Australian Individual Decision Styles, Intuitive and Rational Decision Making in Business

Christopher Cook[+], Dr. Hugo Gonzales

University of Notre Dame, Australia

Abstract. During the last twenty years, decision styles' and thinking styles' impact on decision making processes and behaviour have been studied. Four decision styles other than rational (avoidant, intuitive, dependent, spontaneous) have been identified and validated [1] using the General Decision Making Style (GDMS) scale. The dual process Cognitive-Experiential Self Theory (CEST) of decision making [2] is the basis of the Rational-Experiential Inventory (REI) scale. This REI scale assesses the 'need for cognition' and 'faith in intuition' for general decision making processes by decision makers [3].

The aim of this correlational study research is to analyse data within the Australian business context relating the five styles of decision making [1] with data from other instruments to determine the decision makers' propensity and ability to use the Rational or Intuitive style [2]; the Preference for Intuition and Deliberation (PID) [4] and correlate the Big Five personality dimensions with decision making styles [5]. This paper reports on pilot data from 124 Australian business decision makers (Female 30%, Board Member 21%, CEO 21%, CFO/Director/General Manager 33%) advances the knowledge of Australian business decision making by analysing data on decision making styles and preferences gathered by applying the three scales (REI, GDMS and PID) [6] to measure different aspects of intuition and individual differences. This pilot study confirms that experienced Australians in a senior managerial role have a higher preference for deliberation than intuition in decision making.

Keywords: Decision styles, Heuristics, Intuition, Personality traits.

1. Introduction

The assumption that decision makers are rational is central to sustaining civilised society. Educated decision makers are assumed to know what is in their best interest. During the industrialisation of world trade, Adam Smith [7] observed the 'guiding hand of self-interest' drove humans to seek individual and collective wealth. The rationality assumption is also evident in economic analysis in business, where beneficial economic outcomes drive maximisation of 'expected utility' to ensure the maximisation of economic return for risk endured. Human economic activity has flourished, giving rise to abstract entities such as companies, insurance, banking, and stock markets. It has led to an explosion of choice and the need to make more sophisticated decisions among a large number of options. Mathematics began being applied to the calculation of risk to guide decision making in insurance, banking and gambling.

In the situation where objective probabilities for each choice option are not known by the decision maker, subjective probabilities are applied to facilitate a decision, and the concept of 'Subjective Expected Utility' (SEU) was developed [8]. Where a decision maker has access to objective probabilities, they are making a decision under risk. Where decision makers lack access to objective probabilities, they are making a decision under uncertainty.

This dilution of perfect knowledge of data relevant to a decision choice by the introduction of subjective probabilities is a practical divergence from the normative model, and is where judgement and evaluative errors are introduced to the decision making process [9]. Argument has been developed that claims normative rational decision making is illusory – that no human has omniscience nor the cognitive capacity to apply it [10]. While economists continue to rely on rational decision making to model economic outcomes,

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[+] Corresponding author.
 E-mail address: christopher.cook1@my.nd.edu.au.

[11], [12] and [13] have shown that the normative model of rational decision making is not supported by human decision making behaviour in a large number of instances.

Researchers started to investigate the 'dual process' model of decision making first described by Simon [11] and developing scales to measure decision making style. Four decision styles other than rational (avoidant, intuitive, dependent, spontaneous) have been identified and validated [1]. The avoidant style is characterised by attempts to avoid decision making. The intuitive style is decision making characterised by hunches and feelings. The dependent style is characterised by a search for advice and direction by others. A spontaneous decision maker has a sense of urgency irrespective of external decision timetable, and a desire to get through the decision making process as soon as possible. The two most logical styles for study of business decision making are the rational and intuitive styles because they are the decision making styles with the highest mean scores of the samples in the Scott and Bruce study, and the other three styles appear to be invoked in the hope of avoiding making decisions.

The 'dual process' theory aims to make distinct the differences between intuition and deliberation and aligns with the rational and intuitive styles identified above. The theory describes intuitive decision processes as pre-conscious, fast, automatic, and influenced by affect, whereas rational decision processes are conscious, slower, more deliberate, often rule governed and able to be verbalised [14]; [2]. Epstein developed this theory of rational decision making processes and experiential decision making processes, identifying the cognitive decision making capability (or skill), and the experiential decision making ability created through automatic learning – the cognitive-experiential self-theory (CEST). This has been developed by Epstein into the Rational Experiential Inventory (REI) scale and repeatedly validated.

However, some significant benefits accrue to those applying them. In the context of business, the external competitive environment drives fast decision making, as greater economic advantage accrues to those who can make decisions quickly.

Decision making styles and bounded rationality intersect unsurprisingly with the intuitive style. This style has been explored by researchers [15], with [16] showing that the heuristics (and associated systematic errors) are evident when applying intuitive decision making, even with agents trained in rational decision making processes [12] p.1125. Most conceptualizations of the process of using intuition as a decision making style include the following features: (1) non-conscious information processing, (2) holistic associations, (3) affect, and (4) speed. Subsequent research has shown that rationality in decision making is positively correlated with the rational style, and indecisiveness is negatively correlated with the rational style [17].

Personality Types and Decision Making Styles

Jung [18] proposed that problem solving involves sensing, thinking, feeling and intuition. Riaz and Batool [19] summarise the evolution of personality indicators within trait theory and go on to describe the linkages between the Big Five personality traits and the Decision Making styles of Scott and Bruce [1]. Their study of 300 university students in Pakistan used the GDMS and the Mini-Marker Personality Inventory (MMPI) translated into Urdu. Their study identified that between 15% and 28% of variance in decision making styles was contributed by personality types. Extroversion ($\beta = 0.32$, $p < 0.001$) and Openness to Experience ($\beta = 0.21$, $p < 0.001$) positively predict Intuitive decision style, and Agreeableness ($\beta = 0.36$, $p < 0.001$) and Neuroticism ($\beta = 0.13$, $p < 0.001$) positively predict the Dependent decision making style.

This study collects results from a survey consisting of the three instruments plus personality and demographic information, seeking to validate the method and internal validity of the instruments for this context, confirm earlier results and prepare for continued data gathering for a larger study.

2. Method

2.1. Instruments

This study applies the Ten Item Personality Inventory (TIPI), the Preference for Intuition and Deliberation (PID) scale, General Decision Making Style (GDMS) and Rational-Experiential Inventory (REI)

scale to management subjects in Australia. Initially this pilot of 124 participants forms an exploratory analysis in order to demonstrate the adequacy of the research instruments and methods being used. The full study is to confirm the findings of Betsch & Ianello in [6], Witteman et al. [5] and Riaz,et al. [19] in the Australian business context.

2.2. Ten Item Personality Inventory (TIPI)

TIPI consists of 10 questions only. TIPI was developed to support assessment of the Big Five personality styles where the full questionnaire (100 questions) may not be appropriate due to its length. The TIPI has demonstrated good reliability and the correlation between the TIPI and Big Five subscales is good, with mean $r = 0.77$ with Extraversion ($r = 0.87$, $p < 0.01$) convergent correlation the best, and Openness to Experience ($r = 0.65$, $p < 0.01$) the worst [20].

2.3. Preference for Intuition and Deliberation (PID)

The main focus of this scale for intuition is the reliance on affect and implicit knowledge. For preference for deliberation, the scale's focus is the reliance on explicit evaluation, beliefs and reasons [4]. Judgements and decisions are not determined by just one or other (System 1 or System 2) but reflect both systems to varying degrees. The independent subscales are usually negatively correlated (< -0.20) and the reliability for PID – Intuition, Cronbachs' $\alpha = 0.77$. For PID – Deliberation $\alpha = 0.79$. The preference is stable over time scale as the retest reliability after six months shows (PID – Intuition = 0.76, PID – Deliberation = 0.74). The main difference between PID and REI is the measure of ability – whether thinking logically or intuitively. PID measures personal preference, and is useful for identifying fit with the decision environment.

2.4. General Decision Making Style (GDMS)

Decision making styles broader than just rational and intuitive have been identified and validated [1] and have been linked to decision making competence [21]. Scott and Bruce identified four decision making styles in addition to Rational; being Avoidant, Intuitive, Dependent and Spontaneous. The avoidant style is characterised by attempts to avoid decision making. The intuitive style is characterised by hunches and feelings. The dependent style is characterised by a search for advice and direction by others. A spontaneous decision maker has a sense of urgency, and a desire to get through the decision making process as soon as possible. The scale used to determine the predominant decision making style of an individual has been developed – the GDMS. The instrument consists of five subscales making up the five decision styles each with 5 items and Spontaneous $\alpha = 0.87$, Avoidant $\alpha = 0.93$, Dependent $\alpha = 0.80$, Intuitive $\alpha = 0.81$, Rational $\alpha = 0.81$.

2.5. Rational-Experiential Inventory (REI)

The 'dual process' of decision making, where rational and intuitive processes occur – sometimes at the same time, is described in the Cognitive-Experiential Self Theory (CEST) [2] and later authors in the System 1 (Intuition) and System 2 (Reasoning) model [22]. This theory is the basis of the Rational-Experiential Inventory (REI) scale which assess the need for cognition and faith in intuition for general decision making processes by decision makers [3]. These two subscales are orthogonal, [23] meaning that a decision maker can exhibit both high Rational and high Experiential (intuitive) decision making skills. The REI consists of two independent constructs, the rational dimension (REI-R) of 20 items, and the experiential dimension (REI-E) of another 20 items. Both dimensions are scored on a five point Likert scale with some negatively scored items. Intuition accesses subconscious memory and integrated learning (from experience) and can operate at the same time as rational processes. Active learning from experience and recalling that learning automatically and subconsciously is a key aspect of intuition. This instrument understands intuition and deliberation as abilities, whereas the other instruments see them as styles and stable references or tendencies. The REI-40 survey collects data to determine four subscales – Experiential Engagement, Experiential Ability, Rational Engagement, Rational Ability, which are combined into Rational Thinking (sum of engagement and ability) (20 Items, $\alpha = 0.90$) and Intuitive Thinking (sum of engagement and ability) (20 items, $\alpha = 0.87$).

2.6. Data Collection

Using LinkedIn and an online survey tool (Zoho Survey) respondents were invited to participate in a survey into Decision Making as part of university supported research during December 2015 to February 2016. No incentive was offered during this period. Responses were collected in Google Docs spreadsheets, incomplete responses omitted, and the scoring of the instruments undertaken using IBM SPSS Modeler software.

3. Results

3.1. Reliability

The comparison of Cronbachs'α for the three instruments from this pilot data shows good correspondence with earlier reported results [6].

Table 1: Cronbachs' alpha comparison

Instrument / scale	Reported Alpha	Pilot Alpha
REI Experiential Engagement [3]	0.79	0.89
REI Experiential Ability	0.80	0.87
REI Rational Engagement	0.84	0.77
REI Rational Ability	0.84	0.85
REI Rational Overall	0.90	0.88
REI Experiential Overall	0.87	0.93
GDMS Intuitive [24]	0.79	0.85
GDMS Spontaneous	0.83	0.79
GDMS Rational	0.81	0.76
PID Intuitive [4]	0.77	0.75
PID Deliberation	0.79	0.72

3.2. Demographics

This study has a unique sample demographic compared with earlier studies using these instruments. The gender mode is male (30% Female), with 75% of respondents being Board Member, CEO or a Direct Report to the CEO, with a median age between 51 and 55 years old. The remaining 25% of respondents were second level managers, team leaders, first level managers or individual contributors. 25% of respondents are in the top 1% of Australian population earnings and 38% are in the top 5% of population earning. Interestingly for this sample population, mean GDMS Avoidant score is low (1.831) with significant skew (0.772) which might be expected for senior managers in business.

Further analysis of demographic variables influence on the dependent variables is hampered by the small sample size. Pilot results show Managerial Experience has an influence on PID - Deliberation score (F = 2.15, df = 9114, p = 0.05). Level of education has an influence (marginal) on Rational Ability (F = 1.981, df = 6117, p = 0.05) as well as Rational engagement (F = 2.675, df = 6117, p = 0.05) and therefore Rational Overall (F = 2.856, df = 6117, p = 0.05). Interestingly, level of education was also an influence on Conscientiousness (F = 2.454, df = 6117, p = 0.05) and GDMS Avoidant scores are influenced by Income (F = 1.991, df = 9114, p = 0.05).

3.3. Pairwise comparisons

The t-test for PID - Deliberation and PID - Intuition gives paired t (123) = 6.328, p < 0.05 and a negative correlation of -0.236 showing that the mean scores are significantly different and that the actual scores are mildly negatively correlated. The respondents have a higher preference for deliberation than intuition with a mean difference of 0.507

The Pairwise t-test for REI – Rational Overall and REI – Experiential Overall gives paired t (123) = 9.560, p < 0.05 and a negative correlation of -0.029 showing that the mean scores are significantly different and that the actual scores are weakly negatively correlated. Again respondents have a higher rational overall mean with a mean difference of 0.671

The Pairwise t-test for REI - Rational Ability and REI - Experiential Ability gives paired $t (123) = 8.874$, $p < 0.05$ and a weak positive correlation of 0.057 showing that the mean scores are significantly different in the direction of Rational Ability. Respondents rate their rational decision making ability higher than their experiential decision making ability with a mean difference of 0.635

The Pairwise t-test for GDMS Rational and GDMS Intuitive gives paired $t = 5.619 (123)$, $p < 0.05$ and a negative correlation of -0.294 showing that the mean scores are significantly different and that the actual scores are strongly negatively correlated. Again, this group of respondents rate their rational decision style higher than their intuitive decision style, with a mean difference of 0.540

3.4. Survey Instrument Pearson correlations

Calculating the Pearson Product Moment Correlations (2 tailed) we find a number of correlated dependent variables. For N = 124 a correlation of greater than +/- 0.20 is significant at the $p < 0.05$ level. The following figure: Table 2 – Big Five, PID, GDMS and REI PPMC highlights the significant correlations.

4. Discussion

The literature reports studies of styles and preferences for the use of Intuition, Deliberation and other decision strategies for the general population, groups of students or other sub-segments, but this is the first study that highlights decision making style of senior executives in business and the correlations with the big five personality types.

All three instruments conform to earlier studies' results regarding internal validity [6] and within the study limitations of self-reporting and sample size, confirm a significant effect size for Rational Ability being stronger than Experiential Ability. The respondents also have a higher preference for deliberation than intuition with a mean difference of 0.507. Considering the effect of these managerial decisions on employees, company returns the community and regulatory expectations, it is appealing to see that deliberation / rational decision making is used rather than intuition.

It is to be expected that GDMS decision styles such as Avoidant and Spontaneous have a lower mean score than Intuitive and Rational, as such behaviours are unlikely to support career progression in business to senior management levels.

This pilot study confirms that experienced Australians in a senior managerial role use a more deliberative approach to dealing with decision making.

4.1. Personality and Decision Styles

In this sample, Extraversion personality style is positively correlated with PID Intuition (0.223, $p < 0.05$) and REI Experiential Overall (0.207, $p < 0.05$) scales, and negatively correlated with GDMS Avoidant (-0.214, $p < 0.05$) and GDMS Dependent (-0.210, $p < 0.05$) decision styles.

Emotional Stability personality style is positively correlated to REI Rational Ability (0.367, $p < 0.001$) and REI Rational Engagement (0.204, $p < 0.05$) and like the Extraversion style, negatively correlated with GDMS Dependent (-0.214, $p < 0.05$) and GDMS Avoidant (0.214, $p < 0.05$), which is to be expected in a senior management sample.

The positive correlation between the personality style Conscientiousness and GDMS Rational (0.252, $p < 0.05$), PID Deliberation (0.370, $p < 0.001$) and REI Rational Ability (0.258, $p < 0.05$) plus strongly negative correlation with GDMS Avoidant (-0.508, $p < 0.001$) and GDMS Spontaneous (0.228, $p < 0.05$) decision making, is a result that could be expected to be displayed when working as a senior executive.

Interestingly, Openness to Experience personality style is strongly positively correlated with only REI Rational Engagement (0.360, $p < 0.001$) and Rational Overall (0.284, $p < 0.05$), and negatively correlated with GDMS Dependent (-0.215, $p < 0.05$) decision style, perhaps indicating independence and self-efficacy in decision making.

Agreeableness personality type respondents are the other type apart from Extraversion correlated with any measure of intuitive decision making which is surprising. Agreeableness personality types are strongly

correlated with PID Intuition (0.327, p < 0.001) and GDMS Intuitive (0.245, p < 0.05), plus REI Experiential Ability (0.272, p < 0.05) and Engagement (0.225, p < 0.05) so also Experiential Overall (0.268, p < 0.05).

4.2. Demographics

Significant results from the demographics show the higher the respondent level of education influences Conscientiousness, presumably through the respondent's scrutiny of their own decisions. GDMS Avoidant decision making is positively correlated with level of income. Lower income and diminished level of responsibility (if higher income is equated to more seniority and responsibility) will affect outcomes and may drive a tendency to use avoidant decisions strategies. REI Experiential Ability is correlated with Managerial Experience. Due to the small sample size, other demographic segmentation results have not been analysed until more data is collected.

Table 2: Big Five, PID, GDMS and REI PPMC

Big Five, PID, GDMS and REI Correlations

		Personality types					PID		GDMS					REI					
		Extraversion score	Agreeableness score	Conscientiousness score	Emotional Stability score	Openness to Experiences score	PID Deliberation score	PID Intuition score	GDMS Intuitive score	GDMS Spontaneous score	GDMS Rational score	GDMS Avoidant score	GDMS Dependent score	REI Rational Ability	REI Rational Engagement	REI Experiential Ability	REI Experiential Engagement	REI Experiential Overall	REI Rational Overall
Extraversion score	Pearson	1	0.015	0.146	0.061	**0.428**	-0.051	**0.223**	0.155	0.170	-0.019	**-0.214**	**-0.210**	0.050	0.165	0.188	0.198	**0.207**	0.118
	Sig. (2-tailed)		0.872	0.106	0.498	**0.000**	0.573	**0.013**	0.086	0.060	0.835	**0.017**	**0.019**	0.580	0.067	0.037	0.028	**0.021**	0.191
	N	124	124	124	124	**124**	124	**124**	124	124	124	**124**	**124**	124	124	124	124	**124**	124
Agreeableness score	Pearson		1	**0.300**	**0.444**	0.039	-0.018	**0.327**	**0.245**	0.004	-0.053	-0.083	0.029	0.031	-0.043	**0.272**	**0.229**	**0.268**	-0.005
	Sig. (2-tailed)			**0.001**	**0.000**	0.664	0.843	**0.000**	**0.006**	0.965	0.559	0.357	0.750	0.729	0.639	**0.002**	**0.011**	**0.003**	0.953
	N		124	**124**	**124**	124	124	**124**	**124**	124	124	124	124	124	124	**124**	**124**	**124**	124
Conscientiousness score	Pearson			1	0.187	0.121	**0.370**	-0.009	-0.055	**-0.228**	**0.252**	**-0.508**	-0.020	**0.258**	0.151	0.169	0.034	0.106	**0.228**
	Sig. (2-tailed)				0.038	0.182	**0.000**	0.924	0.544	**0.011**	**0.005**	**0.000**	0.825	**0.004**	0.093	0.060	0.706	0.243	**0.011**
	N			124	124	124	**124**	124	124	**124**	**124**	**124**	124	**124**	124	124	124	124	**124**
Emotional Stability score	Pearson				1	0.088	0.026	-0.044	-0.053	-0.106	0.125	**-0.214**	**-0.214**	**0.367**	**0.204**	0.067	0.017	0.044	**0.318**
	Sig. (2-tailed)					0.329	0.778	0.624	0.560	0.239	0.166	**0.017**	**0.017**	**0.000**	**0.023**	0.460	0.848	0.628	**0.000**
	N				124	124	124	124	124	124	124	**124**	**124**	**124**	**124**	124	124	124	**124**
Openness to Experiences score	Pearson					1	-0.003	0.107	0.037	0.131	0.064	-0.037	**-0.215**	0.155	**0.360**	0.036	0.086	0.066	**0.284**
	Sig. (2-tailed)						0.973	0.238	0.680	0.146	0.479	0.685	**0.016**	0.086	**0.000**	0.694	0.343	0.463	**0.001**
	N					124	124	124	124	124	124	124	**124**	124	**124**	124	124	124	**124**
PID Deliberation score	Pearson						1	**-0.236**	**-0.313**	**-0.369**	**0.665**	-0.148	0.169	**0.471**	**0.246**	-0.094	**-0.273**	**-0.202**	**0.400**
	Sig. (2-tailed)							**0.008**	**0.000**	**0.000**	**0.000**	0.100	0.060	**0.000**	**0.006**	0.300	**0.002**	**0.025**	**0.000**
	N						124	**124**	**124**	**124**	**124**	124	124	**124**	**124**	124	**124**	**124**	**124**
PID Intuition score	Pearson							1	**0.815**	**0.401**	**-0.278**	0.080	-0.036	-0.107	-0.069	**0.674**	**0.797**	**0.792**	-0.098
	Sig. (2-tailed)								**0.000**	**0.000**	**0.002**	0.377	0.688	0.238	0.447	**0.000**	**0.000**	**0.000**	0.279
	N							124	**124**	**124**	**124**	124	124	124	124	**124**	**124**	**124**	124
GDMS Intuitive score	Pearson								1	**0.465**	**-0.294**	0.097	-0.049	-0.159	-0.071	**0.670**	**0.819**	**0.802**	-0.128
	Sig. (2-tailed)									**0.000**	**0.001**	0.284	0.592	0.079	0.432	**0.000**	**0.000**	**0.000**	0.155
	N								124	**124**	**124**	124	124	124	124	**124**	**124**	**124**	124
GDMS Spontaneous score	Pearson									1	**-0.374**	**0.231**	-0.119	-0.145	-0.023	**0.282**	**0.396**	**0.367**	-0.095
	Sig. (2-tailed)										**0.000**	**0.010**	0.189	0.107	0.796	**0.002**	**0.000**	**0.000**	0.294
	N									124	**124**	**124**	124	124	124	**124**	**124**	**124**	124
GDMS Rational score	Pearson										1	-0.092	**0.322**	**0.521**	**0.331**	**-0.200**	**-0.292**	**-0.266**	**0.475**
	Sig. (2-tailed)											0.308	**0.000**	**0.000**	**0.000**	**0.026**	**0.001**	**0.003**	**0.000**
	N										124	124	**124**	**124**	**124**	**124**	**124**	**124**	**124**
GDMS Avoidant score	Pearson											1	**0.218**	**-0.277**	**-0.255**	-0.117	-0.020	-0.071	**-0.295**
	Sig. (2-tailed)												**0.015**	**0.002**	**0.004**	0.197	0.825	0.435	**0.001**
	N											124	**124**	**124**	**124**	124	124	124	**124**
GDMS Dependent score	Pearson												1	-0.095	-0.075	**-0.205**	-0.113	-0.168	-0.094
	Sig. (2-tailed)													0.294	0.409	**0.023**	0.210	0.062	0.297
	N												124	124	124	**124**	124	124	124
REI Rational Ability	Pearson													1	0.624	0.057	-0.057	-0.003	**0.905**
	Sig. (2-tailed)														0.000	0.526	0.529	0.976	**0.000**
	N													124	124	124	124	124	**124**
REI Rational Engagement	Pearson														1	-0.064	-0.032	-0.051	**0.897**
	Sig. (2-tailed)															0.480	0.723	0.576	**0.000**
	N														124	124	124	124	**124**
REI Experiential Ability	Pearson															1	**0.737**	**0.925**	-0.002
	Sig. (2-tailed)																**0.000**	**0.000**	0.979
	N															124	**124**	**124**	124
REI Experiential Engagement	Pearson																1	0.939	-0.050
	Sig. (2-tailed)																	0.000	0.583
	N																124	124	124
REI Experiential Overall	Pearson																	1	-0.029
	Sig. (2-tailed)																		0.748
	N																	124	124
REI Rational Overall	Pearson																		1
	Sig. (2-tailed)																		
	N																		124

Results in **BOLD** are significant at p < 0.05

4.3. Inter – instrument correlations

While a full table of correlations has been prepared, no discussion of the inter-instrument correlations is presented here.

5. Conclusion

A review of the literature identified the current academic views regarding personality traits and decision styles. By the use of assessment scales decision makers can understand their style and degree of preference and comfort with the use of rational or intuitive decision making processes. This study has advanced the knowledge of the validity of these scales to assess senior management business decision makers, and identified some of the personality correlations with the instruments generally used to understand human decision making.

Further data needs to be gathered to deliver suitable sample sizes for demographic categories to become useful and further analysis of all the data is required to develop further conclusions.

6. Acknowledgements

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