EXPLORING FEAR: HOW STUDENT CHARACTERISTICS INFLUENCE RESPONSES TO FEAR-ELICITING OBJECTS AND SITUATIONS

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Abstract

The study aims to explore the intensity of fears associated with various objects and their relationships with specific individual variables. It involved a convenience sample of 328 university students with an average age of 20.9 years (SD = 2.24), of whom 224 (68.3%) were female. Seventy percent of the participants were enrolled in their first or second year of study. A shortened and slightly modified version of the Temple Fear Survey Inventory was administered, which included 35 fear-inducing objects rated on a 5-point Likert-type scale. Results indicate a statistically significant higher level of overall fear in females. Among the 35 objects or situations, females exhibited statistically significantly stronger fears than males for 30 items. The top three fears for females were not being successful, being physically assaulted, and suffocating, while males ranked not being successful, their social media accounts being hacked, and suffocating as their top fears. Interestingly, the fear of social media account hacking was ranked among the top fears for males but was near the bottom for females, with this fear being more pronounced among Turkish participants compared to their Bosnian counterparts. Additionally, psychology students showed a stronger fear of being alone and of looking foolish compared to non-psychology students. Notably, both fear of death and fear of one's social media account being hacked loaded onto the same factor, interpreted as "annihilation." These findings are discussed in the context of contemporary theories of fear, highlighting their implications for understanding fear responses among university students.

Keywords: fear, fear of hacking, students, gender differences, cultural differences

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Introduction

Fear, as one of the basic, core emotions, according to the APA Dictionary of Psychology (2018), has been a constant topic of interest due to its universality and cross-cultural recognition. Defined as “a basic, intense emotion aroused by the detection of imminent threat, involving an immediate alarm reaction that mobilizes the organism by triggering a set of physiological changes" (APA, 2018), fear continues to play an important role in everyday life as a behaviour modifier. Consequently, the objects of fear and its intensity as related to certain subject characteristics may provide an insight into not only the dynamics of fear but also the current social contexts that serve as its breeding ground. The present study aims to examine differences in the fear experience within a heterogeneous group of students, both to gain theoretical insights and to inform practical implications. Exploration of fear-related variables may assist institutions in implementing available resources to provide students with effective psychological support and training, thereby stimulating university-level initiatives to engage personnel expertise to promote students' well-being. Such improvements can be achieved by addressing the modifiable sources of commonly experienced fears, such as those we might classify as social ones.

The psychology of fear

While fear can be highly beneficial in situations involving genuine threats, it can also become dysfunctional, manifesting as anxiety when the threat is ambiguous or unresolved. Understanding the nature of fear, its components, and its potential to shift into anxiety is crucial for addressing maladaptive responses that can hinder daily functioning. Therefore, fear and anxiety, though closely related, are often distinguished in psychological literature. Fear typically involves a clear, external threat and prompts an immediate, adaptive response, while anxiety arises from a sense of impending danger without a clear or direct threat (Ohman, 1993). Some theories propose that anxiety represents unresolved fear (Power & Dalgleish, 2016), manifesting as generalized unease.

Theories of fear

Theories on the origins of fear range from psychodynamic to evolutionary perspectives, each providing insight into why certain fears emerge. The psychodynamic view suggests that fear stems from unresolved childhood conflicts (Freud, 1916). Various stimuli that symbolically relate to these conflicts may trigger fearful response. The universal foundation of fear is the infant's feelings of powerlessness, vulnerability, and separation from the main caregiver, which in turn results in the development of basic fears of abandonment and existential danger. This primal fear serves as a foundation for various types of anxiety and fear that people encounter throughout their lives (Klein, 1948), manifested in fear of fragmentation and disintegration (Winnicott, 1974), existential terror (Becker, 1973), meaninglessness and isolation (Yalom, 1980).

The evolutionary approach posits that fear evolved as a protective mechanism against environmental dangers (Ohman & Mineka, 2001), thus increasing the likelihood of survival and reproductive success. Fear is, therefore, an essential survival mechanism that drives people to stay away from the things that could hurt them. Cognitive-behavioural and social learning theories emphasize that fear is learned through personal experience or social reinforcement. Fear appraisal and interpretation, as well as classical and operant conditioning are responsible for the development of fear (Mineka & Zinbarg, 2006). Similarly, social learning theory also explains fear as a result of learning. However, it emphasizes the role of modelling, observational learning and social reinforcement, both in the process of fear acquisition and its expression (Bandura, 1977). Individuals can learn fear responses by observing others' experiences with fear-inducing stimuli and by receiving social reinforcement for fear-related behaviours.

Fear-eliciting objects

All of these theories shed light on the complex nature of fear by utilizing principles from evolutionary psychology, cognitive science, and psychodynamic theory explain how fear works and what it means for people's well-being. In terms of a wide array of fear-eliciting objects, each theory provides unique emphasis. For example, the psychodynamic perspective predicts that fear-eliciting objects may include symbols associated with primal fears, such as

darkness, abandonment, authority figures, or close relationships. Essentially, repressed feelings are displaced to an object or a situation associated with them (Freud, 1916). From an evolutionary perspective, fear-eliciting objects may include predators (e.g., snakes, spiders, large animals), heights, loud noises (indicative of danger), and potentially harmful substances. The cognitive-behavioural perspective, on the other hand, recognizes stimuli associated with actual experiences involving phobic objects (e.g., needles, flying), and situations perceived as uncontrollable as fear-eliciting. Social learning theory focuses more on those objects or situations that are commonly feared within a group or culture or that are socially reinforced in a particular context. An interesting insight into the dynamics of fear can be gained by examining common fear triggers. Agras et al. (1969) found that snakes were the most common source of extreme fear in a random sample, followed by heights, injury, illness, public transportation, and public places. Costello (1982) studied women and found that animal phobias, enclosed spaces, tunnels, and heights were most common, with social fears, mutilation fears, and separation fears also prevalent. Women are generally more likely to report phobias, especially simple ones (Rachman, 2013). Rutter (1984) noted that childhood fears, like fear of the dark, are common but decrease with age (Gullone, 2000).

Certain fears, like those of snakes, are more widespread, suggesting a biological "predisposition" to fear things that posed a danger to our ancestors (Ohman & Mineka, 2001). However, modern fears, such as driving at high speeds, are less common despite being hazardous (Rachman, 2013). This asymmetry indicates that our fears are adaptive, evolving to address new threats. In the modern world, new sources of fear, such as technological threats, are becoming more prominent, prompting us to explore these modern fears as well and to compare them to traditional, physical fears. Therefore, one of this study’s goals is to investigate the intensity of fear of technological threats, such as hacking. According to our knowledge, no studies have yet compared the intensity of this new fear with traditional ones using the survey method.

The current study

This study aims to explore the complexities of fear by investigating the intensity of fears associated with various objects and their relationships with specific individual variables. By

examining the prevalence and strength of distinct fears among students from diverse backgrounds, we hope to deepen our understanding of the fear experience itself. This insight can inform the development of enhanced practices and emotion regulation intervention programs within educational institutions. Such an endeavour is particularly crucial in light of emerging fears related to technological advancements, such as concerns over digital privacy. As a primal response, fear may provide valuable insights into how we are evolving as a species and adapting to new challenges. Ultimately, the findings of this preliminary study may raise awareness of fear-related issues and highlight their potential impact on mental health and overall effectiveness within educational environments.

Hypotheses

Based on theoretical assumptions and previous empirical studies, the following hypotheses were made:

H_1 Females will display statistically significantly more intense overall fear compared to males.

H_2 Females will display statistically significantly more intense fear from all specific objects/situations.

H_3 There will be no statistically significant differences among students of different cultural backgrounds in the intensity of reported fears.

H_4 There will be a statistically significant negative correlation between age and the intensity of reported fears.

H_5 There will be no statistically significant difference in the intensity of reported fears between psychology and non-psychology students.

H_6 The fear of having one's social media account hacked will be statistically significantly more intense than other common fears.

H_7 Factor analysis of the fear questionnaire will show an interpretable solution that includes the following clusters: fears of small animals, social fears, fears of failure, fears of death and isolation, and fears of physical harm.

Methodology

Sample

For the purpose of this study, a convenient sample consisting of 328 students of an international university in Bosnia and Herzegovina (68.3% female) was used. The average age of the participants was 20.9 years (SD=2.24). In total, 70% of students were enrolled in their first or second study year at twenty different departments from the field of engineering and natural sciences, arts and social sciences, business and administration, law, and education. In addition, 76.8% of students were of Bosnian nationality, while the rest were Turkish (19.8%) or other (2.7%).

Instrument

Participants completed a shortened and slightly modified version of the Fear Survey Schedule (FSS) (Braun & Reynolds, 1969), along with the basic socio-demographic questionnaire (including sex, age, nationality, study program, and study year). The original 100-item scale was reduced to 35 items, enlisting common fear-eliciting objects and situations (as in Dess, 2010). Due to the vagueness assessed during the preliminary test of the instrument, the item *"Being with a member of the opposite sex*" was replaced with the item "*Your social media account being hacked"* broadening the scope of the existing scale and enabling the inclusion of at least one item serving as a proxy for newly emerging cyber-related fears and their consequent comparison to other common fears. Participants marked the extent to which they fear the enlisted objects or situations on a 5-point Likert-type scale: 1 corresponding to "none," 2 - "some," 3 - "much," 4 - "very much," and 5 described as "terrified."

Given statements could serve as rough indicators of phobias. However, to preserve brevity, we did not collect any additional information about the impact of the fear on everyday functioning. The reliability of the initial instrument, measured as Cronbach's Alpha, was 0.61[1]. More precisely, Cronbach's Alpha in the female subsample was 0.71, and 0.44 in males.

[1] Considering the poor reliability of the initial instrument, a reduced version of the Fear Survey with 0.89 Cronbach Alpha was used as a measure of the overall fear, based on the subsequent item-total analysis and factor analysis presented in Table 4.

Procedure

The data were collected both through hard copy questionnaires and online Google Forms from October 2023 to February 2024. Since the items are closed-ended and straightforward, no additional explanations from the administrator were required. Respondents were informed of the study's goals, and guaranteed anonymity and confidentiality. Informed consent was obtained. No respondents have given up on filling out the questionnaire once they have started. Since the survey included minimal risk of psychological harm to participants, ethics approval was deemed unnecessary.

Results

The results were obtained on a sample of 328 respondents in total, of which 100 were males. The data was analyzed using IBM SPSS Statistics 25. Overall fear distribution differed statistically significantly from normal ($D=0.079$, $p<.0001$). Also, individual items within the scale displayed, as expected, positively asymmetric distributions. Therefore, we used non-parametric tests and a non-parametric indicator of central tendency and dispersion. Table 1 shows the total scores on the fear survey across background categories (sex, nationality, and study program) and provides a description of the general characteristics of the sample.

Table 1

Descriptives of the Fear Survey for the overall sample and separately by gender

	Overall Fear			***Female***			***Male***		
	N	***Median***	***IQR***	***N***	***Median***	***IQR***	***N***	***Median***	***IQR***
Bosnian	251	65.00	25.00	184	70.00	23.75	65	51.00	23.00
Turkish	65	67.00	18.50	34	70.00	18.00	29	62.00	27.50
Psychology	105	67.00	20.00	75	73.00	22.00	26	54.00	21.50
Non-Psychology	222	65.50	26.00	148	72.00	23.00	74	57.50	23.50

We used the Mann-Whitney U test to compare the fear score distributions between males and females in relation to our H_1. The results revealed a significant difference between the two groups ($U=5660.50.500$, $Z= -7.076$, $p<.0001$), with females reporting higher overall fear scores than males, thus confirming our first hypothesis.

Table 2 below shows individual item distribution indicators for males and females. As it can be seen, females again report a more intense fear response compared to males. In 30 out of 35

objects or situations, females exhibited statistically significantly stronger fears compared to males, which partially confirms our second hypothesis.

Table 2

Non-parametric descriptive indicators of specific fears for males (N=100) and females (N=224)

Item	*Mean Rank (M)*	*IQR (M)*	*Mean Rank (F)*	*IQR (F)*	*Mann-Whitney U*	*Z*	*p*
being alone	131.01	1.00	176.56	1.00	8051.000	-4.196	0.000
speaking before a group	124.78	2.00	179.34	2.00	7428.000	-4.983	0.000
riding a roller coaster	134.52	2.00	174.99	2.00	8401.500	-3.728	0.000
being in closed spaces	132.38	1.00	175.95	3.00	8187.500	-4.024	0.000
high places	162.24	1.00	162.62	1.75	11173.50	-0.035	0.972
dentists	155.96	1.00	165.42	2.00	10546.00	-0.912	0.362
being physically assault.	101.15	2.00	189.89	2.00	5065.000	-8.057	0.000
failing a test	134.21	2.00	175.13	2.00	8371.000	-3.733	0.000
not being a success	155.03	3.00	165.84	2.00	10452.50	-0.992	0.321
losing a job	132.22	1.00	176.02	2.00	8172.000	-3.995	0.000
making mistakes	133.63	2.00	175.39	2.00	8313.000	-3.817	0.000
death	131.40	2.00	176.39	3.00	8089.500	-4.086	0.000
dark places	109.08	1.00	186.35	2.00	5857.500	-7.060	0.000
receiving injections	137.93	1.00	173.47	2.00	8742.500	-3.443	0.001
snakes	125.77	2.00	178.90	2.00	7526.500	-4.819	0.000
swimming alone	140.96	1.00	172.12	2.00	9046.000	-2.954	0.003
prospects of surg. op.	128.36	2.00	177.74	2.00	7786.000	-4.510	0.000
deep water	120.90	2.00	181.07	3.00	7039.500	-5.471	0.000
blood	146.71	1.00	169.55	1.00	9621.000	-2.384	0.017
being criticized	122.80	2.00	180.22	1.00	7230.000	-5.267	0.000
suffocating	133.90	2.00	175.27	3.00	8339.500	-3.753	0.000
looking foolish	133.88	2.00	175.28	2.00	8337.500	-3.783	0.000
being a passenger on an airplane	145.82	0.00	169.95	1.00	9532.000	-2.584	0.010
meeting someone for the first time	153.71	1.00	166.43	1.00	10320.50	-1.208	0.227
crowded places	133.71	1.00	175.35	2.00	8321.000	-3.886	0.000
boating	130.91	1.00	176.60	1.00	8040.500	-4.501	0.000
entering room w. ever. else is already seated	116.94	1.00	182.84	3.00	6643.500	-6.111	0.000
bats*	135.05	1.00	174.09	2.00	8455.000	-3.736	0.000
large open spaces	141.16	0.00	172.03	1.00	9065.500	-3.500	0.000
being watched while working	120.23	1.00	181.37	1.75	6973.000	-5.637	0.000
being in an elevator	131.91	0.00	176.16	1.00	8141.000	-4.573	0.000
feeling rejected by others	136.54	2.00	174.09	2.00	8604.000	-3.420	0.001
feeling disapproved of	127.94	2.00	177.93	2.00	7744.000	-4.557	0.000
being ignored	133.86	2.00	175.29	2.00	8335.500	-3.772	0.000
your social media account being hacked	155.86	3.00	165.46	2.75	10536.00	-0.875	0.381

**N (females)=223*

The fear of being physically attacked and the fear of dark places showed the largest difference between the sexes, whereas fear of heights and their social media accounts being hacked showed the smallest difference.

Judging by the mean rank value of particular fear objects or situations, as shown in Table 2, males are most afraid of high places (162.24), dentists (155.96), their social media accounts being hacked (155.86), not being successful (155.03), and meeting someone for the first time (153.71). Using the same measure, in females, the strongest five fears are: being physically assaulted (189.89), dark places (186.35), entering a room where everyone else is already seated (182.84), being watched while working (181.37), and deep water (181.07). Furthermore, considering the descriptive points on Likert's scale that refer to "very much" (4) and "terrified" (5), we analyzed objects and situations that had been assessed as either one of those in both sexes, indicating significant fear responses. In that regard, Table 3 represents the top five fear objects or situations measured by selecting either "very much afraid" or "terrified".

Table 3

Five strongest fears measured by selecting either "very much afraid" or "terrified"

	Strongest fear	***Second strongest***	***Third strongest***	***Fourth strongest***	***Fifth strongest***
Females	Not being a success (62.5%)	Being physically assaulted (60.7%)	Suffocating (48.2%)	Deep water (46.9%)	Snakes, death, losing a job (42.5%)
Males	Not being a success (54%)	Your social media account being hacked (32%)	Suffocating (29%)	Death (24%)	High places, deep water (23%)

The third hypothesis about the culturally based differences was tested separately for males and females. Regarding the overall fear level, statistically significant difference was detected between Bosnian and Turkish male respondents, with Turkish respondents exhibiting higher level of the overall fear (U=672.00, Z=-2.215, p=0.027). No difference was detected among females (U=3072.50, Z=-0.164, p=0.869). However, regarding particular fears, Bosnian female respondents showed significantly stronger fears of high places (U=2493.500, Z=1.978, p=0.048) and not being successful (U=2113.50, Z=3.150, p=0.002). On the contrary, Turkish female respondents expressed significantly stronger fear of their social

media accounts being hacked (U=2265.500, Z= -2.657, p=0.008), as did Turkish male respondents compared to their Bosnian male counterparts (U=621.500, Z=-2.716, p=0.007). Although we found some support for our hypothesis about the cultural differences, it is important to note that not all of our results were in line with it, since only few fears were statistically significantly different.

Regarding the correlation with age, we separately conducted Spearman's rank correlation coefficient for males and females. No statistically significant correlation was found with the overall fear level. In males (N=98), however, we did find a statistically significant positive correlation between age and the fear of speaking before a group (r=0.246, p=0.014) and of being watched while working (r=0.252, p=0.012). In females (N=218), however, all statistically significant correlations of particular fears and age were negative, referring mostly to social fears: being ignored (r=-0.208, p=0.002), feeling disapproved of (r=-0.155, p=0.022), feeling rejected (r=-0.148, p=0.028), meeting someone for the first time (r=-0.152, p=0.025), entering a room where everyone else is already seated (r=-0.151, p=0.025). These findings suggest that, at least in our female representative sample, social fears may diminish over time, though further research is needed.

Regarding differences in the intensity of fear depending on the study field, female psychology students compared to non-psychology students exhibited a stronger fear of being alone (U=4721.500, Z=-1.957, p =0.05) and looking foolish (U=4653.40, Z=-2.103, p=0.035). On the other hand, male non-psychology students exhibited a stronger fear of deep water (U = 576.500, Z = 3.206, p = 0.001) compared to male psychology students. Therefore, our findings, detecting only slight differences, do not fully support the fifth hypothesis.

Regarding the sixth hypothesis, the fear of one's social media account being hacked has shown different ratings depending on the participant's gender (Table 2). Although the actual "raw" measures of the intensity of fear in both sexes were comparable, in the male subsample it was the second and third strongest fear, depending on the type of the measure used. On the contrary, females ranked the fear of social media account being hacked at the very bottom of their list (next to last). Therefore, H_6 was confirmed only for our male participants.

Furthermore, considering that our data did not meet the tau-equivalence assumption, that items are heterogeneous and refer to a wide range of objects, and their distributions are

asymmetric, yielding the aforementioned poor reliability, factor analysis was conducted (Table 4). Noticeably, based on the variance percentage of indicators accounted for by the general fear factor, items 2 (speaking before a group), 3 (riding a roller coaster), 11 (making mistakes), 13 (dark places), 16 (swimming alone), 21 (suffocating), 26 (boating), and 29 (large open spaces) showing low loadings were excluded from the scale in order to yield a more meaningful general fear score.

Therefore, the final scale that yields the overall fear score is composed of 27 items with a reliability of Cronbach Alpha 0.89. Nevertheless, these items do possess high unique variability.

Table 4

Factor analysis of the Fear Survey (items with low loadings are underlined)

	Initial	***Extraction***	***Factor1***	***Loading***	***Error Variance***
1. being alone	.219	.119	.344	.409	1.246
2. speaking before a group	.729	.000	.011	.084	58.218
3. riding a roller coaster	.647	.000	-.012	-.067	30.301
4. being in closed spaces	.339	.101	.317	.425	1.615
5. high places	.301	.063	.251	.311	1.430
6. dentists	.202	.061	.248	.314	1.505
7. being physically assaulted	.315	.257	.507	.731	1.548
8. failing a test	.387	.253	.503	.610	1.099
9. not being a success	.393	.181	.425	.536	1.305
10. losing a job	.430	.243	.493	.599	1.118
11. making mistakes	.080	.002	.045	.245	29.636
12. death	.296	.124	.352	.529	1.981
13. dark places	.049	.005	.068	.375	30.085
14. receiving injections	.459	.114	.338	.460	1.647
15. snakes	.433	.125	.353	.497	1.730
16. swimming alone	.087	.006	.077	.425	30.542
17. prospects of surg. operation	.477	.212	.460	.574	1.229
18. deep water	.272	.115	.339	.522	2.094
19. blood	.348	.128	.357	.418	1.195
20. being criticized	.585	.543	.737	.864	.629
21. suffocating	.493	.010	.101	.770	57.280
22. looking foolish	.574	.503	.710	.856	.722
23. being a passenger on an airplane	.269	.090	.300	.261	.686
24. meeting someone for the first time	.394	.206	.454	.487	.912
25. crowded places	.442	.214	.463	.581	1.242
26. boating	.080	.003	.052	.287	29.847
27. entering room wh. everyone else is already seated	.493	.395	.628	.807	.997
28. bats	.418	.104	.322	.389	1.307

29. large open spaces	.124	.030	.172	.233	1.779
30. being watched while working	.456	.345	.587	.743	1.048
31. being in an elevator	.364	.142	.377	.382	.884
32. feeling rejected by others	.738	.646	.804	1.003	.552
33. feeling disapproved of	.724	.657	.811	.993	.515
34. being ignored	.579	.541	.735	.937	.747
35. your social media account being hacked	.231	.122	.349	.512	1.891

In order to test the seventh hypothesis, the reduced scale of 27 items was subjected to Principal component analysis, results of which are shown in Table 5 below.

Table 5

Factors extracted in the Principal component analysis of the reduced Fear Survey (27 items)

	Initial Eigen values			***Extraction Sums of Sq Loadings***			***Rotation Sums of Sq. Loadings***		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.373	27.308	27.308	7.373	27.308	27.308	3.687	13.654	13.654
2	2.199	8.146	35.453	2.199	8.146	35.453	3.395	12.573	26.227
3	1.735	6.427	41.881	1.735	6.427	41.881	2.208	8.178	34.406
4	1.520	5.629	47.510	1.520	5.629	47.510	2.156	7.984	42.390
5	1.171	4.339	51.849	1.171	4.339	51.849	1.786	6.615	49.005
6	1.090	4.038	55.887	1.090	4.038	55.887	1.606	5.947	54.952
7	1.007	3.730	59.617	1.007	3.730	59.617	1.259	4.665	59.617

**Note: Components with Eigen values less than 1 are omitted*

As evident in Table 5, seven factors explaining 59.61% of the total variance were extracted. The rotated matrix showed interpretable clusters of fear objects (Table 6) that align with previous studies (Gullone, 2000). To ease interpretation, the table omits saturations equal or less than 0.3. In cases where there were items saturated in more than one factor, we decided to place them with the factor that has a larger saturation. This was exclusively the case with the first two factors that showed the most overlap. The first factor interpreted as “Social” accounted for 27.31% of the variance, and saturated items 20, 24, 25, 27, and 30. The second factor accounting for 8.15% of the variance, interpreted as “Loss or failure,” including palpable losses but also symbolic and social ones, saturated items 7, 8, 9, 10, 22, 32, 33, and 34. The third factor, "Places," which encompasses the physical properties of the environment, accounted for 6.43% of the variance, with saturated items being 4, 5, 18, 23, and 31. The fourth factor, named “Small animals” accounted for 5.63% of the variance saturated items 15 and 28, while the fifth factor, interpreted as “Physical injury," accounted for 4.34% of the variance saturated items 6, 14, 17, and 19. Interestingly, the sixth factor that accounted for

4.04% of the variance, saturated items 12 (death) and 35 (social media account being hacked), was symbolically interpreted as the "Annihilation" factor. The seventh factor named "Loneliness" was highly saturated only with the first item accounting for 3.73% of the variance.

Table 6

Rotated component matrix of the reduced Fear Survey yielded by varimax rotation with Kaiser normalization

	1	2	3	4	5	6	7
	Social	***Failure***	***Places***	***Small animals***	***Physical injury***	***Annihilation***	***Loneliness***
1.being alone							.806
4.being in closed spaces			.693				
5.high places			.736				
6.dentists					.700		
7.being physically assaulted	.319	.329					
8.failing a test		.697					
9.not being a success		.758					
10.losing a job		.614				.395	
12.death						.668	
14.receiving injections					.709		
15.snakes				.792			
17.prospects of a surgical oper.				.374	.569		
18.deep water			.465	.396			
19.blood				.467	.497	-.305	
20.being criticized	.598	.500					
22.looking foolish	.536	.549					
23.being a passenger on airp.			.472			.377	
24.meeting som. for first time	.772						
25.crowded places	.702		.302				
27.enter.room wh.ever.is seated	.664						
28.bats				.741			
30.being watched while work.	.649			.			
31.being in an elevator			.612				
32.feeling rejected by others	.536	.573					
33.feeling disapproved of	.465	.659					
34.being ignored	.477	.526					.348
35.your SM account hacked						.528	

Discussion

The main objective of this study was to investigate variations in the fear intensity as a result of different objects/situations according to the fundamental sociodemographic variables.

Regarding gender, as expected, females exhibited a higher intensity of the overall fear as well as fears of specific objects/situations, which is in line with previous studies (reviewed in McLean & Anderson, 2009; Gullone, 2000). Some of our findings regarding gender differences in particular, such as a stronger fear of physical assault or the fear of dark places in females, suggest evolutionary interpretations. Moreover, the higher reliability coefficient of the initial scale in the female group (0.71 Cronbach Alpha) as opposed to the male group (0.44) suggests a more consistent measurement of fear in females. This may be indicative of social desirability pertaining to gender schemas. Social reinforcement may have taught individuals to acquire and express fear (Bandura, 1977), in a way that is socially acceptable for their gender. Consequently, this raises concerns about the usage of the initial 35-item scale as an overall fear measure among males, suggesting that some items may be less relevant or are simply perceived differently by males. In that sense, the reduced 27-item version is advised as a psychometrically valid and reliable instrument.

Considering the goals of this study, it is thought-provoking to look more closely at some of our findings, which show differences in the fear of hacking depending on participant's gender, age, and cultural background. These differences may open a fruitful line of research and provide a preliminary insight into the newly emerging technology-induced types of fears. Studies show that people generally experience low to moderate levels of fear regarding cybercrime, though this varies based on measurement methods (Brands & van Doorn, 2021). In that sense, our study provided an opportunity for comparison of the hacking fear and other, "classical" fears. More precisely, both males and females in our sample stated that they are either terrified or very much afraid of "not being a success" (54% and 62.5 % respectively) indicating a strong urge for achievement in both sexes. Also, the fear of suffocating is the third strongest for both genders. A significant overlap is also found in the rest of the "top five" list (death and deep water). However, the second strongest fear in our female sample is the fear of being physically assaulted and, for male sample, the fear of their social media account being hacked. An evolutionary perspective might again add nuance to these findings, suggesting possible survival-related differences in these fears for males and females (feeling less empowered to tackle either a cyber-attack or a physical attack, respectively). Being constantly exposed to the threats in the digital realm makes it increasingly relevant to understand how our psychological need for privacy (including the control of one's private information) adapts to the digital age and how it impacts our sense of security and well-being.

The fear of hacking can be conceptualized within broader fears of privacy invasion or data breaches. In that sense, the importance of personal boundaries, both physical and psychological, that has its origins in our evolutionary history, is now extending into the digital space. From this standpoint, privacy is fundamental to human nature, as it enabled our ancestors to satisfy their needs for safety, introspection, and personal boundaries. To that extent, it seems indicative that, looking at our sample as a whole, this particular fear is comparable in intensity to the "classical" ones.

Although this study involved only one simple item referring to the hacking fear, the detected gender difference further these interesting questions. It is indeed somewhat puzzling considering that women generally place a greater focus on information privacy than men (Tifferet, 2019) and that they have been found prone to higher fears on victimization on social networking sites (Lee et al., 2019, Virtanen, 2017). On the same note and focusing on cybercrime in general, a meta-analysis that involved 28 relevant studies from a range of (sub)disciplines, using a variety of measures or either fear, worry, or anxiety, and the type of cybercrime it related to, reports of greater expressed fear in women (Brands & van Doorn, 2021). As true as this may be, this particular fear was at the bottom of females' fears list. Rare studies tackling this issue found that anxiety about hacking was somewhat higher than, and distinct from, baseline anxiety (Elhai & Hall, 2016). However, no correlation with demographic variables was detected (Elhai & Hall, 2016). On the other hand, some cultural differences in information privacy concerns have been found (Cullen, 2009), with Eastern cultures putting a greater emphasis on information privacy (Lowry et al., 2011). In that regard, our findings did show that the fear about hacking was significantly stronger in Turkish than in Bosnian participants of both sexes. It is necessary to conduct additional research in order to investigate the moderating effects of culture and clarify the basis of this cultural difference. It is noteworthy to underscore that the observed differences may not generalize to all individuals in the aforementioned cultural backgrounds. We need to conduct further research using a larger random sample to be able to fully address the underlying mechanisms of these differences and the cultural diversity in the fear response. This line of research could also help discern universal (biological) from cultural (social) effects.

Our findings raise an important question of whether males truly are more vulnerable to cyber-related threats. Could it be that, from a cognitive standpoint, their fear is due to a different

understanding and interpretation of uncertainty compared to females? Or, from an evolutionary perspective, unlike most "traditional" fear objects, do they perceive themselves as helpless and disempowered in relation to this specific threat that defies easy confrontation? This question is even more puzzling if we look at the results of factor analysis showing that the fear of death and of hacking are saturated with the same factor, which we interpreted as “Annihilation”. We cannot help but ponder whether the phenomenology of death parallels or resembles that of losing a social media account, which symbolically signifies digital or social death. What is the common thread that connects these two fears? Questions like these also call for qualitative research that could shed more light on our findings and pave the way for more narrowly defined hypotheses.

In line with the aforesaid gender differences, this study also found different patterns of correlation of specific fears with age that may warrant further explorations due to our female dominated sample. Several social fears’ correlation with age in females was negative (being ignored, feeling disapproved of, meeting someone for the first time, entering a room where everyone else is already seated), while in males a positive correlation was detected (specifically: speaking before a group, being watched while working). Although correlational, these findings might indicate somewhat different associations between fear response (and possibly mere fear expression) and age in both sexes. Research into this issue is inconclusive. While several studies on student populations did not find any significant correlation of public speaking anxiety with age (Lintner & Belovecova, 2024, Phillips et al., 1997: Marinho et al., 2017), other studies involving general population have found that after the age of 18, there is a marked decline, with a slight increase later in life (Caballo et al., 1997). We might expect more experienced students to have better developed coping mechanisms to tackle potentially stressful situations compared to their younger counterparts. Therefore, it is interesting to note that this was not detected in our male subsample. It may be due to the smaller number of males in our sample and a narrow age range too rough to detect the difference.

Another interesting finding refers to a slight but statistically significant difference in fear that was detected between female psychology and female non-psychology students. Female psychology students exhibited more fear of being alone and looking foolish compared to their counterparts. This difference might be a result of several factors, one of them being their

possibly higher sensitivity to the group context and stronger social interests. Psychology students might also be more aware of their fears and express them more readily.

Regarding the issue of fear clustering, our study suggests the following clusters: social fears, fears of loss/ failure, fears of places, fears of small animals, fears of physical injury, fears of annihilation, and fears of loneliness. Despite initial reliability issues, factor analysis managed to yield interpretable solution, thus providing an indirect confirmation of the scale's potential to tackle fears. The results obtained are consistent with prior research (Gullone, 2000).

Limitations of the study

It is important to keep in mind the limitations of this study. It is based on a non-probabilistic sample, primarily consisting of female participants, which potentially impacts the generalizability of the findings regarding fear-eliciting objects to a broader population. Furthermore, since the sample consists of students, it may not adequately represent the spectrum of fear experience across various age demographics and life situations. However, the results do have important implications for the student population studied, offering valuable insights into how fears manifest within this group. These findings may be of particular interest to educational institutions in understanding and addressing fears that could impact students' well-being and possibly academic performance. In that regard, universities can become more proactive in creating a supportive, safe, and inclusive environment tailored to the diverse needs of their student body. This could improve both academic outcomes and overall student well-being. Future research should seek to improve upon this study by incorporating more cultural and gender diversity, as well as utilizing multiple fear-related instruments. Despite these limitations, this study contributes meaningfully to the understanding of fear-eliciting objects among students and highlights factors that may influence their fears, ultimately raising awareness of their potential impact on students' mental health.

Conclusion

This study explored variations in fear intensity across different objects and situations, focusing on sociodemographic variables such as gender, age, and cultural background. It

confirmed that females generally experience higher levels of fear, especially regarding physical assault and dark places, which aligns with evolutionary theories. However, the reliability of the fear scale was found to be higher in females, suggesting potential gender biases in measurement. Interestingly, while fear of hacking was identified as a prominent fear in both genders, while cultural differences were noted, with Turkish participants exhibiting stronger fears than Bosnian participants. The study also found age-related patterns in fear responses, particularly among females, and highlighted differences in fear between psychology and non-psychology students. These findings contribute to the understanding of how both evolutionary and cultural factors influence fear and suggest that future research should further explore these dynamics, particularly in relation to emerging cyber-related fears and their intersection with traditional fears.

References

Agras, W. S., Sylvester, D., & Oliveau, D. (1969). The epidemiology of common fears and phobias. *Comprehensive Psychiatry, 10*(2), 151–156. https://doi.org/10.1016/0010-440X(69)90025-6

American Psychiatric Association (2018, April 19). APA Dictionary of Psychology>Fear. Retrieved April 2024 from https://dictionary.apa.org/fear

Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice-Hall.

Becker, E. (1973). *The denial of death*. Free Press.

Brands, J. & van Doorn, J. (2021). The measurement, intensity and determinants of fear of cybercrime: A systematic review. *Computers in Human Behavior.* 127, C. https://doi.org/10.1016/j.chb.2021.107082

Braun, P. R. & Reynolds, D. J. (1969). A factor analysis of a 100-item fear survey inventory. *Behavior Research and Therapy.* 7, 4, pp. 399-402.

Caballo, V. E., Salazar, I. C., Irurtia, M. J., Arias, B., Hofmann, S. G., & CISO-A Research Team (2014). Differences in social anxiety between men and women across 18 countries. *Personality and individual differences.* 64, pp. 35–40. https://doi.org/10.1016/j.paid.2014.02.013

Costello, C. G. (1982). Fears and phobias in women: A community study. *Journal of Abnormal Psychology.* 91(4), pp. 280–286. https://doi.org/10.1037/0021-843X.91.4.280

Cullen, R. (2009). Culture, identity and information privacy in the age of digital government. *Online Information Review.* 33(3), 405e421. http://dx.doi.org/10.1108/1468452091096987 1

Dess, N. (2010). Emotion. Retrieved April 2024 from https://www.apa.org/ed/precollege/topss/lessons/emotion.pdf>.

Elhai, J. & Hall, B. (2016). Anxiety about internet hacking: Results from a community sample. *Computers in Human Behavior.* 54, pp. 180-185. http://dx.doi.org/10.1016/j.chb.2015.07.057

Freud, S. (1916). *Vorlesungen zur Einführung in die Psychoanalyse. Erster Teil.* Vienna: Hugo Heller & Cie.

Gullone, E. (2000). The development of normal fear: A century of research. *Clinical Psychology Review.* 20, pp. 429–451.

Klein, M. (1948). *Contributions to psychoanalysis,* 1921-1945. Routledge.

Lee, S., Choi, K., Choi, S., & Englander, E. (2019). A test of structural model for fear of crime in social networking sites. *International Journal of Cybersecurity Intelligence & Cybercrime.* 2(2), *pp.* 5-22. https://www.doi.org/10.52306/02020219SVZL9707

Lintner, T., & Belovecova, B. (2024). Demographic predictors of public speaking anxiety among university students. *Current Psychology.* 43, pp. 1-9. https://www.doi.org/10.1007/s12144-024-06216-w

Lowry, P. B., Everard, A., & Cao, J. (2011). Privacy concerns versus desire for interpersonal awareness in driving the use of self-disclosure technologies: The case of instant messaging in two cultures. *Journal of Management Information Systems*. 27, 163e200. http://dx.doi.org/10.2753/mis0742-1222270406

Marinho, A. C. F., de Medeiros, A. M., Gama, A. C. C., & Teixeira, L. C. (2017). Fear of public speaking: Perception of college students and correlates. *Journal of Voice.* 31(1), 127-e7. https://doi.org/10.1016/j.jvoice.2015.12.012

McLean, C. P., & Anderson, E. R. (2009). Brave men and timid women? A review of the gender differences in fear and anxiety. *Clinical Psychology Review, 29*(6), 496–505. https://doi.org/10.1016/j.cpr.2009.05.003

Mineka, S., & Zinbarg, R. (2006). A contemporary learning theory perspective on the etiology of anxiety disorders: it's not what you thought it was. *The American psychologist*. 61(1), pp. 10–26. https://doi.org/10.1037/0003-066X.61.1.10

Ohman, A. & Mineka, S. (2001). Fears, phobias, and preparedness: Toward an evolved module of fear and fear learning. *Psychological Review*. 108, pp. 483–522.

Phillips, G. C., Jones, G. E., Rieger, E. J., & Snell, J. B. (1997). Normative data for the personal report of confidence as a speaker. *Journal of Anxiety Disorders. 11*(2), pp. 215–220. https://doi.org/10.1016/S0887-6185(97)00007-8

Power, M., & Dalgleish, T. (2016). *Cognition and emotion: From order to disorder* (3rd ed.). Psychology Press.

Rachman, S.J. (2013). *Anxiety* (3rd ed). Hove: Psychology Press.

Rutter, M. (1984). Psychopathology and development: I. Childhood antecedents of adult psychiatric disorder. *Australian and New Zealand Journal of Psychiatry.* 18(3), 225–234. https://doi.org/10.3109/00048678409161295

Tifferet, S. (2019). Gender differences in privacy tendencies on social network sites: A meta-analysis. *Computers in Human Behavior.* 9, pp. 1–12. https://doi.org/10.1016/j.chb.2018.11.046

Virtanen, S. M. (2017). Fear of Cybercrime in Europe: Examining the Effects of Victimization and Vulnerabilities. *Psychiatry, psychology, and law : an interdisciplinary journal of the Australian and New Zealand Association of Psychiatry, Psychology and Law.* 24(3), pp. 323–338. https://doi.org/10.1080/13218719.2017.1315785

Winnicott, D. W. (1974). Fear of breakdown. *International Review of Psycho-Analysis.* 1, pp. 103–107.

Yalom, I. D. (1980). *Existential psychotherapy.* Basic Books.