
Role of the Dark Triad Traits and Attitude Towards Uncertainty in Decision-Making Strategies in Managers

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To cite this article:

Tatiana Kornilova, Yulia Krasavtseva. Role of the Dark Triad Traits and Attitude Towards Uncertainty in Decision-Making Strategies in Managers. *Social Sciences*. Vol. 6, No. 6, 2017, pp. 187-195. doi: 10.11648/j.ss.20170606.17

Received: October 30, 2017; **Accepted:** November 10, 2017; **Published:** December 13, 2017

Abstract: This article presents the results of an empirical study of decision-making strategies in an uncertain environment as modeled by the Iowa Gambling Task (IGT). The study examines the associations between the Dark Triad traits, tolerance of uncertainty and decision-making effectiveness, measured by the results of strategic choices in a sequential decision-making task with a set goal of obtaining the largest possible profit. The differences in the correlations of the Dark Triad traits with decision-making effectiveness are demonstrated between managers and non-managers. The Dark Triad traits are linked with more effective decision-making strategies only in non-managers. Managers with higher levels of the Dark Triad traits prefer risky and chaotic strategies, especially in the later stages of the decision-making process. Tolerant to uncertainty managers make more effective decisions in the early stages of the prognostic task, these stages are characterized by higher levels of uncertainty and lack of information.

Keywords: Decision-Making, Tolerance of Uncertainty, Dark Triad, Iowa Gambling Task, Managers, Prognostic Task

1. Introduction

Decision-making (DM) is a necessary aspect of managerial professional activity [1-3]. As part of their employment positions, managers undertake strategic choices regarding both the organizational process and other people [4-6; and others]. DM is also an important aspect of human life in the modern world, as making choices in the context of multiple alternatives becomes almost a daily necessity [7; 8]. Considering the increasing variety and variability of the modern world, uncertainty is quickly gaining a position of the modern life context [9-11; and others].

In psychological analysis of the managers' decisions, it is important to uncover the strategies of personal regulation in decision-making under uncertain and unstable conditions, since in many respects the choice of the organization's development tactics depends on the realization of the intellectual and personality potential of managers [1; 10-13].

In terms of personality research, authors traditionally focus on the Big Five personality traits as well as other positively (or neutrally) assessed features, such as tolerance of

uncertainty, viewed as a dynamic function of personality [14-17; and others]. Lately, the focus is shifting toward personality aspects that are usually negatively assessed. The study on the trinity of most prominent "aversive" personality traits [18], that has gained massive popularity since its publication, includes descriptions of Machiavellianism, subclinical narcissism and subclinical psychopathy, together making up the Dark Triad of personality traits [19].

On the one hand, these traits are linked to leadership qualities [20-23]; and being a leader is important for a manager. Yet, on the other hand, these same traits are viewed as negative by the society, as they characterize an unstable emotional personality core and may relate to a person perusing selfish values, all of which can adversely affect decision-making [24-27].

However, the relationship between the Dark Triad traits and the effectiveness of prognostic task solution has not been studied on managers. Such tasks are a necessary component of a manager's activities. General psychological analysis

allows one to study decision-making strategies not only within the realm of actual activities of a manager, but also in modeled decision-making situations. This allows us to reveal the specificity of personality regulation of the managers' DM. Earlier studies demonstrate the possibility of using verbal problems for uncovering the personality regulation of decision-making [28].

The aim of this study was to identify the interrelationships between the Dark Triad traits, representing an unstable emotional personality core, with one's attitude to uncertainty and decision-making strategies in a situation where the uncertain conditions are specified by the probabilistic environment of positive and negative choice outcomes.

2. Tolerance and Intolerance of Uncertainty in the Context of Decision-Making

Since E. Frenkel-Brunswik [29; 30] introduced the concept of tolerance of ambiguity, research in the area of attitudes toward uncertainty is divided into two main terms – *tolerance of ambiguity* (as the acceptance of the complexity in understanding of equivocality, vagueness, non-obviousness, or the indistinctness of reality) and *tolerance of uncertainty* (as tolerance to doubt in the context of limited information available) [10]. In recent studies uncertainty is understood as a broader construct within which ambiguity, risk, expected value, variance and asymmetry of the rewards are explored [31]. The distinction between uncertainty and ambiguity is complex due to two polar constructs: full-partial knowledge and subjective-objective knowledge. In the latter, subjective knowledge refers to a limitation in knowledge due to time constraints or lack of effort, and objective knowledge is an objective lack of relevant information [11]. Tolerance of ambiguity and tolerance of uncertainty (as reflecting the subjective component) are similar, but not equal constructs, where uncertainty includes an outlook towards the future with the “unknown” as inherent. In contrast, *intolerance of uncertainty* (ITU) assumes a discomfort regarding the future, irrespectively of how unlikely it is for a certain negative event to occur [11].

In 1994, A. Furnham combined several well known scales for measuring TU-ITU: Budner's, Rydell-Rosen's, O'Connor's and Norton's [32]. The questionnaire was successfully tested by T. V. Kornilova on the Russian sample [33]. The questionnaire highlights three factors: tolerance of uncertainty (TU), intolerance of uncertainty (ITU) and interpersonal intolerance of uncertainty (IITU). TU is defined as a willingness to choose a new path of action, a pursuit of originality, an interest in difficult tasks, a preference for autonomy and an ability to go beyond the usual frameworks. ITU refers to a rejection of uncertainty or ambiguity, a preference for clarity and order, a tendency to follow rules and regulations, a presence of polarized notions on right and wrong opinions, values and actions. IITU means a certain stagnancy with efforts to assume control in interpersonal

relationships, a preference for clarity, a discomfort with uncertain interactions with others, an inclination to monologues in communications with others, and a certain instability or a behavioral volatility [32; 33].

The processes of decision-making (DM), analysis of choice consequences and forecasting (taking into account specific goals) in an uncertain, probabilistically defined environment presuppose one's reliance on various aspects of the intellectual and personal potential [10; 11; 34]. The DM process is characterized by even more responsibility and complexity when studied in dynamically developing organizational contexts [2; 3; 35; 36]. In the process of managerial DM, one encounters a complex system of interdependent components. These include certain goals, probable outcomes, available resources as well as interests of other people, and thus require in-depth and careful analysis [13]. In this case, rational or optimal solutions in real conditions are not always accepted.

The parameters of the environment and the available information seem to define how optimal a choice is. However, in practice, the same action can be ineffective or even fatal if the information is incomplete or false [2]. As important as theoretical indicators of a decision's rationality may be, the DM process cannot be studied without accounting for one's psychological characteristics.

A person builds a unique image or idea of the task, evaluates the probability and value of the expected outcomes, and chooses a strategy. A number of personal and environmental factors can influence the subjective process of DM. The person's intellectual and personal potential acts as a predictor of success in solving prognostic problems based on planning, goal setting and anticipation processes [11].

The genesis of choice or decision-making involves the processes of solving prognostic tasks, because analysis and evaluation of alternatives (based on the prediction of consequences) precede the choice itself. Resolution of an uncertain situation in DM can be studied in the context of both cognitive abilities and relevant personality traits. The solution of a prognostic task involves not only the use of cognitive strategies, but also a personal attitude towards uncertainty [10; 12]. In choice regulation, other personality traits may increase or limit the success and effectiveness of the DM process [10-12; 37].

3. The Dark Triad Traits and Decision-Making

The research on the trinity of “aversive” personality traits includes Machiavellianism, subclinical narcissism and subclinical psychopathy [10-13; 38]. These traits can be seen as both integral leadership qualities and manifestations of an unstable personality core [20-23; 33].

The construct of Machiavellianism, briefly described as a tendency to behave manipulatively, is based on statements taken from N. Machiavelli's work titled “The prince”. According to several authors [3; 19; 38-40], people who

express a high level of agreement with these statements are inclined to behave in a cool and manipulative manner, both in laboratory settings and in field research. Narcissism in relation to normal groups is described in almost clinical terms, such as a high degree of grandiosity, dominance, superiority and unquestionable rightfulness [19; 25; 27; 38].

Typically, subclinical psychopathy is associated with high levels of impulsiveness, a tendency to pursue exciting pleasures, and with low levels of empathy and anxiety [19; 26]. Researches distinguish primary psychopathy that is characterized by low levels of anxiety, high levels of selfishness, emotional coldness, fearlessness, propensity to exploit other people and manipulative behavior, and secondary psychopathy, associated with general instability and antisocial type of behavior [19; 26].

A short questionnaire "Dirty Dozen" was tested for the Russian samples [33; 38]. Based on the results, a strong association is shown between psychopathy and Machiavellianism [33], which is similar to an international meta-analysis [39]. A weak association is also found for psychopathy and narcissism [33]. At the same time, no connection was found between Machiavellianism and narcissism. Negative correlations of psychopathy and intolerance of uncertainty and reflexivity were also demonstrated [33]. Intolerance of uncertainty and reflexivity are also included in the regulation of DM [11; 33].

However, the Dark Triad traits have not yet been studied in the context of the actual DM process development in managers, where the forecast of choice consequences occurs in a modeled uncertain situation. In this study, the probabilistic uncertain situation is experimentally modeled using the Iowa Gambling Task [41]. IGT allows researchers to approach the DM in its actual development, to study the dynamics of successive choices, and to test the hypotheses about the decision-making strategies in a prognostic task for persons with different personality characteristics.

4. Decision-Making Strategies

The concepts of DM and choice can be viewed as pertaining to a person's reality [10-12; 37]. In both cases, one bases the prediction of choice consequences on the entire intellectual and personal potential, as assumed by the concept of multiple decision regulation. The Iowa Gambling Task (IGT) is seen as an effective methodological tool to model a prognostic task in uncertain conditions [37; 41-43]. In IGT, one can assume the interaction of intellectual and personality components in decision strategy regulation.

Researchers from the University of Iowa, USA [41; 42] developed IGT to measure psychophysiological and behavioral responses in a probabilistic situation simulated by "gambling". In this method, participants are asked to alternately choose a symbolic card from one of four possible decks. To start, participants are given a set amount of 2000 game dollars and asked to choose cards from the decks with an aim to get as large a profit as possible (or to lose the minimum amount of "dollars").

In IGT, the choice of a symbolic card can lead to a gain (equal to 100 gaming dollars for decks A and B and 50 dollars in decks C and D) or a loss. While the gains are higher in decks A and B, the possible losses are also higher. Thus, a more frequent choice of "good" decks (C and D) leads to a total profit, and the choice of "bad" decks (A and B) – to a likely loss.

Participants in the experiment are given 100 tries, but up until approximately the 20th choice (what is called block 1) rarely have a conscious idea of the hidden patterns of profits and losses within each deck. However, after about the 10th choice, having often encountered large losses from decks A and B, a consequent choice of a "bad" deck is frequently accompanied by a skin conductance response (SCR). From the middle of the test (at about 50th choice), the participants begin to mention sorts of "premonitions" as to which decks are unprofitable, while their deliberation over the choice of decks A and B is invariably accompanied by a SCR¹ [41; 42]. By the 80th choice, many of the participants in the normal groups could verbally report as to which decks and why they consider as "unprofitable" in the long term.

It is interesting that those who were unable to consciously point out the unprofitable decks around the 80th choice, continued to choose the "good" decks. At the same time, patients with damage to the prefrontal cortex who could verbally identify which decks were "good" continued to choose cards from the "bad" decks.

The dynamics in the levels of uncertainty are assumed at different stages of the IGT. On a non-clinical sample, tolerance and intolerance of uncertainty are associated with different indicators of strategies [10; 37; 44]. It may be possible to link different stages of the prognostic task solutions with the Dark Triad traits.

5. Method

5.1. Participants

The study involved 122 people (58% female), age ranged from 18 to 58 ($m = 32.39$, $\sigma = 9.43$). The total sample consisted of two groups:

1. Middle and lower level managers (62 people, 52% female) age ranged from 22 to 58 ($m = 37.60$, $\sigma = 8.84$), with undergraduate degrees, and with five to 150 people ($m = 25$, $\sigma = 22$) in their direct or indirect subordination. Managers who headed certain departments of organizations and had a minimum of five people under their direct subordination were considered to be lower level managers. Middle level managers were employed in the positions of directors or deputy directors of organizations.

2. A random sample of non-managers (a total of 60 people, 65% female), age ranged from 18 to 49 ($m = 27.01$, $\sigma = 6.63$), consisting of students and representatives of a wide range of professions, most of them had undergraduate

¹ The somatic marker hypothesis was developed when analyzing the difficulties in the process of multi-stage DM observed in patients with certain types of damage to the prefrontal cortex and with a weakened emotional regulation [42].

degrees or were enrolled in an undergraduate course.

5.2. Methods

The following methods were used in the study:

1. The New Questionnaire for Tolerance of Uncertainty (NQTU) [44] to measure the attitudes to uncertainty: tolerance of uncertainty, intolerance of uncertainty and interpersonal intolerance of uncertainty.

2. The “Dirty Dozen” questionnaire [33; 38] to measure the Dark Triad traits: subclinical narcissism, subclinical psychopathy and Machiavellianism.

3. Iowa Gambling Task (IGT) [41] (adapted for the Russian sample by S. A. Kornilov) to model the situation of uncertainty [10; 37].

The participants’ strategy was studied as a sequence of deck choices in each of the five choice blocks (block 1 corresponds to the first 20 choices, block 2 – to choices 21 to 40, block 3 – to choices 41 to 60, block 4 – to choices 61 to 80, and block 5 – to choices 81 to 100). “Choice” is understood as every separate selection of a deck in the IGT. The outcome of each choice is considered in terms of “winning” or “losing” game dollars.

A preference for decks A and B leads a “gambler” to a cumulatively low score, and therefore this type of preference is called a “bad deck preference”. On the contrary, a preference for decks C and D leads to a higher profit with small but stable savings, thus the preference for these decks is called a “good deck preference”.

Strategies were characterized as *pragmatic* (with a goal of gaining a higher profit), *cognitive* (associated with coordination while making a choice), *chaotic* (with frequent deck changes), *stable* (with rare deck changes), *cautious* (with a preference for “good” decks and small but sure wins), and less rational or *risky* (with a preference for “bad” decks with higher gains and larger risks).

Thus, the IGT was used to model an uncertain situation, allowing us to compare the strategies of managers and non-managers.

5.3. Process and Consent

Participants in this study were tested individually or in small groups (up to 3 people). Data was compared in two groups of participants (managers and students).

All participants gave informed consent to take part in the study.

6. Results

6.1. Age and Sex Differences

In the sample of managers (N = 62), tolerance of uncertainty is significantly higher in women (64.3) than in men (56.4, p<0.01).

As demonstrated in Table 1, subclinical psychopathy is significantly lower in women across both compared groups. This difference was also established in the sample of managers (for women M = 6.41, for men M = 7.57, p <0.05).

Table 1. Differences in the Dark Triad traits (according to the Mann-Whitney criterion) between men and women for managers and non-managers.

Dark Triad traits	Women	Men	p value
Psychopathy	6.65 (σ = 2.51)	8.20 (σ = 3.28)	0.004
Narcissism	13.49 (σ = 3.82)	12.59 (σ = 3.85)	0.214
Machiavellianism	10.41 (σ = 3.82)	11.47 (σ = 4.90)	0.246

+ Total sample sizes for men and women in the groups of managers and non-managers are as follows: women – N = 71, men – N = 51. Standard deviation is shown in parenthesis.

Correlation analysis (Spearman – ρ) was used to establish the following associations of personality traits and decision-making aspects in managers. Tolerance of uncertainty decreases with age (ρ = -0.36, p <0.01). The total score in the Iowa test (ρ = 0.26, p <0.01) and the frequency of the “good” decks selection (ρ = 0.32, p <0.001) are positively associated with age, while the tendency to switch decks after losing (ρ = -0.44, p <0.01) is negatively linked with age.

6.2. Attitudes to Uncertainty and the Dark Triad Traits

In the group of managers, it was established through partial correlations accounting for age and gender, that participants with more pronounced narcissistic traits are significantly more tolerant of uncertainty (r = 0.30, p<0.05), but also less tolerant in interpersonal relationships (r = 0.26, p<0.05).

The following relationship was also revealed: managers with a high level of Machiavellianism are characterized by high levels of narcissism (r = 0.61, p<0.01) and psychopathy (r = 0.27, p<0.05). The association between Machiavellianism and psychopathy was found only in the group of managers, while the correlation between narcissism and Machiavellianism was found in both groups (r = 0.56, p <0.01).

As can be seen in Table 2, no significant differences in the Dark Triad traits were found in the groups of managers and non-managers. However, managers significantly less frequently switch to a different deck after encountering a loss in the IGT. This can mean that managers are less chaotic in their decision-making in comparison to non-managers. At the same time, managers make significantly more “good” choices (with small but sure savings from the winning decks) throughout the IGT.

Table 2. Differences in the Dark Triad traits and decision-making strategies between managers and non-managers.

Variable	Managers	Non-managers	p value
Psychopathy	6.97 (σ = 2.94)	7.67 (σ = 2.65)	0,135
Narcissism	12.71 (σ = 3.82)	13.53 (σ = 3.86)	0,258
Machiavellianism	10.63 (σ = 4.40)	11.08 (σ = 4.26)	0,588
Total score in IGT	1964 (σ = 1086)	1729 (σ = 1071)	0,347
Deck change after loss	9.85 (σ = 2.63)	17.41 (σ = 7.07)	<0.001
Good deck preference	58.37 (σ = 19.84)	50.05 (σ = 20.96)	0,042

+ Standard deviation is shown in parenthesis. Differences are calculated using the Mann-Whitney criterion.

6.3. Decision-Making in Managers

As can be seen from Table 3, tolerance of uncertainty (TU)

is linked with some effective decision-making strategies in managers. When choosing decks in the Iowa Gambling Task (IGT), managers with a higher TU are significantly less likely to choose the “worst” (in terms of pragmatic success and riskiness) deck B throughout the IGT ($r = -0.301$), and especially in the first block of choices (this characterized the first 20 choices – with the highest levels of uncertainty) ($r = -0.30$). Since deck B is the only deck where such a large loss

is possible, managers with higher TU are also less likely to encounter a loss of 1250 game dollars ($r = -0.27$) throughout the task. Avoiding this deck leads to a reduction in the number of the largest losses in the entire game ($r = -0.25$, $p < 0.05$). Therefore, participants who rarely lose such a large amount often end up with a higher profit at the end of IGT ($r = 0.77$, $p < 0.01$).

Table 3. Differences in the Dark Triad traits and decision-making strategies between managers and non-managers.

	Tolerance of uncertainty	Loss of 1250 game dollars	Preference of deck B	Preference of deck B in block 1	Preference of deck C in block 1
Tolerance of uncertainty	1				
Loss of 1250 game dollars	-0,269*	1			
Preference of deck B	-0,301*	0,953**	1		
Preference of deck B in block 1	-0,279*	0,401**	0,381**	1	
Preference of deck C in block 1	0,306*	-0,357**	-0,339*	-0,47**	1
Preference of good decks in block 3	0,262*	-0,613**	-0,641**	-0,08	0,089

+ ** $p < 0.01$; * $p < 0.05$

In the first block of choices, managers with high TU levels often prefer a “good” deck C ($r = 0.31$). The more often a participant chooses deck C in the first block of choices, the less frequently they encounter major losses throughout the game ($r = -0.43$, $p < 0.01$) and the higher the total score at the end of testing ($r = 0.37$, $p < 0.01$). Using this cautious strategy leads to fewer encounters of major losses throughout the game and to a higher profit at the end of the IGT.

After the mid-point of the gamble managers with high TU often prefer “good” decks ($r = 0.26$), which confirms the results of previous studies [33]. Supposedly, the shift in preference for “good” decks occurs when participants gain some knowledge regarding the choice outcomes.

As can be seen from Table 4, managers with pronounced narcissism make most chaotic decisions towards the end of the gambling game (block 5). Such choices are counterproductive in terms of the general pragmatic result ($\rho = -0.37$, $p < 0.05$) and often correlate with a preference for risky decks (for deck A $\rho = 0.48$, $p < 0.05$ and for deck B $\rho = 0.52$, $p < 0.01$). This kind of a strategy can lead to a

significant reduction of profit gained over the previous blocks ($\rho = -0.42$, $p < 0.05$).

Notably, managers with high levels of Machiavellianism demonstrate a similar strategy. They also tend to choose the riskiest deck at the end of IGT, where a possible loss is 1250 game dollars. This risky strategy has an even larger adverse affect on the total profit ($\rho = -0.56$, $p < 0.05$) than does the chaotic strategy. Machiavellians after the middle of IGT rarely prefer a “good” deck (with a possible small win of 50, but a possible big loss of up to 250 "dollars") ($\rho = -0.27$). By the end of the gamble, “Machiavellians” prefer “risky” decks. This preference often reduces the overall monetary gain ($\rho = -0.36$).

Managers with subclinical psychopathy avoid the most “neutral” deck in which the fine does not exceed 50 game dollars ($\rho = -0.29$) up until the middle of the gamble. They often prefer “bad” decks ($\rho = -0.58$).

Thus, chaotic strategies often mean that managers, characterized by certain Dark Triad traits, prefer riskier strategies. This choice pattern can lead to a lower total profit as a result of the “gamble”.

Table 4. Partial correlations of the Dark Triad traits and decision-making strategies for managers (controlling for age and sex).

	Machiavellianism	Narcissism	Psychopathy
Machiavellianism	1		
Narcissism	.606**	1	
Psychopathy	.265*	-0.001	1
Win over \$ 250 USD	-.290*	-0.134	-0.125
Preference for deck B in block 5	.254*	0.132	0.044
Preference for deck C in block 2	-0.024	0.028	-.293*
Preference for deck D in block 4	-.272*	-0.184	0.004
Deck change in block 5	.276*	.251*	-0.179

+ ** $p < 0.01$; * $p < 0.05$

6.4. The Dark Triad and Decision-Making in Non-managers

As shown in Table 5, non-managers with pronounced Machiavellianism tend to use a cautious strategy at the beginning of the IGT (in block 1) and choose “good” decks ($\rho = 0.29$). However, their profit in block 1 tends to be lower

($\rho = -0.29$). Nevertheless, the choice of “good” decks in block 1 often leads to a higher total profit at the end of the IGT ($\rho = 0.28$, $p < 0.05$). Perhaps, non-managers with high Machiavellianism successfully implement cognitive strategies in the early stages of the IGT, which leads to higher pragmatic results.

In the control group, non-managers with high narcissism

less frequently prefer deck B ($\rho = -0.27$) in the first block of the IGT, and deck D ($\rho = 0.28$) from the middle of the "gamble" onwards (from block 3) up until the end (block 5). The choice of deck D usually leads to a higher pragmatic result at the end of the IGT ($\rho = 0.38$, $p < 0.01$). Thus, these non-managers with high levels of narcissism demonstrate a successful cognitive strategy throughout the IGT.

Non-managers with subclinical psychopathy less

frequently switch decks after losing in block 5 ($\rho = -0.36$). This sort of a stable strategy leads to higher pragmatic achievements towards the end of the task ($\rho = 0.26$). In the control group, participants with higher levels of psychopathy tend to avoid choosing the risky deck A toward the end of the IGT ($\rho = -0.27$). The less frequently one chooses deck A throughout the game the higher is their profit by the end of the "gamble" ($\rho = -0.40$, $p < 0.01$).

Table 5. Partial correlations of the Dark Triad traits and decision-making strategies for non-managers (controlling for age and sex).

	Machiavellianism	Narcissism	Psychopathy
Machiavellianism	1		
Narcissism	0.34**	1	
Psychopathy	0.28*	0.1	1
Preference for deck B in block 1	-0.21	-0.27*	-0.01
Preference for good decks in block 1	0.29*	0.14	0.12
Amount won in block 1	-0.29*	-0.14	-0.12
Preference for deck D in block 3	0.13	0.28*	-0.01
Deck change in block 5	-0.23	-0.23	-0.36**
Preference of deck A by block 5	-0.03	-0.01	-0.27*
Preference of deck D by block 5	0.23	0.28*	0.08

+ ** $p < 0.01$; * $p < 0.05$

7. Discussion

In this paper, personality traits were studied in association with choice strategies in a modeled situation of uncertainty. Based on the abovementioned differences between the two samples of participants, prognostic solutions based on a cognitive strategy in managers can be seen as more effective than in non-managers. This can be drawn from their greater focus on the consistent long-term accumulation of profit and less frequent unjustified deck switches. Thus, in the modeled uncertain situation, persons engaged in managerial activities make decisions more effectively.

Differences in tolerance of uncertainty between men and women were found only for managers. It is established that tolerance to uncertainty (TU) is lower for older managers.

In the decision-making process, managers with high levels of tolerance of uncertainty made fewer "bad" choices and selected more effective cognitive decision strategies in the initial stages of IGT. It is safe to assume that the level of uncertainty is at its highest in the earlier stages of IGT, as the lack of information about the consequences of choosing different decks is at its peak.

In general, during the whole task, tolerant to uncertainty managers less frequently prefer the most risky deck, which points toward a cautious strategy and a higher pragmatic result in the IGT. These associations partially repeat the results obtained in other studies [37] in that persons with high levels of TU tend to make more successful pragmatic decisions.

Managers with high levels of narcissism have higher tolerance of uncertainty, but also a high interpersonal intolerance of uncertainty. As such, it can be said that the established associations indicate that managers accept the situational uncertainty, but strive for clarity in interpersonal relationships.

At the same time, it is established that managers with

higher levels of the Dark Triad traits tend to make riskier and more chaotic decisions than non-managers with high levels of the same Dark Triad traits.

Psychopathy was higher in men, in both tested groups. This finding is similar to the results obtained in the testing of the Dirty Dozen questionnaire on the Russian samples [33]. In both groups no significant differences between men and women in narcissism were revealed. This finding also confirms the results obtained during the testing of the Dirty Dozen questionnaire [33]. No significant changes were detected in the Dark Triad traits with age in both groups. This result coincides with the data obtained during the questionnaire testing [33] and differs from the results obtained by authors using other questionnaires [40].

Significant associations between Machiavellianism and narcissism, found in managers, correspond to correlations obtained in various studies [19; 33; 38; 40]. Thus, this relationship does not constitute any managerial specificity. However, in both groups Machiavellianism is significantly associated with psychopathy, which confirms the findings of some studies [19; 38; 40], but differs from the associations found in Dirty Dozen questionnaire testing [33].

The established associations between personality traits and decision-making strategies suggest the following. By analogy with other studies, it is not uncommon to see a narcissistic leader preoccupied with the pursuit of a short-term "profit", even to the detriment of the prospect of a stable profit in the future [27]. Narcissistic non-managers, on the contrary, prefer cautious strategies from the middle of the IGT up until its completion. Thus, the chaotic strategies of decision-making closer to the end of the modeled gamble might be specific to managers.

Managers with pronounced Machiavellianism make decisions more chaotically and have a higher preference for bad decks closer to the end of the gamble. Managers with subclinical psychopathy behave similarly. Thus, the Dark

Triad traits, representing an unstable emotional core, can have a role in favoring a short-term risk profit over a long-term profit strategy, especially towards “the end” of a task.

In non-managers (students and individuals engaged in various professions), Machiavellianism is associated with more successful cognitive strategies in the early stages of the task, where the level of uncertainty is especially high. Other studies report that Machiavellianism is associated with poorer performance in the overall IGT score and with “bad” deck preference [45].

In the non-manager group, participants with a higher level of psychopathy react to encountering a loss less chaotically. Also, non-managers with high levels of subclinical psychopathy prefer stable and cautious strategies in their decisions toward the end of the modeled gamble.

Non-managers with high levels of the Dark Triad traits show more effective cognitive mediation and stability than managers with high levels of the same traits. This is manifested in the good deck preference throughout the entire course of the DM process in the non-manager group, even among those with high levels of the Dark Triad traits. The association between the Dark Triad traits and inefficient strategies in decision-making emerged as being specific to the middle and lower level managers.

The effectiveness of strategies in the non-manager group with high levels of the Dark Triad traits proved to be higher than the effectiveness of managers with high levels of the same Dark Triad traits.

8. Conclusion

The role of the Dark Triad traits differs significantly between managers and non-managers. Managers with high levels of Machiavellianism and psychopathy engage in riskier strategies than non-managers. Managers with high levels of narcissism are prone to make more chaotic decisions closer to the end of the prognostic task, represented in an uncertain situation. On the other hand, non-managers with high levels of psychopathy are less chaotic than managers in their decision-making strategies after encountering a major financial loss. Moreover, non-managers with higher levels of the Dark Triad traits demonstrate a better cognitive orientation and a preference for cautious strategies. This indicates a positive effect of these traits in solving the prognostic tasks for non-managers. Thus, the Dark Triad traits are associated with inefficient decision-making in an uncertain situation, but only among managers. This pattern is manifested in their risky and chaotic strategies in the Iowa Gambling Task.

Overall, managers make more stable and cautious decisions than non-managers after encountering a major financial loss. That is, managers seem to continue making effective decisions, even after encountering negative financial results. It can be said that managers make more effective choices than non-managers. However, managers with high levels of the Dark Triad traits chose less effective decision-making strategies than non-managers. This

reiterates the adverse role of the Dark Triad traits in managerial decision-making.

Unsurprisingly, tolerance of uncertainty is associated with successful decision-making strategies in the early stages of a prognostic task. This pattern is reflected in the stability of choices and the caution of strategies. The levels of uncertainty are highest at the beginning of the decision-making task, as the various choice outcomes are yet to be discovered. It is suggested that tolerance of uncertainty plays a beneficial role in the decision-making process, especially when the lack of information is at its peak.

This study establishes the associations between the components of one’s personality potential with: (1) effective pragmatic and cognitive strategies of the decision-making process if the tolerance of uncertainty is high and (2) less successful risky and chaotic pattern of choices if the Dark Triad traits are high. At the same time, “negative” and “positive” personality traits turned out to be interconnected. Thus, the study of the cognitive and personality components of the decision-making regulation remains a complex and multidimensional area for further research.

Acknowledgements

The study was supported by the Russian State Scientific Innovation Fund grant, project No. 15-06-10404.

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