



## Personality factors, student resiliency, and the moderating role of achievement values in study progress



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### ABSTRACT

Resiliency, or the ability to overcome challenges and bounce back from adversity and setbacks, is a key skill for overcoming failure, challenges, and other kinds of hardship. The aim of the current study was to examine the role of student resiliency in students' study progress, its relation to the Big Five personality dimensions, and to assess the moderating role of achievement values. In our analyses, we relied on data from 464 business students. Our study finds support for a positive relationship between student resiliency and study progress. Furthermore, student resiliency was associated with four protective personality factors, namely openness, conscientiousness, extraversion, and emotional stability. In line with our assumption, this relationship between student resiliency and study progress was moderated by achievement values, suggesting a conditional indirect effect.

### 1. Introduction

The road to academic achievement in tertiary education is paved with many uncertainties and challenges, such as adapting to the academic environment and setbacks (Fischer, 2007; Gall, Evans, & Bellerose, 2000; Morisano, Hirsh, Peterson, Pihl, & Shore, 2010). These demanding and stressful environments result in students performing below their potential, taking longer than expected to complete their degrees, or even dropping out of the degree program before completion. For example, in the United States, only 54.8% of the students enrolled in undergraduate programs will leave university with a degree after six years of study (Shapiro et al., 2017). Given the wide-spread offer of free or low-cost study programs at public universities in Europe, similar or even more pronounced problems with study delay and student dropouts have been reported here (Masui, Broeckmans, Doumen, Groenen, & Molenberghs, 2014; van den Berg & Hofman, 2005). Thus, students need to develop personal resources to successfully progress in higher education despite omnipresent challenges.

Resiliency can be regarded as one such important personal resource as it is likely to help students to bounce back from adverse experiences and to achieve positive outcomes despite these adversities (Masten, 2001; Tugade & Fredrickson, 2004). Resiliency is defined as “the capacity to rebound or bounce back from adversity, conflict, failure, or

even positive events, progress, and increased responsibility” (Luthans, 2002, p. 702). It explains why some students might bounce back and successfully progress (Yeager & Dweck, 2012) while others succumb to the challenges and adverse experiences they face in the course of their studies. Richardson's (2002) model of resiliency proposed that resilient individuals possess certain protective factors that help them grow despite adversity. Personality features, such as the Big Five, can be regarded as among the protective factors that enable students to be resilient (Rutter, 1987). The Big Five personality dimensions encompass the five personality traits extraversion, conscientiousness, agreeableness, emotional stability, and openness to experience (Goldberg, 1992) and explain a great proportion of the variation in individuals' capacities and behaviors (John, Naumann, & Soto, 2008).

A longstanding debate about the interconnections between the Big Five personality dimensions and resiliency has not yet reached a theoretical and empirical consensus (e.g., Friborg, Barlaug, Martinussen, Rosenvinge, & Hjemdal, 2005; Sarubin et al., 2015). Friborg et al. (2005) pointed out that some researchers (e.g., Rammstedt, Riemann, Angleitner, & Borkenau, 2004) have used the Big Five to classify individuals into resilient versus vulnerable individuals, while other researchers (e.g., Campbell-Sills, Cohan, & Stein, 2006) associated the Big Five personality dimensions with resiliency. Whereas the former approach does not measure resiliency per se but assumes that individuals

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with certain personality traits are generally better able to respond to adverse conditions, the latter approach acknowledges the importance of personality factors in driving resilience and measures both the Big Five personality factors and resiliency. While the two approaches are distinct in terms of how they investigate the connections between the Big Five and resiliency, they share the assumption that the Big Five personality dimensions and resiliency are closely connected (Friborg et al., 2005).

As current research (e.g., Fisher, Ragsdale, & Fisher, 2018; Hartmann, Weiss, Newman, & Hoegl, 2019) increasingly views resilience as a malleable, state-like attribute, we follow the latter approach and differentiate between traits (i.e., Big Five) and resilience. Consequently, we treat the Big Five as protective factors and examine the association between them and student resiliency in explaining academic study progress. Consistent with prior studies (Gijsselaers, Kirschner, Verboon, & de Groot, 2016; van den van den Berg & Hofman, 2005), we define study progress as the advancement in one's study program. We further examine contingency effects to identify the conditions in which student resiliency is more strongly related to study progress. Specifically, we investigate the role of students' personal achievement values on the relationship between resiliency and study progress. Prior research has shown that it is beneficial for students to regard achievement values as an important part of their personal self-conception (Parks & Guay, 2012). Achievement values include values such as ambition, success, and competence (Schwartz, 1992), and the underlying goal of these values is “personal success through demonstrating competence according to social standards” (Schwartz, 1992, p. 8). Considering achievement values as a potential moderator, we test whether students who possess high levels of achievement values are more likely to profit from their resiliency academically, resulting in enhanced study progress. The Big Five, resiliency, and achievement values are considered because they either have been found to relate to study progress in previous studies (e.g., see de Koning, Loyens, Rikers, Smeets, & van der Molen, 2012 relating the Big Five to study progress) or, in the case of resiliency and achievement values, provide strong theoretical arguments that they will equip students with the necessary resources and ambition to help them progress in their studies. Consequently, by integrating research on the Big Five, resiliency, and achievement values, we hope to provide a more comprehensive view on why some students are more likely to progress with their studies than others.

We make two main contributions to the current literature. Prior research on this relationship focused heavily on clinical settings or certain sub-groups of individuals, such as minorities from low-income environments (e.g., Friborg et al., 2005). In contrast, our study contributes to theory development on determinants of individual resiliency by taking a positive psychology perspective, expanding this line of research to all kinds of students in a more general academic setting not limited to disadvantaged groups and specifically examining the students' achievements in progressing with their studies. Furthermore, we enrich the theoretical foundations of the literature stream of positive psychology, which has increasingly gained importance in learning environments (Howard, 2017; Suh, Gnilka, & Rice, 2017), by linking personal capacities (i.e., resiliency) to the literature on personal values (i.e., achievement values) to demonstrate that motivational forces help explaining the strength of the resiliency—academic achievement relationship.

### 1.1. Student resiliency

The concept of resiliency has attracted increasing attention as a result of the onset of the positive psychology and positive organizational behavior movement (Fredrickson, Tugade, Waugh, & Larkin, 2003; Luthans & Youssef, 2007). A similar trend can be observed in the university context, where much of this work focuses on disadvantaged groups and connections to wellbeing (e.g., Bacchi & Licinio, 2017; Ghisi, Bottesi, Re, Cerea, & Mammarella, 2016; Klibert et al., 2014).

Resiliency is related to (but can be distinguished from) concepts such as perseverance, grit, and coping that have been the focus of several studies in the educational context. Both resiliency and grit encompass perseverance—the “willingness to continue the struggle to reconstruct one's life and to remain involved and to practice self-discipline” (Wagnild & Young, 1993, p. 167)—but whereas resiliency can be understood as a positive response and adaptation to challenges and adversity, grit is defined as “perseverance and passion for long-term goals” (Duckworth, Peterson, Matthews, & Kelly, 2007, p. 1087). Thus, the definition of grit builds on the stability of goals and interests, while resiliency is defined more generally without referring to the maintenance of goals and interests over time (Robertson-Kraft & Duckworth, 2014). Coping can also be differentiated from resilience as it refers to the specific strategies that individuals utilize to deal with stressors (Folkman & Moskowitz, 2004), which in turn enable individuals to be more or less resilient. For instance, prior research has shown that applying a task-oriented coping style strengthens an individual's resiliency (Campbell-Sills et al., 2006). All three concepts—perseverance, coping, and grit—have been found to relate to academic achievement (e.g., Chiu & Chow, 2010; Muenks, Wigfield, & Yang, 2017; Thomas, Cassidy, & Heller, 2017). Consequently, the focus of our study on student resiliency as a resource in dealing with setbacks in the academic context complements and extends related prior research.

Given the prevalence of setbacks in educational contexts, such as failing exams or experiencing conflicts in study groups, student resiliency is a promising construct in explaining student progression. We propose that resiliency equips students with the requisite psychological resources to enable them to successfully proceed with their studies. In this study, we were interested in the initial levels of resiliency the students held when commencing their studies to examine whether students who hold a high level of resiliency when beginning university are better equipped to cope with the challenges that will follow in the first year of their studies, resulting in enhanced study progression.

In the educational context, resiliency has also been linked to academic achievement of general student populations (i.e., not focusing on disadvantaged groups), mainly focusing on primary and secondary education (Ayyash-Abdo, Sanchez-Ruiz, & Barbari, 2016; You, 2016). Moreover, in the few studies on the relationship between resiliency and academic achievement in general student populations in tertiary education, resiliency was shown to be positively associated with academic achievement in terms of achieved grades or learning performance (e.g., de la Fuente et al., 2017; Luthans, Luthans, & Jensen, 2012). In our literature research, we could not spot any empirical studies on the link between resiliency and academic achievement in terms of study progress though. Regarding the latter, we expect that, when facing highly demanding or challenging conditions during their studies, resilient students will devote more time and energy to recovering and facilitating goal attainment (Youssef & Luthans, 2007), which helps them to progress in their studies.

### 1.2. Big Five personality dimensions and student resiliency

When investigating the relationships between personality and resiliency and different types of academic achievement, studies have mainly built on the five-factor personality model (commonly referred to as the Big Five personality dimensions) (Costa & McCrae, 1992; McCrae & John, 1992). The Big Five have frequently been associated with academic achievement, as demonstrated by a recent meta-analysis that found a negative influence of neuroticism and a positive influence of agreeableness, conscientiousness, and openness on academic achievement (Vedel, 2014). The knowledge about the relationship between the Big Five and study progress as one specific indicator of academic achievement is less developed. For instance, prior research found negative relations between neuroticism and study progress and openness and study progress after the first year of studies (de Koning et al., 2012), whereas another study found study progress to be

positively associated with conscientiousness, agreeableness, and neuroticism and negatively associated with extraversion (de Feyter, Caers, Vigna, & Berings, 2012).

Furthermore, previous studies have identified a link between all Big Five personality dimensions and resiliency (Oshio, Taku, Hirano, & Saeed, 2018). Specifically, they identified extraversion, openness, agreeableness, and conscientiousness to be positively related and neuroticism to be negatively related to resiliency (Oshio et al., 2018). Despite the general assumption that high cognitive abilities will equip individuals with the knowledge and creativity to help themselves (Ross, 1972), research surprisingly found resiliency to be largely unrelated to intelligence (Friborg et al., 2005). Consequently, we do not focus on intelligence but limit our theorizing and analyses to the Big Five and resiliency relations.

Openness emphasizes cognitive intellect (Goldberg, 1992) and refers to individuals who are curious, cultured, creative, imaginative, and have a broad range of interests (Barrick & Mount, 1996; McCrae & John, 1992). The ability to analyze and understand experiences and dissociate from these experiences is expected to be closely linked to positive adaptation, academic self-efficacy, and learning (King & Rothstein, 2010; Zhang & Ziegler, 2016). Students with a high degree of openness will be inclined to consider a broad range of perspectives (Connor-Smith & Flachsbart, 2007) before evaluating a given situation or deciding on an appropriate response strategy. This enables students to develop high self-awareness and an enhanced understanding of their environment, which in turn creates a sense of coherence and provides students with the knowledge resources they need to adjust to the conditions they face (King & Rothstein, 2010). Thus, openness can be regarded as a protective factor that helps students to adapt to and learn from challenging experiences, as well as to focus their resources on attaining their study goals, ultimately enhancing their study progress.

Highly conscientious students are systematic and organized (McCrae & John, 1992; Salgado, 1997); they prefer to develop detailed plans and tend to face their problems head-on when they encounter adverse situations (Campbell-Sills et al., 2006; Friborg et al., 2005). Therefore, conscientious students are able to develop structured action plans when facing challenges, which helps them to build resilience and progress in their studies.

Agreeableness refers to the extent to which an individual is gentle, cooperative, and kind (McCrae & John, 1992; Peeters, Tuijl, Rutte, & Reymen, 2006; Trapmann, Hell, Hirn, & Schuler, 2007), whereas extraverted students are regarded as social, talkative, and assertive (McCrae & John, 1992; Salgado, 1997). It has been argued that resilient individuals have good social skills (Friborg et al., 2005) and that they have social sources to develop their strength (Richardson, 2002). Both personality dimensions foster the development of social skills and social capital as students with an agreeable demeanor and who behave socially attract others who can be relied upon as a social resource that helps them deal with challenges, adversities, and demands. Extraverted students commonly initiate social interactions (Costa & MacCrae, 1992) because their cooperative behaviors demonstrate social competence. Such behavior promotes the development of an interpersonal network that may serve as a source for social support during challenging times (Sarubin et al., 2015). Therefore, agreeableness and extraversion can be regarded as protective factors that build up relational capabilities (Sutcliffe & Vogus, 2003) and social skills and support, which in turn provide students with the tools and strategies necessary to identify the actions they need to take to ensure their positive adaptation, despite the challenges (King & Rothstein, 2010).

Being relaxed, calm, and self-confident determines an individual's emotional stability (McCrae & John, 1992; Salgado, 1997). Positive emotions resulting from emotional stability have been linked to resiliency (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Shin, Taylor, & Seo, 2012; Tugade & Fredrickson, 2004). Moreover, such positive emotions tend to increase the range of students' "thought-action repertoires" (i.e., broadened mindsets) (Fredrickson, 2001, p.

220). Students can then draw on such repertoires when they are faced with challenging conditions resulting in the use of available personal resources (Campbell-Sills et al., 2006; Fredrickson, 2001), which helps students to bounce back from such conditions and refocus quickly to further progress in their studies.

### 1.3. Achievement values and student resiliency

Based on the theory of human values, a value is a belief that serves as a guiding principle for individuals' actions (Schwartz, 1992, 1994). Values can be perceived as important by one individual and highly unimportant by another (Bardi & Schwartz, 2003). Individuals with high achievement values tend to emphasize the importance of success, capability, competence, and ambition, which suggests that this type of value is highly relevant to progression in an academic context (Parks & Guay, 2012). Personal values are regarded as enduring underlying goals that motivate individuals to behave according to those values (Roccas, Sagiv, Schwartz, & Knafo, 2002). Conceptually, values can be distinguished from goal orientations. Goal orientations refer to the specific aims and approaches to competence, whereas values have underlying priorities and entail the notion of the relative worth of certain beliefs and actions (Wigfield & Cambria, 2010). In this study, we are interested in how personal values, specifically achievement values, shape the relationship between student resiliency and study progress. Values are instrumental in explaining "individual decision making, attitudes, and behavior" (Schwartz et al., 2012, p. 664). According to Schwartz (1992, 1994), achievement values are regarded as self-enhancing.

While most prior research has examined the direct effects of achievement values on individual outcomes and only found partial support for this direct effect (Parks & Guay, 2012), some studies (Kernan, Watson, Fang Chen, & Gyu Kim, 2011; Oishi, Diener, Suh, & Lucas, 1999) have started to examine the role of achievement values as a potential moderator. Drawing on the value-as-a-moderator model, Oishi et al. (1999) found that daily satisfaction was highest when individuals were satisfied with their daily achievement and placed a great importance on achievement values. Students who place a high value on achievement may have a strong desire to attain academic goals and accomplishments (Khalid, Jusoff, Othman, Ismail, & Rahman, 2010), such as successfully progressing in their studies, leading them to increase their effort and engagement toward achieving this aim. As such, resilient students that are also high on achievement values can better use their personal resources in order to succeed in a task and/or attain their goals (Richardson, 2002). Resilient students that are also high on achievement values are less likely to give up, but rather remain persistent when confronted with significant challenges or demands (Luthans, Avolio, Walumbwa, & Li, 2005), as they are confident that they will be able to succeed despite them. Such expectations determine that the student will approach rather than avoid an achievement situation (Turner & Schallert, 2001), e.g., completing a heavy workload. Therefore, we predict that the highest levels of study progress will be achieved by students who are resilient and place high importance on achievement values, while resilient students with low scores on achievement values are not expected to reach similarly high levels of study progress.

In line with this logic, we expect that low levels of students' resiliency generally will lead to lower levels of study progress, irrespective of achievement values. Students with low levels of resiliency are less effective when it comes to using their personal resources to master challenging conditions. In such a situation, values such as success and ambition cannot play the same guiding role as for students high in resiliency. In contrast students strongly oriented toward achievement values, who lack the resources to realize these values, might be even more likely to disengage and not invest further efforts in order to succeed, thereby resulting in low levels of study progress.

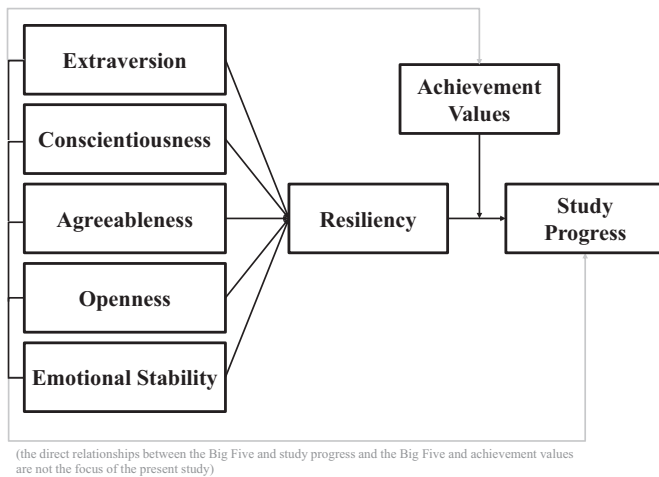


Fig. 1. The theoretical model of the study.

#### 1.4. Research model of the present study

The present study examined the relationship between student resiliency and study progress and the indirect effects of the Big Five personality dimensions on study progress through student resiliency. In so doing, we examined an important, but thus far under-researched, potential success factor of study progress. In our model, we also investigated the contingency effects of achievement values to identify the conditions in which student resiliency is more strongly related to study progress. The theoretical model summarizing our expected relationships is depicted in Fig. 1.

## 2. Methods

### 2.1. Participants and procedure

Data for this study were collected via online surveys and making use of academic records from a large business school in the Netherlands. This data collection effort was approved by the research school's internal review board. This data collection was in accordance with the review board's ethical standards and complied with the guidelines provided by the American Psychological Association. Informed consent was obtained from all individual participants included in this study. We also informed the participants that their participation in the study was voluntary, they could withdraw their participation at any time without sanction, and that all the data obtained would be treated confidentially and would be processed and analyzed anonymously.

All students were freshmen from the same cohort and enrolled in the Bachelor of Business Administration program. The first data collection (T1) took place in the first trimester shortly after commencing their studies. The students completed an online survey measuring the Big Five personality dimensions and student resiliency. The second wave of data collection (T2) took place approximately four months later during the same academic year. At that time, an online survey gathered data on the moderator variable (achievement values). Data on the dependent variable (study progress) were collected via academic records provided by the business school and were collected for all participants at the end of the academic year (T3; approx. one year after the first data collection). The control variables (gender, age, nationality) were also gathered using academic records.

In the first survey, 576 out of 788 students completed the questionnaire (corresponding to a response rate of 73.10%). In the second survey, 533 out of 788 students provided the complete data needed for this study (corresponding to a response rate of 67.38%). The data collection yielded a total of 464 usable paired questionnaires, which represents a total response rate of 58.73%. Of these respondents, 36.6%

were female, and the average age of all the participants was 18.53 years. In terms of their nationality, 76.7% of the respondents came from the Netherlands, while 6.7% came from other Western countries, and the remaining 16.8% came from non-Western countries. The demographic characteristics (i.e., age, gender, and nationality) and the number of credit points obtained of the final sample did not differ significantly from the overall sample of 788 students.

### 2.2. Instruments

#### 2.2.1. Independent variables

At Time 1, the personality dimensions were measured via the Big Five personality dimensions (extraversion, conscientiousness, agreeableness, emotional stability, and openness). Specifically, we used the 50-item inventory of the International Personality Item Pool (IPIP) Big-Five factor markers (Goldberg, 1992; Goldberg, 1999). A validated Dutch translation was obtained from a previous study that has used a Dutch version in a similar context of University students (Locke, Morisano, & Schippers, 2014). Ten items measured each of the Big Five dimensions, for example "I don't mind being the center of attention (1: totally disagree; 5: totally agree). Cronbach's alphas obtained in the sample of this study are 0.88 for extraversion, 0.79 for conscientiousness, 0.78 for agreeableness, 0.84 for emotional stability, and 0.72 for openness.

#### 2.2.2. Resiliency

We measured student resiliency, using the adapted 10-item measure by Campbell-Sills and Stein (2007) based on the Connor–Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) at Time 1. A sample item is: "I am not easily discouraged by failure." (1: totally disagree; 5: totally agree). Cronbach's alpha of the scale in the sample of this study is 0.80. The Dutch translation was obtained from the authors of the CD-RISC scale.

#### 2.2.3. Achievement values

At Time 2, the moderator variable—achievement values—was measured using the six-item achievement values scale of the Schwartz Value Survey, capturing values demonstrating competence according to social standards and which was available in several languages, including Dutch (Schwartz, 1992). The measure captures the importance of following aspects: having success and self-respect and being capable, influential, ambitious and intelligent (1: very unimportant; 5: very important; Schwartz, 1992). Cronbach's alpha of this scale in the sample of this study is 0.78.

#### 2.2.4. Dependent variable

Academic achievement can be operationalized in different ways and includes, but is not limited to, grade point averages, credit points obtained, and test scores (de Koning et al., 2012; Gijssels et al., 2016). As we were interested in how students progressed with their studies, we operationalized study progress at Time 3 (i.e., at the end of the academic year) by the number of credit points (i.e., ECTS = European Credit Transfer and Accumulation System) the student had gathered by then. This operationalization is consistent previous studies in the European context (e.g., Gijssels et al., 2016; van Rooij, Jansen, & van de Grift, 2017; Virtanen, Nevgi, & Niemi, 2015). The information was obtained from the official university records for all students who participated in the study. To progress in Dutch university programs, a student's high or low grade point average is less relevant than whether the student has passed sufficient number of courses. Any complications, severe deficits in learning outcomes, and delays in the study plan should most likely materialize in this measure of ECTS points. Students that do not successfully proceed with their studies or even withdraw from the course are still captured by zero or a very low number of ECTS points. As the study examined how students progressed in their studies, the number of ECTS points achieved represented the best measurement

of study progress in the European university context (e.g., Schippers, Scheepers, & Peterson, 2015).

2.2.5. Control variables

We controlled for variables that might influence study progress and the relationships under examination. These were gender, age, and nationality. We controlled for gender because previous research showed that male and female students tend to appraise stressful life events differently (Hojat, Gonnella, Erdmann, & Vogel, 2003) and may differ in terms of their resiliency (e.g., Cappella & Weinstein, 2001) and study progress (e.g., Schippers et al., 2015). Moreover, age was controlled for because a repeated finding in prior research is that the relationship between personality and academic achievements tends to vary depending on a student's age (Poropat, 2009). Finally, we controlled for the students' country of origin, which was dummy coded for whether they come from the Netherlands, from another Western country, or from a non-Western country (with students from the Netherlands representing the omitted category in the regression models). Studying at a university in one's home country is likely to induce fewer challenges and setbacks than studying abroad. For example, students from other countries are likely to experience problems like language barriers, bureaucracy involved with living and studying in another country, and the need to accustom to local norms, and these challenges can be expected to be even more prevalent and pronounced for students from a markedly different, i.e., non-Western, context.

3. Results

Table 1 displays the means, standard deviations, and correlations of the study's variables. We tested our relationships using hierarchical ordinary least square regression models, which are shown in Table 2. To test the proposed relationships, we regressed student resiliency on all four control variables (Model 1) and on the control variables and the Big Five personality dimensions (Model 2). Furthermore, we regressed study progress on the control variables (Model 3) and the control variables and the Big Five personality dimensions (Model 4). In Model 5, we further included student resiliency, while in Model 6 the proposed moderator 'achievement values' was considered by entering the interaction term (i.e., student resiliency x achievement values). We also checked for collinearity. All variance inflation factors were well below two suggesting that collinearity does not distort the results (Cohen, West, & Aiken, 2003; Mason & Perreault, 1991).

We predicted that the Big Five personality dimensions would be positively related to student resiliency. The results presented in Model 2 of Table 2 support this expectation for four (i.e., extraversion, conscientiousness, emotional stability, and openness) of the five personality dimensions. Agreeableness was not significantly related to student resiliency. We also predicted a positive relationship between student resiliency and study progress in terms of credit points achieved. The results of Model 5 show a significant positive effect of student resiliency

on study progress, thereby supporting our assumption.

Furthermore, we tested the indirect effect of the Big Five personality dimensions (openness, conscientiousness, agreeableness, extraversion, and emotional stability) on study progress through student resiliency. To establish a significant indirect effect between these variables, first there needs to be a significant effect of the independent variable on the mediator (Hayes, 2013; Preacher & Hayes, 2004). As mentioned above the results of Model 2 provide support in this regard for all Big Five personality dimensions except agreeableness. Moreover, there needs to be a significant effect of the mediator on the dependent variable (Hayes, 2013; Preacher & Hayes, 2004), which was already supported by Model 5. Finally, we needed to substantiate the indirect effects of the Big Five personality dimensions on study progress through resiliency (Hayes, 2013; Zhao, Lynch, & Chen, 2010) and calculate the significance of the indirect effects based on the bootstrapping procedures outlined by Preacher and Hayes (2004). These tests yielded significant positive indirect effects on study progress through student resiliency for openness ( $b = 0.92$ ; CI95 [0.31; 1.94]), conscientiousness ( $b = 0.61$ ; CI95 [0.20; 1.24]), extraversion ( $b = 0.66$ ; CI95 [0.24; 1.38]), and emotional stability ( $b = 1.13$ ; CI95 [0.41; 2.10]), but not for agreeableness ( $b = 0.33$ ; CI95 [-0.05; 1.01]).

Furthermore, we assumed that students' achievement values moderate the positive relationship between student resiliency and study progress in that this relationship is more positive for high levels of achievement values. The moderation analysis (Aiken & West, 1991; Dawson, 2014) presented in Model 6 indeed revealed a significant interaction effect of student resiliency and achievement values on study progress. To probe this interaction effect further, we plotted the simple slopes for achievement values one standard deviation above and one below the sample mean (Aiken & West, 1991; Dawson, 2014). The pattern of the simple slopes shown in Fig. 2 provides support to show that the relationship between student resiliency and study progress is more strongly positive for those students scoring high on achievement values ( $\beta = 0.26$ ; s.e. = 1.82;  $t = 3.90$ ;  $p < .01$ ) than for those students scoring low on achievement values ( $\beta = 0.07$ ; s.e. = 2.00;  $t = 0.91$ ;  $p > .10$ ).

Together, the findings also show support for a moderated indirect effect in that the indirect effect of the Big Five personality dimensions on study progress through resiliency is more positive for high levels of achievement values for all Big Five personality dimensions except agreeableness. We tested the moderated indirect effects based on Hayes' (2015) approach by showing the significant moderated indirect effects for high achievement values for all Big Five personality dimensions through a significant index of moderated mediation, except for agreeableness. The results of these analyses are shown in Table 3.

4. Discussion

This study has implications for research on how to improve study progress. Students' resiliency is associated with their study progress.

Table 1  
Means, standard deviations, and correlations.

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1: Gender	0.64	0.48	–									
2: Age	18.54	1.07	0.08	–								
3: Study progress (T3)	52.07	13.85	0.00	–0.22**	–							
4: Resiliency (T1)	3.78	0.51	0.22**	–0.03	0.10*	0.80						
5: Achievement values (T2)	4.12	0.48	0.02	0.03	–0.03	0.15**	0.78					
6: Extraversion (T1)	3.57	0.66	0.07	0.02	–0.07	0.39**	0.15**	0.88				
7: Conscientiousness (T1)	3.46	0.56	–0.14**	–0.03	0.09	0.22**	0.24**	0.04	0.79			
8: Agreeableness (T1)	3.82	0.48	–0.24**	–0.07	–0.01	0.19**	0.09*	0.23**	0.24**	0.78		
9: Emotional stability (T1)	3.36	0.64	0.26**	–0.09*	0.04	0.46**	0.01	0.35**	0.05	0.13**	0.84	
10: Openness (T1)	3.52	0.47	0.21**	0.14**	–0.12**	0.36**	0.32**	0.30**	0.23**	0.14**	0.15**	0.72

N = 464; Cronbach's alphas of this study's sample on the diagonal.

\*p < .05; \*\*p < .01.

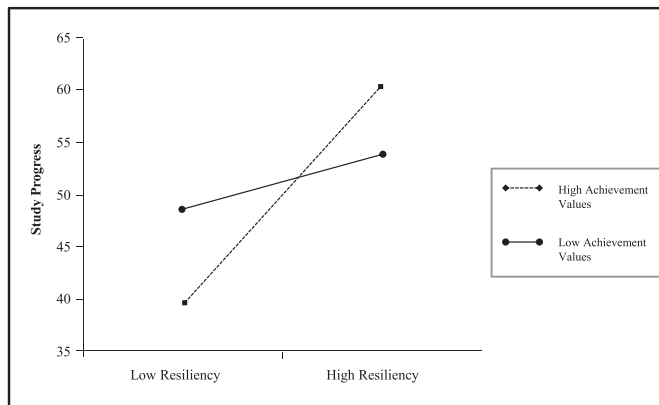
**Table 2**  
Results of the hierarchical ordinary least square regression models.

	Resiliency (T1)		Study progress (T3)			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Control variables</b>						
Gender	0.22**	0.12**	0.00	0.03	0.01	0.01
Age	-0.04	-0.03	-0.20**	-0.17**	-0.17**	-0.17**
Western immigrant	-0.04	-0.01	-0.05	-0.06	-0.05	-0.04
Non-Western immigrant	-0.02	0.02	-0.09	-0.09	-0.09	-0.09
<b>Independent variables</b>						
Extraversion (T1)		0.19**		-0.06	-0.09	-0.10
Conscientiousness (T1)		0.15**		0.12*	0.09	0.09
Agreeableness (T1)		0.07		-0.03	-0.04	-0.04
Emotional stability (T1)		0.32**		0.03	-0.02	-0.02
Openness (T1)		0.19**		-0.12*	-0.15**	-0.15**
<b>Mediator</b>						
Resiliency (T1)					0.18**	0.16**
<b>Moderator</b>						
Achievement values (T2)						-0.01
<b>Interaction</b>						
Resiliency * achievement values						0.10*
R <sup>2</sup>	0.05	0.36	0.05	0.08	0.10	0.11
ΔR <sup>2</sup>		0.31**		0.03*	0.02**	0.01
F	6.19**	28.80**	6.80**	4.51**	5.14**	4.74**

N = 464; standardized regression coefficients.

\* p < .05.

\*\* p < .01.



**Fig. 2.** Interaction effect of achievement values on the student resiliency—study progress relationship.

Researchers have increasingly emphasized the importance of the individual's capacity to bounce back and positively adapt despite adverse conditions or the high demands placed on them (Sutcliffe & Vogus, 2003; Youssef & Luthans, 2007). We applied Richardson's (2002) model of resiliency to connect the different literature streams on personality dimensions, resiliency, and study progress. Thereby, we developed a more comprehensive view by demonstrating that four of the Big Five personality dimensions—specifically openness, conscientiousness, emotional stability, and extraversion—were related to resiliency. Resiliency, in turn, results in enhanced study progress. The importance of student resiliency is in line with research on related constructs, such as grit or coping (e.g., Chiu & Chow, 2010; Muenks et al., 2017; Thomas et al., 2017). While the aim of the study was to examine whether the initial level of student resiliency at the start of their program impacts their students study progress in their first year of study, the present study cannot show how student resiliency evolves over the course of their studies or if personality explains the development of resiliency

**Table 3**  
Conditional indirect effects of protective personality factors on study progress, through student resiliency.

	Conditional indirect effect	s.e.	95% CI	Index moderated mediation	s.e.	95% CI
Openness				1.14	0.58	[0.24; 2.65]
Mediator: student resiliency	-1 s.d.	0.38	0.44	[-0.36; 1.40]		
Mediator: student resiliency	+1 s.d.	1.47	0.52	[0.64; 2.83]		
Conscientiousness				0.76	0.39	[0.15; 1.73]
Mediator: student resiliency	-1 s.d.	0.25	0.29	[-0.26; 0.90]		
Mediator: student resiliency	+1 s.d.	0.97	0.35	[0.42; 1.84]		
Extraversion				0.82	0.41	[0.18; 1.87]
Mediator: student resiliency	-1 s.d.	0.27	0.32	[-0.28; 1.01]		
Mediator: student resiliency	+1 s.d.	1.05	0.38	[0.46; 1.99]		
Emotional stability				1.40	0.63	[0.32; 2.84]
Mediator: student resiliency	-1 s.d.	0.46	0.52	[-0.49; 1.56]		
Mediator: student resiliency	+1 s.d.	1.80	0.52	[0.92; 3.03]		
Agreeableness				0.40	0.35	[-0.04; 1.40]
Mediator: student resiliency	-1 s.d.	0.13	0.20	[-0.09; 0.78]		
Mediator: student resiliency	+1 s.d.	0.52	0.38	[-0.11; 1.43]		

Note: N = 464. Depicted are the conditional indirect effects of protective personality factors on study progress through student resiliency at low (-1 s.d.) and high (+1 s.d.) levels of achievement values. 95% confidence intervals (based on 50,000 bias-corrected bootstrap samples) excluding zero indicate statistical significance at the 0.05 level.

over time. It is possible that experiences during the study program, such as successfully coping with challenges, helps students to further develop their resiliency. We therefore recommend that future research uses a longitudinal design and measures resiliency at several points in time to shed light on its development over time and to further minimize the risk of common method variance. Beyond that, the results of the mediation analyses show that entering resiliency does not decrease the predictive validity of the Big Five. While including a mediator is likely to decrease the predictive validity of the predictors, this is not necessarily the case and depends, for instance, on the existence of other mediators. This is why scholars see the presence of a relationship between the independent variable and the proposed mediator as well as a relationship between the proposed mediator and the outcome variable as core necessities to constitute mediation (Hayes, 2013; Rucker, Preacher, Tormala, & Petty, 2011; Zhao et al., 2010). So while we would have expected the coefficients for the five personality dimensions to decrease when entering resiliency in the model (which is only the case for two of them), this need not affect the interpretation of the indirect effects.

Furthermore, we found openness to be negatively related to study progress, while it was positively related to resiliency. This pattern may emerge from the common observation that students with a high openness to experience may be inclined to engage in activities that distract from the actual study program (e.g., social activities such as joining a study association, engaging in charities, or partying). The negative relation between openness and study progress has also been found in previous research (de Koning et al., 2012). At the same time, more open students might acquire valuable social support through these social activities which is likely to be related to their resiliency. As we were interested in the indirect effect of openness on study progress through resiliency, which is positive as expected, we interpret this finding as demonstrating the expected indirect effect of openness being positive for resiliency, which in turn is positive for study progress and that this exists independent of the negative direct relationship between openness and study progress.

Furthermore, the type of outcome – study progress – might explain why some of the correlations between the Big Five and study progress (our dependent variable) were not consistent with prior meta-analyses on academic achievement (Vedel, 2014). For instance, neuroticism has been found to negatively relate to grade point average (Vedel, 2014), but in our study no significant relation between emotional stability and study progress was supported. The results between neuroticism and study progress are not clear cut. Prior studies have found positive, negative, and nonsignificant relations between neuroticism and study progress (de Feyter et al., 2012; de Koning et al., 2012). Our study develops current research by providing a first indication that emotional stability may help to foster study progress through students' resiliency.

The present study also considered the role of achievement values as a contingency factor in the resiliency–study progress relationship. Therefore, this study adds to the existing body of literature on positive psychology by identifying the conditions in which student resiliency is more strongly related to study progress. Specifically, we showed that resilient students who hold strong achievement values are more likely to successfully complete heavy study workload. Resilient students have the psychological resources to effectively adapt to the high demands placed upon them, as well as to adapt to adverse contexts (Krush, Agnihotri, Trainor, & Krishnakumar, 2013). When coupled with achievement values, which unleashes further motivational power to attain goals, resilient students will achieve better progression in their studies.

On the flip side, when resiliency is low, the same achievement values change from a blessing to a curse, resulting in the lowest study progress—even lower than under conditions of low resiliency coupled with low levels of achievement values. Our explanation is that such students lack the personal resources of resiliency to master challenging conditions. The experience that they are unable to accomplish their goals, coupled with high achievement values (i.e., the personal

importance of success and ambition), may lead to frustration and dissatisfaction (Lusch & Serpkenci, 1990) and hence result in decreased motivation to invest themselves in their studies. Thus, it becomes apparent that the same set of values can be highly beneficial for study progress of one student, while hampering the study progress of another. Our research therefore refines theory on the role of achievement values to explain academic achievement, that has mainly focused on the direct effects of personal values (Parks & Guay, 2012), by pointing to such contingency effects. Moreover, and perhaps even more importantly, the identified contingency effect also has implications for theory building on resiliency in educational contexts more generally by demonstrating that resiliency per se does not necessarily help one to persist and advance in a challenging environment. Instead, other factors, such as personal values, may amplify or counteract the positive effects of resiliency.

#### 4.1. Practical implications

Most research on resiliency and academic achievement has been conducted with children and adolescents in school contexts (e.g., Putwain, Nicholson, Connors, & Woods, 2013) and with students from disadvantaged groups or environments (e.g., Abukari & Laser, 2013). Schools have already started to implement resilience programs to foster wellbeing and mental health. We measured resiliency in the context of higher education at the start of students' degree programs. Our findings indicate that resiliency appears generally beneficial for study progression and for dealing with typical challenges in University contexts and is not limited to traumatic experiences or minority groups. Therefore, educational practitioners should aim at evaluating resiliency and facilitating its development among students through intervention programs (de la Fuente et al., 2017). For instance, they could rely on teaching methods that promote mindfulness (e.g., Caldwell, Harrison, Adams, Quin, & Greeson, 2010) and cognitive activation of students (e.g., Alivernini, Manganelli, & Lucidi, 2016), or offer other support mechanisms, such as resiliency programs or trainings.

The results demonstrated that extraversion, conscientiousness, emotional stability, and openness are significantly related to student resiliency providing additional support for the role of personality differences in learning environments. Knowing the personality profiles of their students would help universities to design more effective and targeted counseling processes in their psycho-educational services (Regehr, Glancy, & Pitts, 2013). In case there is a high risk of dropout, universities could monitor their students' progress and implement support measures to help them foster their resilience. Moreover, universities and educational practitioners should be aware of individual differences emerging from personality factors. Regarding the development of students' own initiative to develop resources for academic achievement, student counselors and lecturers can help students to engage in critical self-reflection (Nijhuis, Segers, & Gijsselaers, 2007) about their personality profiles and resiliency to strengthen students' knowledge about their personal resources and potential protective factors.

Finally, achievement values play a key role in the resiliency–study progress relationship. Educational educators could assess the personal values of their students and help to foster their achievement values, for instance, by offering opportunities for goal setting and continuous reflection about personal growth and competence. Generally, the development of achievement values should preferably start as early as possible in primary and tertiary education in order to support students' academic achievement from the beginning of their academic career (Hayes, Blake, Darensbourg, & Castillo, 2015). Educators should be conscious of the fact that achievement values might be detrimental for students with low resiliency and that these student groups probably would need additional support in case of adversities.

#### 4.2. Limitations and future research

The findings of the present study need to be viewed in light of their limitations. We relied on study progress (as measured by the number of ECTS points obtained) as a measure of academic achievement, without considering common operationalizations of academic achievement, such as grade point average. While this outcome measure was chosen with great care to reflect the most relevant outcome measure for our focal construct—student resiliency—future studies should aim to replicate the findings using different outcome measures, such as grade point average. The type of outcome chosen might also explain the relatively low variance explained in our models predicting academic achievement (de Koning et al., 2012).

The present study was also restricted to one cohort of business students in a single institution and country, which might also explain the relatively small variance explained in our models. Prior research has shown that the results of academic achievement differ depending on the academic discipline (Vedel, 2016). Business students have unique characteristics (for a review see Vedel, 2016), and in terms of their personality, there are specific differences between psychology and business students (van Lange, Schippers, & Balliet, 2011) that may have impacted the results and may account for some of our findings, e.g., the fact that the correlations between some personality dimensions and academic achievement diverged from previous studies. Taking note of such divergent patterns between academic majors, Vedel (2014) suggested more studies on the personality–academic achievement link with students from majors other than psychology in order to scrutinize the potential differences. In this regard, she wrote that “it is necessary to look at the academic fields of students when gauging the predictive validity of the Big Five personality traits for academic achievement. Roughly speaking, we know a lot about psychology students and little about the remaining population” (Vedel, 2014, p. 73). Of course, this shall not imply that most extant research results on personality and resiliency are therefore only valid for psychology majors, nor that the results of our study are only valid for business majors. Rather, our study can also be seen as a validation of psychological theories predicting academic achievement. Reviews and meta-analyses by Vedel (2014), Vedel (2016), and Vedel, Thomsen, and Larsen (2015) suggest that there are structural differences with regards to personality. The different characteristics of psychology students (who have predominantly been used in psychological studies) and students from other fields (like business) could also elucidate the divergence between a few of our results and previous studies on the role of the Big Five personality dimensions in explaining academic achievement (Vedel, 2014), but not necessarily do so. Generally, we believe that by studying non-psychology students, we contribute to building a broader empirical foundation for studying the relationships between personality and academic achievement in tertiary education. Yet, to further examine the role of resiliency in study progression, future studies should be conducted with students enrolled in still other disciplines, institutions, and countries.

Moreover, by focusing on personality dimensions and values and their relation to resiliency, our study only considered the protective factors and motivational forces that lie within the individual. Therefore, future studies may consider environmental characteristics and situational factors, such as social support or control over the study/work environment, when studying resiliency. Despite its limitations, the present study contributes to a growing body of literature reflecting an interest in resiliency, especially in the field of positive psychology and behavior (King, Newman, & Luthans, 2015; van der Vegt, Essens, Wahlström, & George, 2015), as it builds on Richardson's (2002) model of resiliency to increase our understanding of the relationships between personality dimensions, resiliency, values, and study progress.

#### 5. Conclusion

In conclusion, we found that openness, extraversion, emotional

stability, and conscientiousness are related to resiliency, and that resiliency is in turn associated with study progress. This relationship was moderated by achievement values, such that the indirect effect was only significant at high levels of the moderator. Our study is not without limitations, and when interpreting our results researchers need to consider that they might be restricted to the context of business students and to study progress as one indicator of students' academic achievement. As such, our findings provide new evidence of the protective factors being related to resiliency and the contingent relationship between resiliency and study progress.

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