

## Predicting Adolescent High-Risk Behaviors Based on Brain-Behavioral Systems, Defense Mechanisms and Assertiveness

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### Abstract

**Background and Aim:** From the perspective of health professionals and social issues, high-risk behaviors are one of the most important threatening problems for physical, psychological and social health of individuals and society. The aim of this study was to predict high-risk behaviors in adolescents based on brain-behavioral systems, defense mechanisms and assertiveness.

**Method:** The design of this study was descriptive and correlational. The statistical population was all male high school students in the third district of Tehran in the academic year 2021-2022, of which 384 were selected based on the Georgian and Morgan table by multi-stage cluster sampling. The instruments used included adolescent risk questionnaire (Ahmadabadi and Heidari, 2011), brain-behavioral systems (Carver and White, 1994), defense mechanisms (Andrews, 1993) and assertiveness (Gambrill and Ritchie, 1975). Data were analyzed using Pearson correlation and multiple regression in spss-24 software.

**Results:** The results showed that the variables of entertainment search, reward response, underdeveloped defense mechanisms, psychologically disturbed defense mechanisms positively and significantly predict 17, 1, 20 and 12% of the variance of tendency to high-risk behaviors, respectively ( $p < 0.001$ ). Also, the variables of behavioral inhibition system, developed defense mechanisms and assertiveness could negatively and significantly predict 35, 6 and 19% of the variance of tendency to high-risk behaviors, respectively ( $p < 0.001$ ).

**Conclusion:** In general, according to the results of this study, it can be said that increasing the use of immature and psychotropic defense mechanisms, behavioral activation systems tend to perform high-risk behaviors in students.

**Keywords:** high risk behaviors; brain-behavioral systems; defense mechanisms; assertiveness

### Introduction

Adolescence, which is associated with extensive physical, psychological and social changes, due to self-centeredness and lack of proper understanding of adolescents' behaviors, is an important step in starting high-risk behaviors (Fathi, Seraji, Sharifi Rahnego, 1399). During this period, adolescents may engage in risky behaviors in order to prove themselves and their place in society and the family, and to avoid being ignored and the center of attention (Puff, Pantel, Kaiser, 2021). From the perspective of health professionals and social issues, high-risk behaviors are one of the most important threatening problems for physical, psychological and social health of the individual and society (Extremera, Doran and Ray, 2017). High-risk behaviors are potentially destructive behaviors that individuals commit voluntarily or without knowing the adverse individual and social consequences (Maleki Glandoz and Sardari, 1399). Findings show that the incidence of self-harming behaviors has increased from 400 to 1,000 per 100,000 in the last three decades (Mahlen Camp, Camp, Walsh, 2010). The most important high-risk behaviors are: running away from school, running away from home, alcohol and smoking, unsafe sex, dangerous driving and interpersonal violence (Fathi, Maleki Rad, Abbasi, 1400).

Among the factors associated with high-risk behaviors in adolescents are behavioral activation / inhibition systems (Lerner, Hatak, & Roach, 2018). Neurological research has shown that the reactions that people show contain very important information



about the psychological processes in the brain (Reese, Laglin, Bergstrom et al., 2019). The theory of sensitivity to the strengthening of three behavioral brain systems called behavioral inhibition system, behavioral activation system and reward seeking behavior suggests that the feeling of pride and hope for reward in spite of the existing danger or threat consists of two components of active approach and avoidance. The system is responsible for resolving the conflict (Pederson, Fitt, etc.) Botolato, 2018). The behavioral activation system is activated with each sign of reward and the behavioral inhibition system is activated in the face of conflict and conflict between activation and avoidance and plays a role in recognizing and resolving this conflict (Makvand Hosseini, Najafi, Khaleghi, 2017). People with high behavioral activation systems seek greater rewards and points, and may engage in more risky behaviors and show higher levels of impulsivity, while those with higher scores in behavioral inhibition systems are more cautious. , Experience more anxiety and behaviors They show self-avoidance (Bagheri Sheikhangfshah, Abolghasemi, Kafi Masouleh, 1398). Various studies have shown that the behavioral activating system of entertainment search and addiction readiness (Musliman, Hosseini, Sadeghpour, 1397); Experience predicts some pathological symptoms and psychopathology (Reedi, Green, Rizzo, 2016). Sobhi Gharamaleki, Abbasi, Shaykh (1399) in a study showed that behavioral inhibition / activation systems and intolerance of uncertainty are among the variables affecting juvenile delinquency.

In addition to genetic factors, cognitive factors such as defense mechanisms are also associated with a tendency to high-risk behaviors (Boins, 2018). Recently, the diagnostic role of defense in differentiating between psychological situations has received more attention; In other words, defense mechanisms can play an important role in creating and maintaining pathological or adaptive personality function (Shafiei Tabar, 1397). Defense mechanisms are a process that makes it possible to understand the relationship between healthy and unhealthy personality performance and is known as a facilitator of well-being and adaptation (Giuseppe, Siachini, Piaroli, 2019). The defense mechanisms are responsible for protecting me from anxiety, and can be effective or inefficient depending on how they are used in the environment. (2017) .

Developed defense mechanisms are associated with desirable and adaptive coping methods and less confusion, while underdeveloped defense mechanisms are consciously with an inability to perceive unacceptable stressors, impulses, emotions, and responsibilities that are distorted. Understand yourself and others and attribute hostile feelings to agents Leadership leads (Francisco, President, Pianowski, 2018). Accordingly, defense mechanisms affect a person's response to emotional conflict and daily internal and external tensions, which seem to cause impulsivity when immature and neurotic (Devi, Kumar, Singh, 2017). Defense mechanisms are involved in controlling and guiding a person's behavior due to the function of the forehead (Borhani, Mehri, Continuous, 1399); And they have two features in common, first, that they deny or distort reality, and second, that they act on an unconscious level (Kim, 2016).

Assertiveness is the core of interpersonal behavior and the key to human communication (Safari, 1398). Assertiveness refers to the

path that individuals take to express themselves or to defend themselves and their rights as individuals. People with high levels of assertiveness tend to stand up and do not allow others to abuse them. As a result, the individual achieves a higher level of adjustment in social interaction (Sattari, Rouhalamini, Zare, 1397). In another definition, assertiveness refers to an individual's ability to defend his or her personal rights without hesitation, as well as without being aggressive (Speed, Goldstein, Goldfried, 2018). Expressing has two emotional and cognitive dimensions, which in the emotional dimension, includes expressing interpersonal behaviors without feeling anxious or angry. Assertiveness is also associated with cognitive changes that lead to specific cognitive interpretations of the social environment, self, others and interactions with them (Karimi, Yarovisi, 1398). The results of Khavar and Malik (2016) studies showed that assertiveness has an effect on increasing students' decision-making power, initiative and mental health.

Reviewing the research background, Poursaid, Sharifi, Akrami (1400) found that aggression can positively and significantly predict high-risk behaviors among students. Research by Fathi et al. (1400) showed that emotional integration, role-playing, problem solving, emotional companionship, behavior control, and overall performance are inversely related to students' high-risk behaviors. Findings of Mozaffari, Bagherian, Zadeh Ali and Heidari (1399) studies showed that excitement, curiosity, hedonism, courage, lack of motivation has the ability to predict risky behaviors in adolescents. Oregon et al. (2019) in a study stated that forcing them to grow up earlier and enter adulthood, living in a family with problems were among the factors causing risky behaviors. Giaviatkol and Panitrak (2017) cited cognitive, emotional, social, environmental, and familial factors as the causes of adolescents' tendency to engage in risky behaviors.

The issue of high-risk behaviors and its increasing prevalence among adolescents is also one of the main challenges and concerns of the country, which, while creating its own consequences for adolescents, also exacerbates family and social consequences and the involvement of other related institutions.

Therefore, the present study can provide a more realistic and deeper understanding of the contexts and consequences of adolescents' high-risk behaviors and better clarify the semantic and subjective angles of dealing with this phenomenon. Therefore, the general purpose of this study is to predict high-risk behaviors of adolescents based on brain-behavioral systems, defense mechanisms and assertiveness.

## Research method

The present study is a descriptive correlational study in terms of applied purpose. The statistical population of the present study consisted of all high school male students in the third district of Tehran in 1400. Among them, 384 people were selected based on the Georgian and Morgan table by multi-stage cluster sampling. In this way, 5 boys' schools were randomly selected from the schools in District 3 through the list provided by education. In the next stage of each school, after obtaining information about the number of classes, a second grade of high school was randomly selected and in the final step, the desired questionnaires were given to all students. Inclusion criteria include interest in



participating in research, not using psychotherapy drugs for students while studying and students living with their parents. Exclusion criteria also included incomplete completion of the questionnaire, and unwillingness to participate in the study.

It should be noted that due to the spread of Covid-19 virus and the closure of schools and holding classes online and in cyberspace, a briefing session to express the purpose of the research was held virtually for students, then people who had informed consent to participate in the study. And met the entry criteria, volunteered and The research questionnaires were designed online on the web, and by sending the questionnaire link to the sample members, they were asked to refer to the mentioned link and while reading the questionnaire, answer all the questions. In order to collect data, the following tools were used:

**Behavioral Brain Systems Questionnaire:** This scale includes 2 self-report questions prepared by Carver and White in.. The BIS subscale in this questionnaire consists of seven items that measure the sensitivity of the behavioral inhibition or threat response system and the feeling of anxiety when dreaming with threatening symptoms. The BAS scale also includes 11 items and measures the sensitivity of the behavior activating system. This subscale includes three other subscales: drive (includes 4 item), reward response (includes 3 item), and joy and entertainment search (includes 4 item). Reward response measures the degree to which rewards lead to positive emotions. The drive, on the other hand, measures a person's desire to actively pursue desirable goals and, on a pleasure-seeking scale, measures one's desire to pursue desirable goals and one's desire for new rewards and turning to potentially rewarding events in momentary stimulation. To take. Four additional items are listed as cover items on the scale and have no role in BIS evaluation, BAS (Abdullahi Majarishon, 9). Carver and Wyatt (1994) reported Cronbach's alpha coefficient of Inhibition and Behavior Activation Questionnaire 0.78 and 0.81, respectively. According to Carver and White (1994) the internal stability of the BIS subscale is 0.74 and the internal stability of the three subscales of reward response, drive and entertainment search are 0.9, 0.2 and 0.7, respectively (Abdollahi Majarishan, 9). The reliability coefficient of the whole questionnaire was calculated by Cronbach's alpha method of 0.84

**Andrews Defense Style Questionnaire:** This questionnaire has been prepared to examine the defense mechanisms

of individuals and classify them into three general styles: immature, mature and psychologically abused, which was developed as a hierarchical model by Andrews et al. In 1993 and includes 40 The question is on a 9-point Likert scale and has 20 defense mechanisms Evaluates the three mentioned styles (Nasiri, Dashtaki and Salehi, 2015).

Andrews et al. (1993) reported a correlation between test and retest between 0.46 and 0.86, and reported Cronbach's alpha for a mature style of 0.68, an undeveloped style of 0.58, and a disturbed psyche of 0.80. Heidari Nasab, Mansour, Azadfallah and Shairi (2007) in a study to evaluate the validity and reliability of this questionnaire in Iranian samples using test and retest method and also to calculate Cronbach's alpha in the study groups examined the validity of this questionnaire and Also content validity, convergent validity and structural validity with The use of experts' opinions on the relationship between the questionnaire items and the definitions related to the mechanisms under study, as well as

the use of the neo-test were studied. The student sample was 0.75, 0.73 and 0.74, respectively A sign of satisfactory internal consistency for the Iranian form is the Defense Styles Questionnaire (Chapardar et al., 1399). The reliability coefficient of the whole questionnaire in the present study was calculated 0.87 by Cronbach's alpha method.

**Gambrill and Ritchie Assertiveness Questionnaire:** This questionnaire was developed by Gambrill and Ritchie in (1975) and has 40 items and each item contains 5 options. Each item of the questionnaire indicates a situation that requires punitive behavior and a score range between 40 and 200. A higher score indicates more courage. Therefore, the lower score of people indicates their lack of courage.

Gambrill and Ritchie (1975) reported the factor validity of different items of the main questionnaire between 0.39 and 0.70 and the reliability coefficient of this questionnaire was 0.81. Cronbach's questionnaire was reported by Karbasin, Talebian and Abdokhodaei (1398) as 0.83. The reliability coefficient of the whole questionnaire was calculated 0.79 by Cronbach's alpha method.

**Youth Risk Questionnaire:** This scale was developed by Zadeh Mohammadi, Ahmadabadi and Heidari (2011) and includes 53 questions and measures high-risk behavior in six areas of dangerous driving, violence, smoking, drugs, alcohol and sexual risk. Scoring in the Likert scale ranges from 0 to 4 (0 means strongly disagree and 4 means strongly agree). The higher a person's score on a subscale; Indicates greater risk in that subscale. The total score for high-risk behaviors is based on the sum of the scores of the six subscales. Zadeh Mohammadi et al. (2011) used Promax principal component analysis and unintentional rotation to analyze the scale factors. Kaiser-Meyer-Ulkin sampling adequacy test was equal to 0.93 and at the desired level and Bartlett sphericity test was statistically significant. They also measure Cronbach's alpha for the overall risk scale of 0.93, the subscale for alcohol tendency 0.93, the dangerous driving orientation for 0.88, the smoking orientation for 0.91, the drug orientation for 0.83, the sexual orientation orientation. 0.85 and the tendency to violence were 0.77. The reliability coefficient of the whole questionnaire was calculated by Cronbach's alpha method of 0.93.

## Data analysis

Appropriate descriptive and inferential statistical methods were used to analyze the data. In the statistics section, a descriptive calculation of frequency, percentage, mean and standard deviation was performed and in the inferential statistics section, the method of analysis of variance and multiple regression was performed using SPSS statistical software version 24.

## Findings

In Table 1, descriptive indices of variables including mean and standard deviation were reported. Kolmogorov-Smirnov test was also used to test the hypothesis of normal distribution of variables.



Significance level	K-S-Z	standard deviation	Mean	Variables
0/51	0/17	9/85	71/29	Behavioral activator system
0/28	0/84	4/99	97/43	search intertainment
0/12	0/14	4/43	99/71	Response to reward
0/43	0/23	4/03	71/98	drive
0/38	0/55	4/08	71/80	Behavioral Inhibition System
0/51	0/10	4/31	91/88	Undeveloped mechanisms
0/23	0/88	4/29	72/19	developed mechanisms
0/72	7/05	4/20	45/73	Psychologically disturbed mechanisms
0/19	0/11	4/41	92/09	Assertiveness
0/59	0/13	90/82	779/59	High-risk behaviors

**Table 1:** Descriptive indicators of research variables

As the results of Kolmogorov-Smirnov test show, the significance level of all variables is greater than 0.05 and shows that the hypothesis of normal distribution of research variables is confirmed and therefore parametric tests such as Pearson correlation coefficient and multiple regression can be used. Pearson correlation method was used to examine the correlation between variables, the results of which are reported in Table 2.

Significance level	correlation coefficient	Statistical indicators of predictor	Criterion variable
0/007	0/99	Behavioral Activation System	
0/007	0/45	Entertainment Search	
0/007	0/91	Entertainment Search	
0/007	0/95	Driver	Risky Behaviors
0/007	-0/71	Behavioral inhibition system	
0/007	0/31	Undeveloped mechanisms	
0/007	-0/94	developed mechanisms	
0/007	0/41	Psychologically disturbed mechanisms	
0/007	-0/93	Assertiveness	

**Table 2:** Simple correlation coefficients between brain-behavioral systems, defense mechanisms and assertiveness with a tendency to risky behaviors

According to Table 2, the tendency to risky behaviors with the variables of behavioral activation system ( $r = 0.22$ ), entertainment search ( $r = 0.38$ ), reward response ( $r = 0.26$ ), drive ( $r = 0.28$ ), Undeveloped defense mechanisms ( $r = 0.47$ ), disturbed mechanisms ( $r = 0.37$ ) Positive correlation; And with behavioral inhibition system variables ( $r = -0.16$ ) and Developed defense mechanisms ( $r = -0.23$ ), assertiveness ( $r = -0.24$ ) have a negative correlation and are significant at the 0.01 level Multiple regression was used to investigate the hypothesis that the variables of brain-behavioral systems, defense mechanisms and assertiveness have the ability to predict skipping to high-risk behaviors. A summary of the multiple regression results is reported in Table 3

significance level	F	standard error estimation	Modified R2	R2	R	index
0/000	70/141	71/540	0/717	0/751	0/391	1

**Table 3:** Summary of the results of the explained variance value and significance of the model

According to Table 3, the multiple correlation coefficient of the variables of the brain-behavioral system, defense mechanisms and assertiveness is prone to high-risk behaviors (0.427). These three variables together explain 18.7% of the changes in the tendency to risky behaviors. Table 4 presents the results of analysis of variance of brain-behavioral system variables, defense mechanisms and assertiveness based on the criterion variable.

significant level	F	mean squares	degree of freedom	total squares	Model
		884/10	74	1947/13	Regression
0/007	30/89	74/34	439	3820/51	Remaining
			488	77599/87	Total

**Table 4.** Multivariate regression analysis of variance of predictor variables from criterion variable (tendency to high-risk behaviors)

According to the results of Table 4, F-statistic is significant for the tendency to high-risk behaviors ( $F = 40.52$ ) at the level of 0.001; Therefore, it can be concluded that predictor variables (brain-behavioral system, defense mechanisms and assertiveness) are able to predict the tendency to high-risk behaviors in this study. In Table 5, standardized and standardized coefficients of variable regression tendency to high-risk behaviors are reported.

Significance Level	T	Standardized Coefficients		Model
		Beta	Beta estimate standard error	
			B	
0/007	2/88		9/83	94/07
0/051	8/09	0/99	0/93	7/02
0/007	4/51	0/71	0/78	0/17
0/007	7/94	0/07	0/09	0/03
0/439	7/10	0/08	0/73	0/97
0/007	-8/17	-0/48	0/04	-0/71
0/007	4/13	0/90	0/01	0/43
0/007	-7/84	-0/01	0/01	-0/78
0/007	4/57	0/79	0/08	0/91
0/007	3/87	-0/72	0/09	-0/78

**Table 5:** Non-standardized and standardized coefficients of the prediction model of the tendency to high-risk behaviors

According to the results of Table 5, the effect of entertainment



search variables (Beta = 0.17), reward response (Beta = 0.01), immature mechanisms (Beta = 0.20), and psychoactive mechanisms (Beta = 0.12) at 001 level. / 0 is positive and significant on the tendency to high-risk behaviors and with their increase, the tendency to high-risk behaviors also increases and the effect is variable Behavior inhibition system (Beta = 0.35) and developed mechanisms (Beta = 0.06), assertiveness (Beta = 0.19) are negative and significant at the level of 0.001. High-risk behaviors increase. Other subscales in this table were not able to significantly predict the tendency to high-risk behaviors

## Discussion and conclusion

The aim of this study was to predict high-risk behaviors of adolescents based on brain-behavioral systems, defense mechanisms and assertiveness in male students in Tehran's third district. The findings showed that in search of entertainment, increasing the use of immature and mentally challenged defense mechanisms, increasing the response to reward predicts the tendency to high-risk behaviors, and on the other hand, reducing the use of behavioral inhibition systems and developed defense mechanisms. Express the ability to predict tendencies to behaviors It is high risk in students. This finding is in line with the results of Mozaffari et al. (2016) in which they showed that excitement, curiosity, hedonism, courage, lack of motivation has the ability to predict risky behaviors in adolescents.

Also, in a study by Oregon et al. (2019), they stated that assertiveness and compulsion to grow up earlier and enter adulthood were factors in causing high-risk behaviors; Studies by Jiavyatkol and Panitrak (2017) that identified the causes of adolescents' tendency to risky behaviors as emotional, social, and environmental factors; Bowens (2018) Cognition of cognitive factors such as defense mechanisms is also associated with a tendency to high-risk behaviors, Muslim et al. Sobhi Gharamaleki et al. (1399) who found Behavioral inhibition / activation systems are one of the variables affecting juvenile delinquency.

Explaining this finding, it should be said that the behavioral activation system controls and controls pleasant motivation, and pleasant motivation is associated with emotional states of euphoria. People with high-risk behaviors have a stronger behavioral activation system. In other words, the higher the levels of behavioral activation, the greater the tendency for high-risk behaviors in individuals. Increased activity in the behavioral activation system causes the person to actively and without thinking and based on the feeling of pleasure to search for high-risk behaviors and high excitement, as a very pleasant stimulus; Therefore, the more sensitive the behavioral activation system is, the more people are eager to engage in risky behaviors and strive to achieve them will increase (Muslim et al., 1397). Motivation to seek entertainment and new rewards puts people at risk for risky behaviors high levels of entertainment search components, and reward response in adolescents are associated with characteristics such as impulsivity, risk-taking, hedonism, innovation, and diversity; Traits that can make them prone to the occurrence and experience of risky behaviors (Simon et al., 2015).

In other words, the activity or high sensitivity of the behavioral activation system in the individual leads to actions that are more likely to lead to reward instead of negative consequences. Due to

this feature, this system seems to play an important role in the tendency to risky behaviors (Franken and Morris, 2016). In the present study, the relationship between drive component and high-risk behaviors was not significant. One possible explanation for this result is that the drive is not considered a common risk factor for all types of high-risk behaviors. It is possible that because the participants in the present study were in the age range that they have not yet become independent of their parents' living environment (for example, to study at university, work, marriage, etc.), as a result, parents have more control over them. And this can act as a deterrent to high-risk behaviors.

One of the characteristics of adolescence is selfishness. The defining characteristics of self-esteem include a sense of self-aggrandizement, importance, and a tendency to exaggerate personal talents and achievements. The concept of adolescent self-centeredness justifies most adolescents' tendency to view what adults see as daring risk-taking. This feature can lead to ignoring the negative consequences of behavior (Mozaffari et al., 1399). My inability to use effective defense mechanisms causes a person's perception of his or her and others' feelings, thoughts, and behaviors to be pathologically affected and inconsistent with existing objective reality. Based on this, it is possible that the dominant defense style of the person in such situations can determine the form and type of the disorder to some extent. For example, when a person's dominant defensive style requires the use of a change in the direction of impulse from self to subject (projection), or from subject to self (aggression to self or suicide), the person is prone to high-risk behaviors (Chapardar et al., 1399). Instead of using enhanced defense mechanisms (such as suppression and exaltation) that facilitate exposure to psychological changes and stressful environmental stimuli, the individual uses immature mechanisms (such as repression and retaliation) that threaten health, positive functioning, and social adjustment. he does. These mechanisms distort our perception of reality. Distortion of reality causes a person to keep his conflicting feelings and thoughts out of consciousness in various ways, and leads to maladaptive and risky behaviors (Shahata and Radman, 2017). Another explanation is Kronberg's view. He believes that the primary defense mechanisms, including omnipotence, projection, denial, devaluation, and fragmentation, determine the pathological level of the personality, and that the individual, based on unconscious pathological motives based on me, is indistinguishable from others and performs incoherently inconsistent behavior. Pays (Kernberg and Clarkin, 2010).

Assertiveness is also accompanied by cognitive changes that lead to specific cognitive interpretations of the social environment, self, others, and interactions with them, and in the event of a crisis or problem, expressing emotions freely by establishing an open connection. And sharing important and essential information through mutual trust and respect Cultivating and increasing resilience This sense of trust and respect causes a sense of worth and self-esteem in adolescents and they are less involved in high-risk behaviors and even if they commit these behaviors, they inform their parents and ask them for help. Adolescents who are more assertive show more prudent behaviors in the face of problems, but adolescents who are less assertive are more impulsive in emotional situations and less aware of the consequences of their behavior because there is a high relationship between excitement and risk-taking behavior. Farzin



et al., 1399).

The present study faced some limitations, which include the use of self-reporting tools to collect data. In such tools, people may not have enough self-control and not respond responsibly. However, we tried not to say that there is no right or wrong answer in the questionnaires and the best answer is the answer that indicates their real situation reduces the negative effects of this restriction. Another limitation is the non-use of completely random sampling method, and the limitation of the research community to post-secondary students in the third district of Tehran, which can not be generalized to students of other levels and geographical areas of the country. Findings of the present study that have important scientific implications in prevention planning and theorizing about the tendency to high-risk behaviors.

Therefore, due to the destructive effect of the tendency to high-risk behaviors among adolescents, it is suggested that educational sessions be held for adolescents, parents and educators. To be presented.

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