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The aim of this study was to investigate the relation of autonomous and controlling reasons underlying an endorsed achievement goal to intrinsic motivation and cheating. The endorsement of the achievement goal was ensured by involving 212 (M_{age} = 19.24, SD = .97) freshman students in a spatial task and asking them to report their most important achievement goal, as well as the reasons for adopting the goal, during the task. Results from a hierarchical regression analysis revealed that independent of the achievement goal the students adopted, the autonomous reasons for the endorsed goal were positively related to the indices of intrinsic motivation. Furthermore, the autonomous reasons underlying either performance or mastery-avoidance goals were negatively related to cheating. Alternatively, the controlling reasons for the endorsed goal were positively related to pressure and tension. The importance of considering both the 'what' and the 'why' aspect of achievement motivation are discussed.

Keywords: self-determination theory; achievement goals; autonomous reasons; controlling reasons; intrinsic motivation

Students perform many tasks in their classrooms throughout the day and for each task they set different achievement goals. Some may have the goal to complete the task to outperform other students; others have a goal that focuses on self-improvement. Each of these goals could be endorsed for different reasons. For example, two students studying for a test may have the same goal to get a higher grade than the rest of the students in the class; however, one student endorses the goal because he knows his father has promised him a bike if he performs well, while the other endorses the goal because she thinks it is important for her personal development to perform well. Hence, the goal may be the same, but the *reasons* motivating them to pursue the goal are different. Accordingly, the reasons motivating students to pursue a goal may affect students learning outcomes. Indeed in very recent studies in which achievement goals and underlying autonomous (i.e. self-integrated) or controlling (i.e. alien to the true self) reasons were considered in the prediction of achievement outcomes, it has been found that the same underlying reasons of different achievement goals account for the same outcomes irrespective of the goal to which they are tied (Benita, Roth, & Deci, 2013; Gaudreau, 2012; Gillet, Lafreniere, Vallerand,

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Huart, & Fouquereau, 2012; Michou, Vansteenkiste, Mouratidis, & Lens, 2014; Vansteenkiste, Smeet, et al., 2010).

In the present study, we tested the above finding in a real classroom event. We gave undergraduate students a specific spatial task and asked them to report their most important achievement goal for the task along with the autonomous or controlling reasons for endorsing the goal. Through this procedure, we intended to see if the same reasons behind different achievement goals could predict students' intrinsic motivation and cheating. Given that the students identified their most important goal for a very specific task, we were ensured the goal was endorsed and the underlying reasons were indeed referring to that endorsed goal. This way we could have evidence that the obtained pattern of relations between the underlying reasons and the outcomes were more likely due to the content of the reasons rather than to a weak endorsement of the goal.

The achievement goals as pure aims

Until recently, researchers combined a number of aim–reasons to assess individuals' achievement goals; therefore, it was not clear if an achievement goal's correlate had a strong association with the 'aim' part or with the 'reason' part of the achievement goal (Elliot & Murayama, 2008). To give clarity in conceptualisation and operationalisation of the achievement goals, Elliot and Murayama (2008) suggested separating the *aim* of achievement behaviour from the *reasons* for pursuing that aim; the suggestion was made because there is often more than one reason behind a goal. In this vein, the same achievement goal defined as a 'pure' aim can be linked with different outcomes if it is combined with different reasons behind its pursuit. In this respect, the aims for doing a task are the 'what' part of achievement motivation, while the reason for endorsing that goal is the 'why' part of achievement motivation (see Deci & Ryan, 2000). According to Vansteenkiste, Lens, Elliot, Mouratidis, and Soenens (2014), it is important to consider both these parts simultaneously to fully understand students' motivations in achievement situations.

Regarding the achievement goals conceptualisation as pure aims, they have been distinguished according to how competence is defined and to valence. If a student has task-based or self-based competence criteria (definition), with a desire to approach success (valence), she endorses a *mastery-approach goal* (MAp); however, when a student has the same self-based or task-based competence criteria (definition) with a desire to avoid incompetence (valence), she is considered a student with a *mastery-avoidance goal* (MAv). Students who have other-based competence criteria (definition) with a desire to approach success (valance) adopt *performance-approach goals* (PAp); whereas students who might have the same criteria but show a desire to avoid a total failure adopt *performance-avoidance goals* (PAv) (Elliot & McGregor, 2001).

Regarding the relationship of achievement goals with educational outcomes, there is strong agreement about the adaptive character of MAp goals related to the attainment of desired outcomes. MAp goals have been associated with advanced thinking skills, intrinsic motivation, persistence in difficulties, and seeking help when needed (Darnon, Butera, & Harackiewicz, 2007; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Levy, Kaplan, & Patrick, 2004; Pekrun, Elliot, & Maier, 2006; Wolters, 2004). MAv goals have been related to disorganised study and anxiety during exams. The same is true for PAv goals that have also been negatively

linked to intrinsic motivation and self-confidence and positively linked to worrying about the exams (Elliot, Murayama, & Pekrun, 2011). For the adoption of performance approach goals (PAp), findings report both positive and negative associations between PAp goals and desired educational outcomes (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). PAp goals have been positively associated with exam performance and learning efficacy but also with superficial learning strategies and cheating (Anderman & Danner, 2008; Elliot & McGregor, 2001).

Autonomous and controlling reasons and their combination with the achievement goals

Vansteenkiste, Lens et al. (2014) conceptualised the reasons underlying achievement goals through self determination theory (SDT) (Deci & Ryan, 2000). They claimed that there are autonomous and controlling reasons that motivate people to endorse an achievement goal.

From this perspective, *autonomous reasons* underlying achievement goals mean that a student endorses an achievement goal willingly. The autonomous reasons for endorsing an achievement goal have different subcomponents such as: finding the goal enjoyable or interesting and challenging (*intrinsic regulation*); finding the goal personally meaningful (*identified regulation*); and finding the goal is part of personal values (*integrated regulation*) (Deci & Ryan, 2000). A student who has autonomous reasons underlying achievement goals tends to act with full endorsement and sense of self (Vansteenkiste, Lens et al., 2014).

In contrast, c*ontrolling reasons* underlying achievement goals mean that a student feels pressure from external environments or from himself while he is pursuing a goal. Controlling reasons are composed of two subcomponents that are *external* and *introjected regulation*. In the case of external regulation, students can endorse an achievement goal just because their parents (or significant others) will reward or punish them. Students who have introjected reasons for endorsing an achievement goal do so to avoid feeling guilty; for this reason they exert a self-imposed pressure on themselves (Deci & Ryan, 2000).

Research in the framework of SDT has shown that autonomous motivation is associated with concentration, persistence time management, deep learning, creativity, better conceptual understanding, better grades, effective problem-solving and psychological health; however, controlled motivation is related to maladaptive coping strategies, test anxiety, superficial learning, lower psychological well-being, poorer performance in heuristic tasks and more maladaptive behaviours (Roth, 2008; Roth, Assor, Niemiec, Ryan, & Deci, 2009; Ryan & Connell, 1989).

The studies summarised thus far refer to the relationship of educational outcomes to either achievement goals or to autonomous and controlled motivation. However, these studies were limited as they did not measure the unique contributions of each component of students' motivations (i.e. aims in schooling and the underlying reasons) on educational outcomes (Benita et al., 2013). Given the rationale of Elliot's (2005) suggestion to detach reasons from aims and to investigate them separately, few recent research studies have investigated the specific combination of both achievement goals and underlying reasons (i.e. goal complex) and the relationship of this complex to educational outcomes (Benita et al., 2013).

Mainly these few recent studies have focused only on the autonomous and controlling reasons underlying the debated PAp goals and the relation of these goals

with personal characteristics or outcomes. Vansteenkiste, Smeet, et al. (2010) demonstrated that while PAp goals are positively related with both adaptive and maladaptive dimensions of perfectionism, autonomous reasons for pursuing PAp goal were positively related only with the adaptive dimension. Controlling reasons, on the other hand, were related positively only with the maladaptive dimension of perfectionism. Furthermore, autonomous reasons underlying PAp goals were positively related to learning and studying strategies and negatively related to cheating; whereas controlling reasons underlying PAp goals were either negatively related with some studying strategies and academic achievement (performance on exams) or positively related to test anxiety and cheating. In a study conducted with university students, Gillet and his colleagues' (2012) found that over and above PAp goals, autonomous reasons for pursuing PAp goals were associated with goal attainment, need satisfaction, academic satisfaction and positive emotions. While controlling reasons of PAp goals were negatively related with need satisfaction and positive emotions.

Studies on the relation of pursuing PAp goal for autonomous or controlling reasons with achievement outcomes have been conducted in sport settings as well. Vansteenkiste, Mouratidis, and Lens (2010) investigated the relation of pursuing PAp goal for autonomous or controlling reasons to soccer players' well-being and moral functioning. The results demonstrated that the soccer players who pursued PAp goal for autonomous reasons tended to have more positive feelings and reported more vitality during the game compared to soccer players who pursued PAp goals for controlling reasons. Additionally, soccer players with controlling reasons underlying PAp goals were more likely to experience negative feelings and to perceive their opponents as a barrier that they should surpass at all costs (objectifying attitude). Moreover, controlling reasons underlying PAp goals were positively related to immoral outcomes through an objectifying stance.

More recently the relation of the autonomous and controlling reasons underlying other than PAp achievement goals with outcomes has been investigated. Gaudreau (2012) found that MAp goals predict academic satisfaction and performance only when MAp goals' self-concordance is high. Accordingly, PAp goals predict performance only when PAp goals' self-concordance is high. Benita et al. (2013) showed that students who endorse MAp goals tend to find classwork interesting and enjoyable and continue to engage in learning tasks after school hours only when they perceive a high sense of choice (i.e. autonomous motivation). Additionally, Michou et al. (2014) found that MAp goals jointly with autonomous reasons underlying MAp, PAp and PAv goals were positively related to need for achievement and effective learning strategies, whereas controlling reasons were positively related to fear of failure and appeared unrelated to effective learning strategies.

In all the recent studies in which the joint relation of the 'what' and the 'why' aspect of achievement motivation has been investigated, the researchers asked the participants to assess first the strength of an achievement goal using a Likert-type scale and then to assess the reasons for endorsing that particular achievement goal. However, a weak endorsement of the achievement goal (i.e. a low score) for which the reasons could have been assessed strongly has not been taken into consideration in the analysis or the interpretation of the results. It is highly possible for the obtained unified relationship of the autonomous and controlling reasons of different achievement goals with the outcomes to appear due to a weak endorsement of the goal. This weak endorsement could make the situational autonomous and controlled

motivation underlying the achievement goal more powerful. It is therefore unsure if the 'why' aspect of achievement motivations will be still strongly related with the outcomes when the 'what' part is also high. Michou et al. (2014) attempted to gain insight into this issue during a part of their research (study 2) where participants first reported their dominant achievement goal (to assure endorsement of the goal) and then shared the autonomous and controlling reasons for endorsing it. However, most of the participants chose a MAp goal; therefore, the obtained results did not clarify the relationship between autonomous and controlling reasons underlying other strongly endorsed achievement goals with the outcomes. As a result, it became apparent that further studies were needed to clarify whether the obtained relationships of autonomous and controlling reasons with outcomes remain the same when the achievement goal with which the reasons are tied is strongly endorsed.

The present study

In the present study, we investigated the relation of the autonomous or controlling reasons underlying an endorsed achievement goal for a specific achievement task with the subjective experience during the task (interest and enjoyment, tension, value of the task and intention to repeat similar tasks) and with cheating behaviour. We created an achievement situation (i.e. a spatial task) and immediately after the task, asked participants to report their most important achievement goal during the task. They were also requested to share the autonomous or controlling reasons for endorsing this goal. Thus, we were more confident that the students were more likely to have strongly endorsed the reported achievement goal for the specific reported reasons. This approach to assess students' dominant goal and underlying reasons for a specific task permitted us to examine whether the 'why' aspect of the achievement motivation will still be strongly related to the outcomes when the 'what' aspect is also high. A question we intended to answer was: do controlling reasons underlying a strongly endorsed MAp goal (which is considered to be adaptive) predict negative outcomes (i.e. tension)?

According to the findings of the studies reviewed above concerning the relation of autonomous and controlling reasons underlying achievement goals with outcomes, we assumed that autonomous reasons underlying any of the endorsed achievement goal would *positively* predict indices of intrinsic motivation, specifically: interest and enjoyment, value of the task and intention to be again engaged in similar tasks. Likewise, we assumed these autonomous reasons underlying any of the endorsed achievement goal would *negatively* predict tension during the task and cheating behaviour. Alternatively, we assumed that controlling reasons underlying any of the endorsed achievement goal would positively predict the adverse indices of intrinsic motivation (i.e. tension) and cheating.

Method

Participants and procedure

Participants included 212 students from an English language preparatory programme that is part of an English medium, private non-profit university in Ankara, Turkey (M_{age} = 19.24, SD = .97; 47.9% females; 20 students omitted reporting their age and 19 did not report their gender). In this English language preparatory programme, the

majority of the students are Turkish. They have all successfully passed the country's university entrance exam and have been accepted by a University Department. They are attending the preparatory programme because they do not have the proficiency in English language needed to study at the university.

Ethical approval for the study was provided by both the university's ethical committee and the board of the English language preparatory school; permission from the instructors of the participating classes was obtained prior to visiting their classrooms. The session began with the students being informed about the study (that it was a part of a research project on spatial exercise testing), and they were asked to volunteer to participate in the study. The students were then provided with a consent form that was written in Turkish. The document informed them that their participation was voluntary, anonymous and they could withdraw from the study at any time. They were instructed to read the form, and if they agreed, to sign it.

The classroom instructors were trained by the researchers to administer the consent forms, the spatial task and a follow-up survey related to students' experience during the task. All the instruments' items were translated into Turkish by two experts in the field working independently and were adjusted according to the procedures proposed by Hambleton (1994).

Spatial task

Following Lobel and Levanon's (1988) and Pulfrey and Butera's (2013) research paradigm, we included two sets of spatial exercises, each with six trials. The exercises directed participants to try to re-draw 12 different figures without lifting their pencil off the paper and without retracing any line. Within each set of six trials, three diagrams were possible, three were impossible to replicate without lifting the pencil off the paper or retracing a line. For each trial, participants were provided with two blank boxes; the first one was for practicing and the second box was for redrawing their solution *only if* they had succeeded in solving the problem. In other words, if they could not replicate the figure, they were to leave the second box blank.

For the first set of trials, participants were allowed about the 8 min. After 8 min, time was called and they were asked to go to the next page that included questions that asked which exercises they were able to solve. When all participants completed this part, they were instructed to complete the second set of spatial exercises. Once again, they were given 8 min and after 8 min answered a series of questions regarding their success.

Measures

Achievement goals

Participants reported their most important achievement goal during the task by choosing one out of four items adapted from the *3 × 2 Achievement Goal Questionnaire* (Elliot et al., 2011; See Appendix 1). In this instrument, mastery goals are bifurcated into (1) intrapersonal approach or avoidance goals and (2) task approach or avoidance goals. In the battery of the four items that were given to the participants, we selected an intrapersonal approach and an intrapersonal avoidance item to include as a MAp and MAv goal, respectively. Depending on the nature of the spatial task, setting the goal of improving ones' skills through the task has a higher

ecological validity than setting the goal to learn as much as possible through the task. Of the four items we selected, one referred to PAp goal (e.g. To do better than other students on these exercises), one to PAv goal (e.g. To avoid doing worse than other students on these exercises), one to MAp goal (e.g. To do better as I go through the exercises) and one to MAv goal (e.g. to avoid doing worse in the second set of exercises than in the first set).

Autonomous and controlling reasons

After the students reported their most important achievement goal during the task, they were asked why they wanted to achieve this goal. Similar to Vansteenkiste, Mouratidis, et al.'s (2010) approach, we followed the statement, 'I wanted to achieve this goal because …,' with four reasons. Two of these reasons were controlling and two were autonomous. The controlling reasons were represented by one *external regulation* item (e.g. 'I have to comply with the demands of others, such as my teachers, friends, parents, the researcher') and one *introjected regulation* item (e.g. 'I would feel bad, guilty or anxious if I didn't'). The autonomous reasons were represented by one *identified regulation* item (e.g. 'I find this a personally valuable goal') and one *intrinsic regulation* item (e.g. 'I find this a highly stimulating and challenging goal'). The items were rated on a seven-point Likert-type scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). In order to create a controlling reasons score, *external* and *introjected* items ratings were averaged ($\alpha = .61$). The autonomous reasons score was created by averaging *intrinsic* and *identified* items rating ($\alpha = .64$).

Cheating

Cheating was assessed by using Lobel and Levanon's (1988) approach. Cheating was considered to have occurred if the student drew an unsolvable exercise and reported at the end of the set that she or he had completed it. In the spatial task, 171 students (80.7%) did not cheat, 27 students (12.7%) cheated on one of the unsolvable exercises, 4 students (1.9%) cheated on two of the exercises, 4 students (1.9%) cheated on three of the exercises, 2 students (.9%) cheated on four of the exercises and 1 student (.5%) cheated on all six of the unsolvable exercises, whereas 3 students (1.4%) did not report whether they completed the exercises or not.

Intrinsic motivation

The Intrinsic Motivation Inventory (IMI; Deci, Eghrari, Patrick, & Leone, 1994) was used to assess students' *interest and enjoyment* during the task (6 items; e.g. 'They were fun to do'; $\alpha = .89$), the *value and usefulness* they attribute to the task (4 items; e.g. 'I believe doing this activity could be beneficial to me'; $\alpha = .92$), their *intention* to repeat such a task (3 items; e.g. 'I'd like to take some of these exercises to do at home'; $\alpha = .94$), and the *pressure or tension* they felt at the task (5 items; e.g. 'I felt pressured while doing them'; $\alpha = .78$).

Results

Preliminary analysis

Descriptive statistics and bivariate correlations of the measured variables are presented in Table 1. Regarding the reasons underlying achievement goals for the

Table 1. Means, standard deviation and bivariate correlations of the measured variables.

Variables	1	2	3	4	5	6	7
Reasons for the AGs							
1. Autonomous reasons	–						
2. Controlling reasons	.22**	–					
Dependent variables							
3. Interest	.31**	.02	–				
4. Pressure	.08	.32**	−.17*	–			
5. Value	.36**	.11	.68**	.02	–		
6. Intention	.29**	.08	.70**	.03	.80**	–	
7. Cheating	−.13	−.01	−.09	−.11	−.14*	−.16*	–
M	4.20	2.57	4.42	3.29	3.80	4.10	.30
SD	1.69	1.40	1.51	1.31	1.65	1.92	.79

$*p < .05$; $**p < .01$.

spatial tasks, both autonomous reasons and controlling reasons were significantly and positively intercorrelated. Additionally, autonomous reasons underlying achievement goals during the spatial test were positively and significantly related to the interest in the test ($r = .31$, $p < .01$), to the value of the test ($r = .36$, $p < .01$), and to the intention of doing more similar exercises ($r = .29$, $p < .01$); whereas, controlling reasons were only significantly correlated to pressure ($r = .32$, $p < .01$). A MANOVA test showed no gender differences in the measured variables. Therefore, gender was not used as a covariate in the subsequent analysis.

Main analysis

The majority of the students ($N = 136$) endorsed the MAp goal as their more important goal during the spatial test, whereas very few students endorsed a MAv ($N = 14$), PAp ($N = 25$) or PAv goal ($N = 9$). There were 28 students who did not report their achievement goal. Because most of students chose the same achievement goal, the sample was divided into those who endorsed a MAp goal and to those who endorsed any other achievement goal. We decided to make this division to have enough participants in each category for the analysis. Hierarchical multiple regression analyses were conducted to predict indices of intrinsic motivation from the autonomous and controlling reasons of the endorsing MAp goal. The autonomous and controlling reasons were entered in the first step, while their multiplicative terms were entered at the second step.

The results of this analysis (Table 2) indicate that autonomous reasons of endorsing MAp goal significantly predicted interest in the task, value of the task and intention to repeat the task, whereas controlling reason predicted only pressure felt during the task. However, no reason was found to predict cheating. Additionally, the interactions between autonomous and controlling reasons did not predict any of the dependent variables.

Similar to the previous analysis, autonomous reasons for endorsing any other achievement goal (MAv, PAp or PAv) significantly predicted interest, value and intention; whereas, controlling reason predicted only pressure (Table 3). It was also found that autonomous reasons behind endorsing MAv or PAp or PAv goals negatively predicted cheating. The interactions between autonomous and controlling reasons did not predict any of the dependent variables.

Table 2. Hierarchical multiple regression analysis for reasons of endorsing MAp goal predicting intrinsic motivation and cheating.

Predictors	Interest	Pressure	Value	Intention	Cheating
Step 1					
Autonomous	.27**	−.04	.29**	.25**	−.03
Controlling	.01	.18*	.05	.04	.12
F	5.40**	2.07	6.91**	4.76*	.91
R^2	.08	.03	.06	.07	.02
Step 2					
Autonomous	.30**	−.05	.32**	.27**	−.03
Controlling	.00	.18*	.04	.04	.12
Autonomous × controlling	.10	−.06	.09	.10	−.01
Change F	1.22	.51	1.11	1.27	.01
Change R^2	.01	.00	.01	.01	.00

*$p < .05$; **$p < .01$.

Table 3. Hierarchical multiple regression analysis for reasons of endorsing MAv, PAp or PAv goal predicting intrinsic motivation and cheating.

Predictors	Interest	Pressure	Value	Intention	Cheating
Step 1					
Autonomous	.39**	.20	.46**	.38**	−.42**
Controlling	−.10	.43**	.03	−.02	−.11
F	5.01**	10.36**	8.05**	4.66*	7.46**
R^2	.15	.26	.22	.14	.21
Step 2					
Autonomous	.35**	.16	.42**	.35**	−.47**
Controlling	−.07	.46**	.07	.00	−.07
Autonomous × controlling	.08	.15	.16	.08	.19
Change F	1.69	1.53	1.67	.43	2.38
Change R^2	.03	.02	.02	.01	.03

*$p < .05$; **$p < .01$.

Discussion

In the present study, we investigated the relation of autonomous and controlling reasons underlying an endorsed achievement goal with indices of intrinsic motivation and cheating. The results showed that the majority of students selected the MAp goal as their most important achievement goal during a spatial task, although there were students who selected other achievement goals as their most dominant. The students with an endorsed MAp goal, which is considered as an adaptive motivational factor, reported both autonomous and controlling reasons for adopting this goal during the spatial task. Furthermore, students with an endorsed MAv, PAp or PAv goals, which are considered as less adaptive motivational factors, also reported both autonomous and controlling reasons for adopting their goal. It seems that any content of achievement goals could be adopted for either an autonomous or a controlling reason. This finding shows the importance of taking into consideration jointly the 'what' and the 'why' aspect of situational achievement motivation; considering both helps to clarify and to better describe achievers' motivation in particular situations.

Even more importantly, it seems that these combinations are related to different achievement outcomes. Indeed, in the present study, we found that the autonomous reasons underlying any achievement goal were related to intrinsic motivation. Independent of whether the participant intended to improve her skills or to outperform others during the spatial task, if she wanted to do so because it was personally important or challenging for her, she found the goal interesting or important, she enjoyed it; she thought it was worthwhile, and she was keen to repeat a similar task in the future. However, if the participant wanted to improve her skills or to outperform only because she would feel guilty if she didn't comply, she might feel pressure and tension during the spatial task. Additionally, autonomous reasons underlying other than MAp goals were negatively related to cheating; this showed that autonomous reasons behind less adaptive achievement goals could be a preventive factor of cheating that has mainly been related with PAp and PAv goals (Anderman & Danner, 2008).

In the present study, we replicated the findings of previous studies that have reported that autonomous reasons underlying achievement goals could be positively related to adaptive outcomes over and above the achievement goal to which they are tied. Likewise, these studies found that controlling reasons underlying achievement goals could be positively related to maladaptive outcomes over and above the endorsed achievement goal (Benita et al., 2013; Gaudreau, 2012; Gillet et al., 2012; Vansteenkiste, Mouratidis, et al., 2010; Vansteenkiste, Smeets, et al., 2010). However, in these studies, the strength of the achievement goal was not taken into consideration; therefore, it was not clear if the underlying reasons, even when the achievement goal was highly endorsed, were related to outcomes over and above the achievement goal to which they were tied.

In our study, we took the previous findings one step further. We showed that the underlying autonomous or controlling reasons have been revealed as important motivational variables to take into consideration during situational achievement motivation; the reasons appeared as predictors of intrinsic motivation even when achievement goals were strongly endorsed. The findings showed, for instance, that even when MAp goal was endorsed during the spatial test, if this adaptive goal was endorsed out of controlling reasons, the participants felt tension in the task. The adaptive nature of MAp goals did not attenuate the maladaptive nature of controlling reasons. Thus, in the present study, the underlying autonomous or controlling reasons prevailed as motivators in a situation where a strong endorsement of achievement goals occurred. However, further research is needed to explore whether the autonomous and controlling reasons underlying a strongly endorsed achievement goal are predictors of outcomes even when the goal's strength is included in the analysis.

The findings of the present research have important implications for education as it implies that fostering the autonomous motivation in educational settings could promote learners' intrinsic motivation. Teachers' focusing on high grades or having students outperform others may have a less detrimental effect on students' motivation if their focus is accompanied by autonomy-supportive teaching. Teachers support students' autonomy when they allow students to participate in decision-making, to make choices and to express their feelings and perspectives. Likewise, teachers' focus on learning and self-improvement could be associated with feelings of pressure and tension if this focus is accompanied by controlling teaching. Teachers are controlling when they highlight their power in the class, dominate decision-making,

and present their perspective as the only choice for students. It seems that 'what' teachers ask from students (i.e. to improve their understanding and learning skills or to attain high grades and outperform their peers) is not the only important aspect of teachers' approach; their motivating style (i.e. autonomous-supportive vs. controlling) in the class seems to have a particular importance as well. For students' development, it is important for teachers to consider both the achievement goal they promote and the motivating style they adopt to promote it. This counsel has a particular value for pre-service teachers' education and in-service teachers' professional development. Future and present teachers' practice will be improved if theoretical and practical modules related to motivating styles are included in their professional development. We encourage teacher education programmes to guide teachers on how best to apply their motivating styles in the classroom and to examine the consequences of their implementation to best promote student autonomous achievement goals.

Limitations

In the present study, a cross-sectional design was adopted; therefore, the cause–effect relations could not be tested. Furthermore, most of the students selected a MAp-dominant goal and very few (a non-sufficient for analysis number) selected MAv, PAp or PAv goals, preventing us from differentially investigating the relation of autonomous and controlling reasons underlying MAv, PAp or PAv goals with intrinsic motivation and cheating. As it seems to be a frequent phenomenon for students (or athletes) to report at a higher level MAp dominant goals compared to MAv, PAp and PAv goals (see also Michou et al., 2014; Vansteenkiste, Mouratidis, Van Riet, & Lens, 2014), research of large samples is needed to obtain sufficient number of participants who endorse MAv, PAp or PAv dominant goals for autonomous or controlling reasons. This large sample size would permit an investigation to refine the relations of autonomous and controlling reasons underlying any dominant goal to the outcomes. A final limitation concerns the Turkish origin of the participants and the educational context from which they were coming. Further research is needed in samples of other nations and other contexts (i.e. high school or sport, etc.) in order to be able to generalise the results.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix 1

1. The four items adapted from 3×2 Achievement Goal Questionnaire (Elliot et al., 2011) and used in the present study.
2. To do better as I go through the exercises (MAp goal).
3. To avoid doing worse in the second set of exercises than in the first set (MAv goal).
4. To do better than other students on these exercises (PAp goal).
5. To avoid doing worse than other students on these exercises (PAv goal).