

## Population Study of Fears in Two Generations of Ukrainians

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### ABSTRACT

**Aim:** Fear is an ancient natural reaction of a human being to a threat and it is also an adaptive feature. Obsessive fear can transfer into phobias, which lead to a clinical problem. In spite of many studies done on fear, many questions are yet not clarified. In the former Soviet Union, research on human behaviour traits was mostly tabooed. The current research will fill some gaps on the 'behavioural map' of Ukraine in relationship to fear distributions in two successive generations of residents of Ukraine. **Subjects and Methods:** Eight hundred and sixty-seven residents of Ukraine, predominantly residents of Kharkov and Kharkov region participated in the study. All participants were distributed into groups of younger and older generations. Twenty-four emotional states of fear have been studied by Ivleva-Shcherbatyh questionnaire, developed and validated in Slavs samples. **Results:** The population analysis of 24 types of fear has shown that sex differences were found mostly among members of the younger generation. The average value of sex differences from the amplitude trait of variation made up approximately 20%. More significant differences between members of different generations have been found in females. The age dynamics of fears within each generation has been detected. **Conclusions:** The population analysis of fears in Ukraine has demonstrated that the strongest fears independently of the generation were related to diseases of relatives and to problems in the case of diseases of relatives.

**Key words:** Fear, generations, population, sex dimorphism, Ukraine

### INTRODUCTION

Fear is an ancient natural reaction of a human being to a threat and it is also an adaptive feature. There are different approaches to fear classifications. One of them is based on a classification according to an object or a story of fear. This approach is not perfect because there are a lot of fear sources. Obsessive fear can transfer into phobias, which lead to a clinical problem.<sup>[1]</sup> Phobias are

found to be either symptom of psychical and mental disorders or a separate behavioural deviation. According to a number of obsessive fear objects, phobias can be divided into monophobias (one source of fear) and polyphobias (several sources of fear). A polarity is typical for some kinds of fear. For example, such fears as closed space fear (claustrophobia) and open space fear (agoraphobia) are widely spread among population. It is believed that in some cases the transformation of fear into phobia can occur under the influence of individual's environmental conditions. For example, a dog or a snake's bite can turn the fear of animals into zoophobia, and falling into the mine or being stuck in an elevator may promote claustrophobia development. Fears connected with professional activities are of great interest, for instance, actors can develop fear of going on stage, lecturers can develop fear of speaking in public and pathologists can develop fear of the dead people. Some

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kinds of fear can be enforced under certain circumstances after they were initiated by different events, for instance, during epidemic of plague or tuberculosis, the fear of these diseases can develop into hypertrophied form. After the tragedies in Hiroshima, Nagasaki and Chernobyl, the fear of ionizing radiation consequences (radiophobia) increased, nevertheless, until the middle of the twentieth century, the study of their own body using X-rays was just a fun for many people. A certain part of population meets the fear of inexplicable and mystical phenomena (“Flying Dutchman”, “black holes”), psychological influence (hypnosis, extrasensory intervention), innovations (genetically modified organisms and computer technologies), etc.

In some cases, the intensity of fear can go beyond a normal range (often in the strengthening side). Strong intensity of fear to a stimulus of inadequate strength is a component of mental disorders, particularly panic attacks, phobias and obsessive-compulsive syndrome. The prevalence of such disorders in the world population is relatively high,<sup>[2]</sup> weakening the people’s health and quality of life,<sup>[3]</sup> and it is a serious medical problem.<sup>[4]</sup> In some cases, fear can cause cardiac arrest and death, and moreover, it can lead to thrombus formation and increase the risk of thrombosis.

The fear of potential dangerous objects or phenomena, such as spiders, snakes and heights, are evolutionally the most pronounced in humans.<sup>[5]</sup> Objects of pervasive fears are quickly and accurately detected by a person who has high sense of fear for them. In situations where such objects represent a real threat, the advantage of people who quickly identify them is obvious. It has been experimentally shown that people more quickly find the hidden objects (snakes and spiders) on the display of a monitor among other objects that do not pose a threat (flowers and mushrooms). With this, the effectiveness of searching for dangerous objects does not depend on their position on the screen and the number of distraction techniques. Scientists suggest that people with a high sense of fear find all dangerous objects almost simultaneously and concurrently, while safe objects they find serially; one at a time.<sup>[4]</sup>

Besides being adaptive, fear can be irrational and is widely spread among the population. It has been shown that their (fear) high intensity can be a barrier for certain medical and diagnostic procedures. Particularly, a person who has a high sense of fear for closed space can pass tomographic examination with great difficulty if necessary.<sup>[6]</sup> Individuals who have phobia for blood and injections are included in the risk group of late somatic disease detection.<sup>[7]</sup> The frequency of animal fear among western populations ranges from 3 to 12% and is gender-associated.<sup>[8]</sup>

Acrophobia is the fear of heights according to one of the classifications of phobia. It is included in the group of specific phobias which is associated with space and movement. It has been shown that acrophobia is weakly related to previous traumatic events. In one study, the acrophobia relationship in the age of 11 and 18 years old to a childhood at the age range from 5 to 9 years has not been found.<sup>[9]</sup> However, an important role in this specific fear development may play a vestibular apparatus functioning, in particular, susceptibility to motion, sickness and sea-sickness. Acrophobia can be dangerous, humans with excessive heights fear may have panic attacks even at low heights and be too excited to come down independently without thinking of the high risk to be injured. Previously, acrophobia, like other kinds of fear, was considered as a consequence of the fear of falling. More recent investigations did not confirm this and scientists began to incline to the opinion that, along with the fear of loud noises, the fear of falling is one of the most ancient and unassociated fears, i. e., unreasonable at a certain period of time.<sup>[10]</sup>

In spite of adaptive fear significance as a mechanism for self-preservation, modern people instinctively compare real chances of these events with the necessity of prolonged support of such fears, which can negatively reflect on mental conditions. For example, according to statistics in the US, in the beginning of the twenty-first century, the mortality risk due to the following reasons made up: Automobile accident — 1/700, murder by firearms — 1/10000, falling of an aged individual from small heights at home — 1/20000, poisoning — 1/40000, pedestrian death at the crossing—1/60000, cardiac diseases — 1/400, cancer — 1/600, stroke — 1/2000, flue/pneumonia — 1/3000.<sup>[11]</sup>

Nonetheless, in spite of many studies done on fear, many questions are yet not clarified. In the former Soviet Union, research on human behaviour traits was mostly tabooed. Ukraine is a population with a unique history and cultural background and with a specific multiethnic composition.<sup>[12-15]</sup> Until 1991, Ukraine was part of the former Soviet Union. The current research will fill some gaps on the ‘behavioural map’ of Ukraine in relationship with fear distributions in two successive generations of residents of Ukraine, and will lay the ground for further heritability estimation on the basis of traits of population distribution and characteristics.

## MATERIALS AND METHODS

### Subjects

Eight hundred and sixty-seven residents of Ukraine, predominantly residents of Kharkov and Kharkov region participated in the study during 2004-2007. All

participants were distributed into groups of younger and older generations. The age of individuals of the younger generation was up to 35 years. The youngest one in this group was 14 years old. Individuals of the older generations were aged 36 and more. The oldest one in this group was 72 years old. This subgrouping into generations was performed on the ground of the general environment of people who were raised in (the former USSR with its 'strict political regimen' and an independent Ukraine with 'democracy onset'). All participants gave conscious information for the questionnaire. Information collection was done taking into consideration ethic requirements. Due to the questionnaires, social and demographic information was received.

**Psychological tools**

Twenty-four emotional states of fear have been studied by Ivleva-Shcherbatyh questionnaire, which was developed and validated by Russian psychologists in Slavs samples.<sup>[4]</sup> The examined fear sources were as follows: Animals, darkness, psychic disorders development, disease of relatives, street attack, communication with authorities, complications in personal life, making responsible decisions, old age, pain, poverty, uncertainty about future, exam, war, death, closed space, height, depth, adverse changes in the case of relatives' disease, the possibility of disease,

sexual dysfunction, suicide, speaking in public, the possibility of aggressive behaviour with relatives. Each fear was estimated on a point scale, ranging from 1 to 10.

**Statistical analysis**

Statistical analysis in large groups ( $n > 30$ ) has been performed by parametric methods. A relationship between characteristics has been assessed with Spearman correlation coefficient. Conclusion as to statistic hypothesis has been conducted on the significance level  $P \leq 0.05$ .<sup>[16]</sup> Database was formed in Microsoft Excel program. The calculations have been made by Statistics 6.0 software program.

**RESULTS AND DISCUSSION**

In the population sample under study, females got more points practically in all types of situational fears (fear of animals, darkness, closed spaces, height and depth) and in some social phobias [fear of communication with the authorities, uncertainty of future, examination and public speech, Table 1].

From a biological point of view, any fear may have ancient evolutionary roots. For example, socialized xenophobia is a natural reaction of fear to strangers; 'social' fear of the authorities is a biological fear

**Table 1: Population distribution of fears**

Fears	Young males, $n = 257$		Young females $n = 475$		Old males, $n = 34$		Old females, $n = 101$	
	$\bar{x} \pm SD$	95 CI	$\bar{x} \pm SD$	95 CI	$\bar{x} \pm SD$	95 CI	$\bar{x} \pm SD$	95 CI
Animals	3.7±2.6	3.3-4.1	5.3±3.0	5.1-5.5	3.4±2.4	2.6-4.2	5.8±3.2	5.2-6.4
Darkness	2.1±1.7	1.9-2.3	3.2±2.5	3-3.4	1.7±1.3	1.3-2.1	3.2±2.6	2.6-3.8
Mental disorders development	2.9±2.3	2.7-3.1	3.6±2.7	3.4-3.8	2.9±2.4	2.1-3.7	3.9±2.8	3.3-4.5
Diseases of relatives	6.4±2.9	6-6.8	7.6±2.6	7.4-7.8	7.1±2.8	6.1-8.1	7.8±2.6	7.2-8.4
Street violence	3.9±2.6	3.5-4.3	5.4±3.0	5.2-5.6	4.1±2.4	3.3-4.9	5.1±3.1	4.5-5.7
Communication with an authority	3.7±2.4	3.5-3.9	5.1±2.8	4.9-5.3	3.0±2.0	2.4-3.6	4.3±2.7	3.7-4.9
Problems in a private life	4.8±2.8	4.4-5.2	5.8±3.1	5.6-6	4.5±2.6	3.7-5.3	4.9±3.2	4.3-5.5
Responsible decision making	4.7±2.6	4.3-5.1	5.2±2.7	5-5.4	4.8±2.7	3.8-5.8	4.8±2.6	4.2-5.4
Ageing	2.8±2.2	2.6-3	3.8±2.9	3.6-4	4.0±3.3	2.8-5.2	4.0±2.9	3.4-4.6
Pain	2.8±2.2	2.6-3	3.3±2.4	3.1-3.5	4.0±2.8	3-5	3.7±2.6	3.1-4.3
Poverty	4.1±2.6	3.7-4.5	5.2±2.9	5-5.4	4.8±3.0	3.8-5.8	5.2±2.7	4.6-5.8
Future uncertainty	3.8±2.7	3.4-4.2	5.0±3.0	4.8-5.2	3.6±2.7	2.6-4.6	4.8±2.9	4.2-5.4
Exam	4.9±2.5	4.5-5.3	6.6±2.7	6.4-6.8	4.2±1.9	3.6-4.8	5.2±2.7	4.6-5.8
War	3.2±2.5	2.8-3.6	4.8±3.1	4.6-5	4.5±3.3	3.3-5.7	5.1±3.2	4.5-5.7
Death	2.4±2.0	2.2-2.6	3.2±2.5	3-3.4	2.8±2.1	2-3.6	3.3±2.5	2.7-3.9
Confined spaces	1.8±1.8	1.6-2	2.5±2.4	2.3-2.7	1.6±1.0	1.2-2	3.2±3.0	2.6-3.8
Height	3.3±2.5	2.9-3.7	4.1±3.0	3.9-4.3	3.5±2.7	2.5-4.5	4.8±3.0	4.2-5.4
Depth	3.2±2.5	2.8-3.6	4.4±3.1	4.2-4.6	3.4±2.4	2.6-4.2	5.9±3.2	5.3-6.5
Problems in the case of diseases of relatives	4.8±2.8	4.4-5.2	6.4±3.0	6.2-6.6	5.6±3.1	4.6-6.6	6.4±3.0	5.8-7
Disease possibility	2.9±2.2	2.7-3.1	4.1±2.9	3.9-4.3	3.7±2.7	2.7-4.7	4.3±3.0	3.7-4.9
Sex function disorders	2.9±2.4	2.5-3.3	3.7±2.8	3.5-3.9	3.1±2.0	2.5-3.7	2.8±2.4	2.4-3.2
Suicide commitment	2.0±1.9	1.8-2.2	2.4±2.4	2.2-2.6	1.7±1.5	1.1-2.3	1.8±2.0	1.4-2.2
Public speech	4.2±2.6	3.8-4.6	5.0±2.7	4.8-5.2	3.0±2.0	2.4-3.6	4.2±2.5	3.8-4.6
Aggression possibility to relatives	3.2±2.7	2.8-3.6	2.9±2.7	2.7-3.1	3.2±3.1	2.2-4.2	2.5±2.3	2.1-2.9

$n$  – number of subjects,  $\bar{x}$  = arithmetic mean, SD = standard deviation, 95 CI = 95% confidence interval

typical for many species of living organisms. It is just the fear of dominant individual and the possibility of being forced out of the social ladder. 'Social' fear of an exam associated with a possible negative assessment of an individual is related to a fear of rejection and staying without group support. 'Social' fear of poverty is associated with a reduced chance of survival awareness, bringing up the progeny and consequently giving genes to next generation.<sup>[17]</sup> Recently, there were fears unknown to our ancestors, for example, the fear of planes, the consequences of a plastic surgery, genetically modified organisms, cloning, anaesthesia, acquired immune deficiency syndrome (AIDS), cancer and unemployment.<sup>[18]</sup> In western populations, considerable attention is paid to the study of social phobias, the growth rate of which is supposed to be due to the advanced technologies, providing the possibility of no direct contact of people with each other (the development of the Internet, ATMs, filling machines, distance form of learning, etc.).<sup>[19]</sup> Now the main role in fear development may play mass media, especially when a person gets too little or too much information, as well as thrillers, mystic films, 'the room of fear' attractions, etc. We can suppose that in our research sex dimorphism in all these types of fear or their ancient analogues have evolutionary roots. Traditionally, females had less direct contacts with mentioned sources of fear, so they might have lesser adaptation to them. Females with initial greater fear degree to certain objects (predators, unknown people and others) more probably could avoid harm from the contact with them, and consequently had more chances to survive, leave offspring and pass on these adaptive genes of higher fear. On the other hand, the payment for these genes is increased by susceptibility to series of diseases associated with fear.

Comparing the intensity of fears in younger and older generation participants, it has been found that the most differences were recorded in females. Some differences were detected in both sexes simultaneously.

The results of correlation analysis between age and fears separately in each generation are shown in Table 2. As it follows from the data obtained, a small age dynamics was detected almost in all kinds of fear both in older and younger generation individuals. In some cases, this dynamics has sex specificity; in others, it has different direction, depending on the accessories for generation. All the correlation coefficients are not high even in the case of their significance. The most differences were recorded in females of younger generation. Fear as a rule, 'stabilize' in older generation. Some correlation coefficients are explainable and logical. For example with age, the fear of ageing increases in older females. The other tendencies require further analysis.

**Table 2: Correlation coefficients between age and fears**

Fears	Young males	Young females	Old males	Old females
Animals	0.04	-0.05	-0.08	0.16
Darkness	-0.03	-0.06	0.13	0.14
Mental disorders development	-0.09	-0.14**	0.53***	0.17
Diseases of relatives	-0.03	-0.08	0.20	0.13
Street violence	-0.09	-0.23***	0.13	0.09
Communication with an authority	0.01	0.11*	0.26	0.04
Problems in a private life	-0.05	-0.08	-0.06	-0.14
Responsible decision making	0.01	-0.04	0.23	-0.02
Ageing	-0.10	-0.02	0.14	0.25*
Pain	-0.15*	-0.13**	0.20	0.14
Poverty	-0.03	-0.08	0.14	0.02
Future uncertainty	-0.07	-0.10*	0.29	0.06
Exam	-0.10	-0.10*	0.22	-0.02
War	-0.07	-0.09*	0.19	0.05
Death	-0.16**	-0.12*	0.09	0.16
Confined spaces	-0.14*	-0.07	0.20	0.11
Height	-0.08	-0.03	-0.09	0.08
Depth	-0.11	0.01	-0.22	0.11
Problems in the case of diseases of relatives	-0.09	-0.07	0.16	0.15
Disease possibility	0.002	-0.14**	0.15	0.04
Sex function disorders	-0.004	-0.12**	0.21	-0.08
Suicide commitment	-0.02	-0.13**	0.21	0.06
Public speech	-0.04	0.03	0.21	0.01
Aggression possibility to relatives	-0.16*	-0.11*	0.34*	-0.11

Spearman correlation coefficients were calculated, \*, \*\* and \*\*\* – differences are significant at the level  $P < 0.05$ , 0.01 and 0.001, respectively

Some kinds of fear with differences between two generations were found in males and females. One kind of fear [the fear of speaking in public, Table 1] was part of them. It should be mentioned that univalent conclusions about the different causes between representatives of different generations are difficult to make. The resulting difference can be either a consequence of the cohort effect (as representatives of two generations were brought up in different environment), or a consequence of development variation. For more correct conclusions, longitudinal investigations are necessary to be conducted with the same people in certain periods of time. However, due to the complexity of this type of investigation and the necessity of registering the generation, we limited ourselves to the age dynamics study within each generation separately.

In the present research, young males have higher fear of speaking in public than older males ( $\bar{x} = 4.2$  vs.  $\bar{x} = 3.0$ ,  $P < 0.01$ ). A possible explanation for this situation can be environmental effect, promoting the reduction of this fear as far as they gain life experience. The same situation is typical for younger and older females, whose fear intensity comprises 5.0 and 4.2 points ( $P < 0.01$ ), respectively.

According to three types of fear [fear of ageing, pain and war, Table 1], the differences between younger and older males have been detected. More expressed fears in older males, compared with younger males, may have the following explanations. The fear of ageing and pain, apparently, are the consequence of social exposure and prevalence of most diseases in older age group. Although, it is no less true for females, but the 'aggravating' in improving the circumstances of fear for males may be their lower life span than females. Besides that, ageing is often associated with the end of a career, which is more seriously perceived by males, and it is also a risk factor for cardiovascular diseases, etc. Also, the fear of the physical signs of aging in females' appearance may occur much earlier, as these changes are associated with a reproductive value decreasing. Apparently, females may become more adaptive to this inevitable process. The fear of war in older males may be the result of the cohort effect, because either they themselves or their relatives took part in wars (World War II, wars in Afghanistan, Nagorno-Karabakh, Chechnya and other 'hot' spots). Because of the absence of such experience in younger males' generation, the fear of war is less pronounced.

Fear, associated with movement in the space (heights, depth and closed spaces) is low in younger females' generation. At the same time the older females have low 'social' fears (communication with authorities and exam). The same tendency is typical for fears related to personal and intimate sphere (problems in a private life and sexual dysfunction). Evidently, a large financial independence and reproductive realization may partially reduce these fears with age. In addition, older females have less fear of suicide compared with younger females ( $\bar{x} = 2.4$  vs.  $\bar{x} = 1.8$ ,  $P < 0.01$ ).

The most common type of fear which is found among males and females of both generations is the fear of relatives' disease. Because of this, maximum values are often observed in both sexes. The least fear in the sample under study was recorded in connection with darkness, closed spaces and suicide. The lower values in all kinds of fear were recorded in males than in females. In terms of fear of aggression towards relatives, there was no difference among sex or age. In older generation, sex differences have been recorded in nine types of fear, particularly, five native (animals, darkness, closed spaces, heights and depths) and four more 'social' (communication with authorities, uncertainty about the future, exam and speaking in public). The differences between individuals of different generations in regard to fear conditions are more typical for females, although they are less common than sex differences, especially among males [Table 1].

## CONCLUSIONS

The population analysis of 24 types of fear has shown that sex differences were found mostly among members of the younger generation. The average value of sex differences from the amplitude trait of variation made up approximately 20%. More significant differences between members of different generations have been found in females. The age dynamics of fears within each generation has been detected.

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