APSSHS

Academic Publications of Social Sciences and Humanities Studies
2022, Volume 2, Page No: 36-46
Available online at: https://apsshs.com/

Journal of Applied Organizational Systems and Behavior

Exploring How Neuropsychological Traits and Personality Dimensions Influence Students' Attitude to Dangers

Ahmed Mansour[1], Omar Saeed[1], Lina Hassan[2]*, Nour Abdelrahman[2]

1. Department of Organizational Psychology, Faculty of Commerce, Cairo University, Cairo, Egypt.
2. Department of Individual Behavior and Leadership, Faculty of Business, Alexandria University, Alexandria, Egypt.

Abstract

The relevance of this research lies in the critical need to uncover the psychological foundations and contextual elements that influence how individuals form different Attitude to dangers. This investigation specifically sought to examine the associations between the Behavioral Activation System (BAS), Behavioral Inhibition System (BIS), and personality traits, and how these variables collectively shape students' perceptions and responses to potentially threatening situations. The sample consisted of 327 university students enrolled in institutions across Moscow, Cherepovets, and Ivanovo in the Russian Federation. Of these participants, 60 were male and 267 female, with a mean age of 20 years (SD = 2.17). To collect data, several standardized and author-developed instruments were employed. These included customized questionnaires aimed at evaluating individuals' threat sensitivity and preferred reaction strategies in dangerous contexts; the Carver-White BAS/BIS scale for assessing behavioral activation and inhibition tendencies; a localized version of the Five-factor model of personality questionnaire as adapted by L. F. Burlachuk and D. K. Korolev; and the "Adaptability" questionnaire by Maklakov-Chermyanin, with particular emphasis on the Moral normativity scale. Analytical procedures relied on correlation analysis to interpret the relationships among variables.

Findings indicated that a balanced and appropriate Attitude to dangers correlated positively with specific personality characteristics—namely, openness to experience, benevolence, and normativity of behavior. Conversely, tendencies to either overestimate or underestimate threats were primarily linked to neuropsychological traits associated with BIS and BAS. These insights offer practical applications in the design of safety protocols across various domains, as well as in educational frameworks aimed at equipping both youth and adults with effective strategies for coping with hazardous situations.

Keywords: Attitude to dangers, Normativity of behavior, Behavioral Inhibition System (BIS), Five-factor model of personality, Behavioral Activation System (BAS)

How to cite this article: Mansour A, Saeed O, Hassan L, Abdelrahman N. Exploring how neuropsychological traits and personality dimensions influence students' attitude to dangers. J Appl Organ Syst Behav. 2022;2:36-46. https://doi.org/10.51847/pEJaAq5cSH/

Received: 19 April; 2022; **Revised:** 15 August 2022; **Accepted:** 16 August 2022
Corresponding author: Lina Hassan
E-mail ✉ lina.hassan@outlook.com

Introduction

From the moment of existence, both living organisms and inanimate systems are constantly exposed to various threats—defined as any factor capable of disrupting their integrity or hindering their optimal function. When applied to humans, danger encompasses any external or internal influence that can lead to physical harm, psychological distress, social instability, or even mortality.

Contemporary psychological science often turns to the theory of sensitivity to reinforcement to explain how both animals and humans react to danger. Originally introduced by Gray [1], this framework proposed that behavior is regulated by two core neuropsychological mechanisms: the Behavioral Inhibition System (BIS) and the Behavioral Activation System (BAS). Later

revisions expanded the theory to include a third element—the Fight-Flight-Freeze System (FFFS)—incorporated through subsequent works [2–4].

In its evolved form, reinforcement sensitivity theory includes these three interlinked neurobehavioral systems. The BAS governs responses to rewards and the cessation of punishment, promoting goal-directed behaviors accompanied by positive affective states. Elevated BAS reactivity has been connected to a range of tendencies such as impulsivity, aggression, and substance use, and it correlates strongly with extraversion. Meanwhile, the BIS becomes engaged during ambiguous or conflicting situations, halting ongoing action and heightening anxiety—traits often aligned with neuroticism. The FFFS, in turn, drives automatic defensive reactions toward explicit threats, evoking emotional states such as panic or anger, which manifest as flight, attack, or freezing behaviors [5]. For example, fear commonly motivates avoidance behavior [6], while anger can stimulate a confrontational stance [7]. Freezing, or momentary immobility, may act either as an anticipatory mechanism [8] or as a post-threat reaction akin to stupor.

The influence of BAS and BIS sensitivity on how individuals select their responses to danger—whether by fleeing, confronting, or freezing—has received considerable empirical attention. Individuals with heightened BIS activation are more prone to retreat or avoid perceived threats, while elevated BAS sensitivity is often associated with proactive, sometimes risk-oriented approaches [9]. Further research has linked BIS reactivity with obsessive tendencies and anxious rumination, fostering withdrawal or inaction [10, 11]. Conversely, strong BAS engagement may lead to impulsive behavior, diminished self-regulation, and risk-seeking conduct [12, 13], but also to assertiveness and resolute goal pursuit [14], all of which influence the selection of a fight-based strategy in threatening contexts.

Although these reactions—fight, flight, or freeze—constitute the core biological repertoire of responses to threat, human behavior in dangerous contexts exhibits far greater complexity. Humans can adopt nuanced strategies such as compromise, cooperation, or passive resistance, none of which fit neatly into the traditional tripartite model. Therefore, when studying humans, it is more appropriate to explore their Attitude to dangers, which reflects not only their sensitivity to threats but also their selection of appropriate or inappropriate response strategies. Sensitivity, in this sense, involves perceiving environmental cues as either safe or hazardous. Notably, the brain tends to prioritize processing warning cues over mandatory or prohibitive ones [15].

The way individuals respond is shaped by their capacity to apply various forms of defense in line with situational demands. An adequate response yields effective protection or resolution, while an inadequate response often stems from either underestimating or overestimating danger, leading to poor outcomes. The interplay between threat sensitivity and behavioral responses ultimately gives rise to distinct patterns in one's Attitude to dangers [16].

Empirical studies have shown that personal attributes, emotional regulation, cognitive abilities, and irrational belief systems can significantly influence the selection of behavioral responses [17, 18]. Additional factors—such as the individual's awareness of threats [19] and leadership's emphasis on safety—also contribute meaningfully. For instance, perceiving leadership as safety-oriented has been found to buffer employees from burnout [20].

This context frames the relevance of examining how Behavioral Activation System (BAS) and Behavioral Inhibition System (BIS) interact with traits from the Five-factor model of personality—namely neuroticism, extraversion, openness to experience, benevolence, and conscientiousness. Notably, Smits and Boeck [21] found that BIS correlates positively with neuroticism and benevolence, and negatively with extraversion and openness. Meanwhile, BAS-persistence shows positive associations with conscientiousness and extraversion but negative correlations with neuroticism and benevolence. BAS-pleasure seeking aligns positively with extraversion and openness, and negatively with neuroticism, benevolence, and conscientiousness. Finally, BAS reward responsiveness is linked positively to extraversion and conscientiousness. Comparable patterns were identified by Mitchell and colleagues [22], reinforcing the hypothesis that specific constellations of BAS/BIS sensitivity and personality traits could significantly shape an individual's Attitude to dangers—namely, how threats are perceived and how responses are selected. The present study was thus designed to explore these interconnections within a student population, focusing on how neuropsychological activation and inhibition systems align with personal dispositions and strategies for dealing with danger.

Specific hypotheses

The study formulated several precise hypotheses regarding individuals' responses to threat-related scenarios, considering the interplay of behavioral systems and personality traits. It was posited that threat sensitivity might be influenced by a distinct configuration of the BAS/BIS systems, elevated conscientiousness (indicative of strong self-control), and the degree of behavioral normativity. An appropriate reaction to danger was expected to correlate with BAS activation, extraversion, conscientiousness, and a strong adherence to normative behavior. In contrast, heightened perceptions of threat were anticipated to stem from elevated BIS activity, high neuroticism, diminished extraversion, and low openness to new experiences. Meanwhile, a tendency to disregard potential threats could be attributed to heightened BAS, along with reduced levels of benevolence, conscientiousness, and behavioral normativity.

The inclusion of behavioral normativity in these theoretical assumptions is based on the understanding that social norms function as rules and expectations regulating conduct across different contexts. These norms delineate what actions are acceptable or prohibited for members of a social group [23]. Behavioral normativity reflects the internal motivation to comply with these standards [24]. Empirical findings suggest that appropriate conduct in high-risk contexts is significantly shaped by one's inclination to conform to established rules and guidelines. For instance, mask-wearing during the COVID-19 pandemic illustrates a regulatory guideline intended to mitigate infection risk; following such a prescription signifies an adequate threat response, while refusal demonstrates denial [25]. Based on this rationale, it is reasonable to infer that behavioral normativity is more closely associated with rational and adaptive responses to danger than with tendencies to overestimate or downplay threats, and it is expected to show stronger correlations with BAS and BIS.

Materials and Methods

The research was conducted among a group of 327 university students enrolled in either medical or psychology-pedagogy academic tracks at institutions across the Russian Federation. These included Moscow City Pedagogical University, Moscow Humanitarian University, Cherepovets State University (Vologda region), and Ivanovo State Medical Academy (Ivanovo region). The sample comprised 60 male and 267 female participants, with an average age of 20 years (SD = 2.17). A combination of conceptual, empirical, and statistical methods was applied for data collection and analysis.

To evaluate participants' perceptions of danger, two custom-designed instruments were employed: a questionnaire assessing threat sensitivity and another measuring the tendencies to react in specific ways to danger (adequate, exaggerated, or dismissive). The behavioral activation and inhibition systems (BAS/BIS) were assessed using the Carver-White scale. Personality traits were measured via the "Big Five" model adapted by L.F. Burlachuk and D.K. Korolev, while behavioral normativity was assessed using the "Adaptability" instrument, specifically focusing on the "Moral Normativity" subscale.

The Threat Sensitivity Questionnaire [26] includes 12 scenario-based questions reflecting typical situations. Each item presents four options, and participants are instructed to choose the one most aligned with their view. The responses are scored and converted to a standardized 10-point scale.

The Danger Response Questionnaire [27] contains 17 items that depict standard real-life danger situations, offering multiple-choice responses that correspond to either adequate, exaggerated, or minimized reactions. Final scores for each response style are also converted to a uniform 10-point scale.

The Carver-White BAS/BIS Scale, adapted for Russian-speaking populations by G.G. Knyazev [28, 29], consists of 24 items rated on a four-point Likert scale ranging from strong agreement to strong disagreement. The BAS component comprises three subdimensions—"Perseverance," "Reward Sensitivity," and "Pleasure Seeking"—while the BIS dimension is captured through a single scale that measures responses to negative stimuli. Scores were standardized on a ten-point scale.

The Big Five Personality Questionnaire, adapted by Burlachuk and Korolev [30], uses 25 bipolar adjective pairs rated on a five-point scale to assess five key personality traits: extraversion, benevolence (agreeableness), conscientiousness, neuroticism, and openness to experience. Raw scores were converted to stanine scores, which allowed for comprehensive personality profiling.

Behavioral normativity was evaluated using the "Adaptability" Inventory developed by Maklakov and Chermyanin, focusing on the "Moral Normativity" scale [31]. This tool includes 27 statements requiring the respondent to agree or disagree. Responses were scored according to a standardized key and translated into a ten-point scale.

Statistical processing of the results was carried out using correlation analysis, specifically employing the Pearson product-moment correlation coefficient to identify associations among the measured variables.

Results and Discussion

The following section presents the principal outcomes of the investigation, beginning with a detailed analysis of the participants' characteristics across all assessed variables. The findings regarding students' attitudes toward potential threats are summarized in **Table 1**.

Table 1. Students' attitude to dangers

	N	**%**
Sensitivity to threats		
High	159	48,62
Medium	96	29,36
Low	72	22,02

Total:	327	100
Ways to respond in situations of danger		
Adequate	137	41,9
Exaggeration of dangers	87	26,6
Downplaying (ignoring) hazards	43	13,15
Uncertain response	60	18,35
Всего:	327	100

As shown in **Table 1**, 159 participants—representing 48.62% of the sample—exhibited a high sensitivity to threats, while 96 individuals (29.36%) displayed a moderate level, and the remaining 72 respondents (22.02%) scored low on this trait. Overall, these findings suggest an encouraging trend: a significant proportion of students studying medicine, psychology, and pedagogical psychology—amounting to 77.98% when combining the high and moderate sensitivity categories—possess the ability to effectively differentiate between threatening and non-threatening stimuli in both their internal and external environments. However, a subset of respondents seemed to show limited concern regarding potential threats. When examining behavioral responses, 41.9% of the students (137 individuals) demonstrated an adequate reaction to danger. At the same time, 26.6% (87 individuals) appeared to overemphasize threats, responding in a heightened or exaggerated manner. Meanwhile, 13.15% (43 individuals) tended to downplay dangers or dismiss them altogether. Notably, 60 participants (18.35%) did not show a consistent pattern in their threat response style. This lack of a defined strategy may arise from different causes: for some, especially those in adolescence, it may reflect underdeveloped coping mechanisms in dangerous scenarios. For others, such variability might stem from a more situationally driven and selective interpretation of risks—depending on the context, type of threat, or specific circumstances, they may oscillate between overreacting and disregarding potential hazards entirely. Further insights into the group's levels of BAS and BIS activation, personality traits based on the "Big Five," and behavioral normativity are presented in **Table 2**.

Table 2. Levels of sensitivity to BAS and BAS, the severity of personal qualities, and normativity of behavior among students

N	Characteristics	Levels			Total n/%
		High n/%	Medium n/%	Low n/%	
1.	BAS-drive	201/61,47	111/33,94	15/4,59	327/100
2.	BAS- fun seeking	144/44,04	166/50,76	17/5,2	327/100
3.	BAS- reward responsiveness	242/74,00	85/26,00	0/0	327/100
4.	BIS-sensitivity to negative stimuli	101/30,89	167/51,07	59/18,04	327/100
5.	Neuroticism	93/28,44	193/59,02	41/12,54	327/100
6.	Extraversion	29/8,87	203/62,08	95/29,05	327/100
7.	Openness	20/6,12	196/59,94	111/33,94	327/100
8.	Agreeableness	93/28,44	170/51,99	64/19,57	327/100
9.	Conscientiousness	46/14,07	240/73,39	41/12,54	327/100
10.	Normativity of behavior	56/17,13	186/56,88	85/25,99	327/100

Based on the data presented in **Table 2**, a substantial proportion of probationers exhibited a high level of Bas-persistence, accounting for 61.47% (201 individuals), while BAS-pleasure seeking was high in 44.04% (144 individuals), and BAS-responsiveness to rewards was elevated in 74% (242 individuals). Notably, no participants showed low sensitivity to BAS-responsiveness to rewarding stimuli (0%), suggesting that most students maintain a consistent focus on achievement. Concurrently, the findings indicated a considerable share of students with heightened sensitivity to BIS, with 30.89% (101 individuals) displaying a high level and 51.07% (167 individuals) an average level. This duality presents a contradiction: on one hand, there is a strong motivation to attain rewards or positive social interactions, yet in situations involving challenges, risks, or unexpected events, inhibitory mechanisms may activate, potentially undermining performance. Approximately one-quarter of the students demonstrate this combination of high BAS responsiveness to reward alongside elevated BIS sensitivity to negative stimuli.

Regarding personality traits, 28.44% (93 individuals) were identified as having high neuroticism, while only 12.54% (41 individuals) showed emotional stability; this is significant considering that high neuroticism is generally regarded as a hindrance for professions such as medical workers, psychologists, and other helping professionals. Extraversion results aligned with expectations: the majority were ambiverts (62.08%, 203 individuals), with fewer pronounced extroverts (8.87%,

29 individuals) and introverts (29.05%, 95 individuals). Concerning openness to experience, merely 6.12% (20 individuals) demonstrated high levels of curiosity and interest in diverse knowledge, with 59.94% (196 individuals) showing moderate levels and 33.94% (111 individuals) low levels, implying that students with limited openness might face more academic challenges. Benevolence was observed at high levels in 28.44% (93 individuals), moderate levels in 51.99% (170 individuals), and was low in 19.57% (64 individuals). A similar pattern emerged for conscientiousness, encompassing traits such as awareness, diligence, and self-regulation: most students (73.39%, 240 individuals) scored moderately, 12.54% (41 individuals) were low, which may pose academic difficulties, and only 14.07% (46 individuals) exhibited high conscientiousness. Lastly, regarding normativity of behavior, a high level was found in only 17.13% (56 individuals), over half (56.88%, 186 individuals) generally adhered to norms but allowed some individual deviations, and 25.99% (85 individuals) tended to disregard norms in favor of personal interests, potentially complicating adaptation, social relations, and academic success.

Overall, these findings reveal a broad spectrum of individual differences across all parameters studied. A composite profile of a typical student would describe someone who is persistent, particularly when motivated, ambivalent in personality, moderately benevolent and conscientious, occasionally less emotionally stable and open to experience, and sometimes willing to violate social norms depending on situational factors.

Turning now to the main objective of this research — exploring the interconnections between attitudes toward hazards, sensitivity to BAS and BIS, personal characteristics, and normativity of behavior — a Pearson correlation analysis was conducted. The outcomes of this analysis are detailed in **Table 3**.

Table 3. Matrix of correlations of parameters of attitude to hazards, sensitivity to BIS/BIS, personal factors, and normativity of behavior*

№		5	6	7	8	9	10	11	12	13	14
1.	Sensitivity to threats	**0,25**	-0,03	**0,15**	0,05	-0,01	**0,18**	0,07	0,10	**0,21**	**0,25**
2.	Adequate response	0,09	*-0,11*	0,02	*-0,11*	-0,10	**0,28**	**0,16**	0,09	**0,24**	*0,14*
3.	Exaggeration of dangers	**-0,19**	**-0,21**	-0,01	**0,27**	**0,24**	**-0,20**	**-0,22**	0,01	-0,03	0,06
4.	Ignoring hazards	0,04	**0,29**	0,04	-0,13	-0,03	-0,10	0,02	*-0,12*	*-0,13*	**-0,29**
5.	BAS-drive		**0,32**	**0,41**	-0,01	0,07	**0,25**	**0,26**	0,07	**0,19**	0,03
6.	BAS- fun seeking			**0,29**	-0,02	-0,01	0,06	**0,24**	0,01	*-0,14*	**-0,20**
7.	BAS- reward responsiveness				0,18	**0,15**	0,10	0,10	0,04	**0,17**	-0,06
8.	BIS-sensitivity to negative stimuli					**0,25**	-0,09	*-0,14*	*0,12*	-0,04	0,08
9.	Neuroticism						**0,17**	-0,07	0,09	-0,06	0,02
10.	Extraversion							**0,32**	**0,30**	0,09	0,07
11.	Openness								**0,28**	**0,22**	**-0,22**
12.	Agreeableness									0,10	**0,16**
13.	Conscientiousness										0,01
14.	Normativity of behavior										

***Note:** Correlation coefficients significant at the 1% significance level are in bold, while those in italics are at the 5% significance level.

An analysis of **Table 3** highlights a considerable number of statistically significant correlations among the examined variables. Focusing specifically on the associations between the behavioral activation and inhibition systems and individual personality traits alongside normativity of behavior—without delving into the core investigation of how hazard attitudes relate to BAS and BIS sensitivities—the following patterns emerged. BAS-persistence showed a positive relationship with extraversion, openness to experience, and conscientiousness. In contrast, BAS-pleasure seeking correlated positively with openness to experience but negatively with conscientiousness and behavioral normativity. BAS-responsiveness to rewards was linked positively to neuroticism and conscientiousness. On the other hand, BIS demonstrated positive associations with neuroticism and benevolence, while showing a negative correlation with openness to experience. These outcomes generally support earlier findings regarding the connections between neuropsychological indicators and the “Big Five” personality dimensions [21, 22], suggesting that these patterns hold true irrespective of the demographic group or geographical context studied. To enhance clarity and interpretation, the relationships between threat sensitivity, behavioral responses in risky situations, and both neuropsychological and personal variables are visually summarized in **Figures 1** through 4.

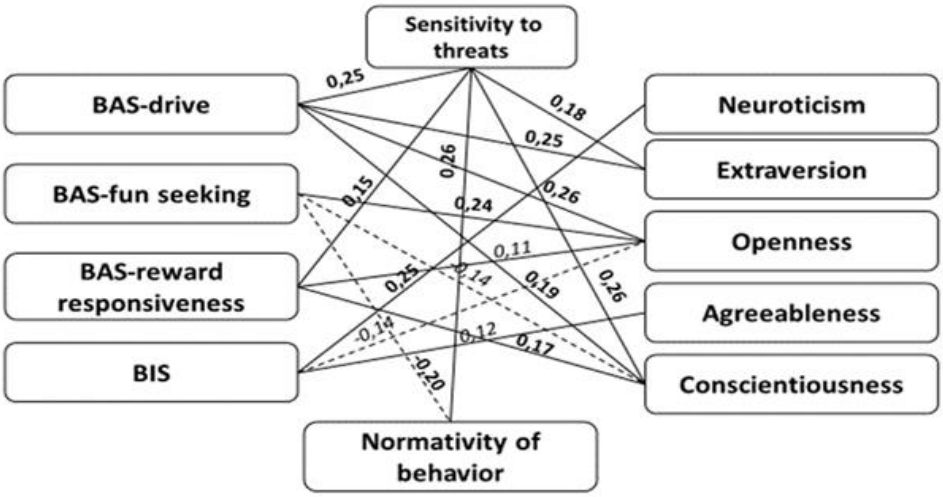

Figure 1. The relationship of sensitivity to threats and neuropsychological and personal factors*

*Note: In the figures that follow, solid lines represent positive correlations, while dotted lines denote negative correlations; correlation coefficients that are significant at the 1% level are highlighted in bold, and those significant at the 5% level are shown in italics.

Figure 1 illustrates that sensitivity to threats has positive correlations with BAS-persistence, BAS-responsiveness to rewards, extraversion, conscientiousness, and normativity of behavior, with no negative correlations observed. Additionally, BAS-persistence correlates positively with extraversion, while BAS-responsiveness to rewards is linked positively to conscientiousness. This suggests that individuals exhibiting extroverted traits tend to be more sensitive to threats, demonstrate strong perseverance toward goals, approach tasks responsibly, and possess well-developed self-regulation and situational control abilities—all of which align with the concept of "sensitivity to threats" and a tendency to adhere to societal norms across different life domains. Conversely, lower threat sensitivity is characteristic of those inclined toward introversion, lacking goal orientation, perseverance, and organizational skills, and more likely to disregard accepted behavioral norms. A similar approach will be taken to examine the associations between preferred responses in hazardous situations and neuropsychological and personality variables, as depicted in **Figure 2**.

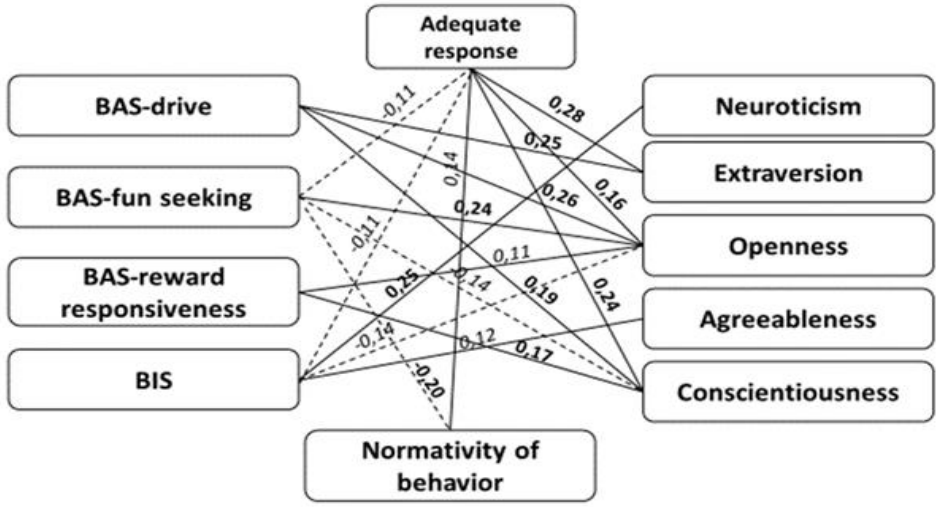

Figure 2. The relationship of adequate response in threat situations with neuropsychological and personal factors

An adequate response in hazardous situations refers to behavior that appropriately matches the threat's nature and is guided by socially accepted and established rules for handling such critical circumstances. Findings from this research reveal that adequate responses are positively linked with extraversion, openness to experience, conscientiousness, and normativity of behavior, while showing negative associations with BAS-pleasure seeking and BIS sensitivity to negative stimuli. Therefore, individuals who are extroverted, open-minded, adhere to behavioral norms, demonstrate conscientiousness with strong self-control, and exhibit low sensitivity to BAS-pleasure seeking and BIS-negative stimuli tend to respond to threats more appropriately. Simply put, challenges and dangers do not lead these individuals to withdraw or inhibit their actions; instead, they motivate them to find suitable solutions to overcome the situation.

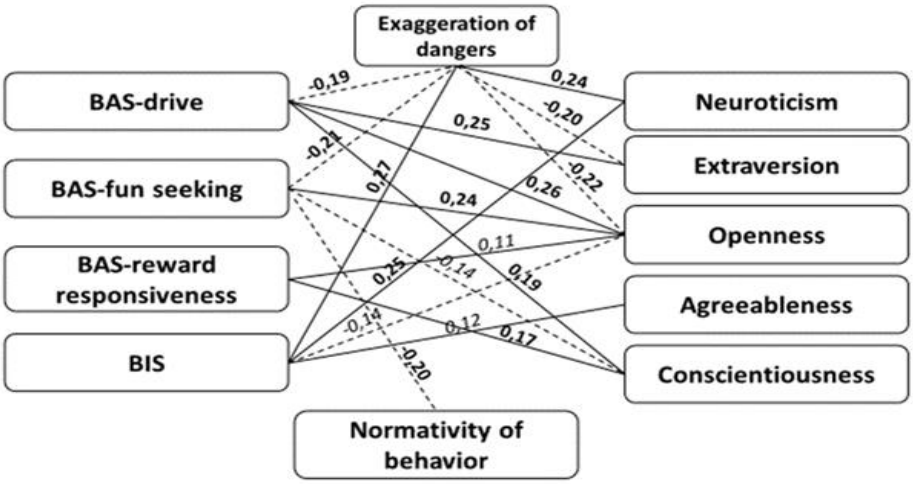

Figure 3. The relationship between exaggeration of the significance of threats and neuropsychological and personal factors

Figure 3 illustrates the phenomenon of an inadequate response characterized by the tendency to amplify the significance of threats. This reaction involves heightened anxiety even over minor hazards, often transforming situations that are not genuinely dangerous into perceived catastrophes. As anticipated, this exaggeration of danger is positively correlated with neuroticism and BIS sensitivity to negative stimuli, which themselves are also positively linked. Conversely, negative correlations were observed with BAS-persistence and BAS-pleasure seeking, as well as with personal traits such as extraversion and openness to experience. Therefore, those who tend to overstate dangers are typically introverted, emotionally unstable, anxious individuals who lack perseverance toward goals, show little pursuit of pleasure or enjoyment, maintain conservative attitudes, demonstrate limited curiosity, and are prone to abandoning activities when faced with real or imagined difficulties and threats. Notably, no significant positive or negative associations were found between this exaggerated threat perception and normativity of behavior.

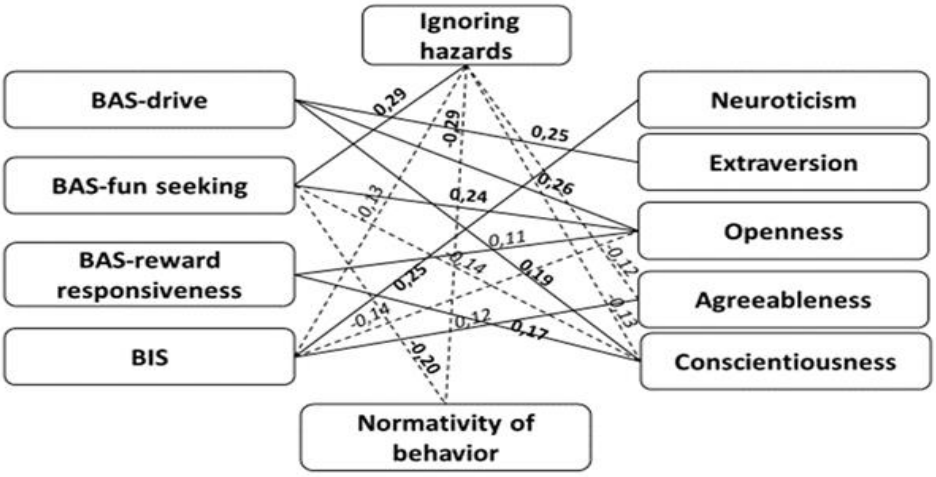

Figure 4. The relationship of ignoring dangers with neuropsychological and personal factors

Disregarding dangers can stem either from a conscious decision to overlook threats or from careless, inattentive behavior. As depicted in **Figure 4**, ignoring dangers shows a positive association solely with BAS—the pursuit of pleasure and entertainment. All other correlations are negative. Notably, ignoring dangers negatively correlates with BIS, suggesting an absence of behavioral inhibition when facing unexpected challenges, difficulties, or threats, as well as with benevolence, conscientiousness, and normativity of behavior. Thus, an individual—such as a student—who tends to ignore risks is typically an ambivert driven by pleasure-seeking tendencies, who often neglects social norms and rules, exhibits carelessness and disorganization, and frequently encounters troublesome or hazardous situations due to low sensitivity to negative stimuli.

Numerous studies have explored the complex relationships between the behavioral activation and inhibition systems (BAS/BIS) and personal traits, as well as people's responses to danger. For example, gender differences have been documented regarding the interaction of BAS/BIS with emotional reactions to adverse events in varying social environments. Research by Logan, Kaye, and Lewis [32] on young drivers revealed that impulsive women (high BAS-pleasure seeking) tend not to perceive speeding as risky, whereas men with greater BAS-persistence are less likely to speed, recognizing it as

hazardous. Similarly, Ma-Kellams and Wu [33] demonstrated that BIS is linked with inhibitory emotions, with women more prone than men to negative feelings such as fear and despair that suppress behavior. Oniszczenko [34] further found a significant correlation between BIS and women's fear of loved ones contracting COVID-19.

Further investigations by Ranđelović and Čirović [35] identified connections between BIS/BAS and social anxiety alongside obsessive thought patterns. The BAS system exerts a complex influence on social anxiety—both directly protecting and indirectly facilitating reflective thinking styles. BIS emerges as a critical vulnerability factor for social anxiety development, impacting it both directly and indirectly through maladaptive cognitive styles.

Research also suggests an association between BAS/BIS and perfectionism [36]. Self-oriented perfectionism correlates with BAS-persistence but not pleasure seeking, whereas socially prescribed perfectionism aligns with elevated BIS. Numerous studies have linked BIS with vulnerability to depression and anxiety, while BAS has been associated with susceptibility to substance abuse disorders alongside comorbid diagnoses [37]. For example, Chat *et al*. [38] highlighted that individuals with brain inflammation show altered reward responses, tied to reward expectation rather than the actual outcome.

Within the current investigation's framework, prior work on the connections between danger perception and the "Big Five" personality traits is particularly relevant. Dennis and Chen [39] emphasized that adequate situational appraisal—a prerequisite for appropriate response—is rooted in balancing emotional reactivity and situational control. Perkins and colleagues [40, 41] linked exaggerated danger perception to heightened anxiety and fear, a phenomenon amplified during adverse contexts like the COVID-19 pandemic, when individuals displaying symptoms such as coughing were stigmatized as infection sources [42]. Underestimation of dangers is associated with poor situational foresight and increased risk-taking tendencies [43, 44]. Wallace and Vodanovich [45] demonstrated that low conscientiousness, coupled with cognitive lapses such as inattention and misunderstanding tasks, leads to higher accident rates. Clarke and Robertson (2003) found extraversion predicts road accidents, whereas low conscientiousness and low benevolence predict accidents at work and elsewhere.

Findings from the present study partially confirm previous research regarding how attitudes toward dangers relate to neuropsychological and personality traits while also offering novel insights. Specifically, the role of conscientiousness (situational control) in selecting appropriate danger responses [40, 46, 47], neuroticism's link to danger exaggeration [40], and the connection between pleasure-seeking with diminished control and danger ignoring [43, 45] were all corroborated.

This study's innovation lies in proposing that attitudes toward dangers be examined as a two-component construct: sensitivity to threats and response strategies in dangerous situations. Furthermore, it demonstrates that neuropsychological and personality factors, interacting dynamically, shape individual attitudes toward hazards.

More precisely, individuals characterized by high BAS-persistence combined with elevated BAS-reward expectation and low BIS-sensitivity to negative stimuli—typically extroverted, emotionally stable, open to new experiences, conscientious, and adhering to accepted norms—are classified as having an adequately sensitive attitude toward dangers. This group, deemed optimal for safety, comprises about 25% of the student sample.

Conversely, a profile featuring high BAS-pleasure seeking, low BIS, and reduced benevolence, conscientiousness, and normativity correlates with an attitude characterized by ignoring dangers and reduced sensitivity, representing roughly 10% of participants.

Another category is marked by low BAS sensitivity, high BIS, increased neuroticism, introversion, low openness, and low conscientiousness, manifesting as an anxious exaggeration of dangers combined with diminished sensitivity. Normativity does not significantly influence this type. Anxiety and impaired situation comprehension lead to behavioral inhibition and inaction, compensated by a defensive tendency to perceive any difficulty or threat as an insurmountable obstacle. Approximately 15% of the sample falls into this group.

While this research enhances understanding of how people relate to dangers, it has limitations. Firstly, the sample mainly included students, predominantly female and younger, which may have influenced results, though the overall relationships between neuropsychological and personal traits and danger attitudes remained consistent. Secondly, while the study clearly delineates one optimal (adequate sensitive) and two non-optimal types (anxious with reduced sensitivity and ignoring with reduced sensitivity), it encounters challenges in explaining hybrid types where threat sensitivity conflicts with response style, such as adequate with reduced sensitivity, anxious sensitivity, and ignoring sensitive types. For instance, findings show a positive correlation between sensitivity to threats and BAS-persistence, but a negative correlation with danger exaggeration, or sensitivity to threats positively correlated with normativity but negatively with ignoring dangers. This raises questions about the underlying mechanisms of disturbing sensitive and ignoring sensitive types, which warrants further investigation.

Addressing these and related questions about attitudes to hazards outlines promising directions for future research.

Conclusion

In summary, this research demonstrates that individuals' attitudes toward dangers arise from a complex interplay between neuropsychological and personal characteristics, where neuropsychological aspects govern the behavioral dynamics of

activation and inhibition, while personal traits influence threat sensitivity and the selection of responses to hazardous situations.

The initial hypotheses were largely supported by the findings. Sensitivity to threats showed stronger connections with BAS sensitivity rather than BIS, alongside associations with extraversion, conscientiousness, and normativity of behavior. Adequate hazard response exhibited similar patterns, correlating positively with extraversion, openness to experience, conscientiousness, and normativity of behavior, while showing negative correlations with BAS-pleasure seeking and BIS sensitivity to negative stimuli. Exaggeration of dangers, representing an anxiety-driven reaction, was linked to a dominance of BIS over BAS, positively associated with neuroticism and introversion, and negatively with openness to experience. Ignoring dangers was characterized by predominant BAS-the search for pleasure sensitivity combined with low benevolence, conscientiousness, and normativity of behavior.

The identified interplay of neuropsychological and personal factors effectively predicts an individual's specific attitude type toward dangers, enabling targeted interventions to optimize both organizational safety measures and individual behavioral adjustments, thereby preventing unsafe practices and rule violations.

Consequently, these results hold practical implications for enhancing security management by incorporating the human factor and offer valuable insights for safety education among youth, as well as for adults addressing real-world hazard and risk management challenges.

Acknowledgments: The authors express their gratitude to all participants for their valuable cooperation in this research.

Conflict of interest: None

Financial support: None

Ethics statement: None

References

1. Gray JA. The neuropsychology of anxiety: an enquiry into the functions of the septohippocampal system. Oxford: Oxford University Press; 1982.
2. Grey JA, McNaughton N. The neuropsychology of anxiety: an enquiry into the functions of the septo-hippocampal system. 2nd ed. Oxford: Oxford University Press; 2000.
3. McNaughton N, Corr PJ. The neuropsychology of fear and anxiety: a foundation for Reinforcement Sensitivity Theory. In: Corr PJ, editor. The Reinforcement Sensitivity Theory of Personality. Cambridge: Cambridge University Press; 2008. p. 44-94.
4. Corr PJ, McNaughton N. Neuroscience and approach/avoidance personality traits: a two stage (valuation–motivation) approach. Neurosci Biobehav Rev. 2012;36(10):2339-54. doi:10.1016/j.neubiorev.2012.09.013
5. Donahue JJ. Fight-Flight-Freeze System. In: Zeigler-Hill V, Shackelford TK, editors. Encyclopedia of Personality and Individual Differences. Cham: Springer; 2020. doi:10.1007/978-3-319-24612-3_751
6. Blanchard DC, Hynd AL, Minke KA, Minemoto T, Blanchard RJ. Human defensive behaviors to threat scenarios show parallels to fear-and anxiety-related defense patterns of non-human mammals. Neurosci Biobehav Rev. 2001;25(7-8):761-70. doi:10.1016/s0149-7634(01)00056-2
7. Veenstra L, Schneider IK, Bushman BJ, Koole SL. Drawn to danger: Trait anger predicts automatic approach behaviour to angry faces. Cogn Emot. 2017;31(4):765-71. doi:10.1080/02699931.2016.1150256
8. Lojowska M, Gladwin TE, Hermans EJ, Roelofs K. Freezing promotes perception of coarse visual features. J Exp Psychol Gen. 2015;144(6):1080-88. doi:10.1037/xge0000117
9. Krupić D, Križanić V, Corr PJ. Personality and defensive behaviour: A factor analytic approach to threat scenario choices. Pers Individ Dif. 2016;94:303-8. doi:10.1016/j.paid.2016.01.045
10. Kimbrel NA, Nelson-Gray RO, Mitchell JT. BIS, BAS, and bias: The role of personality and cognitive bias in social anxiety. Pers Individ Dif. 2012;52(3):395-400. doi:10.1016/J.PAID.2011.10.041
11. Borders A. Rumination and Related Constructs: Causes, Consequences, and Treatment of Thinking Too Much. Academic Press; 2020.
12. Knyazev GG, Slobodskaya HR. Personality types and behavioural activation and inhibition in adolescents. Pers Individ Dif. 2006;41(8):1385-95. doi:10.1016/j.paid.2005.11.035
13. Buelow M. Risky decision making in psychological disorders. Academic Press; 2020. Available from: https://www.twirpx.org/file/3179615/

14. Krupić D. High BAS and low BIS in overconfidence, and their impact on motivation and self-efficacy after feedback. Primenjena Psihologija. 2017;10(3):297-312.
15. Bian J, Fu H, Jin J. Are we sensitive to different types of safety signs? Evidence from ERPs. Psychol Res Behav Manag. 2020;13:495-505. doi:10.2147/PRBM.S248947
16. Maralov VG, Gura AY, Tatlyev RD, Epanchintseva GA, Bukhtiyarova IN, Karavaev DM. Influence of the sex and age people's attitude toward hazards. Astra Salvensis. 2019;7(13):343-52.
17. Maralov VG, Sitarov VA, Kudak MA, Maralova TP, Koryagin II. Phenomena of adequate response, exaggeration or understatement of dangers by people. Perspect Sci Educ. 2020;45(3):360-78. doi:10.32744/pse.2020.3.27
18. Maralov VG, Sitarov VA, Koryagina II, Romanyuk LV, Kudaka MA. The influence of irrational beliefs on attitudes to dangers among medical and psychological-pedagogical students. Int J Pharm Res Allied Sci. 2021;10(1):77-87. doi:10.51847/Gqcy-uT
19. Karim S, Ahmad V. Level of awareness among staff and students of academic institutions towards Covid-19 in Western and Central regions of Saudi Arabia. Int J Pharm Phytopharmacol Res. 2020:169-75.
20. Molero F, Mikulincer M, Shaver PR, Laguía A, Moriano JA. The development and validation of the leader as security provider scale. J Work Organ Psychol. 2019;35(3):183-93. doi:10.5093/jwop2019a20
21. Smits DJ, Boeck PD. From BIS/BAS to the big five. Eur J Pers. 2006;20(4):255-70. doi:10.1002/per.583
22. Mitchell JT, Kimbrel NA, Hundt NE, Cobb AR, Nelson-Gray RO, Lootens CM. An analysis of reinforcement sensitivity theory and the five-factor model. Eur J Pers. 2007;21(7):869-87. doi:10.1002/per.644
23. Kelly D, Setman S. The Psychology of Normative Cognition. In: Zalta EN, editor. The Stanford Encyclopedia of Philosophy (Spring 2021 Edition). 2020. Available from: https://plato.stanford.edu/archives/spr2021/entries/psychology-normative-cognition/
24. Morris A, Cushman F. A common framework for theories of norm compliance. Soc Philos Policy. 2018;35(1):101-27. doi:10.1017/S0265052518000134
25. Kemmelmeier M, Jami WA. Mask wearing as cultural behavior: An investigation across 45 US states during the COVID-19 pandemic. Front Psychol. 2021;12:648692. doi:10.3389/fpsyg.2021.648692
26. Maralov VG, Malysheva EY, Nifontova OV, Perchenko EL, Tabunov IA. Development of a test questionnaire on the sensitivity to threats in adolescence. Perspektivy nauki. 2012;8(35):32-7. (In Russ.)
27. Maralov VG, Malysheva EY, Smirnova OV, Perchenko EL, Tabunov IA. Development of a test questionnaire to identify ways of responding in situations of danger in adolescence. Al'manah sovremennoj nauki i obrazovaniya. 2012;12(1):92-6. (In Russ.)
28. Carver CS, White TL. Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: the BIS/BAS scales. J Pers Soc Psychol. 1994;67(2):319-33. doi:10.1037/0022-3514.67.2.319
29. Knyazev GG, Slobodskaya ER, Savostyanov AN, Ryabichenko TI, Shushlebina OA, Levin EA. Activation and inhibition of behavior as the basis of individual differences. Psihologicheskij zhurnal. 2004;25(4):28-40. (In Russ.)
30. Burlachuk LF, Koroljov LK. Adaptation of The Big Five Locator scale. Voprosy Psikhologii. 2000;(1):126-34. (In Russ.) Available from: https://lib.iitta.gov.ua/707228/1/korolyov_lokator_bolshoy_pyatyerki.PDF (access date: 17.03.2022)
31. Raygorodsky DY. Practical psychodiagnostics, Methods and tests. Samara: Publishing House "BAHRAKH-M"; 2006. p. 549-672.
32. Logan E, Kaye SA, Lewis I. The influence of the revised reinforcement sensitivity theory on risk perception and intentions to speed in young male and female drivers. Accid Anal Prev. 2019;132:105291.
33. Ma-Kellams C, Wu MS. Gender, behavioral inhibition/activation, and emotional reactions to negative natural and social events. Pers Individ Dif. 2020;157:109809. doi:10.1016/j.paid.2019.109809
34. Oniszczenko W. The association between BIS/BAS and fear of COVID-19 infection among women. Curr Issues Pers Psychol. 2021;9(3):237-45. Available from: https://czasopisma.bg.ug.edu.pl/index.php/CIiPP/article/view/6052
35. Ranđelović K, Ćirović N. Social anxiety and rumination in the context of the revised reinforcement sensitivity theory and the mediation model of social anxiety. Psihologija. 2022;55(1):1-24. doi:10.2298/PSI200702034R
36. Randles D, Flett GL, Nash KA, McGregor ID, Hewitt PL. Dimensions of perfectionism, behavioral inhibition, and rumination. Pers Individ Dif. 2010;49(2):83-7. doi:10.1016/j.paid.2010.03.002
37. Johnson SL, Turner RJ, Iwata N. BIS/BAS levels and psychiatric disorder: An epidemiological study. J Psychopathol Behav Assess. 2003;25(1):25-36. doi:10.1023/A:1022247919288
38. Chat IKY, Nusslock R, Moriarity DP, Bart CP, Mac Giollabhui N, Damme KS, Carroll AL, Miller GE, Alloy LB. Goal-striving tendencies moderate the relationship between reward-related brain function and peripheral inflammation. Brain Behav Immun. 2021;94:60-70. doi:10.1016/j.bbi.2021.03.006
39. Dennis TA, Chen CC. Emotional face processing and attention performance in three domains: Neurophysiological mechanisms and moderating effects of trait anxiety. Int J Psychophysiol. 2007;65(1):10-19. doi:10.1016/j.ijpsycho.2007.02.006

40. Perkins AM, Cooper A, Abdelall M, Smillie LD, Corr PJ. Personality and defensive reactions: fear, trait anxiety, and threat magnification. J Pers. 2010;78(3):1071-90. doi:10.1111/j.1467-6494.2010.00643.x
41. Taju NFS, Ahmed BG, Abukhalid NH, Alsaikhan AS, Alhayyaf HH, Alotaibi KH, Alsahafi AS, Alotaibi MS, Alqahtani FT, Alanazi AF, et al. An overview on the role of MRI in diagnosis and management of berry aneurysm. World J Environ Biosci. 2021;10(3):38-41. doi:10.51847/0hl1BHlLpm
42. Bouayed J. Sorry, I am sneezing and coughing but I do not have COVID-19. Brain Behav Immun. 2022;101:57-8. doi:10.1016/j.bbi.2021.12.018
43. Zuckerman M. Sensation seeking and risky behavior. Washington (DC): American Psychological Association; 2007. doi:10.1037/11555-000
44. Castro C, Ventsislavova P, Garcia-Fernandez P, Crundall D. Risky decision-making and hazard prediction are negatively related and could be assessed independently using driving footage. Psychol Res Behav Manag. 2021;14:857-76. doi:10.2147/PRBM.S305979
45. Wallace JC, Vodanovich SJ. Workplace safety performance: conscientiousness, cognitive failure, and their interaction. J Occup Health Psychol. 2003;8(4):316. doi:10.1037/1076-8998.8.4.316
46. Clarke S, Robertson IT. A meta-analytic review of the Big Five personality factors and accident involvement in occupational and non-occupational settings. J Occup Organ Psychol. 2005;78(3):355-76. doi:10.1348/096317905X26183
47. Nikolskaya EY, Lepeshkin VA, Uspenskaya ME, Ushakov RN, Logunova NY, Novak LV. Formation of regional marketing system in the current context. J Adv Pharm Educ Res. 2021;11(3):144-9. doi:10.51847/ECJa7Yq4X8