000)	265	1.64	.08	.84	.81
Five-factor model corrected	252.46 (.001)	185	1.36	.06	.92	.91
Rational	3.94 (.55)	5	.78	.00	1.00	1.00
Intuitive	31.94 (.000)	5	6.38	.23	.84	.70
Dependent	8.26 (.08)	5	1.65	.09	.97	.92
Avoidant	5.29 (.38)	5	1.05	.02	.99	.99
Spontaneous	10.62 (.03)	5	2.12	.13	.95	.89

Note: RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker–Lewis index. The five-factor model corrected was obtained by excluding (based on the analysis of the standardized residual covariance matrix) four items: two from the spontaneous style and two from the dependent style. χ^2 paired comparison for Models 1, 2, and 3 reveals significant differences between the models: for Models 1 and 2 $\Delta^2\chi(10) = 53.05$ ($p < .001$), for Models 1 and 3 $\Delta^2\chi(90) = 235.31$ ($p < .001$), for Models 2 and 3 $\Delta^2\chi(80) = 182.26$ ($p < .001$).

exploratory factor analysis (EFA) as well as a confirmatory factor analysis (CFA; Van Prooijen & Van Der Kloot, 2001). Similar to Loo (2000), we conducted an EFA using principal axis factoring with a varimax rotation. In the rotated structure, five factors with an eigenvalue higher than 1 accounted for 62.49% of variance. In general, items associated with the five scales loaded on the expected factors with the exception of two items from the dependent style (''I often need assistance of other people when making important decisions,'' and ''If I have the support of others, it is easier for me to make important decisions'') that not only loaded on the dependent style factor but also on the spontaneous style factor (cutoff points for significant factorial loads were set at .30). To further explore the appropriateness of the five-factor structure of the GDMSI, we conducted a CFA that supplemented the EFA. We used structural equation modeling (conducted with AMOS 18 software) with a maximum likelihood procedure, and the results of the CFA are presented in Table 2. Three five-factorial models were tested: (a) a model in which the five factors were not allowed to covariate, (b) a model in which the five factors were allowed to covariate, and (c) a corrected five-factor model in which four items were excluded (based on the analysis of the standardized residual covariance matrix)—the two items from the dependent style that cross-loaded on the spontaneous style factor had also rather low beta coefficients, and two items from the spontaneous style scale were also problematic because of the low beta coefficients and were excluded. For the first two five-factorial models, chi-square values were significant and incremental fit indices did not reach the less conservative .90 cutoff. For the last five-factorial model, the chi-square was significant, yet the incremental fit indices reached the .90 (but not the more conservative .95 as specified in Yuan & Bentler, 2004) cutoff point. Moreover, for this model, the root mean square error of approximation (RMSEA) is .06, showing that the model

has a reasonable fit with the data. The RMSEA is .08 for the second model as well, and because RMSEA is the best indicator of absolute fit (Ryser, Campbell, & Miller, 2010), we can conclude that, in general, the five-factorial structure of the GDMSI is supported by our data (the results for the CFA of the five-factorial models are similar to the ones reported by Loo, 2000). In addition to the five-factorial models, the five factors were tested independently, and the results show a good fit between the rational style and the data as well as between the avoidant style and the data (χ^2 is not significant, RMSEA scores are lower than .03, and the incremental fit indices reached the conservative .95 cutoff point as specified in Yuan & Bentler, 2004). Moreover, the CFA results for the spontaneous and dependent styles show a reasonable fit with the data. Similar to the results reported by Loo (2000), the fit between the intuitive style and the data was rather poor. All in all, the results of our EFA and CFA fit the results previously reported in the literature for the GDMSI.

Our results show a negative yet nonsignificant correlation of age with the spontaneous decision-making style. In line with previous studies (Loo, 2000), women showed a stronger inclination to use an avoiding style as compared with men. Similar to Sadler-Smith (2011), our study does not show a systematic association between gender and the intuitive style. The rationality score correlates positively with the rational style and negatively with the avoidant decision-making style. Indecisiveness is negatively correlated with the rational style and the rationality score, and positively with the dependent and avoidant decision-making styles. The pattern of correlations between the five decision styles is consistent with the negative correlations reported by Scott and Bruce (1995). Our results also reveal a positive and significant correlation between the intuitive and spontaneous styles as well as a positive association between the dependent and avoidant styles. To further test our hypothesized relationships, we performed two stepwise ordinary least squares (OLS) regression analyses with rationality and indecisiveness as dependent variables and gender and age as control variables entered in the first step. The five decision-making styles were entered in the second step. All variance inflation factor scores are lower than 1.2; therefore, multicollinearity is not a problem in our analyses. The results of the stepwise regression analyses are presented in Table 3.

In line with the hypothesized relations, our results show that the rational style significantly (and positively) predicts the rationality score, whereas the avoidant style has a negative effect on rationality. The results also reveal a positive effect of the avoidant style and a negative effect of the rational style on indecisiveness. The hypothesized positive effect of the dependent style on indecisiveness is not supported, although the standardized beta coefficient is positive. Nevertheless, the mean scores for the five decision styles used in the OLS regression may suffer from measurement errors and therefore we used a latent variables approach to further analyze the data. To prevent the drawbacks of using misspecified models and to make sure that structural equation modeling (SEM) removes the measurement errors in the regression coefficients (Yuan & Bentler, 2004), only the rational and avoidant latent factors are included in the analyses. We have used an SEM approach (conducted

Table 3. Stepwise Regression Results for Rationality and Indecisiveness

		Rationality		Indecisiveness	
Step	Independent Variables	Model 1	Model 2	Model 1	Model 2
1	Gender	−.20*	−.11	.03	−.05
	Age	.04	.04	−.03	−.02
2	Rational		.30***		−.32***
	Intuitive		−.03		−.07
	Dependent		.09		.15
	Avoidant		−.28**		.21**
	Spontaneous		.03		−.14
	R^2	.04	.18	.01	.22
	Adjusted R^2	.02	.12	.01	.16
	F change	2.07	2.87**	.10	4.93***

Note: Standardized regression coefficients are presented in the table.
***$p < .01$. **$p < .05$. *$p < .10$.

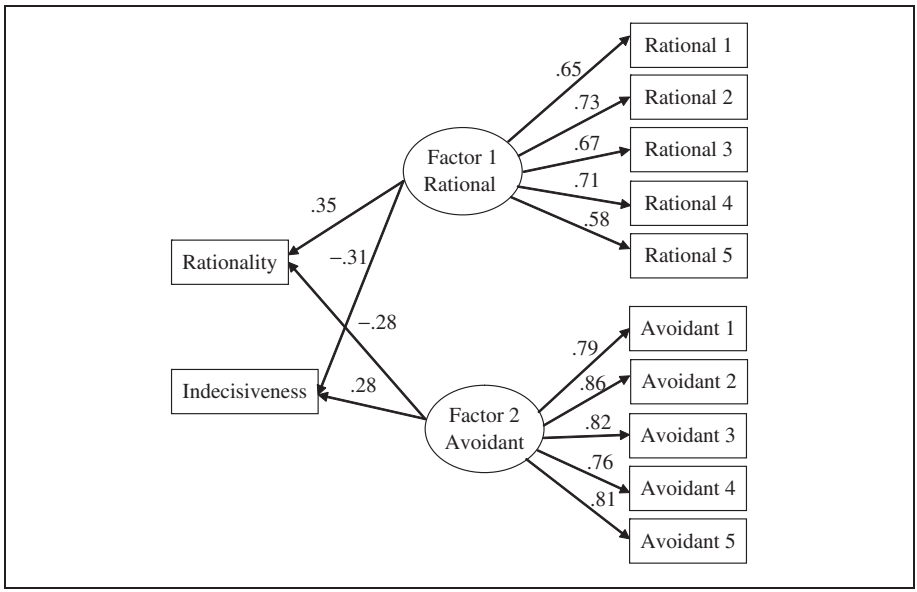

Figure 1. Results of the analyses with two latent variables
Note: Fit indices for this model are as follows: $\chi^2 = 62.1$, $p < .13$, CMIN/DF = 1.19, TLI = .96, CFI = .97, RMSEA = .04, PCLOSE = .50.

with AMOS 18 software) and used the two latent factors to predict rationality and indecisiveness. The results of the SEM and the fit indices are presented in Figure 1. The absolute fit indices (χ^2 and RMSEA) show that the hypothesized model is not

significantly different from the data and the incremental fit indices (comparative fit index [CFI] and Tucker–Lewis index [TLI]) show that the model cannot be significantly improved (using the conservative cutoff points specified in Yuan & Bentler, 2004). Therefore, the results of the latent variables approach fully support the results of the OLS as reported in Table 2.

Discussion

The study addressed the extent to which the five styles evaluated by the GDMSI (Scott & Bruce, 1995) predict rationality in decision making. In line with previous research (Loo, 2000), our results partially support the assumed five-factorial structure of the GDMSI. The intuitive style is particularly problematic as our data (similar to the data reported in Loo, 2000) differ significantly from the assumed model. Moreover, our results show that the rational decision-making style is a strong predictor of rationality in decision making. We therefore have directly addressed the relationship between individual differences in decision-making styles and rationality in decision making. Previous studies did not address this relationship, although some authors used the concepts of rational style and rationality in decision making synonymously (Galotti & Tinkelenberg, 2009). Rationality here is defined as the capability to make logically correct choices. It reflects the extent to which decision outcomes (choices) are aligned with a normative ideal (reduced sensitivity to decision heuristics and biases). It is therefore distinct from a habitual pattern in information processing, which is the defining feature of the decision-making styles. The positive association between the rational decision-making style and rationality is in line with previous results that reported a positive association between the rational style and cognitive engagement conceptualized as connected knowing (emphatic way of knowing by taking others' perspectives into account), separate knowing (critical, detached, and independent way of knowing), and planning (the extent to which decision makers tend to plan their actions in advance; (Galotti et al., 2006). To conclude, the results reported here also support the distinctiveness of decision-making styles in relation to specific decision-making competences. As most decisions are embedded in larger social contexts, further research should explore the implications of decision styles for information search in social settings (Curşeu, 2011).

Another set of results refers to the relationship between the decision-making styles and indecisiveness. Our study contributes to the research in indecisiveness (e.g., Rassin, Muris, Booster, & Kolsloot, 2008) by showing that the avoidant and dependent styles are positively associated with indecisiveness, whereas the rational style has a strong negative influence on indecisiveness. By showing that decision styles are predictive for decision outcomes, our results strongly support the predictive validity of individual differences in decision making. We also answered the call for using the GDMSI in non-American settings (Loo, 2000) and showed that the instrument is a valid way of evaluating decision-making styles.

Appendix

Framing Effect

Imagine that your country is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed: Program A and Program B. Assuming that the exact scientific estimates of the consequences of the programs are known, which one will you choose?

a. If Program A is adopted, 200 people will be saved.
b. If Program B is adopted, there is a $\frac{1}{3}$ probability that 600 people will be saved and $\frac{2}{3}$ probability that no people will be saved.
c. Both programs are equally effective.
d. I cannot decide.

Ellsberg

You take part in a contest in which you have to draw without seeing a ball from an urn. If you draw a red ball you will earn $100. You can choose two urns. In which urn do you think you a have a higher probability of drawing a red ball?

a. In the first urn there are 50 red and 50 black balls.
b. In the second urn there are 100 mixed red and black balls in an unknown proportion.
c. In both urns I have equal probability of choosing a red ball.
d. I cannot decide.

Representativeness

You have the chance of buying a lottery ticket. Suppose that on the first ticket the numbers are 7, 12, 18, 24, 33, and 45, and on the second ticket, the numbers listed are 1, 2, 3, 4, 5, and 6. Which one do you think has the highest chance of being winner?

a. The first ticket.
b. The second ticket.
c. Both tickets have equal chances of being a winner.
d. I cannot decide.

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