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Autonomous and controlled reasons underlying self-approach and self-avoidance goals and educational outcomes

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Abstract Based on the new 3 × 2 achievement goal model, the first purpose of this prospective research was to examine the relation of self-approach and self-avoidance goals to four educational outcomes, namely intentions of dropping out, educational satisfaction, self-efficacy, and achievement. We also considered the autonomous and controlled reasons underlying these self-based goals in order to investigate whether self-approach and self-avoidance goals, as well as their underlying reasons, related to outcomes. Data was collected from 330 students, at two time points. Our findings showed that self-approach and self-avoidance goals did not explain changes in outcomes, with the exception of the significant relationship between self-avoidance goals and educational satisfaction. The present results also revealed that the autonomous and controlled motivations underlying achievement goals were more strongly related to changes in all four educational outcomes than was the endorsement of goals themselves. Theoretical implications and research perspectives are discussed.

Keywords Achievement goal theory · Self-determination theory · College students · Educational satisfaction · Achievement

1 Introduction

Elliot et al. (2011) recently proposed a 3 × 2 model of achievement goals and showed that mastery-based goals (i.e., goals that are focused on the development of competence and task mastery; see Elliot and Harackiewicz 1996) contained two

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different standards for evaluating one's competence: task-based competence (i.e., doing well or not doing poorly with regards to what the task requires) and self-based competence (i.e., doing well or not doing poorly relative to one's prior achievements). Based on these two standards and on the distinction between approach and avoidance goals, Elliot et al. (2011) proposed the existence of four mastery-based goals. Specifically, in the 3 × 2 achievement goal model, task-approach goals refer to the attainment of task-based competence, task-avoidance goals reflect the avoidance of task-based incompetence, self-approach goals pertain to the attainment of self-based competence, and self-avoidance goals apply to the avoidance of self-based incompetence.

Moreover, Vansteenkiste et al. (2014) recently argued for a systematic consideration of the autonomous and controlled reasons underlying individuals' achievement goals. More specifically, based on self-determination theory (Deci and Ryan 2000), they emphasized the importance of considering both the autonomous reasons (i.e., engaging in an activity because it is pleasurable and/or because it comes out of one's own choice) and the controlled ones (i.e., engaging in an activity because of an internal or external pressure) guiding the pursuit of goals. Indeed, authors stated that autonomous and controlled regulations underlying achievement goals would associate distinctively with educational outcomes, and that the relationships between achievement goals and outcomes would be lowered when considering the autonomous and controlled reasons involved in pursuing these goals.

The present study was conducted to replicate and extend this area of research. Specifically, the first purpose of the present research was to examine the links between self-approach and self-avoidance goals and four educational outcomes (i.e., intentions to drop out, educational satisfaction, self-efficacy, and achievement). These four constructs have been extensively studied in the achievement goal literature as numerous researchers have considered goals as predictors of these outcomes (see Elliot et al. 2011). For instance, Dull et al. (2015) examined the relation of achievement goals to self-efficacy in a sample of students enrolled in an introductory financial accounting course at a large public university in the USA. Other researchers also argued and demonstrated self-efficacy to be an outcome of achievement goals in the educational context (e.g., Friedel et al. 2007, 2010; Pintrich 2000). However, it should be noted that no prospective or longitudinal studies to date have examined the relationships of both self-approach and self-avoidance goals to satisfaction, self-efficacy, achievement, and intentions to drop out in the educational setting. The present research is thus unique and adds to the literature on achievement goal theory (Elliot et al. 2011).

In addition, our second purpose was to investigate the relationships of autonomous and controlled reasons underlying self-approach and self-avoidance goals to the four educational outcomes. Finally, in line with Vansteenkiste et al. (2014) suggestions, we examined whether the links between self-approach and self-avoidance goals and outcomes were attenuated when controlling for autonomous and controlled reasons. Even though previous research in the work (Gillet et al. 2014, Study 2) and sport (Vansteenkiste et al. 2014) settings used prospective or longitudinal designs, no studies, to the best of our knowledge, examined the relationships of autonomous and controlled reasons underlying self-based goal pursuit to educational outcomes, over time. Michou et al. (2016, Study 2) did use a

prospective design in a sample of Turkish students but they did not rely on the 3 × 2 model of achievement goals (Elliot et al. 2011). Thus, they did not assess either self-approach or self-avoidance goals and solely considered the autonomous and controlled reasons underlying mastery-approach and mastery-avoidance goals. We aimed to fill this gap in the present research and believe that our study might therefore extend the understanding of the links between the reasons underlying self-based goals and the strength of these goals, on one hand, and educational outcomes on the other hand.

2 Self-approach and self-avoidance goals and educational outcomes

Although the consequences of achievement goals (e.g., performance approach goals) have been well documented in different settings, very few studies have investigated the relationships of self-approach and self-avoidance goals to educational outcomes (e.g., David 2014; Elliot et al. 2011; Gillet et al. 2015). Moreover, these studies yielded inconsistent findings. First, results from Gillet et al. (2015) revealed that self-approach goals were significantly and positively correlated with educational satisfaction in sample 1, while the correlation was not significant in samples 2 and 3. Second, David (2014) showed that self-avoidance goals negatively related to test performance. Conversely, Lüftenegger et al. (2016) found a significant and positive correlation between self-avoidance goals and achievement. Moreover, Gillet et al. (2015) showed that self-avoidance goals were not significantly associated with educational satisfaction. On the contrary, Méndez-Giménez et al. (2016) showed that self-avoidance goals were positively associated with life satisfaction. In sum, results are inconsistent across studies, as self-approach and self-avoidance goals can be positively, negatively or non-significantly related to individuals' attitudes and behaviors.

3 Autonomous and controlled reasons underlying achievement goals

Recent research emphasized the inconsistent findings on the effects of achievement goals, and suggested to examine the reasons underlying achievement goal pursuit in order to reach a better understanding of the links between each achievement goal and outcomes (see Vansteenkiste et al. 2014). Specifically, these studies showed that autonomous and controlled regulations of performance-approach goals (Gillet et al. 2014, Study 1; Vansteenkiste et al. 2010) and dominant achievement goals (i.e., mastery-approach, performance-approach or performance-avoidance goals; Michou et al. 2014, Study 2) differentially related to educational outcomes such as well-being and learning strategies, and added to the variance explained by goal strength. In addition, Vansteenkiste et al. (2010, Study 1) showed, in the sport domain, that autonomous reasons to pursue performance-approach goals were positively related to vitality and positive affect, while controlled reasons were positively associated with negative affect. Finally, Vansteenkiste et al. (2014) found that autonomous reasons underlying mastery-approach goal pursuit positively related to enjoyment and performance in the sport setting. A possible explanation to these findings may

be that, when individuals' achievement goal pursuit is regulated in a controlled manner, they feel pressured to pursue and attain their goals. In contrast, when their achievement goal pursuit is autonomously regulated, they either fully endorse the goals or experience the goal pursuit as inherently pleasurable and satisfying (Vansteenkiste et al. 2014).

4 The present research

In this prospective research, we examined whether self-approach and self-avoidance goals at Time 1 (i.e., at the beginning of spring semester) would explain changes in intentions of dropping out, educational satisfaction, and self-efficacy at Time 2 (6 weeks later). We also wanted to verify whether achievement at the end of the semester would be explained by these goals at Time 1, while controlling for prior semester's achievement. Given the inconsistent findings in the literature, it appeared difficult to make formal hypotheses about the links between achievement goals and outcomes. However, in line with past studies showing positive effects of self-approach goals (e.g., Mascret et al. 2015; Méndez-Giménez et al. 2016), we expected that self-approach goals would positively relate to adaptive outcomes (i.e., educational satisfaction, self-efficacy, and achievement), and negatively to intentions of dropping out (Hypothesis 1). Indeed, these goals may imply that students clearly identify what they need to strive for in order to outperform. In this case, students are most engaged because levels of challenge match or realistically exceed their skills (Martin 2006). In addition, because they believe that effort is a primary cause of success (see VandeWalle 1997), these students would be more confident in their ability to perform their school activities with success (i.e., high self-efficacy). In addition, because students endorsing self-approach goals display higher levels of pleasure and enjoyment (e.g., Lüftenegger et al. 2016), they would also be more satisfied with their studies and less likely to drop out. More generally, challenge-seeking goals create an internal drive to perform, arouse energy and effort, and lead to success and higher achievement (Hulleman et al. 2010; Senko et al. 2011). Challenging goals can apply to self-approach goals as they imply outperforming oneself and are oriented towards action to do so.

As previously mentioned, prior studies yielded inconsistent findings concerning the links between self-avoidance goals and educational outcomes (e.g., Gillet et al. 2015; Lüftenegger et al. 2016). In addition, since mastery goals and perceived competence as well as mastery goals and perceived autonomy interact to predict adaptive learning strategy and effort, respectively (Cho et al. 2011), it is difficult to anticipate how the self and avoidance components may combine in the goal regulation process (Elliot et al. 2011). Given these results, in the current study, we did not formulate any hypotheses with regards to the relationships between self-avoidance goals and educational satisfaction, self-efficacy, achievement, and intentions of dropping out.

In line with past studies (Gillet et al. 2014, 2015), our second aim was to examine the links between autonomous and controlled reasons underlying self-approach and self-avoidance goals and the four educational outcomes. We hypothesized that

autonomous reasons would positively relate to changes in adaptive outcomes (i.e., educational satisfaction, self-efficacy, and achievement), while controlled reasons would be positively associated with changes in intentions of dropping out (Hypothesis 2). Indeed, when autonomously motivated, students feel energetic and vigorous because the goal's informational value is salient, and they strive to achieve goals that are in line with their beliefs and interests (Vansteenkiste et al. 2014). Conversely, students with high levels of controlled motivation may experience their goals in a more evaluative and pressured way, which is likely to deplete their energetic resources and lead to negative outcomes (Moller et al. 2006).

Finally, the third aim of the present research was to demonstrate whether the links of self-approach and self-avoidance goals to outcomes would be attenuated after taking into account the autonomous and controlled reasons underlying these self-based goals. Indeed, the motivational regulations underlying achievement goals alter the latters' functional significance or their meaning (Deci and Ryan 2000). Recent studies showed that autonomous and controlled reasons underlying achievement goals were more strongly related to subjective well-being (Gillet et al. 2015) and learning outcomes (Michou et al. 2014) than the actual pursuit of these goals. In line with these findings, we hypothesized that the significant relationships between self-based goals and outcomes would become non-significant after taking into account their underlying autonomous and controlled reasons (Hypothesis 3).

5 Method

5.1 Participants and procedure

For this study, data was were collected at two time points over a semester (i.e., 2 weeks after the beginning of the spring semester and 6 weeks later). At each data collection, we explained the general purpose of the study and a questionnaire was administered to students in class settings. Participation was voluntary and participants were invited to complete a self-reported questionnaire including basic demographic questions, as well as the ensuing scales, at two time points during the semester (i.e., achievement goals and their underlying reasons at Time 1, and educational outcomes at both Time 1 and 2). Participants were guaranteed that their responses would be kept confidential and would not have any influence on their course grade. They were only required to indicate an identification code to allow researchers to match their responses at each data collection. Each participant provided informed consent and took 10–15 min to complete the questionnaire.

At Time 1, a total of 383 first-year psychology students at a French university took part in the survey. Among these participants, 330 agreed to complete the questionnaire again at Time 2 (response rate = 86.2%). The final sample consisted of 57 males and 273 females. Their average age was 19.76 ($SD = 1.63$), with a range from 18 to 35 years. Descriptive analyses were conducted to compare participants who took part only in the first data collection (i.e., T1) to those who completed the questionnaire at both time points (i.e., T1–T2). Students who took

part only in the T1 survey did not show significantly different scores than those who participated at both data collection times with regards to self-approach goals ($M_{T1} = 5.96$, $M_{T1–T2} = 6.09$; $p = .43$), self-avoidance goals ($M_{T1} = 5.96$, $M_{T1–T2} = 5.89$; $p = .69$), autonomous reasons underlying self-approach goals ($M_{T1} = 5.25$, $M_{T1–T2} = 5.02$; $p = .28$), controlled reasons underlying self-approach goals ($M_{T1} = 3.36$, $M_{T1–T2} = 3.08$; $p = .21$), autonomous reasons underlying self-avoidance goals ($M_{T1} = 4.94$, $M_{T1–T2} = 4.77$; $p = .48$), controlled reasons underlying self-avoidance goals ($M_{T1} = 3.19$, $M_{T1–T2} = 3.08$; $p = .64$), intentions of dropping out ($M_{T1} = 2.45$, $M_{T1–T2} = 2.15$; $p = .17$), educational satisfaction ($M_{T1} = 5.26$, $M_{T1–T2} = 5.32$; $p = .77$), self-efficacy ($M_{T1} = 4.45$, $M_{T1–T2} = 4.69$; $p = .14$), fall semester achievement ($M_{T1} = 0.21$, $M_{T1–T2} = 0.24$; $p = .81$), and spring semester achievement ($M_{T1} = 0.09$, $M_{T1–T2} = 0.34$; $p = .08$).

5.2 Measures

5.2.1 Achievement goals

The strength of participants' self-approach and self-avoidance goals was assessed with two items (i.e., "*To perform better in exams for the current semester than I did in the fall semester exams*", and "*To avoid doing worse in exams for the current semester than I did in the previous semester exams*") from the 3 × 2 Achievement Goal Questionnaire (Elliot et al. 2011). Responses were given on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). These two items were chosen because they displayed the highest factor loadings in a prior study with two samples of French undergraduate students (i.e., Gillet et al. 2015, Samples 1 and 2).

5.2.2 Reasons for endorsing achievement goals

After responding to both achievement goals items, students were asked why they pursued each scale item. Specifically, two items assessing autonomous reasons (i.e., intrinsic motivation: "*Because of the fun and enjoyment that it provides me*"; identified regulation: "*Because I really believe it is an important goal to have*") and two items pertaining to controlled reasons (i.e., introjected regulation: "*Because I would feel ashamed, guilty, or anxious if I did not*"; external regulation: "*Because somebody else wants me to or because the situation demands it*") were submitted. Responses were indicated on a 7-point Likert scale that ranged from 1 (*does not correspond at all)* to 7 (*corresponds exactly*). We followed this procedure consistently with previous research focusing on the reasons underlying achievement goals (e.g., Michou et al. 2014; Vansteenkiste et al. 2014). Michou et al. (2014) showed strong positive correlations between intrinsic motivation and identified regulation (.65 to .83) and between introjected and external regulations (.82 to .86) underlying achievement goals. Consistent with prior research, we created an autonomous and controlled regulation score for each goal by averaging the intrinsic motivation and identified regulation items, and the introjected and external regulations items, respectively. Preliminary analyses showed strong positive

correlations between the autonomous reasons ($r = .83$, $p < .001$) and the controlled reasons ($r = .86$, $p < .001$) underlying both achievement goals. In light of these results, and in line with the method used by Michou et al. (2014), autonomous reasons for self-approach and self-avoidance goals were collapsed into one score. We did the same for both controlled regulation scores.

5.2.3 Educational satisfaction

Students' satisfaction from their studies was assessed using a single item used by Shimazu et al. (2015), and questioning whether or not students were satisfied with their undergraduate courses. Participants indicated their responses on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). It has been argued that a single item measure is an inclusive and valid measure of general satisfaction (Wanous et al. 1997).

5.2.4 Self-efficacy

Self-efficacy was assessed with three items (Time 1 $\alpha = .83$ and Time 2 $\alpha = .80$) from the Motivated Strategies for Learning Questionnaire (Pintrich and De Groot 1990). Participants were asked to rate each item (e.g., "*I am certain I can understand the ideas taught in the courses during the semester*") on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

5.2.5 Intentions of dropping out

Students' intentions to drop out (Time 1 $\alpha = .91$ and Time 2 $\alpha = .92$) were assessed with two items used by Gillet et al. (2012) (i.e., "*I often intend to drop out of my studies"* and "*I am determined to pursue my college education*", reversed) and one item used by Vallerand et al. (1997) (i.e., "*I intend to drop out of university*"). Participants were requested to indicate their responses on a 7-point Likert scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*).

5.2.6 Achievement

Students' official academic transcripts for the fall and spring semesters were obtained from the university registrar once the academic year was concluded. Students who passed the semester were coded as $+1$ and those who failed the semester were coded as -1.

6 Results

Table 1 provides the correlations between self-approach goals, self-avoidance goals, and educational outcomes at both Time 1 and 2. We performed a series of linear regression analyses (see Table 2) for three educational outcomes (i.e., intentions of dropping out, educational satisfaction, and self-efficacy) to examine: (1) whether

Table 1 Means, standard deviations, alpha reliabilities, and correlations involving achievement goals and outcomes

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11
Self-approach goals T1 (1)	6.08	1.04											
Self-avoidance goals T1 (2)	5.87	1.31	.59***										
Autonomous reasons T1 (3)	4.90	1.48	.45***	.39***									
Controlled reasons T1 (4)	3.07	1.44	.32***	.23***	.33***								
Intentions of dropping out T1 (5)	2.16	1.47	−.21***	−20***	−.44***	−.10							
Self-efficacy T1 (6)	4.68	1.06	.09	.13*	.20***	.08	−.40***						
Educational satisfaction T1 (7)	5.32	1.24	.14*	.11	.30***	−.02	−.46***	.22***					
Fall semester achievement (8)	.24	.97	−.10	−.05	.14*	−.01	−.26***	.15**	.29***				
Intentions of dropping out T2 (9)	2.31	1.57	−21***	−.21***	−.46***	−.09	.82***	−.32***	−.43***	−.32***			
Self-efficacy T2 (10)	4.57	1.11	.08	.15**	.17**	−.03	−.34***	.74***	.22***	.21***	−.39***		
Education satisfaction T2 (11)	5.11	1.27	.11*	.17**	.31***	.04	−.34***	.12*	.55***	.19**	−.45***	.21***	
Spring semester achievement (12)	.33	.94	−.01	−.01	.20***	.01	−.30***	.25***	.22***	.57***	−.39***	.25***	.24***

For fall semester and spring semester achievement, students who passed the semester were coded as +1 and those who failed the semester were coded as −1

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 2 Results of the hierarchical linear regression analyses

	ΔF	ΔR^2	DV	SAP	SAV	AR	CR
Intentions to drop out T2							
Step 1	219.68*	.67	.81*	−.02	−.04	–	–
Step 2	4.80*	.01	.76*	.01	−.03	−.12*	.03
Self-efficacy T2							
Step 1	131.09*	.55	.73*	−.02	.06	–	–
Step 2	4.19*	.01	.73*	.01	.06	.03	−.12*
Educational satisfaction T2							
Step 1	50.06*	.32	.54*	−.04	.13*	–	–
Step 2	4.22*	.02	.50*	−.09	.10	.16*	−.00

DV Dependent variable at Time 1, *SAP* Strength of self-approach goals, *SAV* Strength of self-avoidance goals, *AR* Autonomous reasons underlying self-based goals, *CR* Controlled reasons underlying self-based goals

* $p < .05$

self-approach and self-avoidance goals related to changes in each outcome at Time 2, while controlling for each outcome at Time 1 (Hypothesis 1), (2) the links between the autonomous and controlled reasons underlying these self-based goals at Time 1 and changes in each of the four outcomes at Time 2 (Hypothesis 2), and (3) whether the relationships of self-approach and self-avoidance goals to outcomes would be weaker after taking into account the autonomous and controlled reasons underlying these self-based goals (Hypothesis 3). The strength of each achievement goal and each outcome at Time 1 were entered in the first step, while the underlying autonomous and controlled reasons of goal pursuits were entered in the second step to assess whether they explained additional variance and predicted changes in outcomes.[1]

In Step 1, self-approach and self-avoidance goals were not associated with changes in Time 2 intentions of dropping out, educational satisfaction, and self-efficacy, except for a significantly positive link between self-avoidance goals and educational satisfaction. These results did provide support for Hypothesis 1. Adding autonomous and controlled regulations underlying self-based goals in Step 2 resulted in a significant rise in explained variance in all outcomes. Moreover, autonomous reasons were positively related to educational satisfaction, and negatively related to intentions of dropping out, while controlled reasons were negatively associated with self-efficacy. Controlled reasons did not significantly relate to intentions of dropping out and educational satisfaction, while autonomous

[1] Gaudreau (2012) recently showed that performance-approach goals were associated with greater performance, yet solely for students whose reasons to pursue these goals were autonomous. For exploratory purposes, we thus added two-way interaction terms between autonomous and controlled regulations, and achievement goal strength in Step 3, to determine if some of the relationships of self-approach and self-avoidance goals to educational outcomes were moderated by their underlying levels of autonomous and controlled motivations. According to Aiken and West's (1991) procedures, predictors were centered before calculating the interaction products. The addition of the two-way interaction terms between regulations and goal strength in Step 3 did not increase explained variance in the four outcomes.

reasons were not significantly associated with self-efficacy. These results provided partial support for Hypothesis 2. Finally, the initially observed significant relation of self-avoidance goals to educational satisfaction in Step 1 became non-significant after including the autonomous and controlled reasons in Step 2, thus providing support for Hypothesis 3.

Because achievement was a categorical variable in the present research, logistic regression analysis was used for this outcome. Fall semester achievement was significantly linked to spring semester achievement (OR = 4.00, $p < .001$). Self-approach (OR = 1.17, $p = .37$) and self-avoidance (OR = .99, $p = .96$) goals were not related to changes in spring semester achievement. Moreover, autonomous reasons were positively related to achievement (OR = 1.57, $p < .05$), while controlled reasons were not significantly associated with this outcome (OR = .91, $p = .58$).

7 Discussion

The first purpose of the present research was to examine whether self-approach and self-avoidance goals were associated with changes in educational satisfaction, self-efficacy, achievement, and intentions of dropping out. We also relied on the 3 × 2 model of achievement goals (Elliot et al. 2011) and self-determination theory (Deci and Ryan 2000) to reach a better understanding of the autonomous and controlled reasons underlying self-approach and self-avoidance goal striving. More specifically, we examined the links of autonomous and controlled reasons underlying the pursuit of these self-based goals to educational outcomes. Our findings have both theoretical and practical implications.

First, self-approach goals were not significantly related to achievement and self-efficacy at Time 1 and 2. In addition, self-avoidance goals were not significantly associated with achievement and educational satisfaction at Time 1. In contrast, significant correlations were observed between both these goals and intentions of dropping out. Specifically, self-approach and self-avoidance goals were significantly and negatively correlated to intentions of dropping out at Time 1 and 2. However, when we examined the links between these two achievement goals and the four educational outcomes over time, only one relationship reached statistical significance. More specifically, these results revealed that students who aimed to avoid self-based incompetence were more likely to experience educational satisfaction. They are in line with previous research showing positive effects of self-avoidance goals (e.g., Lüftenegger et al. 2016; Stoeber et al. 2015). Conversely, they are not consistent with those found by Gillet et al. (2015) where self-avoidance goals were not significantly associated with educational satisfaction. Our findings are also discordant with prior investigations reporting non-significant or negative links between mastery-avoidance goals and adaptive outcomes (e.g., Baranik et al. 2010; Poortvliet et al. 2015). However, in these studies, researchers did not distinguish between task-based or self-based incompetence avoidance, and used an omnibus mastery-avoidance goal. This makes comparisons between our results and those reported in prior studies very difficult.

The positive link between self-avoidance goals and educational satisfaction over time can be explained by the fact that students in the current sample perceived these goals to be attainable and, as a result, experienced less pressure, enjoyed the activity more, and were more satisfied by their studies when pursuing such goals (Senko and Freund 2015). In other words, they might focus more on self-based competence and construe the goal adaptively, while devoting less attention to the avoidance element. In addition, students in the current sample might view ability as malleable during self-avoidance goal pursuit (Elliot and McGregor 2001). In this case, tenacity increases and strategy is optimized, making self-avoidance goals easier to achieve, thus enhancing their satisfaction towards their studies (Senko and Freund 2015).

These inconsistent findings on the effects of self-avoidance goals, and more generally mastery-avoidance goals, are not surprising as Elliot (1999) expected that mastery avoidance goals should "produce a somewhat complex and variable empirical pattern" (p. 182) because these goals "represent a hybrid of positive (mastery) and negative (avoidance) motivational forces" (Senko and Freund 2015, pp. 477–478). The present results also revealed that self-approach goals were not associated with significant changes in educational satisfaction, self-efficacy, achievement, and intentions of dropping out. Therefore, they did not provide support for our first hypothesis but were in line with recent studies showing non-significant links between these goals and various educational outcomes (e.g., Elliot et al. 2011). However, our results contrast with those found in past studies showing that self-approach goals were significantly and positively associated with adaptive behaviors (e.g., Mascret et al. 2015). Moreover, they did not confirm the results found in previous research focusing on the effects of mastery-approach goals (e.g., Huang 2011; Van Yperen et al. 2015). More generally, future studies on the relation of self-approach and self-avoidance goals to different outcomes (e.g., engagement, positive and negative affect) and in different samples of students are needed, as the predictive validity of these two achievement goals was rather weak in the present research.

Second, as suggested by Vansteenkiste et al. (2014), we also considered autonomous and controlled reasons underlying self-approach and self-avoidance goal pursuits. In line with Hypothesis 2, the present findings showed that autonomous reasons to pursue these goals were associated with higher levels of educational satisfaction and achievement. Autonomous reasons also related to lower scores on intentions of dropping out, while controlled reasons were associated with lower feelings of self-efficacy. These results are in line with those from past research (e.g., Gillet et al. 2014; Michou et al. 2014; Vansteenkiste et al. 2010). However, it appeared striking in the present results that autonomous reasons did not relate to significant changes in self-efficacy, while they were positively associated with both of the other adaptive outcomes, namely educational satisfaction and achievement.

Past research found that controlled reasons underlying achievement goal pursuits were negatively related to adaptive outcomes such as engagement, positive affect, and effort regulation (e.g., Gillet et al. 2015; Michou et al. 2014; Vansteenkiste et al. 2010). Such negative effects may be due to the fact that controlled regulation represents a maladaptive mode of functioning. Indeed, when students pursue

achievement goals for controlled reasons, these goals are experienced in a more coerced way, leading to a decline in their energetic resources (Moller et al. 2006). In contrast, autonomous regulation is associated with adaptive outcomes because, when pursuing goals for autonomous reasons, students are basically doing what they really want to do and the goals are seen as a way to provide guidance for their functioning (Vansteenkiste et al. 2014). In addition, as underlined by Deci and Ryan (2000) in their self-determination theory, autonomous regulation is associated with more adaptive outcomes than controlled regulation because autonomous reasons underlying achievement goals are positively related to the satisfaction of the psychological needs for autonomy, competence, and relatedness, while controlled reasons are linked to the thwarting of these needs (Gillet et al. 2014, Study 2). More generally, the present results suggest that the effects of autonomous and controlled motivations underlying self-based goal pursuits may vary as a function of the outcomes under study. Clearly, future studies on this issue are in order.

Finally, considering the autonomous and controlled motivations underlying the pursuit of self-based goals explained additional variance in the outcomes beyond the strength of achievement goals. In addition, in line with Hypothesis 3, the significant link between self-avoidance goals and educational satisfaction became non-significant after considering autonomous and controlled reasons. The present study is the first, to the best of our knowledge, to examine autonomous and controlled reasons underlying the pursuit of self-based goals by using a prospective design and thus represents an extension of past research which focused on these goals through the use of cross-sectional designs (e.g., Gillet et al. 2015).

Although the present research revealed a number of interesting findings, some limitations and suggestions for future research must be considered. First, it should be noted that the design used was correlational in nature. Consequently, causality cannot be inferred from the present results. Future research using experimental designs should be conducted to provide more clarity regarding the direction of causality in achievement goals, reasons underlying their pursuit, and educational outcomes. Second, it would be interesting to assess the study variables over a longer period of time and with more than two data collections to examine the dynamic relationships between the different constructs that were assessed in the present research. Third, the present sample only comprised students from one country (France). Future research with students from other countries and different cultures is needed to replicate and extend the present findings. Fourth, we assessed participants' self-approach and self-avoidance goals with two items displaying the highest factor loadings in a prior research with two samples of French undergraduate students (i.e., Gillet et al. 2015, Samples 1 and 2). Future research should use all six items from the 3 × 2 Achievement Goal Questionnaire (Elliot et al. 2011) to make it easier to compare different studies. As we also assessed educational satisfaction with one item, future studies should confirm our results with other scales. Fifth, the weak or non-significant relationships between achievement goals and outcomes might be explained by the way we assessed achievement goals in the present research. Specifically, participants completed the items with regard to their exams as in Elliot and McGregor (2001), and we encourage further investigations to use different measures (e.g., achievement goals in a specific class; see Baranik et al.

2010). Moreover, as achievement was represented by a dummy variable in the present research (i.e., success vs. failure), it would also be interesting to have students' grades in each exam during the semester. Sixth, we did not consider potential determinants of the pursuit of achievement goals and their underlying reasons. As recently suggested by Vansteenkiste et al. (2014), future research could examine various antecedents of students' achievement goals and underlying reasons (e.g., implicit theory of intelligence, personality). Finally, additional research on the mediating variables (e.g., goal attainment, psychological need satisfaction) would be fruitful and could help us to understand the processes by which autonomous and controlled reasons underlying achievement goals significantly relate to educational outcomes.

In sum, the present study showed the importance and significance of considering the autonomous and controlled reasons underlying students' self-approach and self-avoidance goals. Indeed, when students pursued these goals for autonomous reasons, their educational satisfaction and achievement were higher, and their intentions of dropping out were lower. In contrast, when these goals were driven by controlled reasons, a significant drop in self-efficacy was observed.

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