

Students' competitive orientation and Big Five personality traits as predictors of cognitive test anxiety

Versavia Curelaru^{1*}, Georgeta Diac¹⁺

Abstract: Competitive orientation is a psychological construct reflecting peoples' tendency to see others as interdependent rivals and to maximize their own outcomes over others, in opposition to cooperative orientation that implies seeing others as interdependent partners in achieving common outcomes. In this study, competitive orientation and Big Five personality traits of a sample of 402 undergraduate students were investigated in relation to cognitive test anxiety, while controlling for the effects of gender and academic performance. The results showed that competitive orientation was positively related, while cooperative orientation is unrelated to cognitive test anxiety. Hierarchical regression analysis indicated that cognitive test anxiety is positively predicted by competitive orientation, beyond the significant positive effect of neuroticism and negative effects of academic performance, conscientiousness, extraversion and openness to experience. The implications of the results are discussed in relation to previous research.

Keywords: Competitive orientation, Cooperative orientation, Cognitive test anxiety, Big Five personality traits, Academic achievement

Introduction

As early as two decades ago, mental health statistics showed that anxiety disorders are among the most common problems in childhood, reaching a prevalence of approximately 41% (Cartwright-Hatton et al., 2006). Having an early age-of-onset, anxiety disorder is associated with a wide range of distinctive personal difficulties, such as poor educational attainment or reduced professional and financial status (Kessler et al., 2010). Test anxiety, as a situation-specific trait, is a pervasive problem experienced by people in contemporary society, commonly increased by the focus on competitiveness and performance in most academic and occupational settings (Zeidner, 1998). Recent research using US and UK samples has estimated that between 10 % and 40% among students of different ages experience a certain degree of anxiety in academic settings (e.g., Thomas et al.,

¹ Faculty of Psychology and Educational Sciences, Alexandru Ioan Cuza University, Iași, Romania

* E-mail of corresponding author: versavia.curelaru@uaic.ro

+ These authors contributed equally to this work.

2017; Segool et al., 2014). Moreover, approximately 16% report an elevated level of test anxiety, with a higher proportion among female (Putwain & Daly, 2014).

Due to the negative effects of test anxiety on performance (Cassady, 2004; Hembree, 1988; Zeidner, 1998), well-being and mental health (Cassady et al., 2019; Hembree, 1988; Herzer et al., 2014; Rothman, 2004; Steinmayr et al., 2016), the construct became the focal point of numerous research projects starting in the years 1950s. Most studies have examined the consequences of test anxiety on a variety of academic outcomes, namely performance (Ashcraft & Moore, 2009; Chapell et al., 2005; Eysenck, & Calvo, 1992; Steinmayr et al., 2016; von der Embse & Witmer, 2014; von der Embse et al., 2018), achievement motivation (Hancock, 2001; Preiss et al., 2006; Wang et al., 2015), or learning process and strategies (Cassady, 2004; Everson et al., 1994; Eysenck et al., 2007). Concerning the potential antecedents of test anxiety, research takes into account both personal factors, such as gender, ability, academic achievement (Hembree, 1988), self-beliefs or personality traits (von der Embse et al., 2018), as well as contextual variables, including evaluative conditions and competitive climate (Zeidner, & Matthews, 2011).

Although there are some studies linking test anxiety to personality factors, research on this construct in relation to competitive orientation as a specific personality-trait is still scarce. Thus, the current paper aims to explore the predictive effect of students' competitive orientation on cognitive test anxiety, also taking into account the Big-Five personality factors, gender and academic performance.

Cognitive test anxiety

Test anxiety is defined as an emotional and behavioral response to anticipating a possible failure and it occurs in an evaluation context, when the student believes that the test's demands exceed his intellectual, motivational or social abilities (Zeidner, 1998). Initially, test anxiety was conceived rather as a unidimensional emotional variable and was evaluated in various test situations (Mandler & Sarason, 1952; Sarason, 1961). Subsequent research confirms the multidimensional structure of test anxiety highlighting at least two factors, emotionality, which refers to negative physiological reactions in evaluative contexts, and worry, which includes self-deprecating ruminations (Hembree, 1988; Liebert & Morris, 1967; Morris et al., 1981). Meta-analytical studies have shown that high test anxiety is associated with poor performance and this relationship is stronger for the cognitive rather than for the emotional and the behavioral dimensions (Hembree, 1988, 1990; von der Embse et al., 2018).

Cognitive test anxiety was conceptualized by self-assessment of students' thoughts and reactions (e.g., worries, distractions, working memory difficulties) related to the three stages of the learning-testing cycle: before the test, during the

test and after test (Cassady & Johnson, 2002; Cassady, 2004). As a contextualised attribute of the person, cognitive test anxiety may be assessed separately from the more stable personality traits (Zeidner, & Matthews, 2011). In literature, cognitive test anxiety was negatively associated, with a small to moderate effect size, with the following aspects: performance at standardised tests, various cognitive tasks, course grade and grade point average (Hembree, 1988; von der Embse et al., 2018). Significant gender differences were found in cognitive test anxiety across grade level (Chapell et al., 2005; Hembree, 1988; von der Embse et al., 2018).

Competitive orientation

Competition is a basic human tendency most commonly investigated in relation to performance within social, organizational, sport and educational psychology (Murayama & Elliot, 2012). Interpersonal competition has been conceptualized in three ways: as a personality trait (competitiveness or competitive orientation), as a structural competition (an objective situation) and as a perception of environmental competitiveness (Brown et al., 1998). Initially, competitive orientation was explored in the framework of both social value theory (Van Lange et al., 1997) and social interdependence theory (Kelley & Thibaut, 1978), in relation to cooperative orientation (Johnson & Johnson, 2015). These psychological constructs refer to stable individual differences concerning peoples' beliefs and attitudes towards social interdependence tasks: the competitive individuals tend to maximise their own outcome, seeking relative advantage over others, while the cooperative people are oriented towards maximizing outcomes for both themselves and others (Van Lange et al. 1997). The competitive orientation develops in social interactions from early childhood to adulthood and has effects not only on individual outcomes, but also on social relationships.

Some psychologists, especially in the social and educational field, highlighted the detrimental influences of competitive orientation on achievement, interpersonal relationships and well-being (e.g., Johnson & Johnson, 2011), while scholars in work psychology emphasized its beneficial effects (e.g., To et al., 2020). Recent empirical research is focused on mixed effects of competitive orientation on achievement motivation and performance (e.g., Elliot et al., 2018; Murayama & Elliot, 2012; Murayama et al., 2021). The meta-analytical findings indicated a nonsignificant direct effect of trait competitiveness on performance, across gender, age, nationality and type of performance, but a significant positive indirect effect through performance-approach goals and a significant negative indirect effect via performance-avoidance goals (Murayama & Elliot, 2012). Epstein and Harackiewicz (1992) argue that competition decreases intrinsic motivation in low achievement-oriented students and enhances it in high achievers. Other studies conducted in work environments showed beneficial effects of competitive orientation. High competitiveness was associated with

greater motivation and performance and less stress than low competitiveness (Fletcher et al., 2008). In addition, trait competitiveness positively predicted employees' motivation to win in a strong competitive situation (Reese et al., 2022).

Concerning the relationship between students' competitive orientation and test anxiety, research is still scarce. A study showed that young adults with competitive orientation exhibit a lower level of secure attachment and a higher level of avoidant and anxious-ambivalent attachment than cooperative people do (Van Lange et al., 1997). Another study showed that promoting a competitive classroom environment may increase the level of anxiety (Church et al., 2001). However, there is empirical evidence regarding the relationship between performance-approach and performance-avoidance goals (as correlates of competition) and test anxiety (e.g., Elliot & McGregor, 1999; McGregor & Elliot, 2002; Pekrun et al., 2009). Also, a study in nonclinical and clinical students have shown that competitiveness is positively correlated with depression, anxiety and stress (McEwan et al., 2012).

Personality traits and cognitive test anxiety

The Big Five Model is currently among the most validated models in the literature and the most influential in psychological research (McCrae, 2009). The model depicts a hierarchical organization of the personality in which specific traits are clustered within the five main factors, similar in different approaches and cultures: extraversion (warmth, gregariousness assertiveness, activity, excitement seeking, positive emotions); agreeableness (trust, straightforwardness, altruism, compliance, modesty, tender mindedness); conscientiousness (competence, order, dutifulness, achievement striving, self-discipline, deliberation); neuroticism (anxiety, hostility, depression, self-consciousness, impulsiveness, vulnerability), and openness to experience (fantasy, aesthetics, feelings, actions, ideas, values) (Costa & McCrae; 1992, Goldberg, 1990). The five factors were explored in association with several variables in a large number of research belonging to different psychological areas.

According to a literature review, several studies demonstrated that, generally, test anxiety has the largest positive correlation with neuroticism and only a small negative correlation with conscientiousness and openness, while there is no significant relationship with extraversion and agreeableness (von der Embse et al., 2018). Other studies showed different effects of personality traits, depending on which facet (cognitive, affective / physiological or behavioral) of anxiety is measured. Thus, neuroticism proves to be a significant positive predictor of general test anxiety (Chamorro-Premuzic et al., 2008), of cognitive and affective facets of test anxiety (e.g., Dobson, 2000; Hoferichter et al., 2015), of foreign language test anxiety (e.g., Safranjanj & Zivlak, 2019), as well as of

statistics anxiety (e.g., Chew & Dillon, 2014). Significant negative correlations were also found between general test anxiety and extraversion (Chamorro-Premuzic et al., 2008) as well as between cognitive test anxiety and agreeableness (Sawyer & Hollis-Sawyer, 2005). In addition, the relationship between personality traits and cognitive test anxiety was mediated by other variables, including control and value appraisal (e.g., Thomas & Cassady, 2019).

Competitive orientation and personality traits

Past research has shown that competitive and cooperative orientation in social interdependence situations is explained by a number of intrapersonal variables, such as personality traits (Ross et al., 2003), temperament or self-beliefs (Gocłowska et al., 2017). Generally, competitive orientation was positively correlated with neuroticism, while cooperative orientation was associated positively with extraversion and agreeableness and negatively with neuroticism (Ross et al., 2003). Specifically, the findings on link between competitive orientation and personality factors are mixed. Research demonstrated a positive correlation between competitive orientation and several specific traits related to extraversion such as assertiveness or excitement (e.g., Fletcher & Nusbaum, 2008), and to some neurotic traits such as harm-intended aggression (Choi et al., 2011). A negative association was also found between competitive orientation and altruism, cooperation, modesty and sympathy, as facets of agreeableness (Fletcher & Nusbaum, 2008).

The present study

Research on test anxiety is prolific and primarily focused on the negative impact of this emotion on both learning strategies and performance (von der Embse et al., 2018). However, the antecedents of cognitive test anxiety are yet to be investigated more extensively. Previous research on the influence of personality traits on test anxiety is scarce, exploring their direct and rarely indirect effect through fear of negative evaluation (Safranji & Zivlak, 2019), core self-evaluation and self-assessed intelligence (Chamorro-Premuzic et al., 2008), or control and value appraisals (Thomas & Cassady, 2019). However, in the present study we chose to explore the interplay between Big-Five personality traits and competitive orientation in predicting students' cognitive test anxiety, while controlling for the effect of gender and academic performance. To our knowledge, there are no recent empirical studies addressing the relationship between competitive orientation and test anxiety. Nevertheless, the studies exploring the trait competitiveness in academic settings are focused on associations of this variable with motivation and performance (e.g., Elliot et al., 2018; Murayama & Elliot, 2012).

In addition, given the mixed effects of competition on various personal and organizational outcomes (To et al., 2020), we intend to explore these associations in a specific educational context, where the performance and competition are highly valued from an early school-age (Curelaru et al., 2014). In the Romanian educational system that strives to align to the standards of more developed countries, school quality management focuses mainly on increasing students' performance. As a consequence, evaluations for ranking and selection have multiplied in the last two decades. These practices are useful for assessing performance, but can be harmful for students by increasing test anxiety. The effect could be enhanced by a number of issues facing the system, namely poor financing, a relatively high rate of school dropout (up to 19-20%), a high rate of illiteracy among pupils enrolled in the school system (42%), and early selection on the basis of high-stake tests (Kitchen et al., 2017).

Our purpose was to build upon past research that proved the significant effect of personality factors on test anxiety, adding competitive orientation as a supposed positive predictor. We hypothesized that 1) neuroticism would positively, but extraversion, agreeableness conscientiousness and openness would negatively correlate with cognitive test anxiety and 2) competitive orientation would positively predict cognitive test anxiety, beyond the effect of gender, academic achievement and Big Five personality traits.

Method

Participants and procedure

Our study was conducted on a sample of 402 undergraduate students in arts and humanities (N = 145), formal sciences (N = 79), natural sciences (N = 74) and social sciences (N = 104), all enrolled in an optional Educational Psychology course at “Alexandru Ioan Cuza” University of Iași. There were 116 males and 283 females involved in the study, along with 3 participants leaving the gender checkbox response blank. For the whole sample, the mean age was 20.85 years (SD = 3.48 years).

Students were asked for consent to participate in research on educational psychology. They were informed that their participation was voluntary and were assured of anonymity. A questionnaire was created including Big Five Inventory, Cooperative and Competitive orientation Scale, Cognitive Test Anxiety Scale, demographic data (age, gender, faculty and specialization), along with a measure for academic performance. Then the students filled out the questionnaire in one of the two ways, either through online survey response using Google Forms software or in pencil-paper format in standard university classrooms. Our study was granted ethical approval by the Ethics Committee of the University.

Measures

Big Five Inventory. Individual differences in personality were measured using the Mini-IPIP, a 20-item short form (Donnellan et al., 2006) of the International Personality Item Pool – Five-Factor Model measure (Goldberg, 1999). The scales were designed to assess the level of five dimension of personality, using four items per factor: extraversion, agreeableness, neuroticism, conscientiousness, and openness to experiences. Because the scales contain reverse-coded items, their recoding was performed so that high scores indicate high levels of the traits. Participants were asked to rate on a 5-point Likert scale the extent to which a statement describes them (1 = not at all like me to 5 = very much like me). The original scales indicated an acceptable internal consistency, with Cronbach alphas well above .60 (Donnellan et al., 2006). In the current investigation the alphas for all the factors were acceptable as well, with .73 for extraversion, .72 for agreeableness, .62 for neuroticism, .65 for conscientiousness, and .62 for openness to experience.

The Cooperative and Competitive Orientation Scale. It is a two-dimensional scale with 13 items that measures students' attitudes and beliefs about the nature of their relationship with other peers in learning situations involving social interdependence. 7 items assess cooperative orientation (“*It is important for me to coordinate with other colleagues in carrying out learning tasks*”, “*Working with others help me to improve my school performance*”) and 6 items measure competitive orientation (“*I hope to do better than other colleagues, even when we work as a team*”, “*I feel somewhat disappointed when the other colleagues perform better than me*”). The items of the two subscales were designed based on Cooperative and Competitive Orientation Scales (Chen et al., 2011). The original tool was translated from English using a forward-backward procedure. For the current study each item was rephrased in order to correspond to the situations of social interdependence in the academic contexts. Participants rated on a 6-point Likert scale to what extent they agreed with each statement of the scales (1 = strongly disagree to 6 =strongly agree). Exploratory factor analysis in principal components confirmed the two-factor model of the Chen et. al (2011) that explained 52.73% of the variance, with cooperative orientation factor explaining 28.57% and competitive orientation factor explaining 24.15% of the total variance. The internal consistency coefficient for the two subscales was .85 and .81, respectively.

Cognitive Test Anxiety Scale (CTAS). A 27-item Romanian translation of the original CTAS (Cassady & Johnson, 2002) was used in order to assess the cognitive dimension of test anxiety. The scale was translated from English into Romanian by two fluent English-Romanian bilinguals using a forward-backward procedure. Participants were asked to rate on a 4-point Likert scale the extent to which a statement describes them (1 = not at all like me to 4 = very much like

me). Because the scale contains 8 reverse-coded items, they were recoded so that finally high scores indicated a high level of cognitive test anxiety. The internal consistency coefficient, Cronbach's alpha, in this study was .91.

Academic achievement. Participants reported the average of the grades earned in all subject areas during the previous semester.

Results

The statistical analyses of the data were conducted in SPSS version 23. We first performed a descriptive analysis of all the variables in our study. In addition, preliminary analyses were performed in order to explore gender differences in cognitive test anxiety and academic performance. Independent samples *t*-tests showed that female students reported a higher level of cognitive test anxiety ($M = 69.08$, $SD = 14.08$) compared to male students ($M = 62.43$, $SD = 14.53$), with $t(397) = 4.25$, $p < .001$, although the academic performance of female students were higher ($M = 8.47$, $SD = .90$) than those of male students ($M = 8.23$, $SD = 1.08$), with $t(362) = 2.17$, $p < .030$.

Next, zero-order correlations among all the variables were analysed (see Table 1) to test the first hypothesis. Then, we performed a hierarchical regression analysis to verify the second hypothesis. Cognitive test anxiety showed significant negative association with academic performance and positive relationship with competitive orientation and female gender. In addition, cognitive test anxiety significantly correlated with all five personality factors: positively with neuroticism and negatively with extraversion, agreeableness, conscientiousness and openness. As can be seen in Table 1, competitive orientation was positively correlated with neuroticism, negatively correlated with agreeableness, conscientiousness and openness to experience, and unrelated to extraversion. There was no significant correlation between competitive and cooperative orientation. Moreover, as expected, cooperative orientation was positively related to extraversion and agreeableness, but unrelated to other personality traits or to cognitive test anxiety. Instead, cooperative orientation was negatively correlated with academic performance and with female gender.

To investigate the unique relationships that competitive orientation has with cognitive test anxiety, a hierarchical regression analysis was conducted. We assumed that while controlling for the effect of gender, academic performance and personality factors on cognitive test anxiety, we will still find a significant effect of competitive orientation. We included three steps in our regression analysis. First, we entered gender and academic performance as control variable, since many studies proved gender differences in test anxiety and significant correlation between academic achievement and test anxiety. Second, we introduced the personality traits, and finally, we added competitive orientation. Since predictors

showed certain intercorrelations, we checked for multicollinearity. The VIF values were all below 2 ($VIF < 1.29$) and the tolerance indicators are all far above .20 (Tolerance ranged from 0.77 to 0.99), so the collinearity was not a problem for our models (Field, 2013). The results of hierarchical regression analysis can be observed in Table 2.

Table 1. Zero-order correlation and descriptive statistics for all the variables

Variable	1	2	3	4	5	6	7	8	9
1. Competitive orientation	-								
2. Cooperative orientation	.01	-							
3. Extraversion	-.03	.15**	-						
4. Agreeableness	-.18**	.22**	.29**	-					
5. Conscientiousness	-.11*	.05	.12*	.17**	-				
6. Neuroticism	.35**	-.06	-.13**	-.09*	-.20**	-			
7. Openness to experience	-.16*	.02	.21**	.32**	.09	-.16**	-		
8. Cognitive Test Anxiety	.23**	.06	-.20**	-.10*	-.27**	.47**	-.23**	-	
9. Academic performance	-.04	-.20**	-.01	.04	.08	-.02	.12*	-.27**	-
10. Gender (female)	-.03	-.12*	-.01	.14**	.03	.16**	-.01	.20**	.11*
Means	18.03	28.22	11.46	14.88	14.30	12.16	15.72	67.09	8.40
SD	6.62	7.23	3.75	3.04	3.14	3.25	2.87	14.48	0.96
Minim-Maxim	6-35	9-42	4-20	4-20	5-20	4-20	7-20	32-106	5-10
Skewness	.29	-.40	.14	-.65	-.33	-.15	-.55	.09	-.41
Kurtosis	-.50	-.39	-.83	.35	-.34	-.41	-.04	-.41	.01

Note. N = 402 for all correlations, except those with academic achievement (N = 366) and with gender (N = 399). The correlation is significant at * $p < .05$; ** $p < .01$. Gender was coded 0 = male, 1 = female.

As shown in Table 2, the three regression models are statistically significant. Including competitive orientation to the third model added a small but significant effect in explaining the variation of cognitive test anxiety ($F_{\text{change}}(1,359) = 5.88, p = .016$), beyond the contribution of gender, performance level, and personality factors. The analysis of regression coefficients from Model 3 (that explained the 40.1% of variance) showed that neuroticism is the strongest positive predictor of cognitive test anxiety, along with competitive orientation and gender, the effect of the last two being smaller. Among the negative predictors of cognitive test anxiety, academic performance proved to have the highest significant contribution, along with conscientiousness and extraversion, while openness to experience had a smaller effect, agreeableness no longer having any significant influence.

Table 2. Summary of hierarchical regression analysis predicting cognitive test anxiety

Steps and predictors	Cognitive test anxiety				<i>F</i> -ratio
	R ²	Δ R ²	β	sr	
Model 1 - Step 1	.130**				F (2,361) = 27.08
Gender (female)			.23**	.23	
Academic performance			-.30**	-.29	
Model 2 - Step 1 and 2	.391**	.26**			F (7,356) = 32.62
Gender (female)			.17**	.16	
Academic performance			-.25**	-.25	
Extraversion			-.12**	-.11	
Agreeableness			.03	.02	
Conscientiousness			-.17**	-.21	
Neuroticism			.38**	.31	
Openness to experience			-.10*	-.09	
Model 3 – Step 1, 2, and 3	.401**	.01*			F (8,355) = 29.67
Gender (female)			.17**	.17	
Academic performance			-.26**	-.26	
Extraversion			-.14**	-.12	
Agreeableness			.05	.04	
Conscientiousness			-.17**	-.16	
Neuroticism			.35**	.31	
Openness to experience			-.09*	-.08	
Competitive orientation			.10*	.10	

Note. N = 364; *p < .05; **p < .01; sr – semi-partial correlations coefficients.

Discussions

The main aim of the current study was to explore the predictive power of competitive orientation and personality traits described by the Five-Factor Model, while controlling the effect of gender and academic performance in a sample of undergraduate students. Although contemporary society acknowledges a strong focus on competition along with a high prevalence of test anxiety, empirical studies on the relationship between trait competitiveness and test anxiety are still scarce. This could be explained by the fact that other psychological variables related to competitiveness were further studied in academic settings, namely goals orientation (Elliot & McGregor, 1999; McGregor & Elliot, 2002; Murayama & Elliot, 2012; Pekrun et al., 2009) and perceived evaluative climate (Church et al., 2001; Elliot et al., 2018). Thus, by including in our analysis competitive orientation as a predictor, we added empirical evidence to the existing research on antecedents explaining students' test anxiety. The preliminary analyses supported the past findings on gender differences in test anxiety (Hembree, 1988; von der Embse et al., 2018). The female students reported being more test anxious than

male students, although their academic performance was higher compared with the performance of the latter.

The main analyses confirmed our first hypothesis concerning the relationship between cognitive test anxiety and personality factors. Students scoring high in neuroticism and low in extraversion, agreeableness, conscientiousness, and openness to experience reported high levels of cognitive test anxiety. The positive relationship between neuroticism and test anxiety is in line with the almost unanimous findings of previous research (Chew & Dillon, 2014; Hoferichter et al., 2015; Safranji & Zivlak, 2019; Thomas & Cassady, 2019; von der Embse et al., 2018). This relationship may reflect the susceptibility of students with low emotional stability to experience high levels of anxiety in evaluative contexts, because of their increased self-consciousness, depression and poor emotion regulation skills (Thomas & Cassady, 2019). The confirmed negative correlation between students' conscientiousness and test anxiety is also consistent with results of other studies (Thomas & Cassady, 2019; von der Embse et al., 2018). These associations could be explained by the influence of conscientiousness on several intermediary variables, namely students' self-efficacy (Stajkovic et al., 2018) and control appraisals (Thomas & Cassady, 2019). Conscientious students, characterized by order, dutifulness and self-discipline, develop over time high self-efficacy and competence beliefs due to the task engagement and effort (Brown et al., 2011).

Our results on openness to experience support other findings (Sawyer & Hollis-Sawyer, 2005; Thomas & Cassady, 2019) that showed a negative relationship with test anxiety, but are inconsistent with certain research that reported a lack of significant correlation between the two variables (e.g., Safranji & Zivlak, 2019). The various results might be explained both by the different conceptualization of test anxiety in research, and by other variables which may interact with openness in predicting anxiety. Furthermore, students' responses to Big-Five scales might reflect different specific features of each factor. For example, the significant relationship between openness and anxiety could be a result of the link between tolerance towards new situations and uncertainty in examination contexts, whereas the lack of a relationship could mean that these features were not activated during the response. The significant negative correlation between cognitive test anxiety and extraversion and agreeableness supported by our results contradicts the findings of a meta-analytical study (von der Embse et al., 2018), but agree with alternative research, in which test anxiety was negatively related either with extraversion (Chamorro-Premuzic et al., 2008) or with agreeableness (Sawyer & Hollis-Sawyer, 2005). The specific features of the two factors, such as positive emotions and trust, could protect extroverted and agreeable students from anxiety in examination situations.

The positive zero-order correlation between competitive orientation and test anxiety in our investigation is in line with the literature that argues the detrimental effects of competitiveness on students' well-being (e.g., Johnson & Johnson, 2011; McEwan et al., 2012; Van Lange et al., 1997). On the other hand, it disagrees with the findings that support the beneficial consequences of competition on intrinsic motivation and coping with stress (Fletcher et al., 2008). The results of hierarchical regression analysis confirmed our second hypothesis. Indeed, controlling for the effect of gender, academic performance, and the overlap of the personality factors, the power of correlation decreased, but competitive orientation still added a significant contribution in explaining the cognitive test anxiety variation, after neuroticism and academic performance, the strongest predictors of test anxiety. Our findings come to support part of the research that studied the effect of some correlates of competitive orientation on academic outcome, namely perceived evaluative and harsh climate of the school (Church et al., 2001); perceived environmental competitiveness (Elliot et al., 2018), or performance-avoidance goals (Elliot & McGregor, 1999; McGregor & Elliot, 2002; Pekrun et al., 2009). It would seem that the effect of trait competitiveness on the academic adjustment is mediated, especially, by the student's perceptions of the examination situation (whether it is perceived as highly or slightly competitive), but also by the students' motivational orientation towards performance-approach or performance-avoidance goals (Elliot et al., 2018; Murayama & Elliot, 2012; Murayama et al., 2021).

Given the focus of Romanian education on competitiveness from an early school-age (Curelaru et al., 2014), it is possible that the association of highly competitive orientation with greater levels of test anxiety in our sample to be partially explained by these particularities of the educational environment. Therefore, further research is needed to expand the sample of participants to several categories of pupils and students from different regions of the country, to investigate some mediators of the relationship and to explore possible intercultural differences.

References

- Ashcraft, M. H., & Moore, A. M. (2009). Mathematics anxiety and the affective drop in performance. *Journal of Psychoeducational Assessment*, 27(3), 197–205. <https://doi.org/10.1177/0734282908330580>
- Brown, S. D., Lent, R. W., Telander, K., & Tramayne, S. (2011). Social cognitive career theory, conscientiousness, and work performance: A meta-analytic path analysis. *Journal of Vocational Behavior*, 79(1), 81–90. <https://doi.org/10.1016/j.jvb.2010.11.009>
- Brown, S. P., Cron, W. L., & Slocum, J. W., Jr. (1998). Effects of trait competitiveness and perceived intraorganizational competition on salesperson goal setting and

- performance. *Journal of Marketing*, 62(4), 88–98. <https://doi.org/10.2307/1252289>
- Cartwright-Hatton, S.; McNicol, K. & Doubleday, E. (2006). Anxiety in a neglected population: Prevalence of anxiety disorders in pre-adolescent children. *Clinical Psychology Review*, 26(7), 817-833. <https://doi.org/10.1016/j.cpr.2005.12.002>
- Cassady J. C., Pierson E. E., Starling J. M. (2019). Predicting student depression with measures of general and academic anxieties. *Frontiers in Education*, 4, 11. 10.3389/educ.2019.00011
- Cassady, J. C. (2004). The influence of cognitive test anxiety across the learning–testing cycle. *Learning and Instruction*, 14(6), 569–592. doi: 10.1016/j.learninstruc.
- Cassady, J. C., & Johnson, R. E. (2002). Cognitive test anxiety and academic performance. *Contemporary Educational Psychology*, 27(2), 270–295. <https://doi.org/10.1006/ceps.2001.1094>
- Chamorro-Premuzic, T., Ahmetoglu, G., & Furnham, A. (2008). Little more than personality: Dispositional determinants of test anxiety (the Big Five, core self-evaluations, and self-assessed intelligence). *Learning and Individual Differences*, 18(2), 258-263, <https://doi.org/10.1016/j.lindif.2007.09.002>.
- Chapell, M. S., Blanding, Z. B., Silverstein, M. E., Takahashi, M., Newman, B., Gubi, A., & McCann, N. (2005). Test Anxiety and Academic Performance in Undergraduate and Graduate Students. *Journal of Educational Psychology*, 97(2), 268–274. <https://doi.org/10.1037/0022-0663.97.2.268>
- Chen, X.-P., Xie, X., & Chang, S. (2011). Cooperative and competitive orientation among Chinese people: Scale development and validation. *Management and Organization Review*, 7(2), 353–379. <https://doi.org/10.1111/j.1740-8784.2011.00215.x>
- Chew, P. K. H., & Dillon, D. B. (2014). Statistics Anxiety and the Big Five Personality Factors. *Procedia - Social and Behavioral Sciences*, 112, 1177-1186. <https://doi.org/10.1016/j.sbspro.2014.01.1282>.
- Choi, J., Johnson, D. W., & Johnson, R. (2011). Relationship among cooperative learning experiences, social interdependence, children's aggression, victimization, and prosocial behaviors. *Journal of Applied Social Psychology*, 41(4), 976-1003.
- Church, M. A., Elliot, A. J., & Gable, S. L. (2001). Perceptions of classroom environment, achievement goals, and achievement outcomes. *Journal of Educational Psychology*, 93(1), 43–54. <https://doi.org/10.1037/0022-0663.93.1.43>
- Costa, P. T., & McCrae, R. R. (1992). The five-factor model of personality and its relevance to personality disorders. *Journal of Personality Disorders*, 6(4), 343–359. <https://doi.org/10.1521/pedi.1992.6.4.343>
- Curelaru, V., Muntele Hendres, D., Farcaş, G.A. (2014). The importance of school competition in teachers' assessment for merit gradations. A case of preschool and primary school teachers in Iasi County, Romania. *Journal of Educational Sciences & Psychology*, 4(2), 15-29.
- Dobson, P. (2000). An investigation into the relationship between neuroticism, extraversion and cognitive test performance in selection. *International Journal of Selection & Assessment*, 8, 99–109.

- Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP Scales: Tiny-yet-effective measures of the Big Five Factors of Personality. *Psychological Assessment, 18*(2), 192–203. doi:10.1037/1040-3590.18.2.192
- Elliot, A. J., & McGregor, H. A. (1999). Test anxiety and the hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 76*(4), 628–644. <https://doi.org/10.1037/0022-3514.76.4.628>
- Elliot, A. J., Jury, M., & Murayama, K. (2018). Trait and perceived environmental competitiveness in achievement situations. *Journal of Personality, 86*(3), 353–367. <https://doi.org/10.1111/jopy.12320>
- Epstein, J. A., & Harackiewicz, J. M. (1992). Winning is not enough: The effects of competition and achievement orientation on intrinsic interest. *Personality and Social Psychology Bulletin, 18*(2), 128–138. <https://doi.org/10.1177/0146167292182003>
- Everson, H. T., Smoldaka, I., & Tobias, S. (1994). Exploring the relationship of test anxiety and metacognition on reading test performance: A cognitive analysis. *Anxiety, Stress & Coping: An International Journal, 7*(1), 85–96. <https://doi.org/10.1080/10615809408248395>
- Eysenck, M. W., & Calvo, M. G. (1992). Anxiety and performance: The processing efficiency theory. *Cognition and Emotion, 6*(6), 409–434. <https://doi.org/10.1080/02699939208409696>
- Eysenck, M. W., Derakshan, N., Santos, R., & Calvo, M. G. (2007). Anxiety and cognitive performance: Attentional control theory. *Emotion, 7*(2), 336–353. <https://doi.org/10.1037/1528-3542.7.2.336>
- Field, A. (2013). *Discovering statistics using IBM SPSS Statistics, 4th edition*. London: Sage.
- Fletcher, T. D., & Nusbaum, D. N. (2008). Trait competitiveness as a composite variable: Linkages with facets of the big-five. *Personality and Individual Differences, 45*(4), 312–317. <https://doi.org/10.1016/j.paid.2008.04.020>
- Fletcher, T. D., Major, D. A., & Davis, D. D. (2008). The interactive relationship of competitive climate and trait competitiveness with workplace attitudes, stress, and performance. *Journal of Organizational Behavior, 29*(7), 899–922. <https://doi.org/10.1002/job.503>
- Kitchen, H., Fordham, E., Henderson, K., Looney, A., & Maghnouj, S. (2017). The Romanian education system. in *Romania 2017*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264274051-5-en>.
- Gocłowska, M. A., Aldhobaiban, N., Elliot, A. J., Murayama, K., Kobeisy, A., & Abdelaziz, A. (2017). Temperament and self-based correlates of cooperative, competitive and individualistic learning preferences. *International Journal of Psychology, 52*(3), 180–188. <https://doi.org/10.1002/ijop.12206>
- Goldberg, L. R. (1990). An alternative “description of personality”: The Big-Five factor structure. *Journal of Personality and Social Psychology, 59*(6), 1216–1229. <https://doi.org/10.1037/0022-3514.59.6.1216>
- Goldberg, L. R. (1999). A broad-bandwidth, public-domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I.

- J. Deary, F. De Fruyt, and F. Ostendorf (Eds.), *Personality psychology in Europe* (Vol. 7, pp. 7-28). Tilburg, The Netherlands: Tilburg University Press.
- Hancock, D. R. (2001). Effects of test anxiety and evaluative threat on students' achievement and motivation. *The Journal of Educational Research*, 94(5), 284–290. <https://doi.org/10.1080/00220670109598764>
- Hembree, R. (1988). Correlates, Causes, Effects, and Treatment of Test Anxiety. *Review of Educational Research*, 58(1), 47–77. doi:10.3102/00346543058001047
- Hembree, R. (1990). The nature, effects, and relief of mathematics anxiety. *Journal for Research in Mathematics Education*, 21(1), 33–46. <https://doi.org/10.2307/749455>
- Herzer, F., Wendt, J., & Hamm, A. O. (2014). Discriminating clinical from nonclinical manifestations of test anxiety: A validation study. *Behavior Therapy*, 45(2), 222–231. <https://doi.org/10.1016/j.beth.2013.11.001>
- Hoferichter, F., Raufelder, D., Ringeisen, T., Rohrmann, S., & Bukowski, W.M. (2015). Assessing the Multi-faceted Nature of Test Anxiety Among Secondary School Students: An English Version of the German Test Anxiety Questionnaire: PAF-E. *The Journal of Psychology Interdisciplinary and Applied*, 150(4), 450-468. 10.1080/00223980.2015.1087374.
- Johnson, D. W., & Johnson, R. T. (2011). Intellectual legacy: Cooperation and competition. In P. T. Coleman (Ed.), *Conflict, interdependence, and justice: The intellectual legacy of Morton Deutsch* (pp. 41–63). Springer Science + Business Media. https://doi.org/10.1007/978-1-4419-9994-8_3
- Johnson, D. & Johnson, R.T. (2015). Cooperation and Competition. *International Encyclopedia of the Social & Behavioral Sciences*, 2nd edition, Vol. 4, 856-861 <http://dx.doi.org/10.1016/B978-0-08-097086-8.24051-8>
- Kelley, H. H., & Thibaut, J. (1978). *Interpersonal relations: A theory of interdependence*. New York: Wiley.
- Kessler, R. C., Ruscio, A. M., Shear, K., & Wittchen, H.-U. (2010). Epidemiology of anxiety disorders. In M. B. Stein & T. Steckler (Eds.), *Behavioral neurobiology of anxiety and its treatment* (pp. 21–35). Springer Science + Business Media.
- Liebert, R. M., & Morris, L. W. (1967). Cognitive and emotional components of test anxiety: A distinction and some initial data. *Psychological Reports*, 20(3), 975–978. <https://doi.org/10.2466/pr0.1967.20.3.975>
- Mandler, G., & Sarason, S. B. (1952). A study of anxiety and learning. *The Journal of Abnormal and Social Psychology*, 47(2), 166–173. <https://doi.org/10.1037/h0062855>
- McCrae, R. R. (2009). The five-factor model of personality traits: Consensus and controversy. In P. J. Corr & G. Matthews (Eds.), *The Cambridge handbook of personality psychology* (pp. 148–161). Cambridge University Press. <https://doi.org/10.1017/CBO9780511596544.012>
- McEwan, K., Gilbert, P., Duarte, J. (2012). An exploration of competitiveness and caring in relation to psychopathology. *British Journal of Clinical Psychology*, 51(1), 19-36. DOI: [10.1111/j.2044-8260.2011.02010.x](https://doi.org/10.1111/j.2044-8260.2011.02010.x)
- McGregor, H. A., & Elliot, A. J. (2002). Achievement goals as predictors of achievement-relevant processes prior to task engagement. *Journal of Educational Psychology*, 94(2), 381–395. <https://doi.org/10.1037/0022-0663.94.2.381>

- Morris, L. W., Davis, M. A., & Hutchings, C. H. (1981). Cognitive and emotional components of anxiety: Literature review and a revised worry–emotionality scale. *Journal of Educational Psychology*, 73(4), 541–555. <https://doi.org/10.1037/0022-0663.73.4.541>
- Murayama, K., & Elliot, A. J. (2012). The competition–performance relation: A meta-analytic review and test of the opposing processes model of competition and performance. *Psychological Bulletin*, 138(6), 1035–1070. <https://doi.org/10.1037/a0028324>
- Murayama, K., Elliot, A. J., & Jury, M. (2021). Motivational dynamics underlying competition: The opposing processes model of competition and performance. S. Garcia, A. Tor, & A. Elliot, (Eds.), *The Oxford handbook on the psychology of competition*. New York, NY: Oxford University Press. <https://hal.uca.fr/hal-03365845/document>
- Peckrun, R., Elliot, A. J., & Maier, M. A. (2009). Achievement goals and achievement emotions: Testing a model of their joint relations with academic performance. *Journal of Educational Psychology*, 101(1), 115–135. <https://doi.org/10.1037/a0013383>
- Preiss, R. W., Gayle, B. M., & Allen, M. (2006). Test Anxiety, Academic Self-Efficacy, and Study Skills: A Meta-Analytic Review. In B. M. Gayle, R. W. Preiss, N. Burrell, & M. Allen (Eds.), *Classroom communication and instructional processes: Advances through meta-analysis* (pp. 99–111). Lawrence Erlbaum Associates Publishers.
- Putwain, D., & Daly, A. L. (2014). Test anxiety prevalence and gender differences in a sample of English secondary school students. *Educational Studies*, 40(5), 554–570. <https://doi.org/10.1080/03055698.2014.953914>
- Reese, Z.A., Garcia, S.M., & Edelstein, R. S. (2022). More than a game: Trait competitiveness predicts motivation in minimally competitive contexts. *Personality and Individual Differences*, 185, 111262. <https://doi.org/10.1016/j.paid.2021.111262>.
- Ross, S. R., Rausch, M. K., & Canada, K. E. (2003). Competition and cooperation in the five-factor model: Individual differences in achievement orientation. *The Journal of Psychology: Interdisciplinary and Applied*, 137(4), 323–337. <https://doi.org/10.1080/00223980309600617>
- Rothman, D. K. (2004). New Approach to Test Anxiety. *Journal of College Student Psychotherapy*, 18(4), 45-60. 10.1300/J035v18n04_05
- Safranij, J., & Zivlak, J. (2019). Effects of Big Five Personality Traits and Fear of Negative Evaluation on Foreign Language Anxiety. *Croatian Journal of Education - Hrvatski časopis za odgoj i obrazovanje*. 21 (1), 275-306. 10.15516/cje.v21i1.2942.
- Sarason, I. G. (1961). The effects of anxiety and threat on the solution of a difficult task. *The Journal of Abnormal and Social Psychology*, 62(1), 165–168. <https://doi.org/10.1037/h0043924>
- Sawyer, T. P. Jr., & Hollis-Sawyer, L. A. (2005). Predicting Stereotype Threat, Test Anxiety, and Cognitive Ability Test Performance: An Examination of Three

- Models. *International Journal of Testing*, 5(3), 225-246, DOI: 10.1207/s15327574ijt0503_3
- Segool, N. K., Carlson, J. S., Goforth, A. N., von der Embse, N., & Barterian, J. A. (2013). Heightened test anxiety among young children: Elementary school students' anxious responses to high-stakes testing. *Psychology in the Schools*, 50(5), 489–499. <https://doi.org/10.1002/pits.21689>
- Stajkovic, A. D., Bandura, A., Locke, E. A., Lee, D., & Sergeant, K. (2018). Test of three conceptual models of influence of the big five personality traits and self-efficacy on academic performance: A meta-analytic path-analysis. *Personality and Individual Differences*, 120, 238–245. <https://doi.org/10.1016/j.paid.2017.08.014>
- Steinmayr, R., Crede, J., McElvany, N., Wirthwein, L. (2016). Subjective Well-Being, Test Anxiety, Academic Achievement: Testing for Reciprocal Effects. *Frontiers in Psychology*, 8(6), 1994. doi: 10.3389/fpsyg.2015.01994.
- Thomas, C. L., & Cassady, J. C. (2019). The influence of personality factors, value appraisals, and control appraisals on cognitive test anxiety. *Psychology in the Schools*, 56, 1568-1582.
- Thomas, C. L., Cassady, J. C., & Finch, W. H. (2017). Identifying Severity Standards on the Cognitive Test Anxiety Scale: Cut Score Determination Using Latent Class and Cluster Analysis. *Journal of Psychoeducational Assessment*, 36(5), 492-508. doi: 10.1177/0734282916686004
- To, C., Kilduff, G. J., & Rosikiewicz, B. L. (2020). When interpersonal competition helps and when it harms: An integration via challenge and threat. *Academy of Management Annals*, 14(2), 908-934. <https://doi.org/10.5465/annals.2016.0145>
- Van Lange, P. A. M.; De Bruin, E. M. N.; Otten, W., Joireman, J. A. (1997). Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology*, 73(4), 733-746. doi: [10.1037/0022-3514.73.4.733](https://doi.org/10.1037/0022-3514.73.4.733)
- von der Embse, N. P., & Witmer, S. E. (2014). High-stakes accountability: Student Anxiety and Large-Scale Testing. *Journal of Applied School Psychology*, 30(2), 132–156. <https://doi.org/10.1080/15377903.2014.888529>
- von der Embse, N., Jester, D., Roy, D., & Post, J. (2018). Test anxiety effects, predictors, and correlates: A 30-year meta-analytic review. *Journal of Affective Disorders*, 227, 483–493. <https://doi.org/10.1016/j.jad.2017.11.048>
- Wang, Z., Lukowski, S. L., Hart, S.A., Lyons, I.M., Thompson, L.A., Kovas, Y., Mazzocco, M.M., Plomin, R., Petrill, S.A. (2015). Is Math Anxiety Always Bad for Math Learning? The Role of Math Motivation. *Psychological Science*, 26(12), 1863-76. doi: 10.1177/0956797615602471.
- Zeidner, M. (1998). *Test anxiety: The state of the art*, New York: Kluwer Academic Publishers.
- Zeidner, M., & Matthews, G. (2011). *Anxiety 101*. Springer Publishing Co.