



## SENSE OF HUMOR AND COPING STRESS AMONG YOUNG PILOTS

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**Introduction:** The study was empirical and concerned the relationship between the sense of humor and styles of coping stress among young military pilots. Theoretical grounds for this work were set in the Humor Styles Questionnaire by R. Martin, P. Puhlik-Doris, G. Larsen, J. Gray and K. Weir, as well as the Coping Inventory for Stressful Situations by N.S. Endler and J.D.A. Parker.

**Methods:** We used the Polish version of Humor Styles Questionnaire (HSQ) by R. Martin, P. Puhlik-Doris, G. Larsen, J. Gray and K. Weir, adapted by E. Hornowska and J. Charytoniuk as well as a Polish version of the Coping Inventory for Stressful Situations (CISS) by N.S. Endler and J.A. Parker adapted by J. Strelau, A. Jaworowska, K. Wrześniewski and P. Szczepaniak.

**Results:** The experimental group comprised students of aviation at the Polish Air Force Academy in Deblin (n=23), while the control group consisted of civil engineering students at the Military University of Technology in Warsaw (n=24). Conducted analyses confirmed some of the hypotheses regarding a correlation between aggressive humor and engaging in substitute activities as well as differences between aviation and civil engineering students with regard to higher levels of affiliative humor, task-oriented style and social diversion among pilots.

**Discussion:** We focused our attention on the nature of adaptive humor under stressful situations in both study groups as well as the differences between study groups with regard to sense of humor and coping stress styles.

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**Conclusions:** Young military pilots are characterized by high level of affiliative humor and preference for task-oriented style of coping stress and social diversion.

**Keywords:** coping stress styles, sense of humor, young military pilots

## INTRODUCTION

Sense of humor is a common, yet ambiguous concept [13]. Current theories associate the sense of humor with person's wellbeing as well as one's physical and mental health. It is thought that humor allows for reducing levels of stress hormones, regulating blood pressure and secondary strengthening of the immune system. It results from bodily response to laugh and changes taking place in the human organism during laughter. Studies are not unequivocal on that matter, yet a connection between sense of humor and widely understood human wellbeing is sought [18].

### Sense of humor and its adaptive function

The literature on the topic stresses the adaptive function of sense of humor manifesting as so-called humor styles:

- a) psychodynamic theory – related to expressing happiness and laughter, as well as concealing the memories that have been subject to denial;
- b) incongruity theory – focuses on cognitive aspects of humor, which unite two contradicting situations, ideas, or concepts into a one, unexpected entirety;
- c) degradation or superiority theory assumes that the one who bursts into a loud laugh builds up a sense of superiority toward the person being laughed at, which ensues from constant competition for a social position;
- d) the theory of individual differences in expressing humor regards humor from typological perspective, evaluating it on two levels: adaptability/non-adaptability, or interpersonal/intrapsychological adaptation [11]. The latter typological concept is the basis for distinguishing four types of sense of humor, two of which are good and important for proper wellbeing of an individual, while the remaining two are deleterious [5]. Based on the 2x2 model, which associates the adaptability of sense of humor and its focus, we may differentiate

four different humor styles:

- (1) Affiliative humor as a form of humor characterized by interpersonal focus, manifesting as a tendency toward telling jokes and funny stories, often spontaneously; such a style positively influences the atmosphere and relationships in the group [18].
- (2) Self-enhancing humor - manifesting through generally humoristic attitude toward life, including stressful situations, noticing funny aspects of various events, which also serves to control emotion and stress levels in intrapsychological terms;
- (3) Aggressive humor - is a maladaptive form directed interpersonally. It manifests as mockery, jeering, or sarcasm, ridiculing others with hidden threats, which is supposed to increase joker's self-esteem or draw attention away from one's faults or mistakes [10].
- (4) Self-defeating humor, a maladaptive, directed intrapsychologically, associated with the need for appreciation and approval from others at a price of making fun of oneself, suppressing negative emotions and low self-esteem [11].

### Relationship between sense of humor and styles of coping stress

Coping stress (as a process, strategy or style) has two functions: instrumental (task-oriented) and regulatory. The first is directed against the stressor and dealing with stress through reduction or elimination of its effects. The second function involves regulating emotion and reducing tension, which is usually unpleasant [4].

Style of coping stress is a relatively constant preventive disposition and is considered a personality trait shaped by temperament and life experiences [16]. The concept of coping stress styles developed by N.S. Endler and J.D.A. Parker [3] and corroborated by the cognitive theory of stress by Lazarus and Folkman [7] that was as-

sumed in this study, distinguishes three styles: task-oriented coping, emotion-oriented coping and avoidance-oriented coping. Task-oriented coping focuses on solving problems and changing the difficult situation. Emotion-oriented coping is characterized by concentrating on self and one's own emotional reactions that appear during stressful situations. However, avoidance-oriented coping involves turning away from the problem, refusal to notice it and ignoring the issue. The latter style may be assessed using two subscales: distraction and social diversion.

Considering sense of humor from a cognitive point of view, literature on the topic contains data suggesting that it might attenuate the negative effect of stress in at least two ways. Firstly, people with greater sense of humor consider their environment less threatening, while the opposite is true for people with less sense of humor. Secondly, in stressful situations people with greater sense of humor will be able to deal with stress more effectively by assessing the primary stressors as less severe. As a result, individuals with greater sense of humor might be better adapted and might be characterized by better emotional and physical health. Studies by Kuiper et al. [6] on the relationship between sense of humor and cognitive assessment of examination stress corroborate this notion. Studies demonstrated that people with high levels of sense of humor assessed by the Coping Humor Scale to greater extent considered the exam a positive challenge compared to individuals with less sense of humor. It was also correlated with better exam results among the first group, as well as with positive prognosis with regard to future exams.

In other studies Lefcourt et al. [8] assessed the role of humor as a possible factor modifying stress on physiological level (systolic and diastolic blood pressure measurements) while performing five tasks differing with regard to the severity of stress (before, during, and after). The Coping Humor Scale (CSH) and the Situational Humor Response Questionnaire (SHR) by Martin and Lefcourt were used as a quantitative measure of sense of humor. Results demonstrated that humor might be of great significance as a moderator of stress, but mainly with respect to uncontrollable situations as well as those where stressful stimulus is experienced passively (e.g. accidental perception of pain). Tasks, which require high degree of activity and problem solving are less susceptible to the influence of humor.

In a literature review on the relationship between humor and coping stress Martin [10] underscores that individuals with greater sense of humor are capable of dealing with stress more effectively, experiencing less negative emotions, maintaining positive, healthy interpersonal relationships and are characterized by better physical wellbeing.

Hornowska and Charytonik [5] in their study on the associations between humor styles and strategies of coping stress according to Lazarus' and Folkman's view [7] demonstrated that the self-enhancing, aggressive and self-defeating humor styles correlated significantly with those strategies. Self-enhancing humor correlated with the propensity toward actively seeking solutions, noticing positive aspects of the situation as well as reduction of negative emotion. On the other hand, aggressive humor was associated with inclination toward planning changes and undertaking action, as well as perceiving negative aspects of a given situation. Those who use self-defeating humor exhibit a tendency toward wishful thinking, avoiding mental effort, engaging others for help and seeking compromises.

Studies by Antoszezewska [2] tested a hypothesis regarding the relationship between sense of humor and styles of coping stress according to Endler and Parker's theory [3] among individuals differing with respect to temperament. Among other things, differences were noted between sense of humor and styles of coping stress among people characterized by high and low activity levels as a feature of temperament. Thus, subjects exhibiting great need for stimulation and a tendency toward affiliative humor deal with stress by seeking interpersonal contact. On the other hand, among people with low need for stimulation humor in the service of ego correlated with an emotion-focused coping style and seeking substitute activities. Aggressive humor was accompanied by seeking substitute activities. Self-defeating humor correlated with emotion-oriented style, avoidance-oriented style and involvement in substitute activities. However, no correlation between humor in the service of ego and task-oriented style was noted in any of the groups.

Fry [after: 1] tested the influence of sense of humor on cognitive assessment of stressful situations and coping stress styles among female management members. Results suggest that women with a higher level of sense of humor are capable of performing cognitive reorganization and secondary assessment of a difficult sit-

uation in a more positive manner, e.g. perceive such situations as challenges to their personal development gained through experience.

While studying a relationship between sense of humor and coping strategies Abel [1] found, among other things, that individuals with great sense of humor are characterized by more realistic interpretation of stressful situations in everyday life, thus people with a higher level of sense of humor more often use a strategy aimed at problem solving. This means that they perceive everyday situations as less stressful. Therefore, it may be considered that humor positively influences assessment of various situations. Saroglou and Ancaux [14] conducted a study focused on the association between dark humor (e.g. laughing at death, illness, deformations, or disability) and coping styles, finding that such a type of humor enables distancing from issues and situations that cannot be controlled, are unpredictable or hurtful, thus correlating positively with a style of coping stress oriented toward emotional expression and coping through humor.

Morgan and Hughes [12] demonstrated that among social workers who deal with difficult situations there is a covariance between acceptance of humor and strategies of coping stress.

## RESULTS

The goal of our work is to evaluate the association between sense of humor and styles of coping stress among young military pilots.

### Hypotheses

The following research hypotheses were formulated:

**Hypothesis 1.** There is a statistically significant positive correlation between self-enhancing humor and task-oriented coping style.

Grounds: This humor style decreases the intensity of emotional reactions during stressful moments in life without cutting oneself off from negative, threatening information. It works in favor of making adequate decisions and choosing adaptive behaviors, which is very important for pilots in order to properly fulfill their tasks.

**Hypothesis 2.** There is a statistically significant negative correlation between affiliative humor and emotion-oriented coping style among aviation students.

Grounds: Such a type of humor allows for reducing tension and negative emotions in

interpersonal relationships, which decreases conflict and tension within the group. It is of great significance for a group of cadets, where they are obliged to cooperate with other members of the team, as well as listen to and execute the orders of their superiors [11].

**Hypothesis 3.** There is a statistically significant positive correlation between self-defeating humor and avoidance-oriented coping style.

Grounds: Self-defeating humor contributes to dysfunctional suppression of negative emotions through self-depreciation in order to gain the approval of others. It is a poorly adaptive form of humor. Suppressing emotion may be associated with avoidance of difficult situations, which significantly surpass one's coping capabilities.

**Hypothesis 4.** There is a statistically significant positive correlation between aggressive humor and engaging in substitute activities.

Grounds: Such a type of humor is directed towards mocking and sneering at other individuals in order to turn the attention away from one's own faults and difficult situations. It is an attempt to avoid facing a stressful situation that requires solving [18].

**Hypothesis 5.** Aviation students differ with regard to humor styles as well as coping stress styles from the civil engineering students.

Grounds: Considering the specific nature of pilot's work, which requires self-control, focus, simultaneous coordination of several tasks, teamwork, students of military aviation are characterized by greater level of adequate humor styles in everyday life.

**Hypothesis 6.** Aviation students differ significantly from civil engineering students with regard to the styles of coping stress.

Grounds: Future pilots, cadets, while undergoing difficult training and taking advantage of their resources, also learn how to react adequately in specific stressful situations.

### Study group characteristics

The experimental group consisted of students of military aviation from Polish Air Force Academy in Deblin (n=23) aged 19 to 24 years (x=20.22).

The control group comprised civilian students at the Military University of Technology in Warsaw (majoring in civil engineering) (n=24) aged 21 to 24 years (x=21.83).

### Methodology

- Humor Styles Questionnaire, HSQ – by Rod Mar-

tin, Patricia Puhlik-Doris, Gwen Larsen, Jeanette Gray and Kelly Weir [11], Polish version edited by Elzbieta Hornowska and Jolanta Charytonik [5]. The questionnaire consists of 32 sentences regarding behaviors that involve humor reactions. It contains 4 humor scales: affiliative humor, self-enhancing humor, aggressive humor, and self-defeating humor.

Cronbach's alpha index of reliability for the scales of the questionnaire varies between 70 and 0.84. Values of Spearman-Brown coefficient (split-half reliability coefficient) vary from 0.66 (self-defeating humor) to 0.82 (affiliative humor).

- Coping Inventory for Stressful Situations, CISS – by Norman S. Endler and James A. Parker [2], Polish version edited by Jan Strelau, Aleksandra Jaworowska, Kazimierz Wrzesniewski and Piotr Szczepaniak [15]. Test scales concern coping stress styles: task-oriented, emotion-oriented, and avoidance-oriented, which includes two subscales: social diversion and distraction.

Cronbach alpha coefficient for the test scales amounts to 0.74-0.88. Stability of this tool was re-assessed after 2-3 weeks (test-retest), yielding a correlation coefficient between 0.73 and 0.80.

## Study results

In our statistical analysis we used Pearson's r coefficient to verify the hypotheses 1-4, while Student's t-test for independent samples was used for hypothesis 5. Based on descriptive statistics of studied variables, which included measures of central tendency (mean), measures

of dispersion (standard deviation, minimum, maximum, range), measures of deviation from the normal distribution (skewness, kurtosis) and the analysis of goodness of fit of obtained distributions with normal distribution using Shapiro-Wilk test for small data sets, we confirmed normal distribution of results in both study groups.

Results of the analyses of relationships between sense of humor and coping stress styles are presented in Tab. 1.

As shown in Tab. 1., hypothesis 1 assuming the correlation between self-enhancing humor and task-oriented style of coping stress was not confirmed either among young military pilots or among the civil engineering students. Hypothesis 2, which proposed a negative correlation between affiliative humor and emotion-oriented coping style, was also rejected both among military aviation students as well as civilian students. Similarly, we failed to confirm in both studied groups hypothesis no. 3, which assumed a positive relationship between self-defeating humor and avoidance-oriented style.

However, we did confirm hypothesis no. 4 that involved a positive correlation between aggressive humor and engaging in distracting activities ( $r=-0.460$ ;  $p<0.05$ ). No such association was corroborated among civilian students.

In order to verify hypothesis 5, which concerned differences with regard to humor styles presented by aviation and astronautics students vs. civil engineering students, we used the parametric Student's t-test for two independent samples and a non-parametric U Mann-Whitney test for two independent samples. Before verifying the hypothesis we checked the distribu-

Tab. 1. Relationship between humor and styles of coping stress in the studied groups.

Self-enhancing humor	Students	Pearson's r	Significance level (two-sided)
TOS	military	0.167	0.447
	civilians	0.236	0.268
Affiliative humor			
EOS	military	-0.092	0.676
	civilians	-0.102	0.636
Self-defeating humor			
AOS	military	0.191	0.382
	civilians	0.164	0.445
Aggressive humor			
Distraction	military	0.460*	0.027
	civilians	-0.189	0.377

\*  $p < 0.05$  (two-sided)

TOS – Task-Oriented Style; EOS – Emotion-Oriented Style; AOS – Avoidance-Oriented Style;

tion of results for normality and variance unity using Levene's test.

As shown in Tab. 2. self-enhancing does not differentiate between students of military aviation and civil engineering. However, aggressive humor ( $t(45)=-2.548$ ;  $p<0.05$ ) and self-defeating humor ( $t(45)=-2.117$ ;  $p<0.05$ ) do differentiate between aviation and civil engineering students.

Since the affiliative humor scale did not fulfill the criteria for use of parametric Student's t-test (non-normal distribution), we applied the non-parametric U Mann-Whitney test.

As shown in Tab. 3., the analysis performed using non-parametric U Mann-Whitney test for independent samples demonstrated that affiliative humor differentiates between military and civilian students ( $U=165.00$ ;  $p<0.05$ ). The level of affiliative humor is significantly higher among young military pilots than the students of civil engineering.

Summarizing, hypothesis 5 regarding differences between study groups with respect to humor styles was confirmed for affiliative, aggressive and self-defeating humor. Young military pilots are characterized by higher level of

affiliative humor and lower level of aggressive and self-defeating humor.

Due to lack of normal distribution in some of the CISS scales hypothesis 6, which assumed that military aviation students differ significantly with regard to the styles of coping stress from civilian students, was tested with a non-parametric U Mann-Whitney test after checking for normal distribution and variance unity using Levene's test.

As demonstrated in Tab. 4., emotion-oriented style differentiates between military pilots and civil engineering students. Emotion-oriented style is significantly lower among aviation students than in civil engineering students, as is the avoidance-oriented style ( $t(45)=-3.614$ ;  $p<0.01$ ). Differences between both study groups with respect to the remaining three styles of coping stress, namely engaging in distractors and social diversion, as well as the task-oriented style were assessed using the U Mann-Whitney test.

According to the analysis presented in Tab. 5, the task-oriented style of coping stress differentiates between both study groups ( $U=80.500$ ;  $p<0.001$ ). Namely, the task-oriented style is

Tab. 2. Comparison of humor styles among military students vs. civilian students using Student's t-test for independent samples.

Group	Students	Mean	F	Significance level	t	Df	Significance (two-sided)
Self-enhancing	military	39.8696	1.004	0.322	1.809	45	0.077
	civilian	36.3333					
Aggressive humor	military	21.3043	0.006	0.938	-2.548*	45	0.014
	civilian	27.7917					
Self-defeating humor	military	22.5217	0.657	0.422	-2.117*	45	0.040
	civilian	26.5833					

\*  $p < 0.05$  (two-sided)

Tab. 3. Comparison of the results of affiliative humor scale between young military pilots and civilian students (U Mann-Whitney test).

Variable	Students	n	Mean rank	U Mann-Whitney statistics	Asymptotic significance (two-sided)
Affiliative humor	military	23	28.83	165.00*	0.018
	civilian	24	19.38		

\*  $p < 0.05$  (two-sided)

Tab. 4. Comparison of coping stress styles between military pilots and civilian students (Student's t-test for independent samples).

Group	Students	Mean	F	Significance level	t	Df	Significance (two-sided)
EOS	military	33.2609	0.003	0.960	-3.614**	45	0.001
	civilian	44.1667					
AOS	military	40.2609	1.318	0.257	-0.122	45	0.904
	civilian	40.5833					

\*\*  $p < 0.01$  (two-sided); EOS – emotion-oriented style; AOS – avoidance-oriented style;

Tab. 5. Comparison of coping stress styles among young military pilots and civilian students (U Mann-Whitney test)

Variable	Students	n	Mean rank	U Mann-Whitney statistics	Asymptotic significance (two-sided)
TOS	military	23	32.50	80.50***	0.000
	civilian	24	15.85		
Distractors	military	23	19.89	181.50*	0.044
	civilian	24	27.94		
SD	military	23	30.61	124.00**	0.001
	civilian	24	17.67		

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$  (two-sided); TOS – Task-Oriented Style; SD – Social Diversion

significantly higher among young military pilots than in students of civil engineering. The two remaining coping styles also differentiate between both groups: engaging in distractors ( $U=181.500$ ;  $p < 0.05$ ) is lower in the group of pilots, while level of social diversion is significantly greater ( $U=124.00$ ;  $p < 0.01$ ) among young airmen compared to civilian students.

## DISCUSSION

Referring to the theoretical foundations of the Humor Styles Questionnaire, particularly classification of humor based on two criteria: directness and adaptive capability, we distinguished the following sense of humor taxonomy in a continuum of the above criteria: (1) humor directed interpersonally (affiliative and aggressive) and intrapsychologically (self-enhancing and self-defeating); (2) adaptive (affiliative and self-enhancing) and non-adaptive humor (aggressive and self-defeating, so-called dark humor) [5,11]. The analyses conducted over the course of this work failed to corroborate all of the hypotheses that had been put forward.

Hypothesis 1 assumed a positive correlation between self-enhancing humor and task-oriented coping style among aviation students due to the fact that humor directed interpersonally requires greater experience in interpersonal relations, which our study subjects (mostly first-year students) were lacking. Moreover, it should be noted that the studies of other authors on this topic are also equivocal [1,5]. A negative association between affiliative humor directed intrapsychologically and emotion-oriented coping style proposed by hypothesis 2 were not confirmed either, reflecting the fact that young pilots have not yet experienced a lot of negative emotions that might generate emotional strategies of coping stress. Such an explanation corresponds to the views presented by Martin [10] and Kuiper et al. [6], who suggest that although

affiliative humor reduces tension and modulates negative emotions, in interpersonal contacts it is rather based on social support than the affiliation mechanism. It is corroborated by the result of verification of the third hypothesis concerning the lack of positive correlation between self-defeating humor, as a maladaptive mechanism, and avoidance-oriented coping style, since such a type of humor is associated with dysfunctional suppression of emotions and leads to their avoidance. Occurrence of such a relationship is corroborated by the studies of Hornowska and Charytonik [5] and Ruch [13], where statistically significant association between variables was noted among adults.

However, we corroborated hypothesis 4, which regarded a positive correlation between aggressive humor directed interpersonally and engaging in distractors. It stands in concordance with the studies by Saroglou and Anciaux [14], which demonstrate among other things that maladaptiveness of this humor style is reflected through harmful behaviors toward others, such as mockery or ridicule, that enable cutting off and turning attention away from one's own adaptive difficulties, particularly in a group characterized by a high degree of rivalry.

Analysis of differences with respect to humor styles demonstrated differences between aviation and civil engineering students. The former received higher scores on the affiliative humor scale and lower scores on the aggressive and self-defeating humor scales (compared to the control group). This means that they exhibit decidedly more adaptive forms of humor in interpersonal relationships as well as with respect to themselves. Friendly attitude toward others, establishing healthy relationships, ability to work in a team, as well as other soft skills are as important for pilot training as gained knowledge. Strenuous job imposes certain schemes of behavior. Selection of candidates with respect to a set of characteristics most desirable in military

aviation is performed as early as during recruitment [17]. The differences in coping stress styles between study groups corroborate that. Aviation students received higher scores in task-oriented style and social divergence, but scored lower in emotion-oriented style and engaging in diversion activities.

Such a research is worth continuing as longitudinal studies, not only at the early stage of aviation training, which would enable assessing the dynamics of shaping the sense of humor and its influence on preferred styles of coping with vocational stress.

## CONCLUSIONS

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A correlation was noted between aggressive, interpersonally directed humor and a style of coping stress characterized by engaging in diversion activities.

No correlations between adaptive self-enhancing humor and task-oriented coping style, between affiliative interpersonally-directed humor and emotion-oriented coping style, or between maladaptive self-defeating humor and avoidance-oriented coping style were noted.

Compared to civil engineering students, young military pilots were characterized by affiliative humor and task-oriented coping stress style, as well as seeking social contact. Pilots received lower scores on the following scales: aggressive humor, self-defeating humor, emotion-oriented coping style, and diversions.

## AUTHORS' DECLARATION:

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**Study Design:** Agnieszka Szymanik, Jan F. Terelak; **Data Collection:** Agnieszka Szymanik; **Statistical Analysis:** Agnieszka Szymanik, Jan F. Terelak; **Manuscript Preparation:** Jan F. Terelak; **Funds Collection:** Agnieszka Szymanik, Jan F. Terelak. The Authors declare that there is no conflict of interest.

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