



Decision-making competence in everyday life: The roles of general cognitive styles, decision-making styles and personality

Chris Dewberry^{a,*}, Marie Juanchich^b, Sunitha Narendran^b

^a Birkbeck, University of London, Malet Street, London WC1E 7HX, UK

^b Kingston Business School, Kingston University London, Kingston Hill KT2 7LB, UK

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ABSTRACT

Research indicates that decision-making competence in everyday life is associated with certain decision-making styles. The aims of this article are to extend this research by examining (a) the extent to which general cognitive styles explain variance in decision-making competence over and above decision-making styles, and (b) the extent to which personality explains variance in decision-making competence over and above both types of style variable. Participants ($N = 355$) completed measures of everyday decision-making competence (Decision Outcomes Inventory), decision styles (Decision Style Questionnaire; Maximization Inventory), cognitive styles (the Cognitive Styles Inventory; Rational-Experience Inventory), and the Big Five personality variables (IPIP Big-Five factor scales). The results indicate that cognitive styles offer no incremental validity over decision-making styles in predicting decision-making competence, but that personality does offer substantial incremental validity over general cognitive styles and decision-making styles. Jointly decision-making styles and personality account for a substantial amount of variance in everyday decision-making competence.

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1. Introduction

Why do people differ in their ability to make competent decisions in everyday life? Some choose unsuitable jobs and careers, inappropriate partners, bad friends, and poor investments, while others choose more wisely and are more likely to achieve their life goals. Understanding the individual difference variables which lead some people to consistently achieve better decision outcomes than others is self-evidently important. Addressing this issue, Bruine de Bruin, Parker, and Fischhoff (2007) examined the extent to which three types of individual difference variables (demographic characteristics, cognitive ability, and decision-making styles) predicted self-reported decision-making outcomes (e.g. getting a parking ticket). The authors also investigated the relationship between these everyday outcomes and the ability to make rational judgments (e.g. to resist the influence of framing) and decisions (e.g. to avoid the influence of sunk costs) using specific normative tasks developed to study decision biases. The results of this study showed that collectively decision-making styles (e.g. the tendency to make choices spontaneously or to avoid making decisions) explained more variance in everyday decision-making outcomes than either cognitive ability, or performance in the normative decision-making tasks.

The purpose of this article is to extend in two ways Bruine de Bruin et al.'s (2007) finding that decision-making styles (e.g. decision-avoidance) predict competent decision-making in everyday life. First, we examine whether general cognitive style variables (e.g. creating, planning) predict variance in competence over and above style variables more specifically aligned with decision-making (e.g. spontaneity, decision-avoidance). Second, we examine whether the Big Five personality characteristics, a class of individual difference variables which did not feature in Bruine de Bruin et al.'s study, explain incremental variance in decision-making competence over and above these two types of style.

2. Cognitive styles and decision-making styles

Cognitive styles have been defined as stable attitudes, preferences, and habitual strategies which determine an individual's modes of perceiving, remembering, thinking and problem-solving (Messick & Fritzky, 1963). Stanovich and West (1998) suggest that such styles may take different forms. At a specific level they may refer to whether or not people utilise certain rules when solving problems, such as "think of alternative explanations", or "think of a reason against your proposition". At a more general level they may involve trait-like characteristics such as dogmatism, absolutism, need for cognition, and cognitive confidence.

Cognitive styles are viewed as valuable predictors of behaviour in applied fields such as industrial and organizational psychology

* Corresponding author. Tel.: +44 0207 631 6754; fax: +44 0207 631 6750.

E-mail addresses: c.dewberry@bbk.ac.uk (C. Dewberry), m.juanchich@kingston.ac.uk (M. Juanchich), s.narendran@kingston.ac.uk (S. Narendran).

(Armstrong, Cools, & Sadler-Smith, 2012) and education (Sternberg & Zhang, 2001), and progress has been made in identifying and measuring various types of style. For example, Pacini and Epstein (1999) took the well-established distinction made between System 1 (i.e. intuitive) and System 2 (i.e., conscious/rational) processing and thinking (Hodgkinson, Langan-Fox, & Sadler-Smith, 2008; Johnson-Laird, 1983; Stanovich & West, 2000), and developed the Rational-Experiential Inventory (REI) to measure the tendency of people to rely on these two types of thought. More recently, Cools and Van den Broeck (2007) reviewed the literature on cognitive styles and concluded that the tendencies to engage in System 1 and System 2 thinking can be usefully conceptualized and measured in a different way. They focus on the extent to which people engage in three broad cognitive activities (knowing, creating, and planning), and develop a measure of these three styles, the Cognitive Style Indicator (CSI). However, although important developments have taken place in the measurement of cognitive styles, whether decision-making performance is better predicted by high-level or more specific elements of cognitive styles (Kozhevnikov, 2007) is currently unclear.

Decision-making styles, a sub-component of cognitive styles (Kozhevnikov, 2007) has been defined as “a habitual pattern individuals use in decision-making” (Driver, 1979, p. 48), and “the learned, habitual response pattern exhibited by an individual when confronted by a decision situation” (Scott & Bruce, 1995, p. 820). Examples of decision-making styles are spontaneous, dependent, and avoidant (Leykin & DeRubeis, 2010). As with cognitive styles more generally, research on decision-making styles has for many years lacked a theoretical framework, although one such framework has recently been proposed (Dewberry, Juanchich, & Narendran, 2013). In Dewberry et al.’s model, a distinction is made between styles concerned with the cognitive processes used to make decisions (e.g. intuition, vigilant), and those concerned with regulating decision-making (e.g. the amount of cognitive resources devoted, the timing of the decision etc.).

There is some evidence that certain types of performance are associated with both general cognitive styles (Pacini & Epstein, 1999) and decision-making styles (Bruine de Bruin et al., 2007). However, we are not aware of any research on the relative importance of general cognitive styles and decision-making styles in predicting decision-making competence.

3. Decision-making competence

Decision-making competence is measured in a variety of ways. Sometimes the intention is to examine the quality of domain-specific decisions such as predicting the results of soccer matches (Cattell, Eber, & Tatsuoka, 1970) or making appropriate medical choices regarding the treatment of a medical condition (Hagger, Wood, Stiff, & Chatzisarantis, 2010). A second group of competence measures are concerned with the ability to perform normatively on particular aspects of the decision-making process, such as correctly calibrating confidence, or being resistant to the effects of framing (Krause, Rossberger, Dowdeswell, Venter, & Joubert, 2011). Bruine de Bruin et al. (2007) have developed a battery of such normative tasks (the Adult Decision-Making Competence index (A-DMC)), and this has been used in several recent studies (Carnevale, Inbar, & Lerner, 2011; Parker, Bruine de Bruin, & Fischhoff, 2007).

A third approach to the assessment of decision-making competence is to examine the extent to which people have experienced a broad range of undesirable decision outcomes in their everyday lives. The Decision Outcomes Inventory (DOI, Bruine de Bruin et al., 2007) is a self-report questionnaire in which people indicate whether or not they have experienced 34 life events. A key strength of the DOI is that it reflects the frequency with which

people have avoided the (negative) outcomes of a wide range of everyday decisions over an extended period of time. Research indicates that performance on the DOI is positively associated with higher socioeconomic status, lower age, and a variety of decision-making styles including the tendencies to decide rationally and to decide intuitively. Bruine de Bruin et al. (2007) established that decision-making styles predict decision-making competence. However, it is not yet clear whether such competence is better predicted by style variables closely associated with decision-making (e.g. spontaneity, decision avoidance) or by variables operating higher in the cognitive style hierarchy (e.g. planning, creating).

The first aim of this study is to address this issue by examining whether decision-making competence is better predicted by (a) variables at the level of general cognitive style, or (b) specific decision-making style variables. Because general cognitive styles are relatively high level dimensions (e.g. a tendency towards creative thought, or a tendency to plan actions), and, compared to decision-making styles such as decision-avoidance, related to the act of decision-making only remotely rather than directly, we propose:

Hypothesis 1. General cognitive styles will provide little or no incremental prediction of everyday decision-making competence over and above decision-making styles.

4. Personality and decision-making competence

There is considerable evidence that personality is associated with human performance. For example, meta-analytic studies indicate that the Big Five traits, and particularly conscientiousness and emotional stability, are associated with performance at many different types of work (Barrick, Stewart, & Piotrowski, 2002; Dudley, Orvis, Lebiecki, & Cortina, 2006; Salgado, 1997). Personality also appears to influence various aspects of decision-making. There is evidence that impulsiveness and anxiety predict message effectiveness in a goal-framing task (Lauriola, Russo, Lucidi, Violani, & Levin, 2005), that personality is associated with risky choices in social, ethical, gambling and recreational risk-taking (Soane, Dewberry, & Narendran, 2010), and that dispositional anxiety is associated with risk-avoidant decision-making (Maner et al., 2007). The influence of personality also appears to extend to decision-making performance (Davis, Patte, Tweed, & Curtis, 2007) as measured by the Iowa Gambling Task.

Given the substantial evidence that personality is associated with general performance, and that it also influences decision-making (Davis et al., 2007; Franken & Muris, 2005), it is plausible that personality explains variation in everyday decision-making competence over and above decision-making style. Furthermore, as personality is associated with cognitive styles (Pacini & Epstein, 1999), it is pertinent to partial out the variance associated with the style variables to investigate whether the Big Five personality traits predict decision-making competence in everyday life over and above cognitive styles and decision-making styles.

We expect conscientiousness to predict decision-making competence because conscientious decision-makers are likely to consider decisions more carefully and thoroughly. Extraversion is associated with impulsivity (Campbell & Heller, 1987), and people making impulsive decisions are less likely to make them competently, a supposition supported by research linking impulsivity with risky and suboptimal decisions (Franken, van Strien, Nijs, & Muris, 2008; Martin & Potts, 2009). In line with this, there is evidence that extraversion (negatively) predicts performance on the Iowa Gambling Task (Pilarik & Sarmany-Schuller, 2011). There is also evidence that neuroticism is associated with poor decision-making. For example, people high in neuroticism are less likely to perform well on the Iowa Gambling Task (Pilarik &

Sarmany-Schuller, 2011), and when making inferences are more likely to use the “recognition heuristic” thereby failing to make use of pertinent background knowledge (Hilbig, 2008). In the light of these findings we propose the following hypothesis:

Hypothesis 2. Conscientiousness (positively), and extraversion and neuroticism (negatively), will provide incremental prediction over and above cognitive and decision-making styles in predicting everyday decision-making competence.

5. Method

5.1. Participants

Participants were recruited from the general public via a marketing agency specialising in data collection through online surveys. The choice of the sample was considered appropriate as the research objective was to study decision-making competence in everyday life. Three hundred and fifty-five individuals took part, aged from 18 to 80 years (*median* = 49), 60.5% were females. Most participants were part of the working population (71.0%, with 9.1% unemployed and 19.9% retired) and were White British (81.1%, 9.5% White/Other, and the remaining from ethnic backgrounds). Thirteen participants did not report their socio-demographic characteristics.

5.2. Materials and procedure

Questionnaires assessing cognitive styles, decision-making styles, personality, and decision-making competence were administered online. The items measuring each of these were presented on a separate page. To counteract the possible effects of item ordering (Israel & Taylor, 1990), the order in which the items in each instrument were presented was randomised for each participant. The mean completion time was 20 min.

Cognitive styles were measured using the Cognitive Style Indicator which has 18 items (Cools & Van den Broeck, 2007), and the short Rational-Experiential Inventory which consists of 10 items (REI: Pacini & Epstein, 1999). Decision-making styles were measured using the Decision Styles Questionnaire (DSQ) developed by Leykin and DeRubeis (2010; 43 items) and the individual Maximization Inventory developed by Turner, Rim, Betz and Nygren (2012; 34 items). The DSQ covers the styles of decision-related anxiety, avoidance, brooding, dependent, vigilant, intuition, and spontaneity, and the Maximization Inventory includes measures of satisficing, decision difficulty and alternative search.

The personality measure used in this study was the International Personality Item Pool (IPIP) ‘NEO domains’ 10 item per scale measure of the Big Five factors (Goldberg et al., 2006) measuring extraversion, agreeableness, conscientiousness, neuroticism and openness to experience (see Gow, Whiteman, Pattie, and Deary (2005) for a validation study on the IPIP Big Five measure). Finally, decision-making competence was assessed with the Decision Outcome Inventory (DOI; Bruine de Bruin et al., 2007). Some of the items of the original North American version of the DOI were adapted for a British audience (e.g. “dollars” was replaced by “pounds”, “having a DUI” was replaced by “having a fine for drink driving”). The DOI was scored using the method suggested by Bruine de Bruin et al. (2007) so that greater scores indicate better decision quality.

6. Results

Descriptive statistics are presented in Table 1. The satisficing and decision difficulty scales of Turner et al.’s (2012) maximization measure were found to have unsatisfactory reliability (see Table 1).

These were excluded from subsequent analyses. Correlations between all measures further analysed are shown in Table 2.

To examine whether cognitive styles (Cognitive Style Indicator; Rational Experience Inventory), explained variation in decision-making competence over and above decision-making styles (Decision Style Questionnaire; Maximization Inventory-alternative search); and whether personality (IPIP) explained variance in decision-making competence over and above decision-making styles, a hierarchical multiple regression analysis was carried out. Decision-making styles were entered in the first step, general cognitive style variables in the second step, and the Big Five personality variables in the third step. Table 3 (Step 2) shows that the general cognitive style measures do not explain a statistically significant amount of variance in competence (DOI scores) over and above the decision-making style variables. Hypothesis 1 was therefore confirmed. Table 3 (Step 3) also shows that the Big Five personality variables collectively explained a statistically significant amount (6%) of variance in DOI scores over and above decision-making styles and general cognitive style. It also shows that extraversion and neuroticism explained a statistically significant amount of unique variance in decision-making competence, but conscientiousness did not do so. Hypothesis 2 was partially confirmed therefore.

7. Discussion

Collectively the decision-making styles predicted decision-making competence quite well, explaining 18% of the variance in the DOI scores. Supporting Hypothesis 1, The general cognitive style variables of planning, creating, and knowing (Cools & Van den Broeck, 2007), and need for cognition and faith in intuition from the Rational Experiential Inventory (Pacini & Epstein, 1999), provided no statistically significant incremental validity over decision-making styles in the prediction of decision-making competence.

Hypothesis 2, that personality would explain variance in decision-making competence over and above decision-making styles was supported also. However, although, as predicted, neuroticism and extraversion made a unique contribution in explaining decision-making competence, conscientiousness did

Table 1
Descriptive statistics for the measures use.

Domain	Measure	N	Mean	S.D.	Alpha
Decision competence	DOI	347	0.14	0.04	
	Decision-making style				
	Anxiety	355	2.86	0.96	.86
	Avoidant	355	2.76	0.91	.93
	Dependent	355	3.36	0.74	.83
	Brooding	355	2.87	0.76	.89
	Vigilant	355	3.82	0.66	.92
	Intuition	355	3.43	0.68	.88
	Spontaneous	355	2.90	0.80	.84
	Max Satisfact	348	3.69	1.72	.07
	Max DecDif	348	2.81	1.58	.37
	Max AchStrv	348	3.15	2.67	.67
	Creating	349	3.40	0.67	.84
Cognitive style	Knowing	349	3.68	0.78	.86
	Planning	349	3.72	0.68	.88
	NfC	346	2.86	0.71	.71
	Faith Int	346	3.73	0.68	.85
Big Five Personality	Extraversion	347	3.28	0.78	.81
	Neuroticism	347	2.89	0.74	.91
	Openness	347	3.49	0.58	.81
	Agreeable	347	3.76	0.56	.87
	Conscientiousness	347	3.66	0.62	.86

Note: Max Satisfact = Maximization – Satisfaction; Max DecDif = Maximization – Decision difficulty; Max AchStrv = Maximization – Achievement striving; Faith Int = Faith in intuition; NfC = Need for cognition.

Table 2

Correlation matrix for all analysed measures.

Measures	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 DOI																		
2 Anxiety	-.30																	
3 Avoidant	-.22	.78																
4 Dependent	-.18	.50	.46															
5 Brooding	-.35	.66	.57	.37														
6 Vigilant	.10	.12	.09	.32	.16													
7 Intuition	-.09	.06	.12	.13	.17	.21												
8 Spontaneous	-.20	.03	.07	.05	.22	-.10	.46											
9 Max AchStr	-.01	-.04	.00	-.01	.05	.11	.03	-.01										
10 CSI Creating	-.09	-.15	-.13	.04	.00	.18	.15	.21	.04									
11 CSI Knowing	-.03	-.12	-.15	.11	.01	.43	-.01	-.07	.01	.56								
12 CSI Planning	-.01	-.01	-.08	.17	.01	.40	.06	-.05	-.01	.48	.75							
13 REI NfC	-.23	-.55	-.55	.30	.45	-.13	.05	.17	-.11	-.16	.45	-.11						
14 REI Faith Int	.01	-.09	-.04	.01	-.01	.32	.55	.32	.13	.19	.15	-.19	-.12					
15 Extraversion	-.14	-.26	-.21	-.05	-.12	.02	.18	.25	.07	.42	.19	.14	-.19	.26				
16 Neuroticism	-.34	.61	.53	.27	.55	-.04	-.06	-.01	-.03	-.10	-.01	-.06	.40	-.16	-.28			
17 Openness	-.06	-.13	-.14	.08	-.02	.31	.08	.06	.09	.42	.32	.23	-.23	.19	.56	-.08		
18 Agreeableness	.11	-.11	-.14	.17	-.15	.30	.16	-.04	-.02	.13	.23	.26	-.17	.24	.37	-.19	.40	
19 Conscientiousness	.12	-.30	-.33	.02	-.18	.34	.14	-.02	.06	.26	.39	.37	-.27	.31	.48	-.37	.49	.57

Note: DOI = Decision Outcome Inventory; CSI = Cognitive Style Indicator; REI = Rational Experiential Inventory; Max AchStrv = Maximization – Achievement striving; NfC = Need for cognition; REI Faith Int = Faith in intuition. All correlations greater than .09 are significant at $p < .05$.

Table 3

Hierarchical regression of DOI on step 1: cognitive style; step 2: cognitive style and decision-making style; step 3: cognitive style, decision-making style, and personality.

		Beta	t	Sig.	R ² change
Step 1	DMS Anxiety	-.19	-2.08	.04	.18; $F(8,334) = 9.12$; $p < .001$
	DMS Avoidant	.09	1.18	NS	
	DMS Dependent	-.09	-1.41	NS	
	DMS Brooding	-.24	-3.50	.00	
	DMS Vigilant	.17	3.14	.00	
	DMS Intuition	-.01	-0.19	NS	
	DMS Spontaneous	-.12	-2.09	.04	
	DMS Max AchStrv	-.03	-0.52	NS	
Step 2	DMS Anxiety	-.22	-2.38	.02	.02; $F(5,329) = 1.68$; $p > .05$
	DMS Avoidance	.09	1.07	NS	
	DMS Dependent	-.07	-1.18	NS	
	DMS Brooding	-.22	-3.04	.00	
	DMS Vigilant	.23	3.54	.00	
	DMS Intuition	-.02	-0.34	NS	
	DMS Spontaneous	-.10	-1.57	NS	
	DMS Max AchStrv	-.03	-0.65	NS	
	GCS Creating	-.08	-1.24	NS	
	GCS Knowing	-.14	-1.61	NS	
	GCS Planning	.06	0.71	NS	
	GCS Faith Int	-.04	-0.63	NS	
	GCS NfC	-.01	-0.19	NS	
Step 3	DMS Anxiety	-.17	-1.87	.06	.06; $F(5,324) = 5.54$; $p < .001$
	DMS Avoidance	.13	1.58	NS	
	DMS Dependent	-.09	-1.48	NS	
	DMS Brooding	-.14	-1.98	.05	
	DMS Vigilant	.15	2.26	.02	
	DMS Intuition	-.04	-0.69	NS	
	DMS Spontaneous	-.06	-0.99	NS	
	DMS Max AchStrv	-.02	-0.38	NS	
	GCS Creating	.01	0.14	NS	
	GCS Knowing	-.11	-1.25	NS	
	GCS Planning	.01	0.18	NS	
	GCS Faith Int	-.05	-0.75	NS	
	GCS NfC	.00	-0.07	NS	
	B5 Extraversion	-.27	-3.92	.00	
	B5 Neuroticism	-.21	-3.03	.00	
	B5 Openness	-.02	-0.25	NS	
	B5 Agreeableness	.11	1.77	NS	
	B5 Conscientiousness	.06	0.83	NS	

Note: DMS = Decision-making style; GCS = General cognitive style; B5 = Big Five personality variables; Max AchStrv = Maximization – Achievement striving; NfC = Need for cognition; Faith Int = Faith in intuition.

not do so. To further examine the possible association between conscientiousness and decision-making competence, we ran a second multiple regression analysis, this time entering only the Big

Five variables. Once again, conscientiousness failed to make a statistically significant unique contribution in explaining the variance in decision-making competence. Therefore the prediction that

conscientiousness would be positively associated with decision-making competence was not supported.

It is worthy of note that the decision-making style scales uniquely responsible for predicting decision outcomes in everyday life (as measured by the DOI) included one associated with System 1 (spontaneity: see Dewberry et al. 2013), and one associated with System 2 (vigilant) processing and thinking (Evans, 2007; Hodgkinson et al., 2008; Johnson-Laird, 1983; Stanovich & West, 2000). Also providing a unique contribution to the prediction of variance in the DOI were scales measuring the tendency to avoid decisions, to feel anxious about making decisions, and to reflect retrospectively on decision-making errors (i.e. brooding). This pattern of results supports the proposal that both core and regulatory decision-making styles have important roles in decision-making (Dewberry et al., 2013).

We now turn to the second issue, the relation between styles, personality, and decision-making competence. Consistent with other research suggesting that personality is influential in the context of decision-making (e.g. Bensi, Giusberti, Nori, & Gambetti, 2010; Maner et al., 2007), the results of this study indicate that it has a substantial influence on decision-making competence. As mentioned earlier, Pacini and Epstein (1999) have also noted positive associations between their rational thinking style and conscientiousness, openness and emotional stability and report their experiential thinking style to be related with extraversion and agreeableness.

Here the personality scales collectively accounted for 6% of the variance in the DOI over and above the style measures; specifically extraversion and neuroticism were negatively associated with decision-making competence. This suggests that the prediction of decision-making competence from non-intellective variables should be extended from a focus on (decision-making) style variables to include personality.

To examine whether decision-making styles explain variance in decision-making style over and above personality, we carried out a second hierarchical multiple regression, this time regressing DOI score on the Big Five personality variables (step 1), and the decision-making style variables (step 2). The style variables did explain more variance in competence than the personality variables alone (R^2 change = .06, $F(13, 329) = 8.73$, $p < .001$). Therefore just as personality provided incremental predictiveness over decision-making styles in explaining variance in the DOI, so decision-making styles provided incremental predictiveness over personality.

There are two notable limitations of this study. First, we cannot, on the basis of this research, draw a definitive conclusion about the influence of general cognitive styles on competent decision-making. One reason for this is that we did not exhaustively measure all variables referred to in the literature as cognitive styles. Nevertheless, the REI and CSI measures we have used to measure cognitive styles are broad and well-validated, and the results of our study suggest that when focusing, either by research or via developmental interventions, on competent decision outcomes in everyday life, the granularity provided by measures of decision-making styles may be more useful than measures of general thinking or cognitive styles. A second limitation is that all the measures in this study were completed by the same participants, and that this may have led to common method variance in the data. Because the DOI, the only measure of everyday decision-making competence currently available, is a self-report instrument, it was not possible to measure the predictor and criterion-variables independently. However, following the recommendation of Podsakoff, MacKenzie, Lee, and Podsakoff (2003) we sought to minimize the effect of common method variance by using well-validated instruments with unambiguous items.

In conclusion, our study contributes to the emergent discourse on the extent to which non-intellective variables such as cognitive

styles, decision-making styles and personality influence decision-making competence in everyday life. Specifically, the results of our study contribute to the literature on individual differences in two ways. First, they suggest that general cognitive style variables do not provide any incremental validity over specific decision-making styles in predicting decision-making competence in everyday life. Second, the results indicate that personality variables explain a significant and substantial amount of variance in decision-making competence over and above cognitive and decision-making style variables. Future research concerned with the prediction and explanation of individual differences in decision-making competence is therefore likely to benefit from a focus on personality as well as on decision-making styles.

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