ACHIEVEMENT GOALS AND ACHIEVEMENT EMOTIONS OF ROMANIAN GIFTED STUDENTS

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ABSTRACT. The current study ia an exploratory study aiming to investigate achievement goals and achievement emotions of romanian gifted students participating at the National Chemistry Olympics using the control-value theory of achievement emotions (Pekrun, 2006) and the trichotomous model of achievement goals (Elliot & Harackiewicz, 1996). Our analysis revelead a homogenous group holding adaptative goals and achievement emotions patterns and the results partially support previous research on the relations between achievement goals and achievement emotions . The results are discussed relative to previous research on the topic and educational implications for gifted education are highlightened.

Keywords: achievement emotions, achievement goals, giftedness

ZUSAMMENFASSUNG. Diese Studie ist eine Forschung und zielt die Leistungszielen und Leistung Emotionen der rumänischen hochbegabte Schülern mit der Steuer-Wert Theorie der Leistungsmotivation Emotionen (Pekrun, 2006) und dem Modell der trichotomische Leistungszielen (Elliot & Harackiewicz, 1996) zu untersuchen. Diese Schüler nahmen an der nationalen Chemie-Olympiade teil. Unsere Analyse ergab eine homogene Gruppe, die adaptative Ziele und Mustern von Leistung Emotionen halten. Die Ergebnisse stützen teilweise die vorangegangene Untersuchung über die Beziehungen zwischen Leistungszielen und Leistung Emotionen. Die Ergebnisse werden im Vergleich zu früheren Untersuchungen zum Thema diskutiert. Die theoretische und praktische Folgen für die hochbegabte Erziehung werden auch betont.

Schlüsselwörter: Leistung *Emotionen, Leistungszielen, Hochbegabung*

The contemporary paradigmatic change in conceptualizing giftedness is obvious in the recent definition of giftedness provided by The National Association for Gifted Students in the US: gifted children are considered those students who show extraordinary aptitudinal levels (defined as exceptional reasoning or learning abilities) or competency levels (demonstrated performance in top 10 percent) in

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one or more domains. These domains include any structured activity field who has his own symbolic system (mathematics, music etc.) and/or a specific set of abilities (dance, sports etc.) (DelSiegel & McCoach, 2010). The multidimensional character of giftedness is highlightened in VanTassel-Baska's (1998, 2005) definition which states that giftedness is the manifestation of general intelligence in a specific domain of human functioning on a level that significantly exceeds the norm in order to predict the possibility of an original contribution to the development of a certain field. Our theoretical position is in accord to that formulated by Heller (1989) that accentuates the notion of potentiality in conceptualizing giftedness; this potential can or cannot be activated by the educational opportunities in the environment. According to this assumption, giftedness represents the individual potential (cognitive and motivational) and the conditions (social and cultural) for excellent performance in one or more domains in difficult theoretical and practical tasks.

During the last decades, two opposite argumentation lines have dominated the dialogue on exceptional performance (Heller & Perleth, 2007): one admits that exceptional contributions in society are made by exceptional individuals (giftedness research) and the other one considers that exceptional contributions can be made by individuals with a wide range of abilities (expertise research). The main argument of the later one is that intelligence or giftedness are totally unimportant for exceptional performance; more important are experience a and "deliberate practice" (Sternberg, 2003), which involve engagement, motivation and self-control. These motivational competencies are responsible for expertise development. Heller and Perleth (2007) consider that this two lines of argumentation overlap considerably and they are the result of different accents, not the result of opposite views. Also, all the recent models of talent development admit that, in order to sustain the transition from high abilities to excellent performance, the action of facilitative factors, like a supportive learning environment and the quality of instruction, play an essential role.

Within this framework, we seek to explore motivational and emotional factors that are able to sustain the performance of gifted students facing important national and international competitions.

Achievement goals

Achievement goals are defined as competence relevant aims that individuals strive for in achievement settings (Dweck, 1986, apud Pekrun, Elliot & Maier, 2009). Initially, a dichotomous framework was used with mastery goals (learning goals) that focus on the development of competence and performance (or ego goals) focusing on demonstrating competence. Mastery goals create a framework in which inputs and outputs provide information about one's learning and mastery, whereas performance goals create a framework in which inputs and outputs are interpreted in terms of one's ability and its adequacy (Dweck & Leggett, 1988, apud. Alkharusi, 2010). Recent work distinguishes between approach and avoidance achievement goals. The distinction

was first applied to performance goals (Elliot and Harackiewicz, 1996), in a trichotomous model of achievement goals. Within this model, mastery goals are defined as approach goals focused on attaining competence defined by task-based standards or intrapersonal standards, performance approach goals are goals focused on attaining competence defined by normative standards and performance-avoidance goals defined as goal focused on avoiding incompetence as defined by normative standards. Research repeatedly showed the predictive utility of achievement goals for academic performance. For example, mastery goals positively predict performance (Linnenbrink, 2005), but research also shows zero results for this relation (Senko & Harackiewicz, 2005) The predictive relationship is insignificant, even though the trend is positive (Pekrun, Elliot, Maier, 2009).

Performance approach goals are positive predictors for performance (Pekrun, Elliot, Maier, 2009; Elliot & Church, 1997), but zero results were also found (Pajares & Valiante, 2001). Performance avoidance goals are negative predictors for performance (Pekrun, Elliot, Maier, 2009; Elliot & McGregor, 2001; Wolters, 2004), but Sideris (2005), for example, found no results for this relation.

Achievement emotions

Educational environment, with all its components, gives rise to a large variety of emotional experiences that influence learning, teaching and performance. Achievement emotions can influence cognitive, motivational and regulatory processes and act as mediators of their relation with learning and performance, but they also influence well-being and life satisfaction (Pekrun et al., 2002). According to control-value theory of achievement emotions (Pekrun, 2006), achievement emotions are those emotions directed related to achievement activities and their results. The distinction between activity emotions and outcome emotions is made based on the object of emotion. Beside this dimension, emotions can be classified regarding their valence (positive vs. negative, pleasant vs. unpleasant) and their activation (activating vs. deactivating).

	Positive		Negative	
The object of emotion	Activating	Deactivating	Activating	Deactivating
Learning activity	Enjoyment	Relaxation	Anger	Boredom
			Frustration	
The outcome of the learning activity	Joy	Contempt	Anxiety	Sadness
	Hope	Relief	Shame	Disappointment
	Pride		Anger	Hopelessness
	Gratitude			

(Source: Pekrun, 2006)

The theory stipulates that the evaluations of different achievement activities and their outcomes are of major importance for emotions to occur. The key element of this theory states that students have specific achievement emotions when they perceive they have /don't have control regarding the achievement activity and its outcomes, activity and outcome that has a subjective value for them. These evaluations (control and value) are the proximal determinants of the emotions, but there are some individual distal antecedents that affect achievement emotions through the influence they have on control and value evaluations (for example, important distal antecedents are individual achievement goals, but also non-cognitive factors like temperament or genetic dispositions). The effects that emotions have on performance is mediated by factors like cognitive resources, motivation, or self-regulation. For example, (Pekrun et al., 2011) showed positive emotions are positively associated with academic control, self-efficacy and task value and negative emotions are negatively associated with the above factors. Pekrun et al. (2002) found that enjoyment, hope and pride are positively associated with interests, extrinsic and intrinsic motivation, general motivation for learning and self-reported academic effort. Negative emotions (anger, anxiety, shame, boredom, hopelessness) are negatively associated with these self-regulated learning factors. This study revealed that metacognitive strategies and the use of superior cognitive strategies in learning are positively associated with positive emotions (except relief). Also positive emotions are associated with perceived self-regulation and negative emotions are positively associated with external regulation. In the same manner, Pekrun et al. (2011), showed that negative deactivating emotions (boredom, hopelessness) are positively associated with external regulation of learning. In another study, Pekrun, Mayer, Goetz, Daniels and Stupinsky (2010) found that boredom coincides with attention problems, is positively associated with reduced intrinsic motivation and reduced overall learning motivation, correlates negatively with effort at studying, elaboration of learning material and perceived self-regulation of learning. Also, Zeidner (1998) found that test anxiety can reduce working memory resources and, consequently, impairs performance on difficult tasks.

The antecedents, the emotions and their effects on learning and performance are related through causal reciprocal linkages over time. As stated above, individual achievement goals can act as distal antecedents for achievement emotions. But the relation between goals and emotions is not a one-way relation. Affectivity can trigger different goal patterns for learning and achievement.

In order to integrate affect in the achievement motivation theory, Pintrich and Linnenbrink (2002) have elaborated a bidirectional, asymmetrical model of goals and affect. Their model focuses on state measures of affect (the term is used for both emotions and mood), this line of research being considered more appropriate than the trait measures approach. The only element considered for the valence of emotional states is the positive-negative distinction. Regarding the relation that moods have with achievement goals, Pintrich and Linnenbrink consider that moods, more than emotions, influence the way students perceive both the goal structure of the classroom and

the personal goal setting. Students in a positive mood will tend to set approach-type goals (they evaluate their resources as sufficient), and those in a negative mood tend to focus on avoiding unpleasant outcomes or can evaluate the classroom environment as threatening and, consequently will tend to adopt avoidance goals. Regarding the relation between goals and emotions, the author's basic assumption is that goals influence specific emotions, not general mood. Adopting mastery goals will determine a higher frequency of positive emotions while doing a task and a reduction of negative emotions. Adopting performance goals (approach) is not related with positive emotions, but tend to enhance negative emotions. Avoidance goals (mastery and performance) reduce positive emotions and enhance negative emotions. Goals can also have an indirect effect on emotional experience through the perception students have on the goals structure of the classroom environment. Students in mastery oriented classrooms will have higher rates of positive affectivity and those in performance oriented classrooms can experience both positive and negative emotions.

The relation stated by the authors is bidirectional because goals and affect tend to influence each other and is asymmetrical because the initial mood is related with adopting mastery goals, but not with performance goals. By contrast, in the terms of affect-goals relation, both mastery and performance goals predict affect. A series of correlational studies gave some empirical support for this model. It has been shown that the orientation to mastery goals (approach) is positively associated with pleasant affective states and negatively associated with unpleasant affective states (Linnenbrink & Pintrich, 2002, 2003, Linnenbrink, 2005). But the results were not equally clear for the relation between performance goals (approach) and affective states; Linnenbrink & Pintrich (2003) showed no relation, but another study showed a positive association (Linnenbrink, 2005). Beside this correlational studies, Linnenbrink and Pintrich (2001) conducted two experimental studies showing that adopting mastery goals is more easily influenced by affective states than adopting performance goals.

The reciprocal relation between achievement goals and achievement emotions is recently extensively studied within the framework of control-value theory of achievement emotions (Pekrun, 2006), this framework allowing to analyze these reciprocal relations with regard to discrete academic emotions. Regarding the influence that specific goal orientation have on the occurrence of discrete emotion, the research shows that mastery goals are positive predictors for enjoyment, hope and pride (Pekrun, Elliot & Maier, 2009; Daniels et al., 2009; Pekrun, Maier & Elliot, 2006) and negative predictors for boredom, hopelessness, anger and anxiety (Daniels et al., 2009; Pekrun, Elliot & Maier, 2009; Pekrun, Maier & Elliot, 2006). Performance approach goals are positive predictors for anger, hope and pride (Pekrun, Elliot & Maier, 2009) and for anxiety (Daniels et al., 2009). Performance avoidance goals are a positive predictor for test anxiety (McGregor & Elliot, 2002; Sideris, 2005), for anxiety, hopelessness and shame (Pekrun, Elliot & Maier, 2009), and negative predictors for hope and pride (Pekrun, Elliot & Maier, 2009).

In a reciprocal manner, Daniels et al. (2009) show that hope is a positive predictor for mastery goals and performance approach goals and that hopelessness is a negative predictor for mastery goals. Also, they showed a positive association between mastery goals and enjoyment and between performance goals and anxiety and a negative association between mastery goals and boredom and anxiety.

Recently, Pekrun et al. (2009) proposed a mediation hypotheses regarding the joint effects of achievement goals and achievement emotions on performance, with emotions as mediators of the relationship between goals and performance. They showed that hope and pride (positive outcome emotions) mediate the relation between all three types of goals and performance, anger, shame and hopelessness mediate the relation between mastery goals and performance and between performance avoidance goals and performance. Concerning anxiety, results show that it acts as a mediator in the relation between performance avoidance goals and performance. In the same manner, Daniels et al. (2009) showed that mastery goals have an overall positive effect on achievement through increased enjoyment and low anxiety and boredom. The indirect effect of performance goals on achievement is mediated by anxiety, suggesting that the effects of performance goals on achievement may be decreased by anxiety (Daniels et al., 2009)

Concerning the relations between emotions and academic performance, Gumora and Arsenio (2002) showed that, even if one controls for cognitive variables, achievement emotions and general emotionality are associated with academic success and predict academic performance. For example, negative achievement emotions are unique predictors of GPA on mathematics and English in their study.

Daniels et al., (2009) show that enjoyment positively predicts performance and boredom negatively predicts performance, the effect of boredom on achievement being even more accentuated than the effect of anxiety. Also, Pekrun et al. (2002) found that positive emotions (except relief) predict superior performances and negative emotions predict low performance (with a stronger prediction for deactivating negative emotions - boredom and hopelessness). In another study, Pekrun, Elliot & Mayer (2009) show that emotions substantially affect performance, over and above cognitive abilities and motivation measures. Positive activating emotions (enjoyment, hope, pride), especially those related to learning and to testing, are positively associated with GPA (Pekrun et al., 2011). Boredom and anxiety negatively predict achievement and enjoyment positively predicts achievement as measured by GPA (Daniels et al., 2009).

Pekrun, Meyer, Goetz, Daniels and Stupinsky (2010) show that boredom correlates negatively with student's perceived performance in terms of estimated current progress at learning and with performance assessed as GPA at mid-studies exams. It's worth mentioning that boredom can be both an antecedent and an outcome of impaired academic performance. Using a predictive design, the authors were able to demonstrate that boredom has a considerable incremental effect on performance adding to the effect of prior achievement, suggesting that this negative emotion has a substantial, negative influence on academic performance.

Current study

The current research aims to explore the achievement goals and achievement emotion of gifted students given the scarcity of empirical studies relating these two concepts in the context of giftedness. Few studies analyzed discrete achievement emotions of gifted students and, to our knowledge, there is no research that addresses the issue of the joint influence of achievement goals and achievement emotion on performance in a gifted population. Chan (2008) showed that gifted students in Hong Kong generally scored highly on learning goals, less highly on performance approach goals and lowest on performance avoidance goals and that learning goals are consistent significant predictors for achievement (measured in academic, nonacademic and social / leadership areas). Regarding achievement emotions, the research addressed discrete emotions issues especially related to the big-fish-little-pond effect (Marsh, 1987), ability grouping (Preckel, Goetz & Frenzel, 2010), and investigated boredom (Preckel et al., 2010), and test anxiety (Goetz, Preckel, Zweidner & Schleyer, 2008), but we found no research investigating achievement emotions in national competition contexts.

Aim of the current study

The current study aims to investigate the relations between achievement goals, achievement emotions and performance in a gifted sample participating at the National Chemistry Olympics in Romania. This study is exploratory in nature, since we began by adapting the AEQ for a Romanian population and investigated achievement emotions for the first time on a gifted population using this instrument. Our first purpose was to explore the achievement goals and the learning- and testing-related emotions that gifted students have prior to a national Olympics. Second, we wanted to investigate the relations between these two constructs and their influence on performance in the competition.

Participants and Procedure

Participants were intellectually gifted students (grades 8-12) participating at the National Chemistry Olympics in Romania. Two hundred and five students completed the Raven Progressive Matrices – Plus and our sample was identified as intellectually gifted based on scoring above the 90th percentile at this test. The identified sample consists of 135 participants (79 males). The achievement goals and learning related emotions were assessed one week prior to the first examination in the competition and the test-related scales were completed two days before the first examination. Performance data were obtained from the teachers at the end of the national competition.

Measures

Intellectual ability was measured using the Plus Form of the Raven Progressive Matrices, which has a better discriminant power for high-ability individuals. The RPM had been adapted for Romanian population using a sample of 2801 people and has a high internal consistency (0.91) and test-retest reliability (0.87).

Achievement Goals. We used the mastery-approach, performance-approach and performance avoidance scales of the Achievement Goals Questionnaire Revised (Elliot & Murayama, 2008) and the participants completed the items in the chemistry examination context. The fidelity coefficient are the following: performance approach ($\alpha = .80$), performance avoidance ($\alpha = .88$), Mastery Approach ($\alpha = .68$).

Achievement emotions. The learning-related and the test-related scales of the Achievement Emotions Questionnaire (Pekrun, Goetz & Perry, 2005) were used to assess participants emotions prior to the exam. We have adapted the instrument for the Romanian population using a two steps procedure (translation-retroversion).

The scales used assess the following emotions: learning-related enjoyment, hope, pride, anger, anxiety, shame and hopelessness and test-related enjoyment, hope, pride, relief, anger, anxiety, shame and hopelessness. Participants responded on a 1 (not at all) to 5 (very much) scale and the scores were summed to form the emotion indexes. The Alpha Cronbach coefficients range between .67 and .92 and are listed in Table 3.

Performance measure. Participants' final score on the two exam sections (theoretical chemistry evaluation and practical chemistry evaluation) was used to measure academic performance (scores range from 0 to 100).

Results and discussion

Achievement goals and achievement emotions

Table 1.

Descriptive Statistics of achievement goals

	N	Minimum	Maximum	Mean	Std. Deviation
Mastery Avoidance	129	3.00	15.00	10.97	3.02
Performance Approach	133	3.00	15.00	12.08	2.82
Performance Avoidance	134	3.00	15.00	10.62	3.50
Mastery Approach	133	7.00	15.00	13.43	1.85
Valid N (listwise)	127				

The descriptive statistics on the achievement goals show the tendency of gifted students to hold more approach than avoidance goals (for both mastery and performance orientations); mastery approach and performance approach goals have a mean of 13.43 and 12.08, respectively, as compared to 10.96 for mastery avoidance and 10.61 for performance avoidance. Similar results have been obtained by Chan (2008) on a sample of gifted Chinese students in Hong Kong and comes in line with current conceptualizations of giftedness that highlight the importance of motivational factors in addition to intellectual ones in developing expertise and for high performances.

Table 2.

Descriptive Statistics of achievement emotions

	N	Minimum	Maximum	Mean	Std. Deviation
LR Enjoyment	134	2.20	5.00	4.1284	.61
LR Hope	134	2.33	5.00	4.1343	.69
LRPride	134	1.17	5.00	3.9652	.77
LRAnger	134	1.00	3.67	1.5912	.60
LRAnxiety	134	1.00	4.18	1.8860	.69
LRShame	134	1.00	3.91	1.9430	.69
LRHoplessness	134	1.00	3.82	1.4993	.59
LRBoredom	133	1.00	4.45	1.8100	.77
TREnjoyment	134	1.30	5.00	3.3843	.77
TRHope	134	1.63	5.00	3.6595	.80
TRPride	134	1.00	5.00	3.4918	.88
TRRelief	133	1.00	5.00	3.3747	1.02
TRAnger	134	1.00	4.20	1.8791	.69
TRAnxiety	134	1.00	4.75	2.1032	.81
TRShame	133	1.00	3.80	1.8594	.67
TRHopelessness	134	1.00	4.64	1.4993	.63
Valid N (listwise)	131				

LR=Learning related, TR=test related

Regarding achievement emotions related to learning chemistry, the gifted sample shows a clear tendency on enhanced positive activating emotions related both to the learning activity (enjoyment) and its outcome (hope and pride) and decreased negative emotions related to the learning activity (boredom, anger) or its

outcome (anxiety, shame, hopelessness). Gifted students in this sample tend to enjoy more when learning chemistry (mean 4.12, SD=.61) and feel less boredom (mean 1.81, SD=.77) and anger (m=1.59, SD=.60). For the outcome of the learning activity they feel rather hope (m=4.13, SD=.69) and pride (m=3.96, SD=.77), than anxiety (m=1,88, SD=0,69) or hopelessness (1.49, SD=.59).

These results are in line with those obtained by Goetz, Preckel, Pekrun & Hall (2007) in a research investigating emotional experiences in relation to students abstract reasoning ability that showed enjoyment to be the predominant emotion for high ability students, while anger and anxiety are predominant for low ability students.

The analysis of the test-related emotions shows that gifted students participating at the National Chemistry Olympics have low rates of negative emotions: hopelessness (m=1.49, SD=.63), anger (m=1.87, SD=.69) and anxiety (m=2.10, SD=.81). The result is somehow surprising regarding test anxiety since the students were facing a highly competitive context and one would expect higher rates of this outcome-related emotion. Perhaps the high control beliefs these students hold given the achievement level in this subject matter influence the intensity of this emotion.

When compared with the non-gifted sample of Pekrun, Goetz & Perry (2005), the results maintain a general tendency toward enhanced positive emotions (enjoyment in preparing the examination, pride and hope) and lower negative deactivating (boredom, hopelessness) and activating emotions (anger, anxiety), as compared to the non-gifted population. This results can be related to the fact that high ability and high achievement in chemistry field (all students participating at his competition already had very high performances on the previous local ones) gave raise to high perceived control in learning and testing situations and to high subjective value of the competition situation and, subsequently, to more adaptive emotions. Another mechanism that can explain these results is that this gifted sample has better emotional regulation skills that allow enhanced control of negative emotionality. Such a hypotheses could be addressed by future research.

Table 3.

Comparison between gifted and non-gifted students
(source: AEQ-The User s Manual)

	Non-gifted sample N=389	Gifted sample N=135	Non-gifted sample N=389	Gifted sample N=135	Non-gifted sample N=389	Gifted sample N=135
Scale	alpha	alpha	mean	mean	SD	SD
LR enjoyment	0.78	0.82	33.09	41.28	5.78	6.17
LR hope	0.77	0.83	20.27	24.81	3.70	4.20
LR pride	0.75	0.84	21.59	23.79	4.00	4.67
LR anger	0.86	0.84	22.00	14.32	7.04	5.43
LR anxiety	0.84	0.86	30.69	20.75	7.76	7.67
LR shame	0.86	0.85	29.00	21.37	8.32	7.61
LRhopelessness	0.90	0.88	23.06	16.49	8.09	6.52
LR boredom	0.92	0.92	30.69	19.91	9.29	8.54

	Non-gifted sample N=389	Gifted sample N=135	Non-gifted sample N=389	Gifted sample N=135	Non-gifted sample N=389	Gifted sample N=135
Scale	alpha	alpha	mean	mean	SD	SD
Test enjoyment	0.78	0.84	28.33	33.84	6.00	7.69
Test hope	0.80	0.85	25.91	29.27	4.93	6.42
Test pride	0.86	0.91	31.32	34.91	6.48	8.80
Test relief	0.77	0.85	21.59	20.25	4.00	6.14
Test anger	0.86	0.67	23.36	19.09	7.28	7.98
Test anxiety	0.89	0.88	45.54	25.24	13.00	9.82
Test shame	0.87	0.83	21.92	18.59	7.52	6.69
Test hopelessness	0.92	0.90	22.12	16.49	8.42	6.96

LR= learning related

Relation between achievement goals and learning related emotions

We first calculated the Pearson correlation in order to investigate the relations between goals and emotions and the results show that for this gifted sample's learning-related emotions have the strongest relations with mastery approach goals.

Table 4.

Relations between achievement goals and learning related emotions

	LR enjoyment	LR hope	LR pride	LR Anger	LR anxiety	LR Shame	LR Hopelessness	LR Boredom
Mastery approach	**.41**	**.37**	**.31**	**-.26**	**-.23**	**-.17**	**-.25**	**-.31**

	LR enjoyment	LR hope	LR Hope	LR Anger	LR anxiety	LR Shame	LR Hopelessness	LR Boredom
Performance approach	**.29**	**.32**	**.45**	-	-	-	-	-

All above coefficients are significant at p<0.05

The highest associations are those between mastery approach goals and enjoyment, hope and pride. Negative associations are reported for mastery approach goals and boredom, anxiety. Hopelessness, shame and anger. The results are in line with previous research and show that striving for competency development in learning chemistry is associated with more enjoyment in learning activity and with both prospectively and retrospectively emotions related to competence related activities. Regarding boredom, our result is in line with research that challenged the traditional views in educational literature that this emotion is attributed to

gifted students. For example, Roseman (1975, apud. Pekrun et al., 2010) found that bored students were overrepresented among middle-school students having IQ scores of less than 95 and that boredom correlated negatively with teacher ratings of student s academic ability. Pekrun et al. (2010) suggest that high competencies and perceived control can protect against boredom rather than making individuals susceptible to experiencing this emotion.

We then investigated the predictive utility of achievement goals for emotions using a regression analysis that revealed that mastery approach goals are a positive strong predictor for enjoyment F (132) =27.58, $p<0.01$. $\beta=0.41$), hope F(131) =20.80, $p<0.01$. $\beta=0.37$) and pride F(132)=14.34). $p<0.01$. $\beta=0.31$) and a negative predictor for anxiety (F(132) =7.82). $p<0.01$. $\beta= -0.23$), boredom (F(131) =14.33). $p<0.01$. $\beta= -0.38$), anger (F(132)=9.78). $p<0.01$. $\beta= -0.26$) and hopelessness (F (132)=8.88). $p<0.01$. $\beta= -0.25$). These results are in line with those obtained by Linnenbrink (2005), Pintrich (2000) and Pekrun, Elliot and Maier (2006). The later study showed that this relationship is strong even when controlling for social desirability, temperament or competence expectancy. Perhaps the mechanism through which mastery goals influence positive emotions (both related to the learning activity and its outcome) are linked to their effects on intrinsic motivation (Ames. 1992), appropriate help seeking behavior. deep processing of studying material that determine positive self-efficacy and adaptive attributional patterns related to learning (Elliot. 1999. Weiner. 1994 apud Alkharusi, 2010) and can sustain learning and performance and subsequently control and subjective values beliefs that determine positive emotions.

In our study performance approach goals positively predict enjoyment (F(132)=12.45). $p<0.01$. $\beta=0.29$). hope (F (132)=14.83). $p<0.01$. $\beta=0.32$) and pride (F(132)=34.89). $p<0.01$. $\beta=0.45$) but do not explain the variances in any negative emotions. This result is contrary with those in the Turner et al. study (1998) which found these goals to be positive predictors for negative affect. In the same manner, previous research showed that they can be predictors for anxiety (Daniels et al.. 2009) and anger (Pekrun, Elliot, Maier, 2009). This result may suggest that gifted students participating in the National Olympics hold multiple goals when facing this competition, being both mastery and performance oriented. The result is similar with Pintrich (2000) who showed that high performance and high mastery goals predict high positive affect in math.

One surprising result is the predictive utility of performance avoidance goals for pride, both learning and testing related. The result can be interpreted taking into account the fact that pride is a retrospective emotion (related to a past learning outcome).

Our data showed no association between performance avoidance goals and test anxiety. even though the relation had been constantly reported in the literature (McGregor & Elliot. 2001. Sideris. 2005. Eum & Rice. 2011). Further analysis on emotional regulation skills could explain this result.

Relation between achievement goals and testing related emotions

The only significant associations for the gifted sample are between approach goals (both mastery and performance oriented) and positive activating emotions:

Table 5.

Relations between achievement goals and testing related emotions

	Enjoyment	Hope	Pride
Mastery approach	**.28**	**.21**	**.31**
Performance approach	**.27**	**.26**	**.50**

All above coefficients are significant on $p<0.05$

The regression analysis shows the predictive value of performance approach goals and testing related emotions test pride (F (132)=8.85). $p<0.01$. β=0.25), hope (F(132)=27.58). $p<0.01$. β=0.41), test enjoyment (F(132)=10.27). $p<0.01$. β=0.27) and of mastery approach goals on test enjoyment (F(132)=11.65). $p<0.01$. β=0.28), test hope (F(132)=10.84). $p<0.01$. β=0.27) and test pride (F12.95). $p<0.01$. β=0.30). These results can be explained by a multiple goals framework, since students in this sample hold strong mastery goals and are facing a competition that uses normative evaluation standards that requires demonstrating the level of competency acquired.

Achievement goals and achievement emotions and their relation with performance on the National Chemistry Olympics

Previous findings clearly stated that emotions substantially affect performance, over and above the influence of cognitive ability and motivation (Pekrun, 2006) But in this specific context the relation is not supported by the data. Regarding achievement goals and their relationship with performance, the data are similar and no associations were found. These results may be due to the different variability in the scores of performance on one hand and of goals and emotions on the other hand. The gifted sample investigated here seems very homogenous regarding the goal patterns and achievement emotion patterns, but students' results varied more on performance attainment measures. Perhaps in the context of a national Olympics, the domain specific knowledge and skills play the major role for performance attainment and this students are more able than the non-gifted to better regulate motivational and emotional levels that can affect performance.

Limitations of the current study

Interpreting the results of this study must be done with caution since this research is exploratory in nature. When interpreting the results obtained here, one has to keep in mind that the current research is the first to investigate the achievement emotions of Romanian gifted students using a control-value theory framework.

With the exception of Goetz et al.'s (2007) study,we have found no research on achievement emotions for gifted population using AEQ. We did not postulate any specific hypotheses due to the scarcity of data and. to our knowledge. This kind of investigation is a premiere for a Romanian gifted sample. A limitation of this study concerns identification issues, since we have used the Plus form of the Progressive Raven Matrices and not taking a multidimensional approach on defining giftedness. A second important limitation comes from the use of self-report measures and all the biases that come with this type of methodological approach. Moreover, the time period between the assessment of achievement goals and achievement emotions might have been too small (three days only) and this particular issue might have influenced the predictive utility of achievement goals in their relation with emotions and performance.

Another important limitation of the current study comes from the small variability of the data collected from a preselected sample (high intellectual ability and high achievement in chemistry), that didn't allow for much statistical analysis procedures.

Conclusions

The current research investigated an intellectually gifted sample that proved to be very homogenous regarding the goal patterns related to achievement and achievement-related emotions. Our exploratory study suggests that gifted students participating in the National Chemistry Olympics hold multiple goals (both mastery and performance oriented) and experience more positive emotions related to both learning and testing than non-gifted students. They have lower negative emotions maybe because of the different patterns of control beliefs they have related to the learning activity and the value that they assign to it or maybe they have better emotional and motivational regulation skills that help them in managing learning and achievement activities. Further research should investigate this issue. Another future research direction could take into account other factors that proved to be important predictors of learning outcomes (e.g. self-regulated learning factors) in order to explain high performances of these students. Our study had an exploratory aim, but future research can address specific relations of the factors that can predict achievement. This line of research seems particularly important in order to gain more understanding of the factors that can sustain outstanding performances of gifted students.

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