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Behavioral Economics and Anxiety as an Individual Personality Trait

Abstract. Introduction*. Scientific interest in behavioral economics has not yet fully addressed research into its impact on human health-preserving behavior. Personal anxiety plays an important role among the factors influencing human behavior.*

Purpose*. This study aims to establish the relationship between behavioral economics and personal anxiety in relation to health preservation. This will contribute to a better understanding of the emergence of unhealthy behavior, the self-assessment of such behavior, and the formation of mechanisms for creating and applying methods of influencing human behavior based on the principles of behavioral economics.*

Results*. The level of anxiety experienced by 376 medical university students was studied based on the results of Charles Spielberger's questionnaire, which covered topics such as their own behavior, healthy lifestyle and the influence of their social circle on health preservation. It was found that people smoke in an attempt to avoid situations that may cause anxiety. Anxious individuals prefer immediate relief (present bias) to long-term benefits in terms of health. People with high levels of anxiety resist change. If they smoke, they adopt the attitude of 'leaving everything as it is', and vice versa: 'I don't smoke' — 'I will not smoke'. Among non-smokers, 83.71±2.77% have not considered taking up smoking, which is a form of health-promoting behavior for individuals with high levels of personal anxiety. People with social anxiety are more likely to smoke if it is the norm in their social group. This reduces internal discomfort and allows them to "fit in" (88.89±4.28% of respondents in the group of smokers and "do not avoid" and "rather do not avoid" societies where people smoke, compared to 69.10±3.46% of respondents in the group of non-smokers, p<0.001).*

Conclusions*. Thus, the relationship between anxiety levels and smoking illustrates how a person's emotional state can shape behavioral patterns, which can be analyzed simultaneously through the lenses of behavioral economics, psychology and medicine. Behavioral economics recognises that people make irrational decisions precisely because of emotional, psychological and cognitive factors, with anxiety playing an important role.*

Keywords*: behavioral economics, mechanisms, anxiety, health preservation, survey, self-assessment, smoking.*

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Поведінкова економіка і тривожність як індивідуальна риса особистості

Анотація. Вступ. *Наукова зацікавленість до питань поведінкової економіки ще не в повній мірі стосується досліджень її впливу на здоров'язбережувальну поведінку людини. Важливе місце серед факторів впливу на людську поведінку займає особистісна тривожність людини.*

Мета*. Метою дослідження є встановлення взаємозв'язку поведінкової економіки та особистісної тривожності направленого на здоров'язбереження, що сприятиме зростанню розуміння аспектів основ виникнення шкідливої щодо здоров'я поведінки, самооцінки такої поведінки та формування механізмів створення та застосування методів впливу на поведінку людей на засадах принципів поведінкової економіки.*

Результати*. Досліджено рівень тривожності у 376 студентів медичного університету за результатами опитувальника Ч. Спілбергера та запитань, які стосувалися власної поведінки і здорового способу життя, а також оцінки впливу оточуючого кола на здоров'язбереження. Встановлено наступні взаємопов'язуючі фактори високого рівня особистісної тривожності та куріння: 1. завдяки курінню люди намагаються уникати ситуацій, які можуть викликати тривогу. Тривожні особи віддають перевагу швидкому полегшенню (present bias) перед довгостроковими вигодами (щодо здоров'я); 2. люди з високим рівнем тривожності не хочуть змін. Якщо куріння – їх звичка, вони залишають «все як є» і навпаки: «не курю» – «не буду курити». Серед осіб, які не курять 83,71±2,77% не задумувались над питанням почати курити, що є одним з елементів здоров'язбережувальної поведінки для осіб з високою особистісною тривожністю; 3. Люди з соціальною тривожністю частіше курять у колективі, де це норма. Це спосіб зменшити внутрішній дискомфорт — «бути як усі» (в групі курців – «не уникають» та «швидше не уникають» товариств де курять – 88,89±4,28% опитаних, у групі осіб, які не курять це – 69,10±3,46%, p<0,001).*

Висновки*. взаємозв'язок рівня тривожності та куріння – це приклад того, як емоційний стан людини формує поведінкові шаблони, які далі можуть бути проаналізовані через призму поведінкової економіки, психології й медицини одночасно. Поведінкова економіка визнає, що люди приймають рішення нераціонально саме через емоційні, психологічні й когнітивні фактори – серед яких тривожність займає важливе місце.*

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***Ключові слова**: поведінкова економіка, механізми, тривожність, здоров'язбереження, опитування, самооцінка, куріння.*

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Formulation of the problem. The study of economic relations, the subject of economics, has always been practical and involved constructing effective economic models to predict human economic behavior. However, based on the idea of humans as rational beings who seek to maximize utility, traditional economic concepts are unable to ensure an adequate level of predictability since the nature of economic actors is much more complex and cannot be reduced to the concept of rationality [1]. In the era of digital transformation and innovative changes, when useful decisions and the human factor in economic processes are becoming increasingly important, it is crucial to refine the economic mechanisms that determine the actual economic behavior of the population. This necessitates the application of methods of systemic influence on human economic behavior in the study of economic processes, which are formed in a person's consciousness during the development of their character and the process of learning and understanding the surrounding world.

Analysis of recent research and publications. The Although scientific interest in behavioural economics has grown, research into its impact on health-promoting behavior has not yet been fully addressed. Instead, research tends to focus on the psychological and social aspects of behavior, such as self-esteem as a regulator of self-respect [2], anxiety and its impact on decision-making [3, 4, 5, 6], and anxiety levels among workers in certain professions [7, 8]. However, the medical aspects of behavioral economics, which recognize that emotional, psychological and cognitive factors cause people to make decisions that are not always rational and which can consequently have a negative impact on health, have received little attention. An important factor influencing human behavior is personal anxiety.

Problems associated with anxiety should be considered in both personal and social contexts [9].

Research on anxiety is important for understanding the factors that influence mental health and overall well-being.

Formulation of research goals. Examining the relationship between behavioral economics and personal anxiety in the context of health preservation will contribute to a better understanding of the underlying aspects of the emergence of unhealthy habits, how people assess them, and how to create and apply methods based on behavioral economics principles to influence human behavior.

Research results. This study is based on the results of a survey of 376 students at the National Medical University in Lviv. The questionnaire consisted of two parts. The first part was designed to determine anxiety levels and consisted of 20 personal questions and 20 reactive questions. It was based on Charles Spielberger's questionnaire [11]. The second part contained 32 questions developed by the researchers themselves. These questions addressed personal behavior, a healthy lifestyle, and the impact of the surrounding environment on health preservation.

An assessment of anxiety levels in 376 students based on Spielberger's questionnaire showed that more than half of the respondents had high levels of both personal (61.70 ± 2.51%, 55.25 points) and reactive (64.63 ± 2.47%, 54.27 points) anxiety (Table 1). Among male students, high levels of personal anxiety were observed less frequently than high levels of reactive anxiety ($p<0.05$). Comparing by gender revealed that high levels of personal anxiety were observed 1.8 times more frequently in women than in men ($p < 0.001$). However, the frequency of high levels of reactive anxiety did not differ significantly by gender in both groups ($p > 0.05$).

Table 1 — **Levels of personal and reactive anxiety by percentage and total score**

		total	%	below 31 points – low level of anxiety	%	31-45 points – average level of anxiety	%	above 45 points – high level of anxiety	%%
Personal anxiety	total	376	100	14	3.72±0.98	130	34.58±2.45	232	61.70±2.51
	score	48.86		27.07		39.79		55.25	
	men	101	26.86±2.29	10	9.90±2.97	51	50.50±4.97	40	39.60±4.87*
	score	43.81		26.80		38.16		55.275	
	women	275	73.14±2.29	4	1.45±0.72	79	28.73±2.73	192	69.82±2.77*
	score	50.71		27.75		40.85		55.24	
Reactive anxiety	total	376	100	9	2.39±0.79	124	32.98±2.42	243	64.63±2.47
	score	48.76		28.67		39.43		54.27	
	men	101	26.86±2.29	4	3.96±1.94	43	42.57±4.92	54	53.47±4.96*
	score	45.82		28.50		38.35		53.06	
	women	275	73.14±2.29	5	1.82±0.81	81	29.45±2.75	189	68.73±2.80
	score	49.89		28.80		40.00		54.62	

**reliable difference (p<0.05) when comparing groups of individuals in whom a reliable difference in anxiety levels was found*

Source: compiled by the author based on the results of his own research

In this regard, we selected a group of students with high levels of personal anxiety to analyze how respondents answered questions about the behavioral aspects of health preservation. The psychological causes of anxiety emergence and formation in students are directly related to age, individual psychological characteristics, and social characteristics [12]. Anxiety reflects a stable character trait, and such individuals are more likely to avoid risky behaviors, even if they are more beneficial.

Of the 232 respondents who indicated high personal anxiety, 40 (17.24 ± 2.48%) were male and 192 (82.76 ± 2.48%) were female. Of these respondents, 70 (30.17%) were under 20 years old, and 162 (69.83%) were over 20 years old.

One of the most important questions regarding a healthy lifestyle concerned tobacco use. Out of 232 respondents, 178 (76.72%) did not smoke, while 54 (23.28%) used nicotine products.

When asked to select the risk factors for human health from a list of options, the respondents most often cited smoking (27.59%, p<0.005) and alcohol consumption (21.05%) as the most significant factors (Table 2). However, among the smokers, harmful working conditions (21.91% of 54 smokers) and alcohol consumption (20.99%) were ranked as the most negative factors affecting public health.

Table 2 **Distribution of health risk factors among respondents with high levels of personal anxiety**

HEALTH RISK FACTORS	Total % from 232	Do not smoke % from 178	Smoke % from 54
A. Smoking	**27.59±1.20***	**29.78±1.40**	20.37±2.24
B. Unhealthy diet	10.27±0.81	8.99±0.88	14.51±1.96
C. Alcohol consumption	21.05±1.09	21.07±1.25	20.99±2.26
D. Harmful working conditions	19.61±1.06	18.91±1.20	**21.91±2.30**
E. Drug use	18.10±1.03	17.88±1.17	18.83±2.17
F. Medication abuse	3.38±0.48	3.37±0.55	3.40±1.01

** reliable difference (p<0.005) in comparison with other health risk factors*

Source: compiled by the author based on the results of his own research

The fight against smoking remains key to improving national health [15]. It is also important for the younger generation. Passive or active smoking of conventional cigarettes or electronic products is dangerous to public health due to their cumulative effect, which will negatively impact the country's demographic situation [16, 17].

According to our survey, 16.29% of 178 non-smoking students said they had considered trying smoking, indicating that social image may influence them more than health risks. However, 83.71% (p<0.001) did not consider it, which is a health-saving behavior for people with high personal anxiety due to risk aversion.

This behavior is confirmed by their responses to the question of whether they would try smoking if offered a cigarette by a friend. A clear "no" was given by 54.49 ± 3.73%, and 26.97 ± 3.33% said "probably not." In total, 81.46±2.91% said they would not try smoking, and only 4.49±1.55% said they would definitely try it.

As for why students in this group do not smoke, 66.85% (p < 0.001) said "it would harm my health," indicating these individuals' protective, health-conscious behavior. 5.62% mentioned a lack of money for cigarettes, and 27.47% did not elaborate on their answer to this question.

When asked about their reasons for starting to smoke, 38.89% of the smokers indicated that stress was their main motive (Figure 1). Young people who experience anxiety or high stress due to studies, conflicts with parents, or emotional difficulties may perceive smoking as a "calming" agent.

Researchers S. Koziy-Bredeleva and T. Gutor point out that stress is often cited by smokers as a reason they smoke and cannot quit. According to the authors, 79.17 ± 4.14% of smokers of new tobacco products, such as nicotine-containing electronic cigarettes, indicated that emotional factors (e.g., bad mood, anxiety, and depression) motivate them to use these products. This percentage is comparable to that of smokers of conventional cigarettes who cite the same factor: 78.95±2.70%. In our survey, an even higher percentage of young people — 90.52% ± 1.92% — indicated that smoking helps them avoid situations that may cause anxiety. Anxious individuals perceive quitting smoking as a loss of peace of mind (loss aversion), preferring immediate relief (present bias) to long-term health benefits.

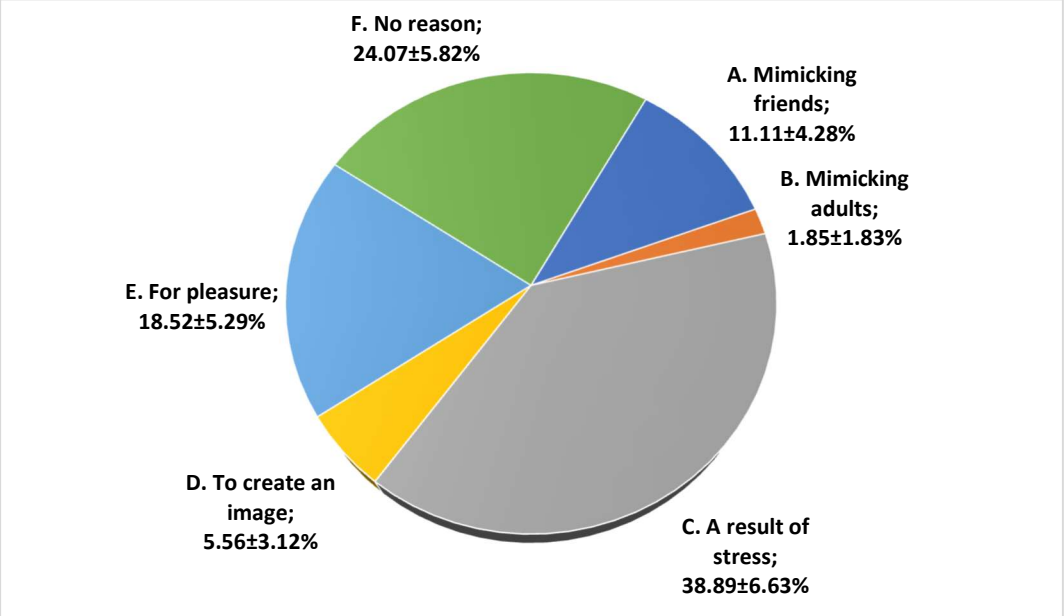

Figure 1 – **Distribution of respondents' motives for starting smoking**

Source: compiled by the author based on the results of his own research

Regarding the latest tobacco products, 66.81% of respondents in our study who reported high levels of personal anxiety believed that electronic cigarettes and heated tobacco products are no less harmful to health than traditional cigarettes, despite advertising. Meanwhile, 27.59±2.93% of respondents said that advertising influences their purchasing intentions (in this case, for cigarettes or tobacco products). However, a comparison of responses from smokers regarding advertising's influence showed that 79.63±5.48% do not notice its effect. Among respondents with high anxiety levels who do not smoke, advertising does not influence the intention to make a purchase in 70.22±3.43% of cases ($p>0.05$). In conclusion, people with high anxiety levels resist change. If they smoke, they leave "everything as it is," and vice versa: "I don't smoke" – "I will not smoke."

As O. Omelchuk notes, people with nicotine addiction experience a lack of human warmth in interpersonal relationships. The motives for smoking are associated with the desire for social recognition and attention, as well as the desire to establish informal, trusting relationships. These individuals are characterized by an insufficient satisfaction of their communicative needs, a lack of psychological closeness, a low level of self-determination, and a lack of genuine motivation to quit smoking. These people define smoking as a source of pleasure during leisure time.

The responses from students surveyed about their behavior around people who smoke or consume alcohol were distributed as follows: among smokers, 88.89±4.28% responded that they do not or rather do not avoid such company. Among non-smokers, 30.90±3.46% responded that they avoid such company ($p<0.001$). People with social anxiety are more likely to smoke if it is the norm in a group. Smoking in a group where it is the norm is a way to reduce internal discomfort and "be like everyone else."

A study on the influence of family on healthy lifestyle behaviors showed that, among non-smokers, 51.12±3.75% of family members did not have harmful habits. Among respondents who smoke, there were 1.45 times fewer individuals with such habits (35.19 ± 6.50%; $p < 0.05$). Respondents in the smoking group indicated that 48.15±6.80% of their family members smoke. These results confirm that families where smoking is common tend to have more smokers, including among young family members.

When asked about the effectiveness of anti-smoking measures, it was found that promoting a healthy lifestyle would influence 74.72% ± 3.26% of nonsmokers and 51.86% ± 6.80% of smokers ($p < 0.005$). A group of smokers indicated that an increase in the cost of cigarettes would not affect their consumption (70.37±6.21%).

Thus, the relationship between personal anxiety and smoking exemplifies how a person's emotional state influences their behavior, which can be analyzed through behavioral economics, psychology, and medicine. Behavioral economics recognizes that people make irrational decisions due to emotional, psychological, and cognitive factors, with anxiety being one important factor.

Conclusions. The issue of health preservation, anxiety, and economic behavior among young people is extremely relevant and is evidenced by the following: anxiety motivates people to start smoking, and people with high levels of personal anxiety often start smoking. Nicotine provides short-term relief from anxiety, and smoking becomes a "stress-relief ritual" as well as a strategy for self-regulation and reducing social tension. For young

people, this is the feeling of "fitting in" with their surroundings.

Behavioral economics explains this.

1. Present bias: People prefer immediate relief over long-term benefits. For example, smoking provides immediate relief and reinforces the habit.

2. Loss aversion: Anxious individuals perceive quitting smoking as losing a source of comfort rather than gaining health.

3. Inertia/default choice: People with high anxiety levels do not want change. If smoking is their habit, they will not change it.

4. Social norms and peer pressure: People with social anxiety are more likely to smoke when it is the norm in their social group. Smoking is a way for them to reduce internal discomfort and "be like everyone else."

Further research involves developing methods based on the principles of behavioral economics to influence people's health-saving behavior.

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