

Decision-making styles and information search – the relationships with need for cognition and curiosity

Rozhodovacie štýly a vyhľadávanie informácií – vzťahy s potrebou poznania a zvedavosťou

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Abstrakt

Štúdia sleduje vzťah medzi vybranými rozhodovacím štýlmi a dvomi premennými vyjadrujúcimi vyhľadávanie informácií – potrebou poznania a zvedavosťou. Na vzorke stredoškolských študentov bola zisťovaná miera využívania piatich rozhodovacích štýlov (racionálny, intuitívny, závislý, vyhýbavý, spontánny), potreba poznania a zvedavosť, pri ktorej boli vyčleňované dve subškály – rozšírenie a prijatie. Výsledky korelačnej a regresnej analýzy poukázali na úlohu najmä dvoch rozhodovacích štýlov pri vysvetľovaní potreby poznania a zvedavosti – racionálneho (pozitívne) a vyhýbavého (negatívne). Podobne ako vzťah potreby poznania a zvedavosti boli však tieto vzťahy sýtené asociáciami len so subškálou zvedavosti rozšírenie. Naopak, vzťah spontánneho štýlu so zvedavosťou je výsledkom korelácie so subškálou prijatie. Študenti gymnázií a strednej odbornej školy sa významne neodlišovali v žiadnej zo sledovaných premenných.

Kľúčové slová: rozhodovacie štýly, potreba poznania, zvedavosť

Abstract

Decision-making styles, which are defined as habit-based propensities to react in a certain way in a specific decision context (Scott & Bruce, 1995), have been in past found to be related to heterogeneous personality characteristics (Dewberry, Juanchich, & Narendran, 2013) as well as real world decision outcomes (Bruine de Bruin, Parker, & Fischhoff, 2007). Although the past research has also found relationships with another cognitive characteristics such as intelligence (Hill et al., 2013) or decision-making competence (Bruine de Bruin, Parker, & Fischhoff, 2007), the associations with variables describing individual's search for new information have not been investigated yet. The study aimed mainly to investigate the role of selected decision-making styles in explaining two variables describing information search – need for cognition and curiosity. Five decision/making styles were assessed by the General Decision-Making Styles – rational, intuitive, dependent, avoidant, and spontaneous. Need for cognition was measured by the short version of the Need for Cognition scale

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(Cacioppo, Petty, & Kao, 1984) and curiosity by the Curiosity and Exploration Inventory-II (Kashdan et al., 2009) with two subscales – stretching (motivation to seek out knowledge and new experiences) and embracing (willingness to embrace the novel, uncertain, and unpredictable nature of everyday life). Data were obtained from the high school sample ($n = 98$, $M_{age} = 16.45$, 59% females) including two types of school – general grammar school ($n = 48$) and vocational school ($n = 50$). Data analysis included basic descriptive statistics, correlation analysis, multiple linear analysis, and independent samples t-test. Correlations as well as linear regression results indicate that need for cognition and curiosity are related positively to the rational decision-making style and negatively to the avoidant decision-making style. The spontaneous style was associated only with curiosity, but in all three decision-making styles have been observed substantial differences in correlation with two curiosity subscales – stretching and embracing. While the associations with the rational and spontaneous style were driven by the correlations with stretching, the contrary was valid for the spontaneous style – it was related to the embracing, but not to the stretching score, and similar pattern was found by the relationship of curiosity and need for cognition. When comparing general grammar school with the vocational school, no significant differences were found in decision-making styles, need for cognition and curiosity. The results are discussed with regard to the past research with similar concepts – thinking styles or group processes and differences between need for cognition and curiosity are elaborated. The results point not only on importance of need for cognition and curiosity in a way of making decisions, but also on necessity to differentiate aspects of curiosity and treat them separately.

Keywords: decision-making styles, need for cognition, curiosity

Introduction

Decision-making styles describe the typical way of making decisions in various types of situations. They are sometimes considered to be a more specific subgroup of cognitive styles (e.g. Kozhevnikov, 2007, Leonard, Scholl, & Kowalski, 1999) and their relationships to other characteristics of information processing are well known (e.g. decision-making competence – Bruine de Bruin, Parker, & Fischhoff, 2007 or intelligence – Hill et al., 2013). On the other hand, while decision-making styles describe the typical behaviour in actual situation, the relationship to the information seeking and to the need for new information has not been studied yet. Based on this, this study aims to expand the current state of knowledge by investigating the associations between the selected decision-making styles and two variables describing search for new information – need for cognition and curiosity.

Decision-making styles

Decision-making styles are defined as habit-based propensities to react in a certain way in a specific decision context (Scott & Bruce, 1995) or, from another point of view, they represent likelihoods of behaviour across situations and domains (Leykin & DeRubeis, 2010). Based on theoretical assumptions, different classifications of decision-making styles have emerged, but two of them seem to be the most prominent. Scott and Bruce (1995) identified five decision-

-making styles – rational, intuitive, dependent, avoidant, and spontaneous with the following characteristics. The rational style is characterized by the search for and logical evaluation of alternatives and the intuitive style by attention to detail and a tendency to rely on feeling. The dependent style is the tendency to search for and reliance on the advice of others. The avoidant style is characterized as avoiding decisions whenever possible and spontaneous style as a sense of immediacy and desire to complete the decision-making process as soon as possible. The second often used classification by Mann, Burnett, Radford, & Ford (1997) proposes four styles with different names, but similar description. They include one style considered to be adaptive (vigilance) and three „non-adaptive“ styles (hypervigilance, buck-passing, procrastination). Vigilance is described as a careful and unbiased evaluation of alternatives (similar to the description of the rational style) and hypervigilance is a hurried, anxious approach to decision making (similar to the spontaneous style). Buck-passing seems as a combination of avoidant and dependent way of making decisions (leaving decision to others and avoiding responsibility) and procrastination (similarly to avoidance) is characterized as delaying decisions.

Need for cognition, curiosity, and possible relationships with decision-making styles

The need for cognition was firstly described by Cohen, Scotland, and Wolfe (1955) as a need to structure relevant situations in meaningful, integrated ways, a need to understand and make reasonable the experiential world and nowadays is understood as an individual's tendency to engage in and enjoy effortful cognitive endeavours (Cacioppo, Petty & Kao, 1984). A similar variable – curiosity – can be viewed from two angles – as perceptual curiosity (the desire for sensory experience) and as epistemic curiosity (the desire for knowledge, Berlyne, 1954). Epistemic curiosity is considered to be a construct very similar to need for cognition (Powell, Nettelbeck, & Burns, 2016) and it was found to be moderately positively related to seven out of the eight measures of curiosity (Olson, Camp, & Fuller, 1984). Although the past research indicates a strong overlap between measures of curiosity and need for cognition (Li & Browne, 2006; Mussel, 2010; Powell, Nettelbeck, & Burns, 2016, Kashdan et al., 2018), Mussel (2010) cautions that the scales of these constructs are meaningfully different and should not be considered as identical. Kashdan et al. (2018) points on curiosity's shared commonalities with such a wide area of psychological terms as openness to experience, novelty seeking, intrinsic motivation, tolerance of ambiguity, tolerance for uncertainty, frustration tolerance, sensation seeking, and, of course, need of cognition.

When considering potential associations of need for cognition and curiosity with the decision-making styles, although they have not been, to our knowledge, investigated before, the rational style seems as the obvious correlate. Rational thinking style in one of the dominant instruments used in thinking styles research (the Rational-Experiential Inventory (REI), Pacini & Epstein, 1999) is in fact measured by an adapted Need for cognition scale and this subscale was even initially named as Need for cognition. When considering the empirical evidence, need for cognition is related to variables similar to the rational way of thinking such as critical thinking and rational thinking (Cacioppo, Petty, & Morris, 1983) as well as to deep processing strategies (Cazan & Indreica, 2014). As people with low need for cognition tend to rely by decision-making on simple cues (Haugtvedt, Petty, & Cacioppo, 1982), their higher tendency to

intuitive or spontaneous decisions can be expected, but with caution – while rational decision-making is related to the lower use of the spontaneous thinking, it is not always the antipole of the intuitive way of making decisions (e.g. Loo, 2000; Baiocco, Laghi, & D'Alessio, 2009). Need for cognition was also found to be related to the higher rationality (Curseu, 2006) as well as to general, fluid and crystalized intelligence (Hill et al., 2013). On the other hand, while the relationship of need for cognition and curiosity with the rational and partially also with intuitive way of decision-making seems well grounded, the associations with another decision-making styles identified in the present study can hardly be derived from past research. Need for cognition and curiosity are only rarely studied together with group processes (Haugtvedt & Petty, 1992; Areni, Ferrell, & Wilcox, 2000; Smith, Kerr, Markus, & Stasson, 2001) with mixed results. The associations with the spontaneous decision-making can be probably derived from the sensation seeking research, when spontaneity as well as curiosity seem to be related to some of its subscales (Baiocco, Laghi, & D'Alessio, 2009; Byman, 2005; Olson, Camp, & Fuller, 1984).

The current study

Based on the current state of knowledge in the decision making, need for cognition and curiosity, the main aim of the present study was to explore the possible role of decision-making styles in explaining two variables indicating people's search for new information and ideas – need for cognition and curiosity. The secondary aim was to compare two different types of school – general high school (grammar school) intended to prepare students for university study and the vocational school focused on some kind of professional training. We expected grammar school students to score higher in search for information indicators as a manifestation of their interest in new knowledge.

Methods

Sample

The sample consisted of 98 high school students from the high schools in Košice, eastern Slovakia (48 from grammar school and 50 from vocational school) aged 15 to 19 years ($M_{\text{age}} = 16.45$, $SD = 1.13$, 59.2% females). The participation of students was voluntary and students completed the measures during the classes.

Measures

Decision-making styles were measured by the General Decision-Making Styles (Scott & Bruce, 1995) identifying five decision-making styles – rational (sample item: I make decisions in a logical and systematic way), intuitive (When I make decisions, I tend to rely on my intuition), dependent (I rarely make important decisions without consulting other people), avoidant (I avoid making important decisions until the pressure is on), and spontaneous (I generally make snap decisions). The inventory consists of 25 items (5 items for each style/subscale) asking participants about their usual way of making decisions. The subscale/style score is a sum of corresponding items. The Cronbach's alphas as indicators of internal consistency for the

present sample were .76, .61, .67, .80, and .69 for the rational, intuitive, dependent, avoidant and spontaneous styles, respectively.

Trait curiosity was identified by the 10 item Curiosity and Exploration Inventory-II (Kashdan et al., 2009). Subjects rated how the items reflect the way they generally feel and behave on 5-point scale from very slightly or not at all (1) to extremely (5). The inventory provides a total score as well as two subscores derived as summation of five items – stretching (motivation to seek out knowledge and new experiences – e.g. I actively seek as much information as I can in new situations) and embracing (willingness to embrace the novel, uncertain, and unpredictable nature of everyday life – e.g. Everywhere I go, I am out looking for new things or experiences). The Cronbach's alpha for the total score was .76, for subscales it was .75 for stretching and .68 for embracing.

Need for cognition was measured with the short version of the unidimensional Need for Cognition scale (Cacioppo, Petty, & Kao, 1984) including 18 items (e.g. I prefer complex to simple problems). The items are rated on 7-point scale from 1 (extremely uncharacteristic of me) to 7 (extremely characteristic of me) with 10 items reversely scored. The Cronbach's alpha was .76.

Results

Descriptive statistics and correlations (Table 1) confirm the results found in past studies – decision-making styles are not independent and significant relationships between them indicate that their associations with other constructs should take into account all of them simultaneously. Based on this, more attention should be devoted to linear regression and its comparison with bivariate correlations. The rational (positively) and avoidant (negatively) styles are related to the need for cognition as well as to curiosity total score and its stretching subscale. The spontaneous style is positively related to curiosity score, mainly with its embracing subscale. Two decision-making styles – intuitive and dependent style – have not been found to be associated with need for cognition or with curiosity. Moreover, the relationship between need for cognition and curiosity is significant and positive. It needs to be pointed out, that associations of curiosity with another variables are driven by different subscales in particular cases. While the relationship of two decision-making styles (rational and avoidant) are due to the associations with the stretching subscale and correlations with the embracing subscale are trivial, the contrary is the case for the spontaneous style – it is related to the embracing, but not to the stretching score.

Table 1. Descriptive statistics and correlations among all variables

	Mean	SD	1	2	3	4	5	6	7	8
1 Rational style	18.89	3.35								
2 Intuitive style	18.45	2.56	.17							
3 Dependent style	17.39	3.38	.30**	.16						
4 Avoidant style	14.15	4.80	-.29**	-.07	.10					
5 Spontaneous style	12.70	2.73	-.22*	.14	-.09	.22*				
6 Need for cognition	72.52	13.83	.38***	-.09	-.03	-.39***	-.17			
7 Curiosity	35.39	6.20	.24*	.06	.08	-.20	.37***	.32**		
8 Stretching	18.19	3.69	.43***	.10	.08	-.34***	.09	.50***	.81***	
9 Embracing	17.19	3.88	-.02	.01	.06	.01	.50**	.05	.83***	.34**

*p < .05, **p < .01, ***p < .001

Table 2 Linear regression explaining need for cognition and curiosity by decision-making styles (standardized regression coefficient reported)

Decision-making style	Need for cognition	Curiosity	Stretching	Embracing
	β	β	β	β
Rational	.35**	.27**	.40***	.05
Intuitive	-.15	-.08	-.03	-.11
Dependent	-.08	.09	.02	.12
Avoidant	-.29**	-.24**	-.29**	-.12
Spontaneous	-.01	.50***	.25*	.57***
R ²	.27	.30	.29	.29
F(5,92)	6.73***	7.88***	7.64***	7.54***

*p < .05, **p < .01, ***p < .001

When considering the differences between two included types of schools – general grammar school and vocational school, no significant differences have been found.

Table 3 Comparison of vocational school and grammar school in decision-making styles, need for cognition and curiosity

		Mean	SD	t	p	d
Rational style	Vocational school	19.50	3.08	1.873	.064	.38
	Grammar school	18.25	3.52			
Intuitive style	Vocational school	18.64	2.56	.752	.454	.14
	Grammar school	18.25	2.57			
Dependent style	Vocational school	17.90	2.93	1.543	.126	.31
	Grammar school	16.85	3.75			
Avoidant style	Vocational school	13.94	4.52	-.446	.656	.09
	Grammar school	14.38	5.11			
Spontaneous style	Vocational school	12.64	2.63	-.236	.814	.05
	Grammar school	12.77	2.85			
Need for cognition	Vocational school	69.94	9.33	-1.911	.059	.38
	Grammar school	75.21	17.02			
Curiosity	Vocational school	35.80	6.23	.670	.504	.14
	Grammar school	34.96	6.20			
Stretching	Vocational school	18.24	3.47	.126	.900	.02
	Grammar school	18.15	3.94			
Embracing	Vocational school	17.56	4.00	.953	.343	.19
	Grammar school	16.81	3.76			

Discussion

The present study's main aim was to investigate the role of decision-making styles in explaining two variables describing information search – need for cognition and curiosity. While these two variables were interrelated, a closer inspection shows that need for cognition is associated only to the stretching, not to embracing subscale. When considering these curiosity subscales in more detail, the similarity of stretching, defined as motivation to seek out knowledge, to need for cognition, is obvious. Beside to this theoretical justification, these findings are in line with the pattern found in the study by Jovanović and Gavrilov-Jerković (2014) who reported the role of only the embracing score in predicting risky behaviour engagement, but only the role of the stretching score in predicting positive affect. Based on this, while the internal consistency of the curiosity scale was sufficient, we will describe the results with regard to its subscales as they seem as substantially different.

The pattern of correlation and regression analysis results is similar in need for cognition, curiosity total score, and curiosity stretching subscore for four of the five included decision making styles. As expected, rational style was positively related to these variables, as could be concluded from the similarity of constructs (as mentioned above, need for cognition items are in fact used as measure of rational thinking style). On the other hand, while intuitive thinking and decision making is sometimes considered to be an antipole of the rational thinking, nor their correlations, neither the results of regression analysis support it. The rational and intuitive decision-making styles are weakly positively related and the intuitive style is not associated to the need for cognition or any of the curiosity scores. Similar results were found for the dependent style pointing on not importance of social context in need for cognition and curiosity as measured in the current study. This information is in concordance with the prevailing focus of the need for cognition and (epistemic) curiosity research – they are dominantly studied in individual context with emphasis on motivational or personality characteristics, not in group context. On the other hand, rare exceptions (e.g. Haugtvedt & Petty, 1992; Areni, Ferrell, & Wilcox, 2000; Smith, Kerr, Markus, & Stasson, 2001) show that need for cognition can be related to group processes such as social loafing or persuasion and the potential associations deserve a deeper examination.

Avoidant behaviour (avoidant coping, avoidant decision-making) has been numerous times reported as nonadaptive with negative correlates (e.g. Sagone & De Caroli, 2014; Bavořár & Orosova, 2015), and, according to our results, it seems that this uselessness is related not only to well-being indicators. Need for cognition and curiosity are dominantly viewed as positive manifestations of human search for information with positive correlates such as lower stress or alexithymia, but not related to anxiety or worry (for review see Cacioppo, Petty, Feinstein, & Jarvis, 1996) and present results indicate that decisions avoidance can be also related to information avoidance, but it needs further exploration.

The last included decision-making style – spontaneous – differs from previous ones in heterogeneity of results across need for cognition and curiosity. While it is negatively related to the need for cognition, it correlates positively with curiosity. Moreover, the relationship with the curiosity is not the result of association with stretching subscale, but with embracing subscale (willingness to embrace the novel nature of everyday life). While the need for cognition and curiosity are associated not only in the current study (e.g. Olson, Camp, & Fuller, 1984),

probably the shared variance with the spontaneous decision can point on difference between them, at least in the way they were measured. The speed of thinking and decision making can distinguish slower need for cognition from the more intense search for information, but more data are needed to confirm this hypothesis.

The secondary aim of the present study was a comparison of two different types of high school – general grammar school intended as prerequisite of the university study and vocational school aimed as training for immediate work. Although we expected higher scores of need for cognition and curiosity in the former group, not only these variable, but also decision-making styles have not differed significantly. It can point on decreasing differences between these types of schools – while the grammar schools were more selective in past, they are accessible to the higher proportion of students nowadays.

While the study indicates the existence of potential associations between decision-making styles, need for cognition and curiosity, some of its limitations should be mentioned. Firstly, the sample size is not very high and participation of only students of selected grammar schools and vocational schools decreases the generalisability of results. Next, while self-reported measures are used for the selected variables worldwide, the behavioural manifestations of decision-making styles or curiosity could be more valid indicators. Incorporation of other variables from cognitive as well as personality and socio-psychological domain would be useful for investigation of more complex associations with potential causal relationships. In spite of these limitations, the current study as, to our knowledge, the first one examining the potential relationships between decision-making styles, need for cognition and curiosity, has pointed on their interrelatedness and has sketched challenges for future research.

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