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Chapter 13

DECISION MAKING COMPETENCIES AND RISK BEHAVIOUR OF UNIVERSITY STUDENTS

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ABSTRACT
Risk behaviour is the result of various social, demographic, motivational and cognitive factors. Social and personality characteristics are the focus in risk behaviour research. The role of cognitive characteristics is relatively less known. The aim of the present research was to examine different types of adolescent health-risk behaviour using gender and decision-making competencies as possible predictors. The role of decision-making competencies was investigated using regression within a cross-sectional design. University students from Slovakia (n=205) completed six components of the Adult- Decision Making Competence and reported on their substance use (cigarette, marijuana, LSD, amphetamines, excessive drinking) and risk sexual behaviour. Binary logistic and linear regression was performed to assess the relationship between decision-making competencies and risk behaviour. ~~No~~ Some gender differences in risk behaviour were found and differences in two of the six decision-making competencies were present. A higher prevalence of risk behaviour was negatively associated with only a small number of decision-making competencies, which depended on the type of risk behaviour. The results show a limited effect of decision-making competencies on risk behaviour with a mixed pattern in different kinds of studied behaviour.

Keywords: risk behaviour, decision-making competencies, university students.

1. INTRODUCTION

Risk behaviour (drinking alcohol, taking illegal drugs, unprotected sex, engaging in delinquent activity) is more probable in adolescents than in older or younger individuals (Arnett, 2000). While most research on risk behaviour has focused on its social-demographic (age, gender, social class) or personality factors (extraversion, neuroticism, religiousness), cognitive factors such as decision-making skills have been omitted with a few exceptions (Parker & Fischhoff, 2005). Adolescence is a period with raising independence on others (mainly parents) and that poses higher demands on a skill to make decisions. The main aim of the present chapter is to investigate a part of variability of risk behaviour that can be explained by decision-making competencies - another broad term with a lot of skills included. They are an area of interest in the normative approach as they show how people perform in comparison with the norm (logic, statistical rules). Grisso and Appelbaum (1998) have named the ability to understand, appreciate, reason and express a choice, while Finucane and Lees (2005) have highlighted the ability to structure a decision problem, understand relevant information, integrate information and reason about it, appreciate the personal significance of information and the limits of one's decision skills. Parker and Fischhoff (2005) have mentioned belief assessment, value assessment, integration and metacognition.

2. BACKGROUND

Decision-making competencies as a broad group of skills were expected to be the predictors of risk behaviour. Decision-making competencies were found to be positively related to life outcomes (Bruine de Bruin, Parker, & Fischhoff, 2007). The middle and high level of risky decision-making is a risk factor in adolescent health risk behaviour (An et al., 2013). According to Hodne (1995) and Gittler, Quigley-Rick, and Saks (1990) the ability to judge risks is considered an essential element of decision-making competence related to the engagement in

health risk behaviour. One of the investigated decision-making competencies – belief assessment is considered to play a central role in risk behaviour (Vlek & Stallen, 1981; Yates, 1992). This indicates that at least some decision-making competencies are crucial in risk behaviour prevention. While risk-taking propensity measures have been found to be, although not equally, predictors of real behaviour (Szrek, Chao, Ramlagan, & Peltzer, 2012), the role of general decision-making competencies is still unknown.

Given that the Adult Decision-Making Competence (A-DMC, Bruine de Bruin et al., 2007) has been used in the present study, the decision-making competence model of its authors is used as the main theoretical framework. A-DMC tries to capture four fundamental decision-making skills in six types of tasks. Decision-making skills include belief assessment (judging the likelihood of outcomes), value assessment (how we can evaluate outcomes of a behaviour), integration (combining beliefs and values as a crucial step in matching a person and the environment) and metacognition (knowing the extent of one's abilities as a skill to evaluate not only decision tasks, but also our potential to cope with them). Performance in these skills can be evaluated as accuracy (relative to external criterion) or consistency (related judgements or choices). In the first use of the measure Bruine de Bruin et al. (2007) used seven components to identify decision-making skills although one of them (Path Independence) was later eliminated because of low factor loadings and correlations with other subscales. Thus only six tasks are now used (e.g. Del Missier, Mäntylä, & Bruine de Bruin, 2010).

The first of the decision-making competencies - belief assessment - involves judging the probabilities of events. Probability judgements are a prominent topic in judgement and decision-making (Kahneman & Tversky, 1972; Gigerenzer, Hoffrage, & Kleinbölting, 1991), often with the emphasis on perception of risk – possibility of negative events (Slovic, 1987; Sjoberg, 2000). Belief assessment is assessed by two tasks in the A-DMC. The first of them, Consistency in Risk Perception, consists of 20 events where subjects have to judge the probability of a given event (e.g. a car accident) in a specified time period (in one year, five years) on a linear scale from 0% (no chance) to 100% (certainty). Twenty pairs of events are assessed followed by the comparison of a) the probability in one and five years (10 pairs), b) the probability of subset and superset events (6 pairs – e.g. to die in a terrorist attack and to die from any cause) and c) the probability of complementary events (4 pairs – e.g. to get or not to get into a car accident). The resulting score is the percentage of the correct item pairs. A direct relationship with risk behaviour was hypothesized as risk assessment is an inherent part of this component. The second task tapping belief assessment is Recognizing Social Norms. Subjects answer 16 questions about whether they think it is sometimes acceptable to engage in different kinds of negative behaviour (e.g. drinking and driving, smoking cigarettes) and their answers serve to compute the actual proportion of people that would engage in this behaviour. They also estimate how many people out of 100 their age behave like this. A Spearman rank-order correlation is computed between the estimated and actual percentage. The accuracy of peers' perception was expected to be closely related to risk behaviour as this behaviour is often connected with peer pressure (Madarasová-Gecková et al., 2005; Bindah & Othman, 2011).

Value assessment is also assessed by two tasks. The first of them, Resistance to Framing, detects the vulnerability of being affected by the framing effect – the way a situation is described. Seven valence framing problems and seven attribute framing items are presented twice – as gains and as losses. The absolute differences between ratings for the loss and gain versions of each item are subtracted from 5 in order to report higher values as better performance (smaller framing effect). Higher resistance to the situation description was expected to be negatively related to risk behaviour. The higher competence to find substantial aspects of problem can be helpful, as this behaviour can be activated by peers, explaining it in a positive way and overpassing or modifying its negatives. The next task measuring insensitivity to irrelevant features is Resistance to Sunk Costs, which contains 10 situations where prior investments have been made. A choice between the sunk-cost option and normatively correct option is made on a six-point scale. Performance is indicated by the average rating. A higher ability to abandon spent resources was expected more in students with lower levels of risk behaviour as persons not able to terminate the behaviour with more negative than positive consequence (it is valid for risk behaviour mainly from the long-time perspective).

Combining beliefs and values is called integration. It is measured by one subscale in the present study – Applying Decision Rules. Participants are asked for the best choice out of five DVD players for a hypothetical consumer with certain preferences regarding five characteristics (e.g. picture quality, brand reliability). Performance is represented by the percentage of correct DVD players chosen. Deficiencies in this competence were expected to be connected to risk behaviour as this can be viewed as not following own preferences (although they can be unknown to the individual at that moment).

Metacognition is the view of one's own competence and is measured in the Over/underconfidence component involving 34 knowledge questions. Participants indicate the correctness of each statement (true/false – e.g. alcohol causes dehydration) and their confidence in that answer. The resulting score is computed as one minus the absolute difference between the mean confidence and percentage of correct knowledge answers. A proper assessment of own knowledge was hypothesized to be related to a lower level of risk behaviour.

Gender was studied as another predictor of risk behaviour to tap into the differences between males and females. Gender has often been approved as a significant factor with a higher prevalence of risk behaviour in males (Wilsnack et al., 2000; Nolen-Hoeksema & Hilt, 2006).

3. METHODS

3.1. Objectives

The main aim of the study was to investigate the effect of gender and decision-making competence on various kinds of risk behaviour employing a cross-sectional design was used.

3.2. Sample

205 university students from Slovakia (58.0% females, age 19-26, mean age 22.1) from two universities were contacted personally during their courses and asked to participate in the study. A paper-pencil measure of decision-making competence was filled out and risk behaviour prevalence and demographic data were collected.

3.3. Measures

Decision-making competencies were assessed by the Adult Decision-Making Competence (Bruine de Bruin et al., 2007). The A-DMC consists of six subscales (Resistance to Framing, Recognizing Social Norms, Under/overconfidence, Applying Decision Rules, Consistency in Risk Perception, Resistance to Sunk Costs) differing in question and response mode. Although the range of possible scores is not unified, a higher score means a higher level of decision-making skill. A Slovak version of the scale was used (Bavolar, 2013).

Nicotine dependence was measured by the Fagerstrom test for nicotine dependence (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991), which contains 8 questions detecting nicotine dependence. A higher score implies stronger dependence. The other kinds of risk behaviour (occurrence of smoking, alcohol and marijuana use) were detected by particular questions.

3.4. Statistical analyses

Both a binary logistic and linear regression (depending on the risk behaviour questions response mode) were performed to assess the relationship between decision-making competencies and risk behaviour and the effect of gender.

4. FINDINGS

Neither the binary logistic regression (dependent variable smoking during last 3 months: never (124; 61.0%) – at least once (80; 39.0%)) nor the linear regression (DP Fagerstom score by regular smokers: 0-7 (M = 2.05 (1.57)) showed a significant effect of decision-making competencies (DMC) on smoking (Tables 1, 2; abbreviations of decision-making competencies are used: RtF – Resistance to Framing, RSN – Recognizing Social Norms, UOC – Under/overconfidence, ADR – Applying Decision Rules,

CiRP – Consistency in Risk Perception, RtSC – Resistance to Sunk Costs).). In addition, neither gender no decision-making competence were found to be statistical significant. While the first model explained a very small portion of the variance (R^2 = .02 (Cox & Snell), .03 (Nagelkerke), the second one predicting nicotine dependence explained 16% of the variance. However, the sample in the second model (regular smokers) consisted of only 40 participants (24 females) and the whole model was not found to be significant.

Table 1. Binary logistic regression predicting occurrence of smoking.

	B	SE	Wald	df	p	Exp(B)
Constant	-1.08	2.17				
Gender (M=1)	-.33	.33	1.008	1	.315	.721
RtF	-.11	.35	.102	1	.750	.895
RSN	.76	.72	1.105	1	.293	2.143
UOC	.28	1.86	.023	1	.879	1.327
ADR	.39	.77	.262	1	.608	1.481
CiRP	-.59	1.06	.309	1	.579	.556
RtSC	.20	.20	.970	1	.325	1.222

R^2 = .02 (Cox & Snell), .03 (Nagelkerke). Model $\chi^2(7)$ = 4,137, p = .764

Table 2. Linear regression predicting nicotine dependence (Fagerstrom).

	Unstandardized coefficients		Standardized coefficients			
	B	SE	β	t	p	r
Constant	5.68	3.93				
Gender (M=1)	1.60	.52	.51	3.069	.004	.50
RtF	-.06	.69	-.01	-.086	.932	.17
RSN	.68	1.16	.09	.589	.560	.05
UOC	-2.42	3.30	-.11	-.735	.467	.06
ADR	-.11	1.40	-.01	-.079	.937	.21
CiRP	-.11	1.67	-.01	-.063	.950	.03
RtSC	-.48	.35	-.22	-1.344	.188	-.22

R^2 = .31, adjusted R^2 = .16, F(7,39) = 2,03, p = .082

Similar results were found in other types of risk behaviour (alcohol and marijuana use) with a very limited effect of DMC. 57 students (27.8%) had used marijuana at least once and two decision-making competencies (Recognizing Social Norms and Consistency in Risk Perception) were found to be significant predictors, while gender was not. No DMC was found to be a significant predictor of alcohol use (represented by being drunk at least once in the last four weeks; 91 students, 44.8%). Males were found to have higher occurrence of alcohol use than females.

Table 3. Binary logistic regression predicting occurrence of marijuana use (marijuana ever).

	B	SE	Wald	df	P	Exp(B)
Constant	-3.26	2.53				
Gender (M=1)	.42	.37	1.285	1	.257	1.520
RtF	.05	.41	.017	1	.897	1.055
RSN	2.01	.89	5.060	1	.024	7.443
UOC	1.82	2.25	.657	1	.418	6.182
ADR	.30	.87	.118	1	.731	1.350
CiRP	-3.49	1.21	8.308	1	.004	.031
RtSC	.42	.24	3.113	1	.078	1.529

R^2 = .10 (Cox & Snell), .14 (Nagelkerke). Model $\chi^2(7)$ = 20,818, p = .004

Table 4. Binary logistic regression predicting occurrence of alcohol use (drunk at least once in the last 4 weeks).

	B	SE	Wald	df	P	Exp(B)
Constant	4.72	2.24				
Gender (M=1)	.71	.323	4.718	1	.030	2.035
RtF	-.47	.35	1.753	1	.185	.626
RSN	1.23	.72	2.913	1	.088	3.430
UOC	-2.79	1.87	2.218	1	.136	.061
ADR	.34	.78	.192	1	.662	1.407
CiRP	-1.25	1.07	1.374	1	.241	.286
RtSC	-.14	.20	.511	1	.475	.865

R^2 = .06 (Cox & Snell), .08 (Nagelkerke). Model $\chi^2(7)$ =12,079, p = .098

5. CONCLUSION

The university period (early adulthood) can be viewed as a time of rapid change and a higher risk of negative phenomena. Decision-making competencies and gender were examined as possible predictors of certain types of risk behaviour amongst university students. While decision-making characteristics are viewed as an important set of skills to make proper decisions about risk taking, the present results provide the opposite view. Decision-making competencies seem to be a poor predictor of risk behaviour, which is surprising in regard to the used subscales. All of them were expected to be negatively related to risk behaviour as hypothesised protective factors and skills helping to decide in ambiguous situations. The same is valid for gender when gender differences were confirmed only in half of the investigated models.

The first of the inspected competencies – Resistance to Framing – is the ability to not rely on event description but on real facts. While it was supposed to prevent risk behaviour as a skill helping to consider real consequences and not unrelated aspects, this was not confirmed by the current research. The same was found for the other subscales that examined information processing. Applying Decision Rules is the competence to use these rules (e.g. judgement according to more criteria) properly and was also supposed to help in risky situations. These two competencies seem to be very general and do not manifest in certain situations. The factors connected with risk behaviour are probably not purely cognitive and it is likely that personality and social ones play a more central role in the studied types of the risk behaviour. The same was found for Under/overconfidence as the ability to assess one's own knowledge. The absence of this relationship can perhaps be explained by the two opposite functions of this ability. People more confident in their own beliefs may refuse the persuasion of others to change their opinions in risk behaviour in a positive (engagement) as well as negative (rejection) way so higher levels of this competence can be related to the presence and also the absence of risk behaviour. This is in concordance with the well-known findings of McGuire (1968), which reported higher persuability in people with medium self-esteem and a lower, level in people with the extreme (low or high) self-esteem. A pattern similar to the previous ones can be seen in the next subscale – Recognizing Social Norms although it was a significant predictor in one case. Respondents with higher scores in this component have a higher probability to use marihuana in comparison with those with lower scores. The evaluation of this subscale as nonsignificant can probably explained similarly as by the under/overconfidence (understanding of peers' norms can mean the tendency to engage as well as to avoid risk behaviour). The competence of knowing other people's attitudes can lead to following them in either a positive or negative way as the influence of peer pressure on risk behaviour has often been confirmed (e.g. Lewis & Lewis, 1984; Cherie & Berhane, 2012).

The next subscale, Consistency in Risk Perception, seems to be very close to risk behaviour (and risk perception), although it is a slightly different construct. The main object of interest in this scale is not risk perception alone but the consistency of risk perception alongside

time or comparing general and specific situations. The observance of these rules does not reveal the inclination of risk behaviour, only about its concordance across situations or time. It is similar to Applying Decision Rules which was also found to be a nonsignificant predictor. Thus while protective function of this component was expected at first, its non-relevant role can probably be explained similarly like by other subscales above. High scores in Consistency in Risk Perception can mean consistency in assessing the same or similar risk behaviour – always as risk or always as safe situations. The last subscale – Resistance to Sunk Costs – is a measure of the ability to abandon invested resources (time, effort, money) when it is more profitable to start from the beginning. The direct effect of this component on the initialization of risk behaviour was expected, but its non-existence can maybe be explained by the inspected tendency, which is very distant from the decision-making in risk behaviour situations. Resistance to sunk costs can mean a trend not to try something new and risky (protective role) which can bring a loss of actual assets, but also a tendency to not quit risk behaviour after starting it.

Ambiguous results were found examining the role of gender in risk behaviour. Gender was found to be a significant predictor of the nicotine dependence and alcohol use (drunk at least once in the last 4 weeks) with a higher occurrence of risk behaviour in males, but not in the case of smoking and marijuana use.

To sum up, all of the present results indicate that the role of the examined decision-making competencies is not straightforward and the interaction with other factors is of more importance. The differences with previous studies can be a result of sample characteristics or risk behaviour questions allowing in most cases to treat with only dichotomous dependent variables. Only voluntary university students completed the measures and they can differ from the others in the risk behaviour as well as in decision-making competencies. Although decision-making skills have not previously been directly examined in relation to risk behaviour, Bruine de Bruin et al. (2007) have reported fewer negative life outcomes in subjects with higher scores in decision-making competencies. The present findings are in contrast with these results and also with Parker and Fischhoff (2005) who found fewer maladaptive (risk) behaviours (antisocial behaviour, alcohol and marijuana use, risky sexual behaviour) in male adolescents with higher decision-making competencies. Risk perception and the propensity to risk taking belong to the most studied factors of risk behaviour from the decision-making area (e.g. Brewer, Weinstein, Cuite, & Herrington, 2004) and most of the used subscales have inspected the process of judgement present in risk perception. Given that only a limited number of results have confirmed the expected relationships, it is a necessity to add other cognitive and mainly social and personality factors. The examination of situational and personality characteristics in interaction with the cognitive ones can probably change the direction of the relationships.

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