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Factors Related to (Under)achievement in Postsecondary Students

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Abstract

Factors related to (under)achievement were explored among postsecondary students (n = 569) with an online questionnaire measuring education-related attitudes and beliefs, self-evaluations of self-regulated study behaviors, and behavioral cost. Exploratory factor analysis resulted in seven factors with an eigenvalue above 1 explaining 65.17 % of the variance. Cluster analysis revealed four types of students based on the factors. Students with less positive attitudes and beliefs had lower grades and more academic delay than students with positive attitudes and beliefs. Students with the least positive characteristics were more common in a high-ability group (with self-reported IQ above 130; n = 65), compared with a group with average to above-average ability (with self-reported IQ between 90 and 130; n = 47).

Keywords: underachievement; attitudes; beliefs, cost; motivation; high-ability

Factors Related to (Under)achievement in Postsecondary Students

Students in postsecondary education experience more freedom in their education compared with secondary education. There is more opportunity for them to choose whether to attend classes and to work on assignments or exams (Balduf, 2009; Honken & Ralston, 2013). Consequently, higher demands are placed on the ability of students to motivate themselves to be engaged, and to invest appropriate time and energy in their education (Balduf, 2009; Pintrich, 2004). Students performing below their potential for a significant period of time are called underachievers (Reis & McCoach, 2000). Recognition of underachievement among postsecondary students is important, since it is associated with a higher risk of dropping out of their education (Morisano et al, 2010; Peterson, 2000; Shaw & Mattern, 2013). Problems in motivation may play a role in underachievement (Siegle et al., 2017; Snyder & Linnenbrink-Garcia, 2013). When postsecondary students have problems in motivation for their education, this may result in lower grades and eventually in academic delay, i.e., not earning their degree in time (Allen & Robins, 2010) or even dropping out of their education (Robbins, et al., 2006).

Particularly students with high cognitive ability (i.e., high potential), are at risk for underachievement because they often experience a discrepancy between their needs and the opportunities provided in their education (Snyder & Linnenbrink-Garcia, 2013; Speirs Neumeister & Hebert, 2003). However, since a student's potential is not always known, underachievement may be hard to detect, especially when underachieving students gain average or above average academic results (Landis & Reschly, 2013). For them, both their high potential and their underachievement may go by unnoticed.

Since a discrepancy between potential and achievement will not always be recognized, it is useful to study characteristics that are related to students' motivation for their education, such as attitudes and beliefs. The study of these characteristics might help stakeholders recognize possible indicators for underachievement and develop interventions for these students.

Attitudes and Beliefs related to Underachievement

Theories on motivation for learning and academic achievement have provided insight in factors related to underachievement (Steenbergen-Hu et al., 2020), particularly theories on

expectancy-value (Eccles et al., 1983; Wigfield & Eccles, 2000; Wigfield et al., 2017), goal orientation (Elliot, 1999; Elliot & Church, 1997; Elliot & Hulleman, 2017), self-determination (Deci & Ryan, 1994: Ryan & Deci, 2000; Ryan & Moller, 2017), self-efficacy (Bandura, 1989, 1993; Marsh et al., 2017; Zimmerman et al., 2017), mindset (Dweck & Leggett, 1988; Dweck & Molden, 2017; Dweck & Yeager, 2019), and self-regulated learning (Pintrich & de Groot, 1990; Zimmerman, 2002; Zimmerman et al., 2017).

A theoretical framework specifically developed to identify factors related to achievement is the achievement orientation model (AOM; Siegle & McCoach, 2005; Siegle et al., 2017). This model incorporated well-studied concepts including expectancy-value, self-efficacy, and self-regulated learning. According to the AOM, for a student to have sufficient motivation for school, students need to have a positive attitude on each of the three following components: (1) task or outcome value (goal valuation), (2) expectation to succeed (environmental perceptions), and (3) confidence in one's ability to perform (self-efficacy). Therefore, when a student shows negative or neutral attitudes on one or more of these components, this will result in less motivation. According to the AOM, only when students have sufficient motivation, they will be self-regulated, which leads to engagement and consequently to achievement (Siegle et al., 2017). Self-regulation consists of three aspects: (a) the application of self-management strategies, (b) setting personal standards, and (c) self-monitoring (Siegle & McCoach, 2005). However, even motivated students may fail to engage due to problems in self-regulation. For example, students with high cognitive abilities may have insufficiently developed self-regulatory skills due to an unchallenging curriculum. As long as they were successful due to their superior memory and information processing skills, there was no need to develop these self-regulatory skills (Siegle & McCoach, 2005). This might imply that underachievement results from low engagement and in turn, low engagement may result from low motivation, insufficiently developed self-regulatory skills, or a combination of both.

Based on the AOM, the School Attitude Assessment Survey-Revised (SAAS-R; McCoach & Siegle, 2003b) was developed. This instrument was originally intended for usage in secondary education. In a study with the SAAS-R in primary education underachieving gifted students showed less self-regulated study behaviors than achieving gifted students (Mofield & Parker Peters, 2019).

Studies with the SAAS-R conducted in secondary and postsecondary education indicated that underachieving students had lower positive attitudes toward school, teachers, and classes; lower positive academic self-perceptions; lower valuation of performing well in school; and less self-regulated study behaviors than achieving students (Baslanti & McCoach, 2006; Dedrick et al., 2015; Figg et al., 2012; Matthews & McBee, 2007; McCoach & Siegle, 2003a; McCoach & Siegle, 2003b; Miñano et al., 2014). However, McCoach and Siegle (2003a) reported that gifted underachievers seemed to be a more heterogeneous group than gifted achievers with respect to academic self-perceptions, attitudes toward school, motivation, self-regulation, and goal valuation. Therefore, each gifted student may underachieve for a different combination of reasons.

Different Definitions of Underachievement

In studies that used the SAAS-R to measure possible factors related to underachievement, this construct was defined as a discrepancy between potential (to achieve) and actual academic performance (e.g, Landis & Reschly, 2013: Reis & McCoach, 2000). However, a great variability can be seen with regard to the operationalization of potential. Two main reasons can explain this. One reason concerns the fact that participants in these studies were recruited from a broad variability of populations, i.e., middle school (Mofield & Parker Peters, 2019), secondary education (McCoach & Siegle, 2003a; McCoach & Siegle, 2003b; Miñano et al., 2014), an independent boys secondary school (Figg et al., 2012) (pre-) International Baccauralearate (IB; Dedrick et al., 2015), a residential summer educational program for specific courses (Matthews & McBee, 2007), and a university for top-ranked high school students (Baslanti & McCoach, 2006). The other reason concerns the fact that potential was operationalized with different ways, i.e., Scholastic Assessment Test (SAT) score and state criteria used to determine giftedness (Mofield & Parker Peters, 2019); American College Testing or SAT score and grade level standardized score (Mathews & McBee, 2007); previous grade point average and admission assessment test (Dedrick et al., 2015); college admission test measuring reasoning abilities (Baslanti & McCoach, 2006; Figg et al., 2012); IQ or achievement score (McCoach & Siegle, 2003a: McCoach & Siegle, 2003b); and IQ alone (Miñano et al., 2014).

As far as academic or school performance concerns, most studies on the SAAS-R measured this concept by grade point average (Baslanti & McCoach, 2006; Dedrick et al., 2015; McCoach &

Siegle, 2003a; McCoach & Siegle, 2003b; Matthews & McBee, 2007; Miñano et al., 2014; Mofield & Parker Peters, 2019) while other studies utilized self-reported grade point average (Matthews & McBee, 2007; Miñano et al., 2014). In a select number of studies with the SAAS-R, performance was measured by ranking students within their class (McCoach & Siegle, 2003a) or students ranking within their grade cohort and ranking on a general achievement test (Figg et al., 2012).

In summary, even though multiple studies compared a group of underachieving students to a group of achieving students with the SAAS-R, there was variation in the operationalization of the construct underachievement. This complicates the comparability of these studies and points to the limitation of aiming to study underachieving students as one homogeneous group.

A Person-Centered Approach

The limitations of SAAS-R studies suggest that differences between gifted achievers and gifted underachievers are not as clear cut as it seems, because (1) there appears to be great variability among underachieving students regarding their attitudes and beliefs (McCoach & Siegle, 2003a), (2) different combinations of attitudes and beliefs may result in underachievement (McCoach & Siegle, 2003a), and (3) there is a great variability among definitions of underachievement. Therefore, a shift has taken place from using 'artificial median split procedures' (Conley, 2012, p. 34) to a person-centered approach focusing on identifying naturally occurring combinations of variables at the level of the individual (Conley 2012; Daniels et al. 2008; Luo et al. 2011; Wormington, & Linnenbrink-Garcia, 2017). In studies that applied this approach, types of students were identified with different combinations of factors related to (under)achievement. Recent studies on motivational student types, specifically in postsecondary education, distinguished student types based on goal orientation (Lee et al., 2017), expectancy-value and goal orientation (Linnenbrink-Garcia et al., 2018), and self-determination (Litalien et al., 2019). This person-centered approach seems to do more justice to the diversity in characteristics of the students and therefore it will be applied in the current study.

Motivational Pathways to Underachievement

According to Snyder and Linnenbrink-Garcia (2013), there may be two pathways in which high-ability students gradually lose their motivation and may become disengaged from their education: the Maladaptive Competence Beliefs Pathway and the Declining Value Beliefs Pathway. Snyder and

Linnenbrink-Garcia based these pathways on extensively studied theories and concepts, such as the expectancy-value theory (Eccles et al., 1983; Wigfield & Eccles, 2000; Wigfield et al., 2017) and the theory on implicit beliefs about intelligence (Dweck & Leggett, 1988: Yeager & Dweck, 2012). Students who experience the Maladaptive Competence Beliefs Pathway consider academic success very important for their self-esteem. They respond negatively to increasing task demands because this makes them feel unsure of performing well. As a result, they feel that they are not capable of succeeding and disengage from their education (Snyder & Linnenbrink-Garcia, 2013). On the contrary, students who experience the Declining Value Beliefs Pathway do not attach much value to schoolwork. They respond negatively to the increasing difficulty level and increasing amount of their schoolwork. As a result, they lack the motivation to put enough effort or time in their schooling and disengage from their education (Snyder & Linnenbrink-Garcia, 2013).

In both pathways, perceived costs play an important role. According to Eccles et al. (1983), costs are the negative aspects associated with engaging in a task or activity, which play a role in the valuation of the task or activity. Eccles et al. divided them into three categories: (a) the amount of effort needed to succeed, (b) the loss of time that could be used for other valued activities, and (c) the psychological meaning of failure (Eccles et al., 1983). The first two cost categories may be classified as behavioral costs, which play a role in the Declining Value Beliefs Pathway (Snyder & Linnenbrink-Garcia, 2013). The third may be classified as psychological cost, which is relevant in the situation in which a person who considers success of great importance is unsure of succeeding (Eccles et al., 1983; Snyder & Linnenbrink-Garcia, 2013: Snyder et al. 2021). Therefore, this psychological cost is not applicable to the situation in which the student is confident in succeeding in a task or does not value the task (Eccles et al., 1983). Psychological cost plays a role in the Maladaptive Competence Beliefs Pathway (Snyder & Linnenbrink-Garcia, 2013).

The two motivational pathways to underachievement of Snyder and Linnenbrink-Garcia (2013) may point to the possible existence of two main types of underachieving students, namely (a) those who consider academic achievement important and are insecure of their ability to achieve, and (b) those who lack the motivation to invest time and energy in their education due to their low valuation of it. These students differ from each other on multiple characteristics, namely their

valuation of their education, the importance of performing well, their academic self-perceptions, and their perceptions of costs. Therefore, it is important to study these attitudes and beliefs related to their education in conjunction with one another while taking perceived costs explicitly into account.

The Current Study

The specific characteristics related to underachievement discussed above, namely school-related attitudes and beliefs, and self-evaluations of self-regulated study behaviors, have been studied extensively in secondary education (Dedrick et al., 2015; Figg et al., 2012; Matthews & McBee, 2007; McCoach & Siegle, 2003a; Miñano et al., 2014). However, two issues stand out when reviewing the literature so far. One issue concerns the shortage of research on these attributes among postsecondary students. The only study on these characteristics in postsecondary education was done by Baslanti and McCoach (2006). They compared underachieving and achieving students with each other. The other issue concerns the small amount of studies on the relation between underachievement and cost perceptions of (postsecondary) students. Although multiple studies found an association between cost and achievement (e.g., Bergey et al., 2018, Conley, 2012; Guo et al., 2016; Hentges et al., 2019; Jiang et al., 2018; Jiang et al., 2020; Jiang & Rosenzweig, 2021; Kim et al., 2021), research on the association of cost with underachievement is particularly scarce. The only exception is a recent study of Snyder et al. (2021), in which the role of psychological cost is studied in the development of underachievement among students in middle school. Besides, there may be multiple types of underachieving students, with different underlying characteristics (Siegle & McCoach, 2003a; Snyder & Linnenbrink-Garcia, 2013). For this reason, we chose to study different types of students based on characteristics that are associated with underachievement and explore the association of these types with academic performance, instead of aiming to compare a group of achieving with a group of underachieving students. Knowledge of characteristics of types of underachieving students in postsecondary education may contribute to the recognition of students with different risks and needs. In addition to the characteristics previously studied in research on underachievement, we included behavioral cost perceptions, since these play a role in one specific motivational pathway to underachievement (Snyder & Linnenbrink-Garcia, 2013).

The current study served four purposes. The first purpose was to explore the factor structure of

the questionnaire, which was mainly based on the School Attitude Assessment Survey-Revised (SAAS-R, Siegle & McCoach, 2003b) and which also included two behavioral cost items (Conley, 2012). All items were translated into Dutch and modified in order to make them particularly suitable for postsecondary students, as the SAAS-R was originally developed for usage among students in secondary education. The aim of the questionnaire was to measure attitudes toward their education, their teachers and classes, their academic self-perceptions and their attitude toward performing well in their education, their self-evaluations of self-regulated study behaviors, and their behavioral cost perceptions. We expected to find the same factor structure as was found in the items of the original SAAS-R (Siegle & McCoach, 2003b) and that the behavioral cost items would form a separate factor, since these items were developed to measure a separate construct next to the SAAS-R factors.

The second purpose was to determine whether different types of students in postsecondary education could be distinguished based on their attitudes toward their education, their teachers and classes, their academic self-perceptions, and their attitudes toward performing well in their education, their self-evaluations of self-regulated study behaviors, and perceived behavioral costs. In previous studies, achieving students had more positive characteristics than underachieving students and underachieving students appeared to be more heterogenous in their school-related attitudes and beliefs than achieving students (e.g., Siegle & McCoach, 2003a). Based on these findings, we expected to find a student type with positive attitudes, positive beliefs, positive self-evaluations of their self-regulated study behaviors, and low behavioral cost perceptions. Based on the two motivational pathways to underachievement (Snyder & Linnenbrink-Garcia, 2013), we also expected to find at least two types of students with one or more of these characteristics being relatively less positive; specifically (a) a student type with relatively less positive academic self-perceptions and high valuation of performing well in their education, and (b) a student type with relatively less positive attitudes toward their education, teachers and classes, and high behavioral cost perceptions.

The third purpose was to explore the relative frequencies of these student types in a high-ability group (with self-reported IQ above 130) and a group with average to above average ability (with self-reported IQ between 90 and 130). Since high-ability students are at risk for experiencing a mismatch with their education (e.g., Snyder & Linnenbrink-Garcia, 2013), we expected to find more

high-ability students with less positive characteristics, in comparison with students with average to above average ability.

The fourth purpose was to study the differences between these student types on two indicators of academic success, namely academic performance (i.e., self-reported grades) and academic delay (i.e., students taking longer than the nominal duration of their education to complete their study, for example due to changing to a different major; van Ewijk et al., 2011; Schmidt & Simons, 2011). Previous research suggested that postsecondary students who were motivated for their education earned higher grades and more often earned their degree in time when compared with students with less motivation for their education (Allen & Robbins, 2010). We expected students with positive attitudes, positive beliefs, positive self-evaluations of their self-regulated study behaviors, and low behavioral cost perceptions, to put more effort in their education and as a result, gain relatively higher grades and complete more courses without delay than students with less positive characteristics. For these reasons, we expected students with less positive characteristics to report academic delay more often and with longer duration than students with positive characteristics. We also expected the student types to differ from each other regarding what they think the causes are for their academic delay. Students may experience academic delay for multiple reasons. First, some delays may be related to a mismatch between the needs of the students and the characteristics of the education, including the demands put on the students. Next, there may be positive reasons for academic delay, such as being an active member of a study association (Schmidt & Simons, 2011). Finally, there may be other reasons that have no direct relationship with the education, such as health problems.

We expected that students with less positive characteristics would more likely report causes for their academic delay to be related to motivational problems, stress, and their education not meeting their needs. On the contrary, we expected that students with positive characteristics would more likely report these causes to be related to health problems and being an active member of a study association. The research questions were:

1. What is the factor structure of the questionnaire, based on the adapted SAAS-R and cost items for postsecondary students?

2. To what extent can student types be distinguished based on their study-related attitudes and beliefs?

3. To what extent are student types equally frequently present in high-ability students (with self-reported IQ above 130) in comparison with students with average to above average ability (with self-reported IQ between 90 and 130)?

4. To what extent do student types differ in terms of their self-reported academic performance and self-reported academic delay, including the number of months of the delay and the causes of the delay?

Method

Participants

Participants were undergraduate and graduate students in the Netherlands of at least 18 years old. No distinction was made between undergraduate and graduate students, because in the Netherlands, unlike in many other countries, the majority of students continue a master study directly after their bachelor (CBS, 2021). Therefore, we did not expect that graduate students would significantly differ from the undergraduates. Of the 575 participants who completed the questionnaire, six were excluded from the study because they did not meet the inclusion criteria: one was under 18, two were not subscribed as students, two were subscribed as postgraduate students, and one was studying outside the Netherlands. The final sample included 569 participants (age M = 23.08, SD = 5.39, range 18 - 63), with 31.1 % male (n = 177), 67.8 % female (n = 386), and 1.1 % unknown or other (n = 6). Most of the participants (n = 365, 64.1 %) were undergraduate students and 35.8 % were graduate students (n = 204). Participants were enrolled in a broad range of educational programs in 23 different educational institutions. All fields of study (e.g., economics and health care) were represented in the final sample. A small subgroup (6.3 %) was enrolled in two or more educational programs at the same time.

Participants were asked whether they had taken an official IQ test and if they knew their IQ score. In approximately one-fifth of the sample (n = 112, 19.8 %), this was the case. These participants then were assigned to one of two groups; the high-ability group (n = 65, 11.5 %) or the group with average to above average ability (n = 47, 8.3 %). The high-ability group included participants who reported that their full-scale IQ was above 130. This score is approximately in the 98th percentile or higher, which was classified as 'highly gifted' according to Resing and Blok (2002). The group with

average to above average ability consisted of participants who had a self-reported IQ between 90 and 130.

Procedure

Recruitment of participants started after permission of the Ethics Committee of the Radboud University (ECSW-2018-011R1). Several partners in Dutch society were contacted during the recruitment process. Study advisors and study associations from publicly-financed postsecondary education institutions were requested for their assistance in the recruitment of participants in general. Furthermore, in order to include a sufficient number of participants with a self-reported IQ above 130, associations and internet fora related to high-ability were specifically requested to help in the recruitment of the participants with high-ability. All partners voluntarily distributed the link to the questionnaire (created in LimeSurvey) by posting a recruitment text with this link on websites and by e-mailing students. A maximum of 20 minutes was needed for each participant to complete the questionnaire which was filled in anonymously between April and June 2018.

Measures

Education-Related Student Characteristics

Attitudes, beliefs, self-evaluations of self-regulated study behaviors and behavioral cost perceptions were measured with items based on the School Attitude Assessment Survey-Revised (SAAS-R; McCoach & Siegle, 2003b) and items that measured behavioral cost (Conley, 2012; Eccles et al., 1983; Flake et al., 2015). Initially, 51 items were developed; 48 items based on the SAAS-R and three items measuring behavioral cost. Final item selection took place after factor analysis. A Likert scale with the following seven response categories was used for all items: *strongly disagree*, *mostly disagree*, *somewhat disagree*, *neither agree nor disagree*, *somewhat agree*, *mostly agree*, and *strongly agree.* The items are presented in the Appendix.

Adapted SAAS-R. We adapted and extended the 35-item SAAS-R (McCoach & Siegle, 2003b) to 48 items for postsecondary students, because the SAAS-R was originally developed for usage among students in secondary school. The researchers who developed the SAAS-R (McCoach & Siegle), granted permission for adapting the SAAS-R.

The original SAAS-R consisted of five subscales: Academic Self-Perceptions, Attitudes Toward Teachers and Classes, Attitudes Toward School, Goal Valuation, and Motivation/Self-Regulation. These subscales had good levels of reliability, with Cronbach's alpha above .80 (Baslanti & McCoach, 2006; Dedrick et al., 2015; McCoach & Siegle, 2003a; McCoach & Siegle, 2003b; Miñano et al., 2014). We translated and edited the 35 English SAAS-R items into Dutch. We aimed to tap the content of the original SAAS-R items and to make them applicable to students in higher postsecondary education. For example, *schoolwork* was modified into the Dutch equivalent of *coursework* and *school* into *education* or *educational institute*. For 24 items, we developed one translation and for nine items, we developed two translations. For example, the original SAAS-R item *This is a good school* was translated into two Dutch variants, namely *This is a good educational institute,* and *This is a good education*. For two items, three translations were developed, in which the original SAAS-R *school* was translated into Dutch items with *school,* as well as *lectures* and *workgroups.* In total, 48 adapted SAAS-R items were developed.

A panel of postsecondary students commented on the items regarding clarity and ambiguity and translated the items either from Dutch to English or vice versa. Based on the comments of the panel, we finalized the questionnaire. We decided to include the items and their extra variants in the factor analysis to explore which items were most suitable in measuring the intended constructs.

All items were positively formulated. Low scores indicated that positive characteristics (i.e., positive education-related attitudes, beliefs, and self-evaluations of self-regulated study behaviors) were present to a small extent and high scores indicated that these were present to a large extent.

Behavioral Cost. Three items measuring behavioral cost were developed. We translated and edited two items developed by Conley (2012), originally written for secondary school students regarding their attitudes toward math, by changing *math* into *education*. These items measured a specific type of behavioral cost, namely the perceived loss of time as a result of studying that could otherwise be used for valued alternative activities. Furthermore, we developed a new item, measuring another type of behavioral cost, namely the perceived amount of time and effort needed to engage in studying (Eccles et al., 1983: Flake et al., 2015).

A panel of postsecondary students commented on the items regarding clarity and ambiguity and translated the items either from Dutch to English or vice versa. We finalized the three items, taking the comments of the student panel into account. High scores on these three items indicated that students considered their education time/energy consuming to a large extent.

Self-Reported Grades

Participants were asked to report grades they obtained in their postsecondary education on a scale from 1 to 10 with one decimal (which is the standard way in The Netherlands). These grades concerned the mean grade in the current academic year, the highest grade in the current academic year, the lowest grade before re-examination in the current academic year, the lowest grade after re-examination in the current academic year, and the mean grade in the entire educational program. Participants who were enrolled in more than one educational program, were asked to report the grades they considered the most important.

Self-Reported Academic Delay

Participants were asked whether they experienced academic delay. If they did, they were requested to report the number of months of their academic delay and self-attributed causes for this delay. Response categories were based on studies concerning causes for academic delay (van Ewijk et al., 2011; Schmidt & Simons, 2011).

Self-Reported IQ

Participants were asked whether they had taken an official supervised IQ test. When this was the case and when they knew their full-scale IQ score exactly or by approximation, they were requested to report their IQ score, either exactly or by choosing one of the following intervals: 89 or below; 90 - 110; 111 - 120; 121 - 130; 131 or above (Resing & Blok, 2002). There were no restrictions regarding the year in which this IQ test was taken.

Data Analyses

First, to determine the factor structure of the adapted SAAS-R and the behavioral cost items, we conducted an exploratory factor analysis with principal axis factoring with direct oblimin rotation, which was most suitable since it was likely to imply that multiple factors had mild to moderate correlations (McCoach et al., 2013). We decided to exclude two items that measured attitudes towards

workgroups from further analyses, since these were not applicable to all participants. Thus, we included 46 adapted SAAS-R items and three behavioral cost items in the factor analysis. We reverse-coded the behavioral cost-items, with the result that for all cost items a high score meant low behavioral cost perceptions.

To determine the final number of factors to retain the following criteria were used: eigenvalues and scree plots, the proportion of the variance accounted for by each factor, factor loadings, convergent and divergent validity, and the interpretability of the factors (i.e., face validity). Factors with an eigenvalue above 1 (Kaiser's criterion) were retained. Items with a small pattern loading on their target factor (between -.4 and .4) and items with one or more pattern loadings (above .3 or below -.3) on other than their target factor were removed. This resulted in the removal of nine of the initial 49 items. Reliability analyses were conducted with Cronbach's alpha for the factors**.**

Second, to distinguish different student types, we first calculated for each participant the mean of the item scores on each factor and these were called factor-based scores. Next, cluster analyses were conducted on these factor-based scores. To determine the number of clusters, Ward's hierarchical cluster analysis was conducted. Based on visual inspection of the dendrogram, we further explored a four-, five- and six-cluster solution with K-means cluster analysis. The four-cluster solution was chosen because it resulted in the largest number of significant differences between cluster pairs on the factors, compared with the other cluster solutions. This way, four clusters of participants were formed and a cluster number was assigned to each participant. Each cluster had a specific pattern of scores on the seven factors, representing a specific type of student. To describe the student types, the factor-based scores of the clusters (i.e., types) were compared with each other with one-way analysis of variances (ANOVA) and post-hoc pairwise comparisons. When assumptions of equal variances were violated, Welch's correction was applied and Games-Howell corrections were used in post-hoc pairwise comparisons.

Third, we explored with chi-square tests whether frequencies of the student types were different in the high-ability group compared to the group with average to above average ability. Post-hoc comparisons between the two groups were conducted per student type with *z* tests and Bonferroni correction.

Finally, we explored differences in academic performance and academic delay. Differences among clusters on academic performance (i.e., self-reported grades) and number of months of academic delay, were tested with one-way analysis of variances (ANOVA) and post-hoc pairwise comparisons. When assumptions of equal variances were violated, Welch's correction was applied, and Games-Howell corrections were used.

For self-reported academic delay (i.e., yes / no academic delay) and all self-reported causes for this delay, chi-square tests were used to investigate whether relative frequencies of causes were similar over the four student types. Post-hoc pairwise comparisons were conducted with *z* tests with Bonferroni correction.

Results

Factor Structure of Adapted SAAS-R and Behavioral Cost Items

The first purpose was determining the factor structure of Dutch adapted SAAS-R and behavioral cost items for postsecondary students. The final factor solution consisted of 40 items measuring seven factors with an eigenvalue above 1 explaining 65.17 % of the variance. Pattern loadings and structure loadings of the 40 items are presented in Table 1 and the explained variance of the factors are presented in Table 2. Although our factors showed high resemblance to the original SAAS-R factors, none of these were identical to the original (i.e., consisting of the same items), since some items were removed and different versions of items were included. Although the original SAAS-R (McCoach & Siegle, 2003b) consisted of five factors, the SAAS-R for postsecondary students in the current study consisted of six factors, since the original SAAS-R factor 'Attitudes Toward Teachers and Classes' was in the current study found to be divided into two factors, namely 'Attitudes Toward Teachers', and 'Attitudes Toward Classes'. Next to these six factors, we also found a behavioral cost factor, separated from the SAAS-R factors, as expected. In order to make clear that the factors found in the current study were based on data of postsecondary students, we added 'PS' to the original SAAS- R factor names.

This resulted in the following seven factors: (1) Attitudes Toward School–PS (8 items; alpha = .945); (2) Motivation/ Self-Regulation–PS (8 items; alpha = .901); (3) Academic Self-Perceptions–PS (6 items; alpha = .809); (4) Behavioral Cost–PS (3 items; alpha = .887); (5) Goal Valuation–PS (7

Table 1

Pattern Loadings for Exploratory Factor Analysis with Direct Oblimin Rotation of Adapted SAAS-R and Behavioral Cost Items for Postsecondary Students

	Item	Pattern loading						
		ATS	Mot/S-R	ASP	BC	GV	ATT	ATC
4	I am glad that I go to this educational institute.	**.87**	-.03	.04	.04	-.02	.02	-.05
5	This is a good educational institute.	**.81**	-.02	.05	.00	.00	-.02	-.04
9	This educational institute is a good match for me.	**.75**	-.10	-.03	.08	-.10	-.07	-.04
35	I am proud of this educational institute.	**.75**	-.02	.04	-.08	.02	-.14	.01
15	I like this educational institute.	**.73**	.00	-.03	.04	-.10	-.14	-.06
43	I am proud of this education.	**.68**	-.02	-.02	-.06	-.02	-.16	-.08
38	This is a good education.	**.63**	-.03	.08	.00	.01	-.03	-.19
39	This education is a good match for me.	**.46**	-.05	.08	.09	-.06	-.03	-.22
26	I am a responsible student.	-.02	**-.75**	.07	-.03	-.04	-.04	.02
20	I am organized about my study assignments.	.02	**-.75**	.00	.08	-.09	.03	.06
27	I put a lot of effort into my study assignments.	-.09	**-.73**	-.03	-.30	-.01	-.12	-.03
29	I concentrate on my study assignments.	.03	**-.72**	.03	-.07	.02	.02	-.17
18	I complete my study assignments regularly.	.08	**-.69**	.02	.16	.04	-.01	-.03
24	I spend a lot of time on my study assignments.	-.07	**-.68**	-.07	-.30	-.05	-.10	-.04
30	I check my assignments before I turn them in.	.11	**-.54**	.01	-.04	-.10	.03	.05
8	I am intrinsically motivated to make all assignments for this education.	.18	**-.48**	.00	.07	-.08	.02	-.22
34	I am a smart student.	-.02	.00	**.84**	-.06	.03	-.01	.05
2	I am intelligent.	.06	.16	**.77**	-.12	.05	.05	.02
3	I can learn new ideas quickly in my education.	.20	-.07	**.59**	.00	.04	.03	-.06
33	I am good at learning new things in my education.	-.06	-.12	**.57**	.08	-.16	-.11	-.08
16	I can grasp complex concepts in my education.	.07	-.07	**.57**	.08	-.03	-.09	.06
31	I am capable of getting high grades (A or higher).	-.17	-.07	**.47**	.15	-.09	-.05	-.06
50	Success in this education requires that I give up other activities I enjoy.	.02	-.08	-.03	**.89**	.03	-.01	.01

36	I have to give up a lot to do well in this education.	.00	.06	-.01	**.84**	.04	-.04	-.03
51	I have to invest time and effort in my education in order to perform well.	.01	.16	.08	**.76**	.04	.02	.10
40	Performing well in my education is important for my future career goals.	.18	.10	.01	-.09	**-.81**	.03	.05
19	It's important to get good grades in my education.	-.06	.00	.00	.09	**-.80**	.05	-.09
32	I want to get good grades in my education.	-.14	.00	.03	.00	**-.79**	-.03	-.15
23	It is important for me to do well in my education.	-.02	-.14	-.01	-.05	**-.77**	-.02	-.07
14	Doing well in my education is important for my future career goals.	.14	.00	-.03	-.03	**-.74**	-.05	.15
17	Doing well in my education is one of my goals.	-.04	-.12	.09	-.02	**-.73**	-.08	-.01
22	I want to do my best in this education.	.02	-.25	.01	-.10	**-.50**	-.03	-.15
13	My teachers care about me.	.01	.03	.00	.02	.02	**-.84**	.03
7	I relate well to my teachers.	-.01	-.04	-.02	-.02	-.02	**-.79**	-.02
47	I feel seen and heard by my teachers.	.09	.04	.00	.05	.03	**-.76**	-.09
11	I like my teachers.	.07	.02	.07	-.01	-.03	**-.69**	-.02
44	My lectures are interesting.	.04	.07	.00	-.01	-.02	-.07	**-.87**
48	I like my lectures.	.07	-.02	.00	-.04	-.01	-.07	**-.82**
28	I like my classes.	.08	-.07	.01	-.01	.02	-.08	**-.80**
1	My classes are interesting.	.14	.00	-.03	-.02	-.09	-.01	**-.71**

Note. Pattern loadings > .40 are in boldface. ATS = Attitudes Toward School–PS, MOT/S-R = Motivation/ Self- Regulation–PS, ASP = Academic Self-Perceptions–PS, BC = Behavioral Cost–PS, GV = Goal Valuation–PS, ATT = Attitudes Toward Teachers–PS, ATC = Attitudes Toward Classes–PS; PS = postsecondary.

Items are original and modified SAAS-R items (McCoach & Siegle, 2003b), modified behavioral cost items (Conley, 2012), and a new behavioral cost item based on Eccles et al. (1983) and Flake et al. (2015).

items; alpha = .923); (6) Attitudes Toward Teachers–PS (4 items; alpha = .871); (7) Attitudes Toward Classes–PS (4 items; alpha = .940).

Table 2

Explained Variance of the Adapted SAAS-R and Behavioral Cost Factors After Direct Oblimin Rotation

Factor	Explained variance of factor	Cumulative explained variance
1 Attitudes Toward School–PS	32.86	32.86
2 Motivation/ Self-Regulation–PS	11.37	44.22
3 Academic Self-Perceptions–PS	7.02	51.24
4 Behavioral Cost–PS	4.22	55.46
5 Goal Valuation–PS	4.12	59.58
6 Attitudes Toward Teachers–PS	3.23	62.81
7 Attitudes Toward Classes–PS	2.36	65.17

Note. Factors with eigenvalue > 1 were selected. PS = postsecondary.

Student Types

The second purpose of the study was to distinguish student types, based on the factor-based scores on the seven factors. A cluster analysis was conducted with these factor-based scores, resulting in four types of students (for more details, see Data Analyses paragraph in Method section). The factor-based scores of the four student types are presented in Table 3 and boxplots of the four student types are presented in Figure 1. Pair-wise comparisons with Bonferroni correction showed significant differences (adjusted p values < .05) in most of the pairs of student types on the factor-based means. The total number of comparisons was 42 since there were 12 pairs of student types in which all seven factor-based scores were compared. In only five out of these 42 comparisons, no significant differences were found, i.e., between Types 2 and 3 on Motivation/Self-Regulation (adjusted p = .708), between Types 1 and 3 on Academic Self-Perceptions (adjusted p = .176), between Type 2 and

4 on Academic Self-Perceptions (adjusted $p = .945$), between Type 3 and 4 on Behavioral Cost (adjusted $p = .484$), and between Type 2 and 3 on Goal Valuation (adjusted $p = .757$).

In order to describe the four student types, we classified the factor-based scores into three categories, comparable with the ones in Baslanti and McCoach's study (2006): low / not positive (1.00 – 2.99), moderate / neither positive nor not positive (3.00 – 4.99), and high / positive (5.00 – 7.00). However, for an appropriate description of the four student types in the current study, we considered it useful to differentiate additionally between high / positive (5.00 – 5.99) and very high / very positive (6.00 – 7.00). With a combination of, on the one hand, attitudes, beliefs and self-evaluations of self-regulated study behaviors, and, on the other hand, behavioral cost perceptions, student types could be described as follows:

Type 1: Not positive–moderate behavioral cost: Except for positive academic self-perceptions; this student type had no positive attitudes, beliefs and self-evaluations of self-regulated study behaviors, and moderate behavioral cost perceptions.

Type 2: Partially positive–high behavioral cost: This student type had moderate and positive attitudes, beliefs and self-evaluations of self-regulated study behaviors, and high behavioral cost perceptions.

Type 3: Positive–low behavioral cost: This student type had positive attitudes, beliefs and self-evaluations of self-regulated study behaviors and low behavioral cost perceptions.

Type 4: Very positive–high behavioral cost: This student type had positive and very positive attitudes, beliefs and self-evaluations of self-regulated study behaviors and high behavioral cost perceptions.

Table 3

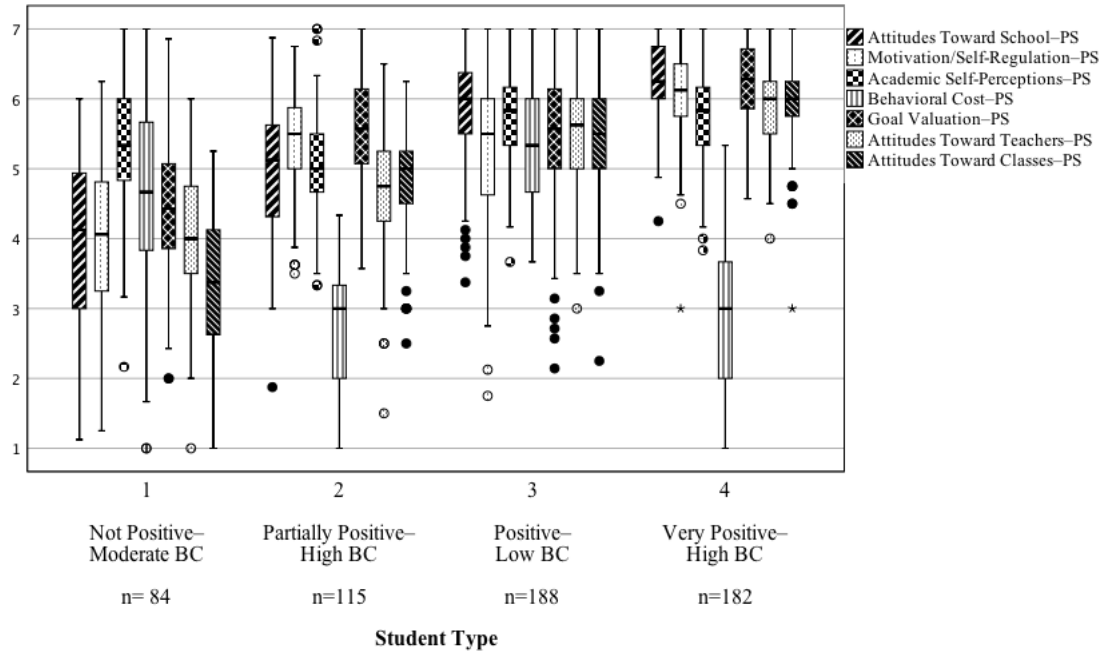
Factor-Based Scores of Student Types Ranging from (1) Not Positive to (7) Very Positive on Adapted SAAS-R and Behavioral Cost for Postsecondary Students

Student type	ATS		M/S-R		ASP		BC		GV		ATT		ATC	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
1 Not Positive– Moderate BC	3.96	1.14	4.06	.96	5.32	.94	4.59	1.36	4.39	.99	4.02	.97	3.35	1.08
2 Partially Positive– High BC	5.01	.85	5.40	.65	5.07	.71	2.75	.91	5.58	.75	4.65	.83	4.87	.75
3 Positive– Low BC	5.86	.73	5.30	1.02	5.72	.66	5.36	.76	5.48	.96	5.49	.75	5.47	.69
4 Very Positive– High BC	6.27	.54	6.10	.58	5.76	.67	2.91	1.02	6.20	.60	5.91	.62	5.99	.55

Note. ATS = Attitudes Toward School–PS, MOT/S-R = Motivation/Self-Regulation–PS, ASP = Academic Self-Perceptions–PS, BC =Behavioral Cost–PS, GV = Goal Valuation–PS, ATT = Attitudes Toward Teachers–PS, ATC = Attitudes Toward Classes–PS. Low BC = low behavioral cost–PS, Moderate BC = moderate behavioral cost–PS, High BC = High behavioral cost–PS; PS = postsecondary.

Figure 1

Student Types Based on Factor-Based Scores on Adapted SAAS-R and Behavioral Cost for Postsecondary Students



Note. Factor-based scores ranged from (1) not positive to (7) very positive.

Student Types and Ability

The third purpose was to compare the relative frequencies of the different types of students in the high-ability group with those of students in the group with average to above average ability. These frequencies are presented in Table 4. Overall, frequencies of the student types in both groups did not differ significantly, $X^2(3) = 6.03$, $p = .11$. However, as expected, comparisons per student type revealed that Type 1 (Not Positive–Moderate BC) was relatively more frequent in the high-ability group (33.8%) than in the group with average to above average ability (14.9%; adjusted $p < .05$). Type 2 (Partially Positive–High BC), Type 3 (Positive–Low BC) and Type 4 (Very Positive–High BC) were equally frequent in the two groups.

Table 4

Frequencies of Student Types in the High-Ability Group (IQ above 130) and the Group with Average to Above Average Ability (IQ between 90 and 130)

Student type	High ability		Average to above average ability	
	n	%	*n*	%
1 Not Positive–Moderate BC	22	33.8 [a]	7	14.9 [a]
2 Partially Positive– High BC	13	20.0	11	23.4
3 Positive–Low BC	17	26.2	13	27.7
4 Very Positive–High BC	13	20.0	16	34.0
Total	65	100	47	100

Note. BC = behavioral cost.

[a] Frequencies that were significantly different within a student type (*z*-tests with Bonferroni correction, adjusted $p < .05$)

Student Types and Academic Performance and Delay

The fourth purpose concerned differences between the student types on self-reported academic performance, self-reported academic delay, and self-reported causes for the delay.

Self-Reported Academic Performance

The means and standard deviations of the self-reported grades of the four types and the pairwise comparisons are presented in Table 5. Omnibus one-way-ANOVA's indicated significant differences between types on all self-reported grades, namely on mean grade in the current academic year: $F(3, 564) = 17.85$, $p < .001$ ($n = 568$), highest grade in the current academic year: $F(3, 239.81) = 7.15$, $p < .001$ ($n = 568$), lowest grade in the current academic year, before re-examination: $F(3, 246.56) = 13.30$, $p < .001$ ($n = 566$), lowest grade in the current academic year, after re-examination: $F(3, 561) = 3.98$, $p = .008$ ($n = 565$), and mean grade in the entire educational program: $F(3, 244.22) = 10.18$, $p < .001$ ($n = 569$).

Post-hoc pairwise comparisons indicated that all self-reported grades of Type 1 (Not Positive–Moderate BC) were lower than the self-reported grades of Type 4 (Very Positive–High BC). Compared with Type 3 (Positive–Low BC), for Type 1 the following grades were lower: mean grade in the current academic year, highest grade in the current academic year, lowest grade in the current academic year before re-exam, and mean grade in the entire educational program (adjusted $p < .05$). In comparison with Type 3, the following grades in Type 2 (Partially Positive–High BC) were lower: mean grade in the current academic year, lowest grade in the current academic year before re-exam, and mean grade in the entire educational program (adjusted $p < .05$). In comparison with Type 4, the following grades in Type 2 were lower: Mean grade in the current academic year, highest grade in the current academic year, lowest grade in the current academic year before re-exam, and mean grade in the entire educational program (adjusted $p < .05$). There were no significant differences between the grades of Type 1 and 2 and between the grades of Type 3 and 4.

Table 5

Student Types' Self-Reported Grades for Current Education

Student type	Mean grade current year			Highest grade current year			Lowest grade current year before re-exam			Lowest grade current year after re-exam			Mean grade entire educational program		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
1 Not Positive– Moderate BC	84	6.82[bc]	.90	83	7.97[bc]	1.24	83	4.58[bc]	1.98	83	5.80[c]	1.45	83	6.83[bc]	1.09
2 Partially Positive– High BC	115	7.00[de]	.89	115	8.24[e]	1.07	115	5.15[de]	1.73	115	5.98	1.30	115	7.07[de]	.68
3 Positive– Low BC	188	7.43[bd]	.70	188	8.52[b]	.85	186	5.79[bd]	1.53	185	6.25	1.41	188	7.33[bd]	.63
4 Very Positive– High BC	182	7.42[ce]	.76	182	8.55[ce]	.80	182	5.92[ce]	1.56	182	6.34[c]	1.29	182	7.39[ce]	.70

Note. BC= behavioral cost.

Significant pairwise differences after Games-Howell correction (adjusted $p < .05$) are marked with a letter corresponding with a specific pair of student types: [a] Student Type 1 – Student Type 2, [b] Student Type 1 – Student Type 3, [c] Student Type 1 – Student Type 4, [d] Student Type 2 – Student Type 3, [e] Student Type 2 – Student Type 4, and [f] Student Type 3 – Student Type 4.

Self-Reported Academic Delay

The proportions of participants with academic delay were significantly different for the student types, $X^2(3) = 18.17$, $p < .001$. Type 3 (Positive–Low BC) experienced the least academic delay (30.9%, $n = 58$), which was significantly less often than Type 1 (Not Positive–Moderate BC; 53.6%, $n = 45$) and Type 2 (Partially Positive–High BC; 49.6%, $n = 57$). Of Type 4 (Very Positive–High BC), 36.8% ($n = 67$) had been academically delayed, which was not significantly different from the other types.

There were significant differences between the student types on the number of months of academic delay, $F(3, 236.299) = 4.08$, adjusted $p = .008$. Type 1 had significantly more academic delay ($M = 11.27$, $SD = 19.53$, range = 0-120) than Type 3 ($M = 4.13$, $SD = 8.72$, range = 0-48; $p = .009$) and Type 4 ($M = 4.51$, $SD = 11.30$, range = 0-120; $p = .020$). The number of months of academic delay of Type 2 ($M = 6.29$, $SD = 11.47$, range = 0-75) was not significantly different from the other types; adjusted $p = .161$ with Type 1, adjusted $p = .309$ with Type 3 and adjusted $p = .559$ with Type 4. Type 3 and 4 did not differ from each other on number of months of academic delay, adjusted $p = .984$.

Self-Reported Causes of Academic Delay

The student types differed in relatively frequency of reported causes of academic delay: Wrong study choice $X^2(3) = 18.60$, $p < .001$; physical illness $X^2(3) = 10.18$, $p = .017$; psychological problems (moodiness, depression) $X^2(3) = 9.85$, $p = .020$; psychological problems (anxiety) $X^2(3) = 11.95$, $p = .008$; psychological problems (stress) $X^2(3) = 20.52$, $p < .001$; motivational problems $X^2(3) = 28.21$, $p < .001$; inadequate study counseling $X^2(3) = 16.81$, $p = .001$; enjoying student life $X^2(3) = 8.96$, $p = .030$.

Pairwise comparisons on all self-reported causes among all 12 pairs of clusters indicated the following significant differences (all with adjusted p values < .05): Type 1 (Not Positive–Moderate BC) more frequently reported the following causes for academic delay compared with other types: wrong study choice and motivational problems (more often than Type 2, 3 and 4), moodiness/depression and anxiety (more often than Type 3), inadequate study counseling (more often than Type 3 and 4), and enjoying student life (more often than Type 4). Type 2 (Partially Positive–High BC) more frequently reported the following causes for academic delay: physical illness (more

often than Type 3), anxiety (more often than Type 3), stress (more often than Type 3 and 4), and inadequate study counseling (more often than Type 3). Type 3 (Positive–Low BC) and Type 4 (Very Positive–High BC) did not report causes for academic delay at a higher frequency than the other student types.

For the following self-reported causes for academic delay, no significant differences between student types were found: psychological problems (other than depression, anxiety, or stress), $X^2(3) = 4.46$, $p = .216$; active position within student association, $X^2(3) = 3.86$, $p = .276$; active position within study association, $X^2(3) = 2.71$, $p = .438$; courses too difficult $X^2(3) = 2.58$, $p = .461$; extra courses $X^2(3) = 4.31$, $p = .230$; internship $X^2(3) = 1.74$, $p = .628$; and having a job, $X^2(3) = 1.56$, $p = .668$.

Comparisons between student types were not possible for the remaining self-reported causes for academic delay since the number of participants mentioning them, was too small. These self-reported causes included pregnancy, second educational program, unable to start master's program due to re-exams bachelor's courses, studying abroad, volunteering, traveling, children, professional athletics, serious engagement in music, insecure labor market, and too young for employment.

Discussion

This exploratory study was conducted to contribute to the identification of students in postsecondary education who may be at risk of underachievement. We adapted existing instruments for specific usage among students in postsecondary education (SAAS-R, McCoach & Siegle, 2003b; behavioral cost items, Conley, 2012), measuring education-related attitudes and beliefs, self-evaluations of self-regulated study behaviors, and perceptions of the amount of time and energy involved with studying. As expected, the factors showed high resemblance with the original SAAS-R factors, and behavioral cost formed a separate factor.

Four types of postsecondary students could be distinguished based on their mean item scores on these factors. Students of one type appeared to be well-balanced (Type 3); they had positive attitudes, beliefs, positive self-evaluations of their study behaviors, and considered their education not too time or energy consuming. The other students had vulnerabilities in their attitudes and beliefs (Types 1 and 2) or their self-regulated study behaviors (Type 1), or they perceived the amount of time and effort involved in studying as high (Types 2 and 4). Therefore, with these factors, different types

of postsecondary students were described indicating to what extent the students were motivated and committed to their education.

Students with less positive education-related attitudes and beliefs and less positive self-evaluations of their study behaviors (Types 1 and 2) had lower academic performance compared with students with positive characteristics (Types 3 and 4). These findings were as expected and correspond with previous studies in secondary (e.g., Dedrick et al., 2015; McCoach & Siegle, 2003a) and postsecondary education (Baslanti & McCoach, 2006). A possible explanation of this outcome is that students with not all positive education-related attitudes and beliefs invest less time and energy in their education in comparison with students with positive education-related attitudes and beliefs, which results in lower grades (Siegle et al., 2017; Snyder & Linnenbrink-Garcia, 2013). A closer look at students with characteristics of Types 1 and 2 may provide insight in possible causes for their relatively low academic performance. Students with characteristics of Type 1 had none of the forementioned positive attitudes towards their education and did not seem to have enough motivation to put their full effort in their education. They showed resemblance with the description of underachieving students experiencing a Declining Value Beliefs Pathway (Snyder & Linnenbrink-Garcia, 2013). The findings that characteristics of Type 1 were relatively more common in students with high ability (measured with self-reported IQ above 130), corresponds with previous research indicating that particularly high-ability students may be at risk of developing a low valuation for their education (Snyder & Linnenbrink-Garcia, 2013). Students with high ability may already have developed these attitudes in previous education before entering their postsecondary education.

In contrast to Type-1 students, Type-2 students wanted to perform well, put effort in their education, and considered it very time and energy demanding. This may indicate that Type-2 students found their education to be difficult for them. These findings demonstrate the importance of distinguishing different types of students that may appear similar, based on their relatively low grades, since they seem to have different characteristics and different needs.

The findings of the current study suggest that students with less positive attitudes and beliefs may be at risk of experiencing academic delay, since both student types with less positive attitudes and beliefs (Types 1 and 2) had academic delay more often, compared with students with positive attitudes

and beliefs (Type 3). These Type-1 and Type-2 students seemed to be at risk of experiencing psychological problems and in need of counseling, since they mentioned psychological problems and inadequate study counseling more often than the other types. However, the underlying causes for these problems may be different for these types. Type-1 students mentioned more often than the other types, that motivational problems and wrong study choice caused the academic delay. Thus, particularly students with high ability (as measured with self-reported IQ above 130) seem to be at risk for academic delay, since Type 1 was the most common type in this high-ability group.

In sum, based on the findings of the current study, there seem to be two types of postsecondary students with similar academic delay and relatively low academic achievement. It is important to distinguish both types of students, since they have distinct characteristics and seem to have difficulties in their education for different reasons. Of particular importance is the finding that students with characteristics of Type 1, who had the lowest scores on positive attitudes and beliefs, were more common in groups of students with high ability (IQ > 13) than students with average to above average ability. It is likely that students with high ability and characteristics of Type 1 are at risk of underachieving.

Practical Implications

The findings from the current study point to the importance of the recognition of specific needs of different types of students, the provision of appropriate support, and the assessment of the extent to which the education fits the characteristics of students, specifically those with high ability. Based on the current study, the following actions seem particularly important.

First, it seems advisable for student advisors to regularly screen students' attitudes towards their education, their confidence in performing well, their willingness to invest time and energy in their education, and their study behaviors. These screenings can be used to detect problems in an early stage, and to offer appropriate advice or intervention.

Second, the attitudes and beliefs that hinder postsecondary students' development may originate from previous education not meeting their capabilities and their needs, of which particularly students with high ability may be at risk (Snyder & Linnenbrink-Garcia, 2013). This stresses the

importance of providing students in secondary education with enough challenge adapted to their capabilities and interests and helping these students to find relevance in their education.

Limitations of Current Study and Future Research

Although the current study provides new insights in characteristics of types of students related to (under)achievement, it has several limitations. First, there may have been selection bias for two reasons. One reason is that participants may have had specific characteristics that made them interested in the study since they were self-selected. The other reason lies in the fact that, in order to increase the likelihood of the inclusion of participants with high ability (self-reported IQ above 130), recruitment took place by means of associations and websites related to high ability, besides recruitment by educational institutions. Participants affiliated with those associations may have specific characteristics. For example, they may experience more difficulties compared with other persons with equally high ability who do not join these associations or visit their websites. For this reason, participants in the high-ability group may not be representative of all students with high IQ.

Second, validity and reliability of the measurements could be improved. One issue related to this, is the fact that self-reported IQ was asked for in the beginning of the questionnaire might have influenced the answers to the questions in the rest of the questionnaire that were about attitudes and beliefs (such as motivation). However, it is unclear to what extent and in what direction. Also, since in our study participants already were informed about the purpose of study, namely ‘to investigate characteristics that play a role in academic motivation’, the order of the questions might not have had a large impact. In future research, it might be considered to ask for IQ at the end of the questionnaire or to have different orders of the questions within the same sample and to reveal less of the objective of the study to the participants. Another issue is that self-reported measures of IQ, grades, academic delay and causes of academic delay are less reliable than objectively measured data. A final issue related to reliability and validity, is the fact that the self-reported IQ scores cannot be interpreted as on the same metric, because they were based on different intelligence tests assessed at different moments in time at different ages of the participants. They were only meant to function as a global indication for a distinction between students with high and average IQ scores.

For future research, it is preferable that participants are selected for inclusion in a high-ability group based on the results of a test measuring cognitive abilities with exceptional psychometric qualities, that all participants take this test at the same time, and that the assessment is done by professionals. It is also important to retrieve student information about grades and academic delay from official school and university records.

Third, we used exploratory factor analysis with principal axis factoring with direct oblimin rotation. Thought this was the most suitable type of analysis given the exploratory purposes of the present study (McCoach et al., 2013), it only seeks to explain patterns of correlations among observed variables taking measurement error into account (Schmitt, 2011). However, it does not require data distributional assumptions and is, therefore, a nonstatistical estimation method (Kaplan, 2009). Thus, it does not provide standard errors that would enable researchers to statistically test model fit and model parameters (Schmitt, 2011). For the future, it is recommended that factors and correlations among these factors are investigated using a statistical estimation method (e.g., with the maximum likelihood procedure) in which hypothesis concerning overall model fit, interfactor correlations, factor loadings, and other model parameters can be tested (Kaplan, 2009; Schmitt, 2011).

Fourth, the student types were found by means of cluster analysis and they cannot directly be generalized beyond the current sample, since cluster analysis is a descriptive technique that provides room for interpretation and does not generate one ‘solution’ (Aldenderfer & Blashfield, 1984; Everitt et al., 2011). However, the finding that there were differences between these types on grades and academic delay provides support for the validity of these four types. In the future, replication studies are needed to determine whether the same student types can be distinguished in other samples. Differences between undergraduates and graduates could also be considered.

Fifth, all data were gathered on one single point in time. In order to study the development of students’ education-related characteristics and their relationship with grades and academic delay, a longitudinal design is needed in future research.

Sixth, environmental characteristics were not included. For example, the current study provides no information concerning objective characteristics of their education and the way these are related to participants' attitudes, beliefs, self-regulated study behaviors and behavioral cost

perceptions. Future research may include both students' and environmental characteristics in order to study the relationship between them.

Seventh, we used a slightly adapted SAAS-R and included an extra behavioral cost scale. Because of this adaptation, it would have been better to conduct a preliminary study to investigate the factor structure and psychometric quality of the questionnaire and answer the remaining research questions in a separated study with a different sample. However, because the outcomes of the factor analyses showed high resemblance with those of the original SAAS-R (Siegle & McCoach, 2003), because the cost items formed one separated factor, and because several other recent studies used the same approach (McCoach, et al, 2020; Siegle et al., 2020), we think it was justified to combine a research question on the factor structure of the questionnaire in the current study with the remaining research questions.

Finally, the instruments used in the current study measured specific characteristics. In this study, the adapted SAAS-R and behavioral cost factors for postsecondary education explained roughly 65% of the variance of the items. In future research, additional instruments measuring other factors, may provide a more complete view on students' characteristics related to (under)achievement. In order to gain more insight in the development of problematic education-related characteristics, it may prove useful to conduct research with in-dept exploration regarding the needs of the students that were not met in their previous and current education and the counseling they were seeking.

Conclusion

This exploratory study demonstrates the value of combining several characteristics of postsecondary students to investigate factors related to underachievement. In particular, the combination of (1) factors measured with the Adapted SAAS-R, (2) a factor measuring behavioral cost, and (3) information on high (cognitive) ability appears to be useful to created profiles of motivational types in search for students who are at risk for underachieving.

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References

Aldenderfer, M. S., & Blashfield, R. K. (1984). *Cluster analysis*. Sage.

Allen, J., & Robbins, S. (2010). Effects of interest-major congruence, motivation, and academic performance on timely degree attainment. *Journal of Counseling Psychology*, *57*(1), 23–35. https://doi.org/10.1037/a0017267

Balduf, M. (2009). Underachievement among college students. *Journal of Advanced Academics*, *20*(2), 274–294. https://doi.org/10.1177/1932202X0902000204

Bandura, A. (1989). Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology*, *25*(5), 729–735. https://doi.org/10.1037/0012-1649.25.5.729

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, *28*(2), 117–148. https://doi.org/10.1207/s15326985ep2802_3

Baslanti, U., & McCoach, D. B. (2006). Factors related to underachievement of university students in Turkey. *Roeper Review*, *28*(4), 210–215. https://doi.org/10.1080/02783190609554366

Bergey, B. W., Parrila, R. K., & Deacon, S. H. (2018). Understanding the academic motivations of students with a history of reading difficulty: An expectancy-value-cost approach. *Learning and Individual Differences*, *67*(May 2017), 41–52. https://doi.org/10.1016/j.lindif.2018.06.008

CBS (2021). Statistische trends: Hoe vergaat het studenten in het leenstelsel? (Statistical trends: How are students in the student loan system?). https://www.cbs.nl/nl-nl/longread/statistische-trends/2021/hoe-vergaat-het-studenten-in-het-leenstelsel-/3-resultaten (retrieved October 2021)

Conley, A. M. (2012). Patterns of motivation beliefs: Combining achievement goal and expectancy-value perspectives. *Journal of Educational Psychology*, *104*(1), 32–47. https://doi.org/10.1037/a0026042

Daniels, L. M., Haynes, T. L., Stupnisky, R. H., Perry, R. P., Newall, N. E., & Pekrun, R. (2008). Individual differences in achievement goals: A longitudinal study of cognitive, emotional, and achievement outcomes. *Contemporary Educational Psychology*, *33*(4), 584–608. https://doi.org/10.1016/j.cedpsych.2007.08.002

Deci, E. L., & Ryan, R. M. (1994). Promoting self-determined education. *Scandinavian Journal of Educational Research*, *38*(1), 3–14. https://doi.org/10.1080/0031383940380101

Dedrick, R.F., Shaunessey-Dedrick, E., Suldo, S.M., & Ferron, J. M. S. (2015). Psychometric properties of the School Attitude Assessment Survey-Revised with international baccalaureate high school students. *Gifted Child Quarterly*, *59*(1), 38–54. https://doi.org/10.1177/0016986214559596

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, *95*(2), 256–273. https://doi.org/10.1037/0033-295X.95.2.256

Dweck, C. S., & Molden, D. C. (2017). Mindsets: Their impact on competence motivation and acquisition. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (2nd ed., pp. 135–154). Guilford.

Dweck, C. S., & Yeager, D. S. (2019). Mindsets: A view from two eras. *Perspectives on Psychological Science*, *14*(3), 481–496. https://doi.org/10.1177/1745691618804166

Eccles, J. S., Adler, T., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). Achievement and achievement motives. Psychological and sociological approaches. In J. T. Spence (Ed.), *Achievement and achievement motivation* (pp. 75–146). W.H. Freeman and Company.

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist*, *34*(3), 169–189. https://doi.org/10.1207/s15326985ep3403_3

Elliot, A. J., & Church, M. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*, *72*(1), 218–232. https://doi.org/10.1037/0022-3514.72.1.218

Elliot, A. J., & Hulleman, C. S. (2017). Achievement goals. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (2nd ed., pp. 43–60). Guilford.

Everitt, B. S., Landau, S., Leese, M., & Stahl, D. (2011). *Cluster analysis* (5th ed.). John Wiley and Sons, Ltd.

van Ewijk, L., Fictorie, D., & Kleij, S. (2011). *Studievertraging: een bewuste keuze? Onderzoeksrapport Stichting OER 2010-2011 [Academic delay: A deliberate choice? Research report OER Foundation 2010-2011]*. http://stichting-oer.nl/wordpress/wp-content/uploads/2010/10/Rapport-Studievertraging.pdf

Flake, J. K., Barron, K. E., Hulleman, C., McCoach, B. D., & Welsh, M. E. (2015). Measuring cost: The forgotten component of expectancy-value theory. *Contemporary Educational Psychology*, *41*, 232–244. https://doi.org/10.1016/j.cedpsych.2015.03.002

Figg, S., Rogers, K.B., McCormick, J., Low, R. (2012). Differentiating low performance of the gifted leaner: Achieving, underachieving, and selective consuming students. *Journal of Advanced Academics*, *23*(1), 53–71. https://doi.org/10.1177/1932202X11430000

Guo, J., Nagengast, B., Marsh, H. W., Kelava, A., Gaspard, H., Brandt, H., Cambria, J., Flunger, B., Dicke, A.-L., Hafner, I., Brisson, B., & Trautwein, U. (2016). Probing the unique contributions of self-concept, task values, and their interactions using multiple value facets and multiple academic outcomes. *AERA Open*, *2*(1), 1-20. https://doi.org/0.1177/2332858415626884

Hentges, R. F., Galla, B. M., & Wang, M. T. (2019). Economic disadvantage and math achievement: The significance of perceived cost from an evolutionary perspective. *British Journal of Educational Psychology 89*(2), 343–358. https://doi.org/10.1111/bjep.12242

Honken, N. B., & Ralston, P. A. S. (2013). High-achieving high school students and not so high-achieving college students: A look at lack of self- control, academic ability, and performance in college. *Journal of Advanced Academics*, *24*(2), 108–124. https://doi.org/10.1177/1932202X13482466

Jiang, Y., Kim, S. I., & Bong, M. (2020). The role of cost in adolescent students' maladaptive academic outcomes. *Journal of School Psychology 83*, 1–24. https://doi.org/10.1016/j.jsp.2020.08.004

Jiang, Y., & Rosenzweig, E. Q. (2021). Using cost to improve predictions of adolescent students' future choice intentions, avoidance intentions, and course grades in mathematics and English. *Learning and Individual Differences*, *86*. https://doi.org/10.1016/j.lindif.2021.101978

Jiang, Y., Rosenzweig, E. Q., & Gaspard, H. (2018). An expectancy-value-cost approach in predicting adolescent students' academic motivation and achievement. *Contemporary Educational Psychology*, *54*, 139–152. https://doi.org/10.1016/j.cedpsych.2018.06.005

Kaplan, D. (2009). *Structural equation modeling: Foundations and extensions* (*2nd ed.*). SAGE.

Kim, Y. E., Yu, S. L., Koenka, A. C., Lee, H., & Heckler, A. F. (2021). Can self-efficacy and task values buffer perceived costs? Exploring introductory- and upper-level physics courses. *Journal of Experimental Education*, 1–23. https://doi.org/10.1080/00220973.2021.1878992

Landis, R. N., & Reschly, A. L. (2013). Reexamining gifted underachievement and dropout through the lens of student engagement. *Journal for the Education of the Gifted*, *36*(2), 220–249. https://doi.org/10.1177/0162353213480864

Lee, Y., Wormington, S. V., Linnenbrink-Garcia, L., & Roseth, C. J. (2017). A short-term longitudinal study of stability and change in achievement goal profiles. *Learning and Individual Differences*, *55*, 49–60. https://doi.org/10.1016/j.lindif.2017.02.002

Linnenbrink-Garcia, L., Wormington, S. V., Snyder, K. E., Riggsbee, J., Perez, T., Ben-Eliyahu, A., & Hill, N. E. (2018). Multiple pathways to success: An examination of integrative motivational profiles among upper elementary and college students. *Journal of Educational Psychology*, *110*(7), 1–23. https://doi.org/10.1037/edu0000245

Litalien, D., Gillet, N., Gagné, M., Ratelle, C. F., & Morin, A. J. S. (2019). Self-determined motivation profiles among undergraduate students: A robust test of profile similarity as a function of gender and age. *Learning and Individual Differences*, *70*, 39–52. https://doi.org/10.1016/j.lindif.2019.01.005Luo, W., Paris, S. G., Hogan, D., & Luo, Z. (2011). Do performance goals promote learning? A pattern analysis of Singapore students' achievement goals. *Contemporary Educational Psychology*, *36*(2), 165–176. https://doi.org/10.1016/j.cedpsych.2011.02.003

Marsh, H. W., Martin, A. J., Seeshing Yeung, A., & Craven, R. G. (2017). Competence self-perceptions. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (2nd ed., pp. 85–115). Guilford.

Matthews, M.S., & McBee, M. T. (2007). School factors and the underachievement of gifted students in a talent search summer program. *Gifted Child Quarterly*, *51*(2), 167–181. https://doi.org/10.1177/0016986207299473

McCoach, D.B., Gable, R.K., Madura, J. P. (2013). *Instrument development in the affective domain.* (3rd ed.). Springer.

McCoach, D. B., & Siegle, D. (2003a). Factors that differentiate underachieving gifted students from high-achieving gifted students. *Gifted Child Quarterly*, *47*(2), 144–154. https://doi.org/10.1177/001698620304700205

McCoach, D. B., & Siegle, D. (2003b). The School Attitude Assessment Survey–Revised: A new instrument to identify academically able students who underachieve. *Educational and Psychological Measurement*, *63*(3), 414–429. https://doi.org/10.1177/0013164403063003005

Miñano Pérez, P., Castejón Costa, J. L., & Gilar Corbí, R. (2014). Psychometric properties of the Spanish adaptation of the School Attitude Assessment Survey-Revised. *Psicothema*, *26*(3), 423–430. https://doi.org/10.7334/psicothema2013.186

Mofield, E., & Parker Peters, M. (2019). Understanding underachievement: Mindset, perfectionism, and achievement attitudes among gifted students. *Journal for the Education of the Gifted*, *42*(2), 107–134. https://doi.org/10.1177/0162353219836737

Morisano, D., Hirsh, J. B., Peterson, J. B., Pihl, R. O., & Shore, B. M. (2010). Setting, Elaborating, and Reflecting on Personal Goals Improves Academic Performance. *Journal of Applied Psychology*, *95*(2), 255–264. https://doi.org/10.1037/a0018478

Peterson, J. S. (2000). A follow-up study of one group of achievers and underachievers four years after high school graduation. *Roeper Review*, *22*(4), 217–224. https://doi.org/10.1080/02783190009554041

Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review*, *16*(4), 385–407. https://doi.org/10.1007/s10648-004-0006-x

Pintrich, P. R., & de Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, *82*(1), 33–40. https://doi.org/10.1037/0022-0663.82.1.33

Resing, W., & Blok, J. (2002). De classificatie van intelligentiescores: Voorstel voor een eenduidig systeem [The classification of intelligence scores: A proposal for a uniform system]. *De Psycholoog*, *37*(5), 244–249.

Reis, S. M., & McCoach, D. B. (2000). The underachievement of gifted students: What do we know and where do we go? *Gifted Child Quarterly*, *44*(3), 152–170. https://doi.org/https://doi.org/10.1177/001698620004400302

Robbins, S. B., Allen, J., Casillas, A., Peterson, C. H., & Le, H. (2006). Unraveling the differential effects of motivational and skills, social, and self-management measures from traditional predictors of college outcomes. *Journal of Educational Psychology*, *98*(3), 598–616. https://doi.org/10.1037/0022-0663.98.3.598

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, *25*(1), 54–67. https://doi.org/10.1006/ceps.1999.1020

Ryan, R. M., & Moller, A. C. (2017). Competence as central, but not sufficient, for high-quality motivation: A self-determination theory perspective. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (2nd ed., pp. 214–231). Guilford.

Schmidt, E., & Simons, M. (2011). *De (on)schuld van langstuderen [The causes of prolonged studying]*. https://lsvb.nl/wp-content/uploads/2016/10/LSVb_-_Rapport_studievertraging_-final-.pdf

Schmitt, T. A. (2011). Current methodological considerations in exploratory and confirmatory factor analysis. *Journal of Psychoeducational Assessment*, *29*(4), 304–321. https://doi.org/10.1177/0734282911406653

Shaw, E. J., & Mattern, K. D. (2013). Examining student under- and overperformance in college to identify risk of attrition. *Educational Assessment*, *18*(4), 251–268. https://doi.org/10.1080/10627197.2013.846676

Siegle, D., McCoach, D.B., Roberts, A. (2017). Why I believe I achieve determines whether I achieve. *High Ability Studies*, *28*(1), 59–72. https://doi.org/10.1080/13598139.2017.1302873

Snyder, K. E., & Linnenbrink-Garcia, L. (2013). A developmental, person-centered approach to exploring multiple motivational pathways in gifted underachievement. *Educational Psychologist*, *48*(4), 209–228. https://doi.org/10.1080/00461520.2013.835597

Snyder, K. E., Carrig, M. M., & Linnenbrink-Garcia, L. (2021). Developmental pathways in underachievement. *Applied Developmental Science*, *25*(2), 114–132. https://doi.org/1080/10888691.2018.1543028

Speirs Neumeister, K. L., & Hébert, T. P. (2003). Underachievement versus selective achievement: Delving deeper and discovering the difference. *Journal for the Education of the Gifted*, *26*(3), 221–238. https://doi.org/10.1177/016235320302600305

Steenbergen-Hu, S., Olszewski-Kubilius, P., & Calvert, E. (2020). The effectiveness of current interventions to reverse the underachievement of gifted students: Findings of a meta-analysis and systematic review. *Gifted Child Quarterly*, *64*(2), 132–165. https://doi.org/10.1177/0016986220908601

Yeager, D. S., & Dweck, C. S. (2012). Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational Psychologist*, *47*(4), 302–314. https://doi.org/10.1080/00461520.2012.722805

Wigfield, A., Eccles, J. S. (2000). Expectancy–value theory of achievement motivation. *Contemporary Educational Psychology*, *25*(1), 68–81. https://doi.org/10.1006/ceps.1999.1015

Wigfield, A., Rosenweig, E. Q., & Eccles, J. S. (2017). Achievement values: interactions, interventions, and future directions. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (2nd ed., pp. 116–134). Guilford.

Wormington, S. V., & Linnenbrink-Garcia, L. (2017). A new look at multiple goal pursuit: the promise of a person-centered approach. *Educational Psychology Review*, *29*(3), 407–445. https://doi.org/10.1007/s10648-016-9358-2

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, *41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2

Zimmerman, B. J., Schunk, D. H., & DiBenedetto, M. K. (2017). The role of self-efficacy and related beliefs in self-regulation of learning and performance. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and application* (2nd ed., pp. 313–334). Guilford.

Appendix

Adapted SAAS-R and Behavioral Cost Items for Postsecondary Students

Number	Item in Current Study	Original SAAS-R Item
1.	My classes are interesting.	1
2.	I am intelligent.	2
3.	I can learn new ideas quickly in my education.	3
4.	I am glad that I go to this educational institute.	6
5.	This is a good educational institute.	7
6.	I work hard for this education.	8
7.	I relate well to my teachers.	9
8.	I am intrinsically motivated to make all assignments for this education.	10
9.	This educational institute is a good match for me.	12
10.	This education is easy for me.	13
11.	I like my teachers.	14
12.	My teachers make learning interesting.	16
13.	My teachers care about me.	17
14.	Doing well in my education is important for my future career goals.	18
15.	I like this educational institute.	19
16.	I can grasp complex concepts in my education.	20
17.	Doing well in my education is one of my goals.	21
18.	I complete my study assignments regularly.	24
19.	It's important to get good grades in my education.	25
20.	I am organized about my study assignments.	26
21.	I use a variety of strategies to acquire new material.	27
22.	I want to do my best in this education.	28
23.	It is important for me to do well in my education.	29
24.	I spend a lot of time on my study assignments.	30
25.	Most of the teachers of this educational institute are good teachers.	31
26.	I am a responsible student.	32

27.	I put a lot of effort into my study assignments.	33
28.	I like my classes.	34
29.	I concentrate on my study assignments.	35
30.	I check my assignments before I turn them in.	36
31.	I am capable of getting high grades (A or higher).	37
32.	I want to get good grades in my education.	38
33.	I am good at learning new things in my education.	40
34.	I am a smart student.	41
35.	I am proud of this educational institute.	42
36.	I have to give up a lot to do well in this education.	[a]
37.	I am glad that I receive this education.	6
38.	This is a good education.	7
39.	This education is a good match for me.	12
40.	Performing well in my education is important for my future career goals.	18
41.	I like this education.	19
42.	Most of the teachers of this education are good teachers.	31
43.	I am proud of this education.	42
44.	My lectures are interesting.	1
45.	My workgroups are interesting.	1
46.	My teachers make studying interesting.	16
47.	I feel seen and heard by my teachers.	17
48.	I like my lectures.	34
49.	I like my workgroups	34
50.	Success in this education requires that I give up other activities I enjoy.	[a]
51.	I have to invest time and effort in my education in order to perform well.	[b]

Note. Item numbers of the items included in the final factor solution are in boldface. Item 1 up to and including item 35 are from the original SAAS-R (McCoach & Siegle, 2003b) and item 37 up to and including item 49 are Dutch variants (translated in English for the current study). [a] Behavioral cost items based on Conley (2012), [b] Behavioral cost items based on Eccles et al. (1983) and Flake et al. (2015).