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A new instrument for the rational and intuitive decision-making styles – RIDMS

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Abstract: Intuition is universally recognised as a prevalent decision-making approach across various research domains, encompassing intricate, interconnected, multi-faceted, and interdisciplinary concepts. An integrated framework that effectively combines and consolidates various approaches is currently missing when implementing intuitive decision-making. The main purpose of this paper is to develop a new and comprehensive measurement instrument embracing a variety of styles by using existing and new items in the literature. Data were collected via a convenience sampling method from employees (n = 212 for study 1 and n = 530 for study 2) working in different organisations in Germany. The explanatory and confirmatory factor analyses, internal consistencies, concurrent and predictive validities, and discriminant analysis were calculated for the validity and reliability of the measurement instrument. The findings indicate that the ten-dimensional decision-making style (RIDMS) serves as a valid and reliable measuring tool for assessing different individual preference tendencies in future studies.

Keywords: decision-making styles; intuitive decision-making; rational decision-making; validity and reliability.

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1 Introduction

Intuition is a concept that has been studied across various disciplines, such as management, sociology, psychology, and philosophy (Hodgkinson and Sadler-Smith, 2003; Sinclair and Ashkanasy, 2005; Dane and Prat, 2009; Hogarth, 2010), neuroscience (LeDoux, 1996; Barais et al., 2017, 2018; Craig, 2002; Damasio, 1999), behavioural sciences (Hodgkinson et al., 2008; Askari and El Refae, 2024; Ali et al., 2024; Kotzian, forthcoming), parapsychology (Bem, 2011), medicine, and health sciences (Glatzer et al., 2020), engineering (Cash and Maier, 2021; De Rooij et al., 2021). Due to the non-conscious nature and the complex process of cognition and affect interactions, intuition does not have a clear common understanding in terms of conceptualisation and measurement across various scientific fields and practices.

Intuition-style measurement studies date back to the Myers-Briggs Indicator (MBTI) (Myers, 1962), which distinguishes between intuition and sensing on a two-polar continuum following Jung (1926). Based on a broader integrative theory of personality, cognitive-experiential self-theory (CEST) (Epstein, 1973, 1985) involves dual information processing systems as rational systems with abstract rules and experiential systems with context-specific, heuristic rules. Further developing the CEST approach, Pacini and Epstein (1999) suggest the rational-experiential inventory (REI) for measuring rational and experiential thinking styles.

Focusing on decision-making styles, general decision-making style (GDMS) (Scott and Bruce, 1995) proposes rational analytic (Hunt et al., 1989), avoidant, intuitive, and dependent (Harren, 1979), and spontaneous styles. The rational style is based on logical decisions by searching for information; the intuitive style depends on hunches or feelings; the dependent style is related to searching for advice from others; the avoidant style means hesitating to decide; the spontaneous style indicates quick decisions. For stress situations, Burns and D'Zurilla (1999) propose perceived modes of processing inventory (PMPI) adding an automatic processing style beside the rational and emotional processing styles. Automatic processing style also indicates quick, efficient, swift, aware,

repetitive, and experience-based processes. Based on the requirements of situations, Betsch (2004) develops a scale for measuring individual tendencies of deliberation or intuition (PID). She distinguishes between deliberation (rationality) based on the need for cognition (Cacioppo and Petty, 1982), and Intuition based on REI (Pacini and Epstein, 1999).

For the rational style, Cools and van den Broek (2007) propose a cognitive style indicator (CoSi) based on the cognitive style index (Hayes and Allinson, 1994) suggest knowing, planning, and creating styles for receiving and processing information. Knowing style is related to facts and data, based on clear and rational solutions; planning style indicates a need for structure with organising and controlling work environment; creating style donates experimentation of environment in terms of opportunities and challenges.

Criticising the intuition styles, Pretz et al. (2014) developed the types of intuition scale (TIntS) by describing three types of intuition. Holistic intuitions integrate diverse sources of information in a holistic big picture as Gestalt-like and holistic abstract in a non-analytical manner (Pretz and Totz, 2007). Inferential intuitions are based on previously analytical processes that have become automatic. Affective intuitions are based on feelings. Lately, Pachur and Spaar (2015) combined different styles of REI, GDMS, CoSI, PMPI, and PID into a unified scale to assess individual differences in intuition and deliberation (USID). They divided the preference for intuition into affective and spontaneous, and the preference for deliberation into knowing and planning.

Even though these previous studies identify three rational styles (analytical, planning, and knowing) and six intuition styles (feelings, spontaneous, experience-based heuristic, holistic, and dependent), some of the styles are not sufficiently described and understood. It remains unclear what is meant by feelings or the general term gut feeling. Feelings can be described in more depth as emotional and anticipation (hunches). From a neuroscience perspective, the concept of a gut feeling can be described as a differentiated approach based on emotions originating from the stomach, colon, skin, and the visceral sensory system (Hopper, 2001; Arumugam et al., 2011; Cryan and Dinan, 2012), the interception and somatic markers of the heart beating rate (Schandry, 1981; Garfinkel et al., 2015; Schulz, 2016) and skin arousals (Loggia et al., 2011; Breimhorst et al., 2011).

Hunches (we named anticipation) are described in the GDMS study as well as in REI, PID, and USID. Many researchers try to explain this atypical or paranormal type of decision-making in depth (Honorton and Ferrari, 1989), as presentiments of future emotions (Radin, 2004), precognition and premonition (Bem et al., 2015), extrasensory perception (Thalbourne and Haraldsson, 1980) paranormal belief and experiences (Lange and Thalbourne, 2002), and automatic evaluation (Ferguson and Zayas, 2009). The received information in this regard may come from outside the body (Sinclair, 2011, 2014).

Based on the unconscious thought theory (Dijksterhuis, 2004) decisions can not only be made fast but also after a period of time and (unconscious) reflection and activation (Bowers et al., 1990; Waroquier et al., 2010), incubation (Carlson, 2008), unconscious thinking (Dijksterhuis and Nordgren, 2006), distraction (Kohler, 1969), removal of blockages (Duncker, 1945), completion of schemes (Mayer, 2011), or in intuitive step-ups (Nicholson, 2000).

According to various theories and approaches from different fields, we combine or divide styles from different studies, add new styles which are not much mentioned

before, and test styles to find a comprehensive valid, and reliable instrument. Therefore, the main purpose of this paper is to develop a new measurement instrument embracing a variety of styles. For this purpose, we named and proposed ten types of styles *analytic*, *planning*, *knowing*, *holistic unconscious*, *spontaneous*, *heuristic*, *slow unconscious*, *emotions*, *anticipation*, and *support by others* on the basis of studies in the literature.

Analytic is a rational style with logical evaluation (GDMS), analytical and logical manner (REI), problem-solving (PMPI), and deliberative thinking on facts and details (PID). *Planning* is a rational style associated with sequential, structured, conventional, planned confirmative, and systematic routines (CoSI, PID, USID). *Knowing* is a rational style with understanding facts and details without the reasoning behind (REI, CoSI, USID). *Holistic unconscious* is an intuition style based on experiential ability in abstract terms or holistically in a gestalt-like, non-analytical manner (CES, TIntS). *Spontaneous* is an intuition style with speed and efficient automated information processing (GDMS, PMPI, TIntS, USID). *Heuristic* is an intuition style with experience-based automated information processing (CEST, PMPI, TIntS, PID, USID). *Slow unconscious* is an intuition style with an unconscious reflection and activation developed over a period of time with distractions (Dijksterhuis, 2004). *Emotions* are an intuition style relying on feelings (GDMS, REI, PMPI, TIntS, PID, USID). *Anticipation* is an intuition style based on hunches and vibes (GDMS, REI, PMPI, TIntS, USID). *Support from others* is an intuitive style involving seeking advice and direction from others while experiencing a sense of whether the person is right or wrong (GDMS, REI).

2 Method

2.1 Item purification and reduction

Item purification process has been conducted with the face and content validity for testing appearance to measure what it is supposed to measure and evaluate the aspects of items measuring related constructs. In the face and content validity, we have asked ten experts from related literature to categorise the selected items for each intuition type. All the experts are academic professors with a higher web of science h-index and research on fields such as decision-making, management, or organisational behaviour. After giving explanations about the purpose of the research and the contents of the categories, we have requested experts to give their suggestions on items and score each item concerning three questions: “to what extent this item is clear” (five-point Likert type from 1 = very poor to 5 = very good), “the meaning of this item is … to relate the theory or related category” (five-point Likert type from 1 = very dissatisfying to 5 = very satisfying), and “if this item is excluded, other items represent content ” (five-point Likert type from 1 = very dissatisfactory to 5 = very satisfactory). Based on the assessment criteria, 25 items that have been scored below the average score of 2.5 have been excluded.

2.2 Final model for testing

After the selection and purification process, the instrument consisted of a total of 65 questions measuring ten different decision-making types. Rational (deliberation) decisions as *analytic* with seven items, *planning* with seven items, and *knowing* with five items; *holistic unconscious* decisions with six items; fast decisions as *spontaneous* with

eight items and *heuristic* with six items; *slow unconscious* decisions with seven items; *emotional* decisions as emotions with eight items, *anticipation* (hunches) with seven items; advice as *support by others* with four items.

2.3 Study 1

The purpose of study 1 is to translate and adapt items into German, explore the multi-factorial structure of the instrument from the generated item pool, confirm the factorial structure, and test the item's statistics and consistencies. We have used a sample of 212 employees working in different organisations in Germany. Data have been collected with a convenience sampling method. The gender distribution of the sample is 47.2% female, 51.4% male, and 1.4% not binary. The job experience has ranged from 1 to 50 years with an average of 18.8 years (SD = 13.8). The average age of the sample is 40.1 years old (SD = 13.5) ranging from 18 to 65.

2.3.1 Translation of items

Since most of the items have already German versions from previous translation and adaptation studies, the translation study has focused on the not adapted items in the pool. Out of 65 items in the pool we have not encountered the German version of 51 items in the previous studies, so a translation study has been conducted on these items. In the first step, these items have been translated from English into German by three German researchers with PhD degrees in the management field, who know English as their native language. Then two bilingual experts from the field reviewed and proofread the translation. In the third step, the translated version has been given to three different researchers from the management field for back-translation into English. Then, another two bilingual experts from the management field proofread the back-translated version.

2.3.2 Statistical procedure

To determine and confirm the factorial structure of types of intuition we have conducted explanatory factor analyses (EFA) and confirmatory factor analysis (CFA) for determining the multi-factorial structure. In the EFA, the principal axis factoring extraction method was used in combination with a varimax rotation has been used to interpret the loadings of the solution. Communalities have been examined to understand the variance of each item accounted for by the extracted factor. Then, items have been omitted if an item shows low communality ($h^2 < 0.20$), high cross-loadings (>0.32), and all loadings under 0.32 (Tabachnick and Fidell, 2001), or not loaded on any factor. After excluding the inconsistent items individually, we have conducted EFA with the remaining items until finding an admissible solution. After an acceptable EFA solution, the factorial structure of the instrument has been evaluated by the CFA model. The confirmation of the CFA model has been tested based on fit indices, such as the ratio of chi-square divided by degrees of freedom (X^2/df), comparative fit index (CFI), Tucker Lewis Index (TLI), and root mean square error of approximation (RMSEA). For the item statistics the item total correlations, Cronbach's alpha (α) and McDonald's omega (ω) reliabilities for the consistencies have been calculated. The correlations and gender differences among the types of intuition have been also examined.

Table 1 Descriptive statistics and validity results

Types/items	*Sample 1 (n = 212)*							*Sample 2 (n = 530)*				
	M	*SD*	*Item total r*	*EFA loadings (eight factors)*	*CFA loadings (ten factors)*	*AVE*	*CR*	*M*	*SD*	*CFA loadings (ten factors)*	*AVE*	*CR*
Analytical	4.11	1.42				0.79	0.92	3.59	1.85		0.87	0.95
1			0.07	0.501	0.890					0.911		
2			0.13	0.621	0.905					0.935		
3			0.10	0.599	0.879					0.947		
Planning	4.25	1.52				0.72	0.88	4.10	1.82		0.87	0.95
4			0.25	0.831	0.837					0.954		
5			0.20	0.714	0.828					0.953		
6			0.23	0.707	0.879					0.895		
Knowing	4.27	1.37				0.71	0.88	3.52	1.86		0.84	0.94
7			0.30	0.508	0.873					0.893		
8			0.33	0.685	0.872					0.936		
9			0.27	0.652	0.787					0.914		
Holistic unconscious	4.85	1.04				0.71	0.88	3.95	1.87		0.89	0.96
10			0.26	0.832	0.803					0.940		
11			0.25	0.854	0.816					0.943		
12			0.32	0.886	0.905					0.955		
Spontaneous	3.38	1.57				0.84	0.94	3.35	1.91		0.92	0.97
13			0.43	0.494	0.905					0.953		
14			0.40	0.500	0.938					0.959		
15			0.44	0.537	0.901					0.958		

Table 1 Descriptive statistics and validity results (continued)

Types/items	*Sample 1 (n = 212)*							*Sample 2 (n = 530)*				
	M	*SD*	*Item total r*	*EFA loadings (eight factors)*	*CFA loadings (ten factors)*	*AVE*	*CR*	*M*	*SD*	*CFA loadings (ten factors)*	*AVE*	*CR*
Heuristic	3.98	1.21				0.55	0.78	3.94	1.81		0.83	0.93
16			0.44	0.743	0.642					0.935		
17			0.34	0.818	0.702					0.942		
18			0.26	0.709	0.865					0.859		
Slow unconscious	4.04	1.44				0.69	0.87	3.47	1.81		0.85	0.94
19			0.13	0.842	0.865					0.886		
20			0.19	0.806	0.758					0.918		
21			0.08	0.821	0.869					0.954		
Emotional	3.86	1.53				0.83	0.93	3.76	1.75		0.87	0.95
22			0.42	0.759	0.887					0.912		
23			0.45	0.744	0.955					0.962		
24			0.41	0.799	0.883					0.921		
Anticipation (hunches)	3.75	1.56				0.80	0.92	3.22	1.79		0.88	0.96
25			0.43	0.752	0.917					0.936		
26			0.38	0.793	0.892					0.958		
27			0.43	0.701	0.881					0.918		
Support by others	3.54	1.44				0.65	0.85	3.43	1.78		0.84	0.94
28			0.39	0.806	0.793					0.927		
29			0.39	0.925	0.843					0.930		
30			0.40	0.870	0.785					0.894		

Table 2 The correlations among the types of intuition

		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1	Planning	1	0.45**	0.49**	0.29**	–0.17**	–0.27**	0.69**	–0.56**	0.16**	0.29**
2	Analytic	0.77**	1	0.04	–0.12**	–0.10**	–0.14**	0.34**	–0.37**	–0.26**	0.36**
3	Knowing	0.66**	0.56**	1	0.70**	–0.01**	–0.05**	0.34**	–0.11**	0.11**	–0.01
4	Spontaneous	0.05	0.05	0.25**	1	–0.04	–0.01	0.52**	0.03	0.33**	–0.09*
5	Heuristic	–0.00	0.06	0.08	0.64**	1	0.74**	–0.43**	0.30**	0.32**	–0.25**
6	Holistic unconscious	–0.08	–0.10	0.24**	0.05	0.00	1	–0.42**	0.33**	0.32**	–0.25**
7	Slow unconscious	0.44**	0.45**	0.32**	–0.35**	–0.27**	0.01	1	–0.39**	–0.17**	0.29**
8	Emotion	–0.56**	–0.43**	–0.33**	0.22*	0.20*	0.23**	–0.18*	1	0.50**	–0.08*
9	Anticipation	–0.48**	–0.38**	–0.27**	0.34**	0.28**	0.29**	–0.31**	0.72**	1	–0.10**
10	Support from others	0.31**	0.35**	0.38**	0.12	0.02	0.06	0.32**	0.04	–0.05	1

Notes: *$p < 0.05$, **$p < 0.01$, sample 1 results ($n = 212$) are on the left and sample 2 results ($n = 530$) are on the right of the diagonal.

2.3.3 Results of study 1

In the first step, we have included all 65 items in the EFA and found eight factors with all loadings ranged from 0.694 to 0.925, and explaining 76.2% of the total variance (KMO measure of sampling adequacy is 0.908; see Table 1). These initial results have indicated that some types of intuition gather into the same factors. The *analytic* and *planning* items; *spontaneous* and *knowing* items have grouped into the same factors without any cross-loadings from others (except one item from knowing), such as, *heuristic*, *holistic unconscious*, *slow unconscious*, *anticipation*, and *support by others* (<0.32). To decrease the number of items and generate a higher variance of the construct for interpretation, we have selected the most loaded items (four items) from each types of intuition by using domain homogeneous item parcelling (each parcel consisted of only certain type of style). Accordingly, we have conducted CFAs for confirming the factorial structure of 48 items with eight dimensions. We have firstly tested eight dimensions with 48 items that were founded in EFA and then modified the factorial models by increasing the proposed dimensions based on the modification suggestions until reaching an admissible solution. After testing different models, the ten-factor model that measure each types of intuition in a separate factor has reached the best fit indices (fit indices results are: eight-factor model: $X^2/df = 3.03$, CFI = 0.775, TLI = 0.760, RMSEA = 0.098; nine-factor model: $X^2/df = 2.26$, CFI = 0.862, TLI = 0.850, RMSEA = 0.077; ten-factor model: $X^2/df = 1.87$, CFI = 0.905, TLI = 0.896, RMSEA = 0.065). These results have confirmed the goodness of the ten-factor structure of instrument. Based on the results we have also calculated the average variance extracted (AVE) and composite reliability (CR) values of each factors. All of the results have indicated acceptable values with the AVE values ranging from 0.65 to 0.84, and CR values ranging from 0.83 to 0.93. The intercorrelations among most factors are below the AVE values that indicate the discriminant validity of the scale (Table 1). However, discriminant validity among the planning, analytic, and knowing factors (r = ranged from 0.56 to 0.77, $p < 0.01$); the spontaneous and heuristic factors ($r = 0.64$, $p < 0.01$); and the emotion and anticipation factors ($r = 0.72$, $p < 0.01$) are not very well constructed. The item-total correlations have ranged from 0.07 to 0.45 with very lower-level item statistics for the analytic (from 0.07 to 0.13) and slow unconscious (from 0.08 to 0.19) factors. We have also calculated Cronbach's alpha (α) and McDonald' omega (ω) reliabilities for the item consistencies; $\alpha = 0.94$ and $\omega = 0.94$ for planning, $\alpha = 0.92$ and $\omega = 0.92$ for analytic, $\alpha = 0.90$ and $\omega = 0.90$ for knowing, $\alpha = 0.93$ and $\omega = 0.93$ for spontaneous, $\alpha = 0.90$ and $\omega = 0.90$ for holistic unconscious, $\alpha = 0.91$ and $\omega = 0.91$ for slow unconscious, $\alpha = 0.81$ and $\omega = 0.85$ for heuristic, $\alpha = 0.97$ and $\omega = 0.97$ for emotion, $\alpha = 0.92$ and $\omega = 0.92$ for anticipation, and $\alpha = 0.88$ and $\omega = 0.88$ for support by others. The results have indicated acceptable item consistencies with the limitations of some item-total correlations in two factors.

We then examined correlations among types of intuition from the generalised results so far (Table 2 on the left results). The results have indicated that there are relatively higher relations among the planning analytic, and knowing types (r is ranging from 0.56 to 0.77), the emotion and anticipation types (r = 0.72), and between the spontaneous and heuristic types (r = 0.64).

Table 3 The correlations with personality types

		Agreeableness	*Conscientiousness*	*Neuroticism*	*Openness*	*Short-term orient.*	*Long-term orient.*	*Analytical*	*Planning*	*Knowing*	*Holistic unconscious*	*Spontaneous*	*Heuristic*	*Slow unconscious*	*Emotional*	*Anticipation*	*Support by others*
1	Extroversion	0.37**	0.03	0.00	0.05	–0.06	–0.17**	–0.25**	–0.06	–0.13**	–0.06	0.23**	0.25**	–0.33**	0.31**	0.23**	0.02
2	Agreeableness		0.06	0.19**	0.39**	–0.25**	–0.21**	–0.42**	–0.27**	–0.02	0.14**	0.31**	0.36**	–0.40**	0.62**	0.46**	–0.19**
3	Conscientiousness			–0.63**	0.29**	0.10*	0.70**	0.36**	0.03	0.29**	0.28**	0.23**	0.18**	0.12**	–0.08	0.11*	–0.06
4	Neuroticism				–0.12**	–0.16**	–0.62**	–0.34**	–0.09*	–0.16**	–0.12**	–0.25**	–0.14**	–0.11*	0.31**	0.14**	0.14**
5	Openness					–0.18**	0.16**	0.14**	–0.31**	0.53**	0.64**	0.14**	0.18**	0.14**	0.29**	0.63**	–0.24**
6	Short-term orientation						0.23**	0.19**	0.12**	–0.00	–0.05	–0.15**	–0.13**	0.19**	–0.19**	–0.16**	0.14**
7	Long-term orientation							0.50**	0.14**	0.29**	0.19**	0.14**	0.03	0.30**	–0.29**	–0.07	0.08

2.4 Study 2

The purpose of study 2 is to confirm the multi-factorial structure and internal consistency of instrument that has been explored in the study 1, increase the generalisability of the results with using a different and larger sample size, test the concurrent and predictive validity of the instrument with some associated structures, and explore the gender differences across types. For the study 2, we have collected data from 530 employees working in different organisations in Germany. Data have been collected online based on a convenience sampling method. The gender distribution of the sample is 51.6% female, 48% male, and 0.4% not binary. The job experience has ranged from 1 to 46 years with an average of 21.3 years (SD = 12.7). The average age of the sample is 42.7 years old (SD = 12.9) ranging from 18 to 75.

2.4.1 Statistical procedure

To confirm the factorial structure of types of intuition we have conducted CFA on the dimensions that tested in study 1. Then the item and factor statistics with correlations among types of intuition have been calculated. Moreover, the concurrent and predictive validities of the instrument have also been tested. For the concurrent validity, the Big Five personality scale has been used for testing the relationship between personality and intuition styles. For the predictive validity individual task and contextual performance have been used for understanding the effects of intuitive decision-making types on individual work performance. Lastly, one-way ANOVA has been conducted to find the gender differences across intuition types.

2.4.2 Results of study 2

To test the structure of the 48-item scale that been tested in study 2, CFA has been conducted on ten factors of the intuition scale. Employing the maximum likelihood estimation method CFA results have shown that intuition structure confirmed the fit of 10 different types (Table 1; $X^2/df = 2.66$, CFI = 0.974, TLI = 0.969, RMSEA = 0.0475). To decrease the number of items and generate a higher variance, we have selected the most loaded items (three items) from each types of intuition by using domain homogeneous item parcelling (each parcel consisted of only certain type of style). The calculated AVE values have changed from 0.84 to 0.92, the CR values have ranged from 0.93 to 0.97, and the factor loadings have ranged from 0.86 to 0.96. The intercorrelations among factors have been below the AVE values that indicate the discriminant validity of the instrument (Table 1). However, correlations between knowing and spontaneous ($r = 0.702$, $p < 0.01$), and heuristic and holistic unconscious ($r = 0.743$, $p < 0.01$) have been relatively higher that indicating a possible threat for discriminant validity between these types. The Cronbach's alpha (α) and McDonald' omega (ω) reliabilities for the item consistencies have been calculated as $\alpha = 0.89$ and $\omega = 0.89$ for planning, $\alpha = 0.95$ and $\omega = 0.95$ for analytic, $\alpha = 0.94$ and $\omega = 0.94$ for knowing, $\alpha = 0.96$ and $\omega = 0.96$ for spontaneous, $\alpha = 0.97$ and $\omega = 0.97$ for holistic unconscious, $\alpha = 0.93$ and $\omega = 0.94$ for slow unconscious, $\alpha = 0.94$ and $\omega = 0.94$ for heuristic, $\alpha = 0.95$ and $\omega = 0.95$ for emotion, $\alpha = 0.96$ and $\omega = 0.96$ for anticipation, and $\alpha = 0.94$ and $\omega = 0.94$ for support by others. The findings have indicated acceptable item consistencies in terms of intuition types. When examined the correlations among types (Table 2 on the right results) there are

relatively average (between 0.40 to 0.60) and lower level (between 0.20 to 0.40) relations among all types (positive relations have ranged from 0.11 to 0.65; negative relations have ranged from –0.09 to –0.51) except the higher relations between knowing and spontaneous, and heuristic and holistic unconscious (ranged from 0.70 to 0.74).

The concurrent validity results have showed that (Table 3) extroversion has been positively associated with spontaneous ($r = 0.23$, $p < 0.01$), heuristic ($r = 0.25$, $p < 0.01$), emotional ($r = 0.31$, $p < 0.01$), anticipation ($r = 0.23$, $p < 0.01$), and negatively associated with analytical ($r = –0.25$, $p < 0.01$), knowing ($r = –0.13$, $p < 0.01$), and slow unconscious ($r = –0.33$, $p < 0.01$); agreeableness has been positively associated with holistic unconscious ($r = 0.14$, $p < 0.01$), spontaneous ($r = 0.31$, $p < 0.01$), heuristic ($r = 0.36$, $p < 0.01$), emotional ($r = 0.62$, $p < 0.01$), anticipation ($r = 0.46$, $p < 0.01$), and negatively associated with analytical ($r = –0.42$, $p < 0.01$), planning ($r = –0.27$, $p < 0.01$), slow unconscious ($r = –0.40$, $p < 0.01$), and support by others ($r = –0.19$, $p < 0.01$); conscientiousness has been positively associated with analytical ($r = 0.36$, $p < 0.01$), knowing ($r = 0.29$, $p < 0.01$), holistic unconscious ($r = 0.28$, $p < 0.01$), spontaneous ($r = 0.23$, $p < 0.01$), heuristic ($r = 0.18$, $p < 0.01$), slow unconscious ($r = 0.12$, $p < 0.01$), and anticipation ($r = 0.11$, $p < 0.05$); neuroticism has been positively associated with emotional ($r = 0.31$, $p < 0.01$), anticipation ($r = 0.14$, $p < 0.01$), support by others ($r = 0.14$, $p < 0.01$) and negatively associated with analytical ($r = –0.34$, $p < 0.01$), planning ($r = –0.09$, $p < 0.05$), knowing ($r = –0.16$, $p < 0.01$), holistic unconscious ($r = –0.12$, $p < 0.01$), spontaneous ($r = –0.25$, $p < 0.01$), heuristic ($r = –0.14$, $p < 0.01$), slow unconscious ($r = –0.11$, $p < 0.05$); openness has been positively associated with analytical ($r = 0.14$, $p < 0.01$), knowing ($r = 0.53$, $p < 0.01$), holistic unconscious ($r = 0.64$, $p < 0.01$), spontaneous ($r = 0.14$, $p < 0.01$), heuristic ($r = 0.18$, $p < 0.01$), slow unconscious ($r = 0.14$, $p < 0.05$), emotional ($r = 0.29$, $p < 0.01$), anticipation ($r = 0.63$, $p < 0.01$), and negatively associated with planning ($r = –0.31$, $p < 0.05$), support by others ($r = –0.24$, $p < 0.01$). For the time orientation, short term orientation has been positively associated with analytical ($r = 0.19$, $p < 0.01$), planning ($r = 0.12$, $p < 0.01$), slow unconscious ($r = 0.19$, $p < 0.05$), support by others ($r = 0.14$, $p < 0.01$), and negatively associated with spontaneous ($r = –0.15$, $p < 0.01$), heuristic ($r = –0.13$, $p < 0.01$), emotional ($r = –0.19$, $p < 0.01$), anticipation ($r = –0.16$, $p < 0.01$); long term orientation has been positively associated with analytical ($r = 0.50$, $p < 0.01$), planning ($r = 0.14$, $p < 0.01$), knowing ($r = 0.29$, $p < 0.01$), holistic unconscious ($r = 0.19$, $p < 0.01$), spontaneous ($r = 0.14$, $p < 0.01$), slow unconscious ($r = 0.30$, $p < 0.01$), and negatively associated with emotional ($r = –0.29$, $p < 0.01$).

The predictive validity results (Table 4) have indicated that planning ($\beta = 0.28$, $p < 0.01$), analytic ($\beta = 0.20$, $p < 0.01$), support by others ($\beta = 0.15$, $p < 0.01$) have positive impact; anticipation ($\beta = –0.26$, $p < 0.01$) has a negative impact on task performance ($F = 25.5$, $p < 0.01$); analytic ($\beta = 0.10$, $p < 0.01$), knowing ($\beta = 0.14$, $p < 0.01$), heuristic ($\beta = 0.12$, $p < 0.01$) have positive impact on contextual performance ($F = 42.9$, $p < 0.01$).

Finally, one-way ANOVA results (Table 5) have produced that there are significant gender differences in analytic, spontaneous, heuristic, slow unconscious, emotion, and anticipation types. Females use more spontaneous (mean for female = 3.57, SD = 1.76, mean for male = 3.13, SD = 2.02, $p < 0.01$), heuristic (mean for female = 4.18, SD = 1.55, mean for male = 3.72, SD = 1.74, $p < 0.01$), emotion (mean for female = 4.38, SD = 1.44, mean for male = 3.18, SD = 1.80, $p < 0.01$), anticipation (mean for female = 4.06, SD = 1.49, mean for male = 2.43, SD = 1.70, $p < 0.01$); less analytic (mean for

female = 3.37, SD = 1.78, mean for male = 3.80, SD = 1.89, $p < 0.01$) and slow unconscious (mean for female = 3.16, SD = 1.65, mean for male = 3.76, SD = 1.92, $p < 0.01$) types of intuition than males.

3 Discussion

The purpose of this paper is to develop a new instrument for measuring the complex and multi-disciplinary construct of rational and intuitive decision-making. Elaborating on items in the previous instrument studies on intuition, we try to establish a comprehensive instrument for measuring decision-making styles. Based on different theories and approaches from various fields, we combine similar items, divide incompatible items, add new items needed, name or rename inconsistencies, and test all items and style structures for the psychometric properties. The results indicate a clear multidimensional measurement instrument for ten different types of decision-making styles. The types are *analytic*, *planning*, *knowing*, *holistic unconscious*, *spontaneous*, *heuristic*, *slow unconscious*, *emotions*, *anticipation*, and *support by others*.

The findings of validity analyses indicate an acceptable construct, concurrent, and predictive validities. For the purpose of assessing construct validity, we utilise EFA, CFA, and AVE, and attain acceptable solutions in study 2 (n = 212). The version of the 48-item scale validates the fit out of the initial 64 items. Moreover, the reliability criteria of the Cronbach alphas, McDonald omegas, and composite reliabilities indicate higher-level internal consistencies in all types, which leads to reliable solutions. However, we encounter relatively high correlations among certain styles that can be grouped into three distinct categories. The first category consists of planning, analytic, and knowing types, all of which are part of rational decision-making. The second category includes spontaneous and heuristic types, which are part of fast, automated, and experienced-based intuitive decision-making. The third category comprises emotion, and anticipation types, which are affective and feeling-based intuitive decision-making.

We employ another sample in study 3 (n = 530) for testing the multi-factorial structure, increasing the generalisability, testing concurrent (with big-five and time orientation), discriminant (with gender), and predictive (task and contextual performance) validities. After decreasing the number of items by using the domain homogeneous item parcelling for a relatively short scale and higher variance the final version of the scale consists of 30 items. The CFA and AVE results for validity and the reliability criteria of the Cronbach alphas, McDonald omegas, and composite reliabilities show higher-level internal consistencies for the 30-item scale. There are also relatively higher correlations among certain styles, such as between knowing and spontaneous types, and between heuristic and holistic unconscious types. The concurrent validity results indicate there are significant relations between big-five personality types, short- and long-term time orientation, and decision-making styles. Based on the predictive validity analysis, decision-making styles have positive effects on task and contextual performances. While some cognitive-based or rational decision-making styles increase both task and contextual performances, some affective-based styles decrease them. Lastly, the discriminant analysis results present that women prefer more affective-based styles with spontaneous and heuristic types; and less analytic and slow unconscious types than men.

Table 4 Predictive validity results

Independent variables	*Dependent variable*							
	Task performance				*Context performance*			
	Control variables		*Full model*		*Control variables*		*Full model*	
	β	*t*	*β*	*t*	*β*	*t*	*β*	*t*
Extroversion	–0.00	0.07	0.01	0.31	–0.06*	–2.10	–0.05	–1.76
Agreeableness	–0.00	–0.19	0.10	1.98	–0.09*	–2.48	0.03	0.61
Conscientiousness	0.26**	4.44	0.25**	4.75	0.19**	4.21	0.20**	4.28
Neuroticism	–0.05	–0.93	–0.00	–0.09	–0.20**	–4.84	–0.18**	–4.10
Openness	–0.39**	–9.27	–0.19**	–3.19	0.20**	5.84	0.10*	2.04
Short-term orientation	0.21**	5.13	0.21**	5.99	–0.07*	–2.30	–0.07*	–2.42
Long-term orientation	0.08	1.28	–0.10	–1.89	0.37**	7.82	0.29**	5.95
Planning			0.28**	4.50			0.00	0.01
Analytic			0.20**	5.11			0.10**	2.97
Knowing			–0.02	–0.34			0.14**	2.78
Spontaneous			0.01	0.17			0.03	0.59
Heuristic			0.08	1.30			0.12**	2.33
Holistic unconscious			0.08	1.50			–0.05	–1.12
Slow unconscious			0.00	0.04			0.04	0.82
Emotion			0.02	0.30			0.01	0.14
Anticipation			–0.26**	–5.24			0.08	1.84
Support by others			0.15**	3.55			0.02	0.44
R			0.55	0.70			0.75	0.79
R^2			0.30	0.49			0.56	0.62
F			36.3**	25.5**			96.0**	42.9**

Table 5 One-way ANOVA results

		n	*Mean*	*SD*	*F*
Analytic	Male	271	3.80	1.89	7.181**
	Female	253	3.37	1.78	
Planning	Male	270	4.19	1.87	1.353
	Female	253	4.01	1.77	
Knowing	Male	271	3.57	1.97	0.394
	Female	253	3.47	1.74	
Holistic unconscious	Male	271	3.79	1.99	3.611
	Female	253	4.10	1.72	
Spontaneous	Male	270	3.13	2.02	7.173**
	Female	253	3.57	1.76	
Heuristic	Male	271	3.72	1.74	10.095**
	Female	253	4.18	1.55	
Slow unconscious	Male	269	3.76	1.92	15.000**
	Female	253	3.16	1.65	
Emotion	Male	271	3.18	1.80	70.987**
	Female	253	4.38	1.44	
Anticipation	Male	271	2.43	1.70	136.66**
	Female	253	4.06	1.49	
Support from others	Male	271	3.38	1.87	0.786
	Female	253	3.51	1.68	

4 Implications

For researchers, this instrument offers a validated, multidimensional framework for studying decision-making processes across diverse organisational contexts. Future studies can leverage this tool to examine the relationship between decision-making styles and factors such as job performance, leadership effectiveness, and team dynamics. Additionally, researchers can investigate cultural differences in decision-making by applying the instrument in cross-national studies, allowing for comparisons of rational and intuitive styles in various business environments.

Managers can utilise the instrument to evaluate their own decision-making tendencies as well as those of their teams. Gaining insight into whether a leader tends to rely more on analytic versus intuitive decision-making styles can inform the design of leadership training programs and enhance strategic thinking. For instance, senior managers in risk-sensitive industries – such as finance, aviation, and healthcare—may gain from striking a balance between rational and intuitive approaches in order to make more comprehensive decisions.

Organisations can incorporate the instrument into HR analytics and talent management strategies to cultivate diverse decision-making teams. For example, in project teams, a blend of holistic unconscious (big-picture thinkers), Planning (structured

decision-makers), and Spontaneous (fast responders) can enhance problem-solving effectiveness. Furthermore, managers can employ this tool for succession planning to ensure that future leaders possess the necessary decision-making flexibility to navigate complex business challenges.

5 Limitations and suggestions

The study already has methodological and theoretical limitations that require all the findings to be assessed accordingly. Firstly, the cross-sectional design of the study, which involves collecting data from participants at a single point, may be insufficient to understand actual individual states or tendencies. Secondly, collecting data from a single source may create common method bias, which indicates the difficulty of distinguishing between multiple attributes and making generalised evaluations about them. Thirdly, some of the styles are relatively highly correlated to each other in the second and third studies, indicating a limitation to discriminant validity. Even though the categorisations in the second study can be acceptable with the nature of rational and intuition processes, the third study's findings look more complicated to interpret the results to particular decision-making styles. Therefore, future studies are needed to test and explore possible correlated relations among some rational and intuition styles. Lastly, the item pool in the beginning consists of 64 items all of which are associated with theories or approaches in related styles. After the validating and item parcelling the instrument confirms the 30 items in total with three items for each decision-making style. When examining the left items in the final version, some of the styles may need more explanations based on the theoretical conceptualising. For instance, in terms of holistic unconscious intuition, while there are items measuring holistic big-picture structure, there is no clear item available for measuring holistic abstract structure. There may also be some items that need to be added in future studies for measuring hunches for the anticipation style.

6 Conclusions

The study introduces an integrated and all-encompassing multidisciplinary structure aimed at understanding and measuring decision-making styles. The structure builds upon well-established and universally recognised research in the field. Encompassing a wide array of dimensions essential for both rational and intuitive decision-making processes, this framework presents ten distinct dimensions that provide these tendencies. Designed to be comprehensive, this framework can be applied across diverse decision-making situations within the extensive research field. Termed as the RIDMS approach, it serves as a valid, reliable, practical, and economical assessment tool.

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Appendix

Table A1 Rational and intuitive decision-making styles instrument – RIDMS

To what extend which you would agree that that statement is true for you at your current job?	
Analytical	
1	Before I make decisions, I usually think carefully first.
2	Instead of acting on the first idea that comes to mind, I carefully consider all my options.
3	I make decisions in a logical and systematic way.
Planning	
4	I like detailed action plans.
5	Following a clear plan in very important to me.
6	A good task is a well-planned task.
Knowing	
7	I study every problem until I understand the underlying logic.
8	I enjoy solving problems that require hard thinking.
9	I prefer complex problems to simple problems.
Holistic unconscious	
10	I use my general thought of whole rather the details when to decide.
11	Before I decide, I try the understand the big picture of the problem.
12	I always use big picture perspective when to decide.
Spontaneous	
13	I generally make snap decisions.
14	I make quick decisions.
15	I typically figure out the way to decide swiftly.
Heuristic	
16	I make decisions based on my knowledge of human nature.
17	I make decisions based on my life experience.
18	I've had enough experience to just know what I need to do most of the time without trying to figure it out every time.
Slow unconscious	
19	When I make decisions, I always sleep over it for a night.
20	Over time, I process many different influences on my decision.
21	I usually set aside enough time to think things through carefully and figure out what is the be thing to do.
Emotional	
22	Feelings play a big role in my decisions.
23	I follow my feelings when deciding.
24	Emotions are usually more useful than thoughts for coping.

Notes: From 1 – definitely false to 5 – definitely true. Bold is added after analysis for completion.

Table A1 Rational and intuitive decision-making styles instrument – RIDMS (continued)

To what extend which you would agree that that statement is true for you at your current job?	
Anticipation (hunches)	
25	I have a premonition of what is going to happen.
26	I can foresee the outcome of a process.
27	I foresee how to decide before I review all aspects.
Support by others	
28	I need assistance of other people when making important decisions.
29	If I have support by others, it is easier for me to make important decisions.
30	I like to have someone to steer me in the right direction when I am faced with important decisions.

Notes: From 1 – definitely false to 5 – definitely true. Bold is added after analysis for completion.