

Academic Demands and Resources and Students' Burnout:
The Moderating Role of Psychological Capital

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Abstract

The current study examined the moderating role of psychological capital (i.e. *hope, optimism, resilience* and *self-efficacy*) in the Job-Demands Resources Model among the student population. In the academic context, this model states that the presence of high academic demands leads to exhaustion and that the absence of academic resources leads to disengagement from one's studies. Exhaustion and disengagement are perceived to be the two core elements of the academic burnout syndrome. Another aim of this study was to develop a new measurement tool for assessing burnout among students and to compare it to the Maslach Burnout Inventory-Student Survey. A total of 184 higher educated students filled out a questionnaire that was distributed via social media and e-mail. As expected, Pearson correlations showed that academic demands were significantly and positively associated with exhaustion and that academic resources were significantly and negatively linked to disengagement. Contrary to expectations, hierarchical regression analyses showed that psychological capital did *not* moderate the relationships between academic demands and exhaustion; and academic resources and disengagement, respectively. However, results show that psychological capital was a significant, direct predictor of exhaustion and disengagement. Our findings also show that the newly developed BAT-SS offers a promising alternative to the student version of the MBI, which should be further extended and examined in future research. Our study demonstrates that academic burnout could be reduced or even prevented by implementing interventions that target academic demands, academic resources or psychological capital.

Keywords: *Burnout; students; job-demands resources model; psychological capital; BAT*

University students are often seen as a privileged group of youngsters going through a transitional period in which they acquire more independence, make new friends and break away from their home environments (Holdsworth, 2009). While this may seem a positive change for some, for others it can be problematic to cope with new sources of stress or pressures associated with this turbulent period (Stoliker & Lafreniere, 2015). For example, university students often experience stressors such as working long hours, deadlines and assignments, which in turn are linked to exhaustion (Law, 2007). This is one of the three dimensions of the burnout syndrome, which includes an overwhelming exhaustion, a sense of ineffectiveness or reduced accomplishments and feeling cynical or detached from one's job (Maslach & Leiter, 2016).

However, Schaufeli and Taris (2005) argue that the key elements of burnout are exhaustion and cynicism, since the element of reduced professional accomplishments may act as an antecedent or a consequence of burnout. Cynicism can also be interpreted as *disengagement*, since it is described as mental distancing or withdrawing from one's work or job role (Demerouti, Nachreiner, Bakker & Schaufeli, 2001). From that perspective, exhaustion and disengagement are the two core elements of burnout and will therefore be the focus of the current research (see Figure 1 on p. 7).

Burnout in the educational field is also referred to as *learning or academic burnout*. This is based on the idea that students in higher education experience burnout as a result of homework overload, academic pressure and individual psychological factors, which may result in negative attitudes, emotional exhaustion and low personal accomplishment (Lin & Huang, 2012). In other words, students who are burned out are exhausted as a result of study demands and have a detached and cynical attitude towards their studies (Schaufeli, Salanova, González-Romá & Bakker, 2002). Research among medical students from the United States found that 49.6% of students (N=2248) met the criteria for being burned out. Although medical education is often viewed as particularly stressful, it is doubtful whether this differs significantly from other disciplines in higher education (Firth-Cozens, 2001). The finding that nearly half of the research population met the criteria for being burned out suggests that burnout is a serious problem among all students.

Additionally, research has shown that the prevalence of burnout among university students is rising (Stoliker & Lafreniere, 2015). A deeper understanding of this phenomenon would therefore benefit both higher educated students and educational institutions, since it might be the key to understanding problematic student behaviour such as students dropping out of university (Lin & Huang, 2012). Research has also found that burnout can be linked to a

decreased self-esteem and academic performance, and even suicidal ideation (Dyrbye, Thomas, Massie, Power, Eacker, Harper, Durning, Moutier, Szydlo, Novotnu, Sloan & Shanafelt, 2008; Edwards, Burnard, Bennett & Hebden, 2010; Moneta, 2011). Consequently, further research focusing on higher education students is called for. The present paper contributes to the ongoing discussion about academic burnout among higher educated students by taking a closer look on the possible causes of burnout and the possible factors that might protect students from ending up burned out.

The job demands-resources model

As mentioned above, research on burnout has primarily focused on employees that work in organisations. Although students are not employed, nor hold jobs at the university, from a psychological perspective their activities conducted throughout their studies can be considered to constitute work (Lin & Huang, 2012), since studying can be interpreted as a systematic, goal-oriented and structured activity which is compulsory (Schaufeli, 2007). Therefore, just like people who are employed, students may suffer from the burnout syndrome or display burnout symptoms.

Accordingly, we can use the job demands-resources (JD-R) model in order to gain a better understanding of the possible causes and consequences of burnout among students. The JD-R model states that work characteristics can be divided into job demands and job resources (Demerouti et al., 2001). *Job demands* refer to organisational, social and physical aspects of a job that require psychological or physiological efforts, such as workload and time pressure. These job demands in turn could lead to exhaustion (Demerouti et al., 2001). In a similar vein we define *academic demands* as the aspects of studying that require psychological or physiological efforts. Research has found that, on average, time restrictions and economic and academic issues, such as worrying about money and being engaged in a demanding academic program, caused the most stress to students in different fields (Heins, Fahey & Leiden, 1988) and these obstacles were associated with being burned out (Salanova, Schaufeli, Martínez & Bresó, 2009). Kohn, Lafreniere and Gurevich (1990) found that most students struggle with time pressure and developmental challenges during their studies. Developmental challenges are referred to as challenges students have to face, such as finding courses too demanding or having lower grades than they hoped for (Kohn et al., 1990). In line with the JD-R Model, having to face too many academic demands can be associated with exhaustion.

Job resources refer to aspects of the job that help individuals to achieve their work goals, stimulate personal growth and development, such as rewards and supervisor support. They also reduce job demands and the associated psychological and physiological costs (Schaufeli & Bakker, 2004). When individuals lack job resources, they cannot obtain their goals or targets, which in turn leads to withdrawal from the job and a reduction of motivation (Demerouti et al., 2001). In other words, lacking job resources leads to *disengagement* from one's work. Along the same lines, *academic resources* can be defined as those aspects of the situation that enhance students' performance, such as having access to students' grants, and having social support from family and friends (Salanova et al., 2009). For example, research conducted on students has found that social support, especially from friends, is a major resource that provides a buffer against burnout (Jacobs & Dodd, 2003).

In the research of Salanova and colleagues (2009), academic resources were defined as *performance facilitators*, which are factors that enhance performance at one's studies. These performance facilitators, in turn, were divided into three categories: organisational, personal and social facilitators that might help students to enhance their ability to perform at their studies. The findings suggested that personal facilitators did not work similarly to organisational and social facilitators, since personal obstacles (*demands*) and personal facilitators did not correlate positively, while organisational and social obstacles and facilitators did (Salanova et al., 2009). Also, some of the examined personal facilitators can be interpreted as psychological capital, which will also be investigated in the current research as a moderator. For example, personal facilitators in Salanova's research (2009) included having positive expectations and being optimistic. Therefore, in the current research, we will take organisational and social facilitators into account as academic resources.

According to the job demands-resources model, individuals experiencing high job demands are at risk for exhaustion and individuals lacking job resources will disengage from their work (Demerouti et al., 2001), which are both the two core elements of burnout (Schaufeli & Taris, 2005). By analysing these two processes in the academic context, the present study will shed more light on the phenomenon of academic burnout among students.

Moderating role of psychological capital

Xanthopoulou and colleagues (2007) found that personal resources, namely self-efficacy, organisational-based self-esteem and optimism, also play a role in the JDR-Model. Since the

conceptualization of personal resources parallels the concept of psychological capital, also known as PsyCap, we will use PsyCap to conceptualise and operationalise personal resources. Individuals with psychological capital are referred to as having a positive psychological state of development, which is characterised by having confidence in succeeding in challenging tasks (*self-efficacy*), having a positive outlook on succeeding now and in the future (*optimism*), persevering towards goals in order to succeed (*hope*) and being *resilient* when one stumbles across problems or adversity to attain success (Luthans & Youssef, 2004; Luthans, Avolio, Avey & Norman, 2007).

Previous research proposes that personal resources, and thus PsyCap, may function as moderators in the relationship between environmental factors and organisational outcomes (Judge, Locke, Durham & Kluger, 1998). Xanthopoulou and colleagues hypothesised that personal resources act as a moderator between job demands and exhaustion, in a sense that psychological capital offsets the effect of academic demands on exhaustion (Xanthopoulou, Bakker, Demerouti & Shaufeli, 2007). Although the results showed that personal resources did not act as a moderator in this relationship, there were multiple reasons why the moderation might not have been found, such as the homogeneous nature of the sample population and the specific personal resources included in the study (Xanthopoulou et al., 2007). This might suggest that psychological capital may, in fact, still act as a moderator in the relationship between the demands and exhaustion. For example, other research has found that psychological capital moderates the relationship between *positive display rule perceptions* and exhaustion (Yin, Wang, Huang & Li, 2018), in a sense that psychological capital buffered the effect of having positive display rule perceptions on exhaustion. Positive display rule perceptions include perceptions on which emotions to express or not to express in a certain situation and can be categorised as an organisational requirement, or, in other words, as a job demand (Yin et al., 2018). Since an academic setting at a university or college can be considered as work, these findings suggest that psychological capital may act as a moderator between academic demands and exhaustion, meaning that psychological capital may buffer the effect of academic demands on exhaustion.

Additionally, psychological capital may also act as a moderator in the relationship between academic resources and disengagement in the sense that psychological capital may reinforce the effect of academic resources on disengagement. According to the conservation of resources theory, resources do not exist in isolation of each other, but they are rather used in accumulation in order to get the best results (Hobfoll, 1989). In other words, people use both

job resources and personal resources simultaneously in order to achieve their goals. Previous research has found that this accumulation of job resources and personal resources reinforces engagement (Leiter & Bakker, 2010). Through moderation, psychological capital might boost the positive effect of academic resources on disengagement, meaning that disengagement is less for students who have high self-efficacy and who are optimistic, hopeful and resilient.

Taken together, these two moderating roles of psychological capital in the relationships between academic demands and exhaustion, on the one hand, and academic resources and disengagement, on the other, are the main focus of the present study. The main purpose is to find an answer to the research question *whether psychological capital moderates the relationship between academic demands and exhaustion; and academic resources and disengagement*. We will work with and evaluate the following research model:

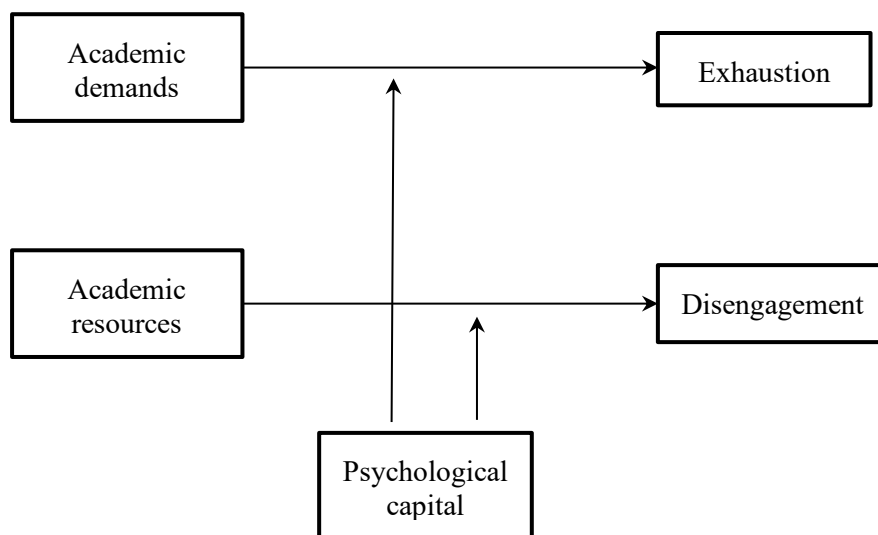


Figure 1 The research model

More specifically, we hypothesise that:

H1 – Academic demands (i.e. time pressure and developmental challenges) are positively related to exhaustion among students.

H2 – Academic resources (i.e. organisational and social facilitators) are negatively related to students' disengagement from their studies.

H3a – Psychological capital (i.e. self-efficacy, optimism, hope, resilience) moderates the relationship between academic demands and exhaustion, in the sense that psychological capital buffers the positive association of academic demands with exhaustion.

H3b – Psychological capital moderates the relationship between academic resources and disengagement, in the sense that psychological capital reinforces the negative association of academic resources with disengagement.

In addition, a second minor aim of the study is to validate a new burnout measure by comparing it with a measure that is usually employed to assess burnout. More specifically, we will compare the Maslach Burnout Inventory-Student Survey (Schaufeli, Martínez, Pinto, Salanova & Bakker, 2002) with the newly developed Burnout Assessment Tool-Student Survey (Appendix B). The MBI-SS is a widely used measurement tool for measuring burnout among students and is even considered the golden standard for measuring burnout. However, while our knowledge on and experience with burnout has evolved (Desart, Schaufeli & De Witte, 2017; Leiter, Bakker & Maslach., 2014), the MBI-SS has not changed and is therefore outdated. Also, the MBI-SS suffers from psychometric deficiencies since some items are formulated in an extreme way, while others are not, which results in a skewed distribution of the scale (Desart et al., 2017). In other words, the development of a new assessment tool to measure the presence of burnout seems necessary. Desart, Schaufeli and De Witte provided a solution to these problems by developing the Burnout Assessment Tool, also known as BAT (Desart et al., 2017). BAT measures the presence of the burnout syndrome by tapping into four core symptoms: exhaustion, impaired cognitive and emotional control and mental distance, and also measuring three additional symptoms: depression, psychological distress and psychosomatic complaints. Research has yet to support the assumption that BAT performs better than MBI-SS when it comes to construct validity. In order to compare the MBI-SS with the Burnout Assessment Tool, a student version of the BAT was created that targeted the core dimensions of the burnout syndrome, namely exhaustion and disengagement (Appendix B). The present study uses the

MBI-SS as well as the BAT-SS in order to compare both questionnaires and establish the concurrent validity of the BAT-SS.

Method

Sample and procedure

An online questionnaire was designed and administered to a total sample of 184 undergraduate students through social network websites, such as webpages for university students. Of this total sample, 45 students were male (24.5%), 138 students were female (75.0%) and 1 student identified with another gender (.50%). The majority of the sample was between 18 and 24 years old (N = 132, 71.1%), followed by 24.5% of students who were between 25 and 34 years old (N = 45). The majority of the students (51.1%) were enrolled in a university-level master's degree (N = 94), followed by 29.3% of students who were enrolled in a university-level bachelor (N = 54), 17.9% of students who were enrolled in a college degree (N = 33) and 3 students who were enrolled in another higher educational program. These sample characteristics are presented in Table 1.

TABLE 1
Sample Characteristics

Gender (%)	
Male	24.5
Female	75.0
Other	.50
Age-category (%)	
18-24 years old	71.7
25-34 years old	24.5
35-44 years old	2.2
45+ years old	1.6
Education (%)	
College degree ('HBO')	17.9
Bachelor's degree ('WO')	29.3
Master's degree ('WO')	51.1
Other	1.6

Measures

Exhaustion. Exhaustion was assessed by the Maslach Burnout Inventory-Student Survey, also known as the MBI-SS (Schaufeli et al., 2002; Appendix A). Five items were scored on a seven-point frequency rating scale that ranges from 0 (*never*) to 7 (*every day*). Examples of items that tap into exhaustion are “*I feel emotionally drained by my studies*” and “*I feel tired when I get up in the morning and I have to face another day at the university.*” The internal consistency (Cronbach’s α) for the exhaustion scale was .91.

As mentioned above, a student version of the Burnout Assessment Tool, henceforth referred to as BAT-SS, was created in order to compare the two measurement tools. Items of this BAT-SS were rephrased in such a way that they were directed at students’ perceptions about their studies instead of referring to ‘*work*’ (Appendix B). Therefore, the decision was made to rephrase ‘*work*’ into ‘*studying*’. This resulted in a newly developed questionnaire with thirteen items that tap into the key elements of burnout, namely exhaustion and disengagement (Schaufeli & Taris, 2005), among the student population. All thirteen items of the BAT-SS were scored on a five-point frequency rating scale that ranged from 0 (*never*) to 4 (*always*). Eight items tap into exhaustion, examples of which are: “*Everything I do in my studies requires a great deal of effort,*” and “*I want to be active in my studies, but somehow I am unable to manage.*” The internal consistency (Cronbach’s α) for the exhaustion scale, measured by the BAT-SS, was .88.

Disengagement. The second core element of burnout, disengagement, was also assessed by the MBI-SS and the newly developed BAT-SS (Appendices A and B) cynicism items for students. In the case of the MBI-SS, all four items scored on a seven-point frequency rating scale that ranges from 0 (*never*) to 6 (*every day*). Examples of items that tap into disengagement are “*I have become less enthusiastic about my studies*” and “*I doubt the significance of my studies.*” The internal consistency (Cronbach’s α) for the disengagement scale was .92.

As mentioned above, disengagement was also assessed by the BAT-SS, in which disengagement is described as experiencing a mental distance from one’s studies. Five items on disengagement are measured with a five-point frequency rating scale that ranges from 0 (*never*) to 5 (*always*). Examples of items that tap into disengagement are “*I feel indifferent about my studies*” and “*I’m cynical about what my studies mean to others.*” The internal consistency (Cronbach’s α) for the disengagement scale measured by the BAT-SS was .87.

Academic demands. Academic demands are assessed by the Inventory of College Students' Recent Life Experiences (Kohn et al., 1990; Appendix C) in which demands are measured with two subscales: time pressure and developmental challenges. Time pressure refers to the students' experience of having a lot of responsibilities, doing too many things at the same time and lacking time to meet other obligations or to spend on leisure (Kohn et al., 1990). Developmental challenges concern typical challenges faced by college students, such as struggling to meet academic standards, having to make important decisions about your future career and finding courses too demanding (Kohn et al., 1990). All items are scored on a four-point frequency rating scale that ranges from 0 (*not at all part of my life*) to 3 (*very much part of my life*). Examples of items that measure academic demands are "*Struggling to meet the academic standards of others*" and "*Not enough time for sleep.*" The internal consistencies (Cronbach's α) for the scales on time pressure and developmental challenges were .85 and .80, respectively. Taken together, the internal consistency (Cronbach's α) for the scale that combines all items on academic demands is .89.

Academic resources. Academic resources are assessed by Salanova and colleagues' list of *performance facilitators*, which are divided between organisational facilitators and social facilitators and are defined as those aspects of the situation that enhance students' performance (Salanova et al., 2009; Appendix D). Four items from Salanova and colleagues' questionnaire were removed from the survey, since these items were either outdated or not relevant for the Dutch academic setting. The items that were removed focused on the presence of a library with a photocopy machine (outdated), the presence of a library with longer opening hours during the exam period, access to student language learning service and access to University-Enterprise Foundation Service (not applicable).

In order to check for the actual academic resources in the Dutch context, a focus group was held amongst eight female students from Utrecht University. As a result of this focus group, three more academic resources were added to Salanova and colleagues' list of performance facilitators: (1) having holidays off to unwind without having exams or resits scheduled, (2) variation in studying (i.e. through projects, tutorials or lectures) and (3) having tutorials in small student groups (Appendix D). Respondents were asked whether each academic resource was either *present* or *not present* in their study environment. Examples of academic resources measured with the survey are *sunny and properly lighted and ventilated classrooms*, *the presence of student associations* and *having good social relationships with teachers*. The internal consistencies (Cronbach's α) for the scales on organisational facilitators and social

facilitators were .63 and .66, respectively. Taken together, the internal consistency (Cronbach's α) for the scale that combines all items on academic resources is .73.

Psychological capital. Psychological capital was assessed by the Compound PsyCap Scale, also known as the CPC-12 (Lorenz, Beer, Pütz & Heinitz, 2016; Appendix E), which consists of 12 items that represent psychological capital, including self-efficacy, optimism, hope and resilience. All items scored on a six-point frequency rating scale that ranges from 0 (*strongly disagree*) to 5 (*strongly agree*). Examples of items that represent psychological capital are “*Right now, I see myself as being pretty successful*” and “*I am looking forward to the life ahead of me.*” The internal consistencies (Cronbach's α) for the scales on hope, optimism, resilience and self-efficacy were .78, .87, .39 and .82, respectively. Taken together, the internal consistency (Cronbach's α) for the scale that combines all items on psychological capital is .88.

Results

Preliminary analyses

Table 2 shows the means, standard deviations, internal consistencies (Cronbach's α) and intercorrelations of the study variables. Apart from the internal consistency of the scale for resilience, all Cronbach's α values meet the criterion of .70 (Nunnally & Bernstein, 1994). All variables from the research model show significant relationships with each other. As expected, exhaustion measured by MBI-SS has a significant, positive and strong correlation with exhaustion measured by BAT-SS. Disengagement measured by MBI-SS also correlates significantly, positively and strongly with disengagement measured by BAT-SS. These findings confirm that there is a strong overlay between exhaustion, measured by the two tools, and disengagement, also measured by the two tools.

As anticipated, both exhaustion scales also have a significant, negative but weak relationship with resources and all PsyCap-scales. Moreover, the disengagement scales have significant, negative but weak relationships with resources and weak to moderate relationships with all PsyCap-scales. This also confirms the expectation that there is an overlay between the two tools, since they both measure the same dimensions of the burnout syndrome.

Table 2 also shows that the academic demands are significantly and positively related to exhaustion, both as measured by MBI-SS and BAT-SS. Using the Fisher r -to- z transformation, we confirmed that the difference between the two correlation coefficients,

Table 2: Means, standard deviations and Pearson correlations among the study variables.

	<i>M</i>	<i>SD</i>	α	1	2	3	4	5	6	7	8	9
1. Academic demands	2.436	.535	.874	1								
2. Exhaustion (MBI-SS)	3.315	1.454	.909	.528**	1							
3. Exhaustion (BAT-SS)	2.946	.752	.880	.691**	.771**	1						
4. Academic resources	16.201	3.721	.761	-.314**	-.188*	-.222**	1					
5. Disengagement (MBI-SS)	2.738	1.635	.919	.423**	.592**	.536**	-.249**	1				
6. Disengagement (BAT-SS)	2.394	.850	.867	.560**	.552**	.651**	-.218**	.785**	1			
7. Hope	4.049	1.000	.781	-.294**	-.265**	-.380**	.216**	-.252**	-.352**	1		
8. Optimism	4.652	.893	.865	-.313**	-.269**	-.370**	.302**	-.337**	-.432**	.629**	1	
9. Resilience	4.509	.709	.392	-.228**	-.203**	-.316**	.203**	-.209**	-.305**	.507**	.508**	1
10. Self-efficacy	4.371	1.013	.822	-.244**	-.288**	-.367**	.238**	-.293**	-.357**	.557**	.480**	.622**

** . Correlation is significant at the 0.01 level (2-tailed)

* . Correlation is significant at the 0.05 level (2-tailed)

regarding the relationships between academic demands and exhaustion measured by both MBI-SS and BAT-SS, was statistically significant, $Z = -2.50$, $p < .05$. The first hypothesis, concerning the positive relationship between academic demands and exhaustion, can be confirmed.

Moreover, Table 2 also shows that academic resources are significantly and negatively related to disengagement among the student population, both measured by MBI-SS and BAT-SS. Also using the Fisher r-to-z transformation, we can conclude that the difference between the two correlation coefficients is not statistically significant, $Z = -.31$, $p = .76$. Still, the second hypothesis, concerning the negative relationship between academic resources and disengagement, can also be confirmed.

Factor structure of the measures

A confirmatory factor analysis using the principal component analysis with a varimax rotation was conducted among all MBI-SS items to examine whether two different factors emerge: exhaustion and disengagement. All items correlated at least .30 with the other items, suggesting reasonable factorability. The Kaiser-Olkin measure of sampling adequacy was .88, which is above the recommended value of .60, and the Bartlett's test of sphericity was significant ($\chi(36) = 1296.33$, $p < .000$). Principal component analysis revealed two factors with an Eigenvalue above 1, which explained 61.17% and 16.12% of the variance, respectively (Appendix F). The interpretation of the components is consistent with the expectations that there are two underlying factors in the MBI-SS which tap into exhaustion and disengagement, respectively.

The same factor analysis using the principal component analysis with a varimax rotation was conducted among BAT-SS items to examine whether the BAT-SS also constitutes two different factors, namely exhaustion and disengagement. Almost all of the items correlated at least .30 with the other items and the Kaiser-Olkin measure of sampling adequacy was .91. The Bartlett's test of sphericity was significant ($\chi(78) = 1226.42$, $p < .00$). The principal component analysis with a varimax rotation revealed two factors with an Eigenvalue above 1, which explained 48.99% and 11.22% of the variance, respectively (Appendix F). These findings confirm the expectation that the BAT-SS has two underlying factors which tap into exhaustion and disengagement.

The analyses of the MBI-SS and the BAT-SS separately revealed that both instruments hold two underlying factors, namely exhaustion and disengagement. A principal component analysis with a varimax rotation conducted amongst all items of MBI-SS and BAT-SS simultaneously reveals a somewhat different structure. Almost all items correlated at least .30 with the other items and the Kaiser-Olkin measure of sampling adequacy was .94. The Bartlett's test of sphericity was significant ($\chi(231) = 2930.90, p < .00$). The principal component analysis with a varimax rotation revealed three factors with an Eigenvalue above 1, which explained 49.00%, 10.67 and 5.37%, respectively (Appendix G). These findings show that the items of MBI-SS and BAT-SS combined tap into three separate factors: disengagement, exhaustion measured by BAT-SS and exhaustion measured by MBI-SS. However, since PCAs among BAT-SS and MBI-SS separately (Appendix F) clearly show that the two instruments have two underlying factors, exhaustions and disengagement, four scales were conducted as a result of the factor analyses, namely exhaustion and disengagement, both measured by BAT-SS, and exhaustion and disengagement, both measured by MBI-SS.

In order to examine whether two scales on academic demands and academic resources could be conducted, a principal component analysis with a varimax rotation was conducted among all items that tapped into academic demands and academic resources. Not all items correlated at least .30 with each other, but the Kaiser-Olkin measure of sampling adequacy was .76 and the Bartlett's test of sphericity was significant ($\chi(741) = 2256.02, p < .00$). Initial results showed that there were thirteen factors with an Eigenvalue above 1, contrary to the expectation that results should reveal two underlying factors, namely academic demands and academic resources. However, results also show that eight factors (concerning being dissatisfied with one's mathematical ability, access to student grants, access to computer labs, granted cultural activities, sunny and properly lighted and ventilated classrooms, autonomy to determine what tasks one performs every day, student associations and feedback from teachers or fellow students) are dominated by only one item. Excluding these items and conducting a new PCA with varimax rotation on the remaining items led to a new model with nine factors with an Eigenvalue above 1. Again, not all items correlated at least .30 with each other, but the Kaiser-Olkin measure of sampling adequacy was .80 and the Bartlett's test of sphericity was significant ($\chi(465) = 1795.84, p < .00$). Subsequently, a principal component analysis with a varimax rotation and a fixed number of two factors was conducted amongst these remaining items. Not all items correlated at least .30 with each other, but the Kaiser-Olkin measure of sampling adequacy was .80 and the Bartlett's test of sphericity was significant ($\chi(465) = 1795.84, p <$

.00). As expected, the rotated component matrix revealed that all remaining academic demands and academic resources clearly tap into two separate factors, explaining 20.66% and 9.97% of the variance, respectively. Four items that loaded less than .40 on both of the two factors (concerning having to make important decisions about one's future career, being dissatisfied with one's physical appearance, having administrative services located in the same building and having holidays off that can be spent on leisure time) were discarded in order to conduct two scales, namely academic demands and academic resources (Appendix H). Examples of academic demands are the struggle to meet the academic standards of others, not having enough leisure time or time to meet one's obligations and having to deal with extracurricular activities. Academic resources include items such as having tutorials with few students, having tutoring time available and social support from family and friends.

Finally, a principal components analysis with a varimax rotation was conducted amongst all items from the CPC-12, tapping into psychological capital, in order to examine how many underlying factors this instrument holds. Most items correlated at least .30 with each other, and the Kaiser-Olkin measure of sampling adequacy was .88, with the Bartlett's test of sphericity being significant ($\chi(66) = 1044.35, p < .00$). Initial results showed that there were three factors with an Eigenvalue above 1, explaining 45.55%, 11.66% and 8.52% of the variance, respectively. However, only one item that originally tapped into resilience loaded highly on the third factor. This item was therefore left out from a new PCA with a varimax rotation. This new model showed that most items correlated at least .300 with each other, with a Kaiser-Olkin measure of sampling adequacy of .88 and the Bartlett's test of sphericity being significant ($\chi(55) = 1010.95, p < .00$). Results reveal two underlying factors with an Eigenvalue above 1, explaining 48.73% and 12.61% of the variance, respectively. One factor tapped into hope and optimism, whereas the other factor tapped into resilience and self-efficacy.

However, the unrotated component matrix (Appendix H) shows that all items load above .50 on the first factor, implying that there could be one underlying factor that taps into psychological capital as a whole. Also, the first factor, with an Eigenvalue of 5.36, explains 48.73% of the variance, while the second factor, with a smaller Eigenvalue of 1.39, explains only 12.61% of the variance. Furthermore, these two factors are significantly and positively correlated with each other, $r(183) = .61, p < .00$, meaning that there is a moderate to strong relationship between the two factors. Also, the internal consistency (Cronbach's α) of the two factors are .86 (hope and optimism) and .82, respectively, while the internal consistency

(Cronbach's α) of the scale that combines all items is .89. Conducting one scale among the items on psychological capital would thus benefit the internal consistency. Therefore, a decision was made to conduct one scale among all items that tap into psychological capital.

Test of Psychological Capital-Interaction Effects

According to Hypotheses 3a and 3b, psychological capital buffers the effects of academic demands on exhaustion and reinforces the effect of academic resources on disengagement. In order to test these hypotheses, the variables academic demands and psychological capital were centred. Subsequently, interaction terms were built by multiplying academic demands \times psychological capital and academic resources \times psychological capital. In a hierarchical regression, academic demands and psychological capital were included in the first step of the regression equation, and the interaction term between academic demands and psychological capital was included in the second step. This way, we examined whether the interaction variable explained a unique proportion of the variance in exhaustion, measured by MBI-SS, after controlling for the main effects of academic demands. As can be seen in Table 3, the results show that the interaction between academic demands and psychological capital fell short of statistical significance ($F(3, 180) = 24.56, p = .70$, with an R^2 of .29). This means that psychological capital does not significantly moderate the relationship between academic demands and exhaustion, measured by MBI-SS.

Since we have measured exhaustion with both MBI-SS and BAT-SS, another hierarchical regression was calculated with exhaustion measured by BAT-SS as the independent variable. The results (Table 3) show that the interaction between academic demands and psychological capital also fell short of statistical significance ($F(3,180) = 66.99, p = .83$, with an R^2 of .53). In other words, psychological capital does not significantly moderate the relationship between academic demands and exhaustion, measured by BAT-SS. Therefore, the hypothesis *H3a*, concerning the moderating role of psychological capital in the relationship between academic demands and exhaustion, must be rejected.

As mentioned above, psychological capital was also expected to reinforce the negative effect of academic resources with disengagement (Hypothesis 3b). In order to examine this hypothesis, the variables academic resources and psychological capital were centred, and scales were conducted. Subsequently, interaction terms were built for academic resources and

Table 3: Regression of Burnout on Academic Demands and Exhaustion: Psychological Capital

Step	Model	Exhaustion, MBI-SS			Exhaustion, BAT-SS		
		β	ΔR^2	ΔF	β	ΔR^2	ΔF
1	Academic demands	1.130**			.790**		
	Psychological capital	-.356**	.290**	36.933**	-.247**	.527**	100.989**
2	Academic demands × Psychological capital	.076	.001	.147	.018	.000	.046

Table 4: Regression of Burnout on Academic Resources and Disengagement: Psychological Capital

Step	Model	Disengagement, MBI-SS			Disengagement, BAT-SS		
		β	ΔR^2	ΔF	β	ΔR^2	ΔF
1	Academic resources	-1.191**			-.220**		
	Psychological capital	-.629**	.137**	14.318**	-.481**	.209**	23.899**
2	Academic resources × Psychological capital	-1.060	.011	2.310	-.362	.005	1.081

psychological capital. In a hierarchical regression, academic resources and psychological capital were included in the first step of the regression equation, and the interaction term was included in the second step. As can be seen in Table 4, the results show that the interaction between academic resources and psychological capital fell short of statistical significance ($F(3,180) = 10.39, p = .13$, with an R^2 of .15). This means that psychological capital also does not significantly reinforce the relationship between academic resources and disengagement, measured by MBI-SS.

The same hierarchical regression was conducted with disengagement measured by BAT-SS. Academic resources and psychological capital were included in the first step of the regression equation, whereas the interaction term was included in the second step. The results (Table 4) show that the interaction between academic resources and psychological capital is not statistically significant ($F(3,180) = 16.30, p = .30$, with an R^2 of .21). This means that psychological capital also does not significantly moderate the relationship between academic resources and disengagement, measured by BAT-SS. Therefore, hypothesis *H3b*, concerning the moderating role of psychological capital between academic resources and disengagement, must be rejected.

Discussion

The present study investigated the moderating role of psychological capital (i.e. hope, optimism, resilience and self-efficacy) in the JD R-Model in the academic context. During the qualitative focus group analysis, it became clear that students who were enduring a lot of academic demands were exhausted and that the absence of academic resources would enhance students' disengagement from their studies. Our quantitative statistical results confirm these findings, since they show that academic demands are associated significantly and positively with exhaustion and academic resources associated significantly and negatively with disengagement (Demerouti et al., 2001), both of which are the core elements of the burnout syndrome (Schaufeli & Taris, 2005).

Contrary to expectations, psychological capital (i.e. hope, optimism, resilience and self-efficacy) did not significantly moderate the relationship between academic demands and exhaustion. This means that we cannot conclude that psychological capital buffers the effect of academic demands on exhaustion. However, the hierarchical regression shows that academic

demands and psychological capital, separately, are significant predictors of exhaustion, rather than through interaction.

In addition, we also found that psychological capital did not significantly moderate the relationship between academic resources and disengagement. In this sense, psychological capital does not reinforce the effect of academic resources on disengagement. As mentioned above, rather than working through an interaction between academic resources and psychological capital, both psychological capital and academic resources are significant predictors of disengagement. Therefore, psychological capital may not act as a moderator in the JD R-Model, but our findings show that it does have a direct and significant effect on the two core elements of burnout, namely exhaustion and disengagement. The failure of psychological capital to fulfil a moderating role in the JD R-Model may be attributed to the nature of the factors (i.e. hope, optimism, resilience and self-efficacy). It is possible that these factors operate at an affective-cognitive level, rather than on a practical level, which would mean that psychological capital would not necessarily help individuals cope with academic demands or enhance their academic resources, but rather that it would have a direct influence on exhaustion and disengagement due to its affective-cognitive effects.

Another explanation for the direct effect of psychological capital on exhaustion and disengagement, rather than an interaction effect with academic demands or academic resources, can be found in the operationalisation of psychological capital. The present study uses the CPC-12 questionnaire (Lorenz et al., 2016; Appendix E) in order to measure hope, optimism, resilience and self-efficacy among the student population. Although this is a widely used measurement tool, each factor of psychological capital is measured by only three items and the factor concerning resilience only contained two items, since the third item did not load highly enough and was discarded from the scale. Using a more extensive measurement tool might give a more thorough and in-depth understanding of the role of psychological capital within the JD-R Model.

Another aim of this study was to evaluate a new burnout measure that could be used in the academic setting. A student version of the BAT, the Burnout Assessment Tool-Student Survey (BAT-SS), was compared to the student version of the Maslach Burnout Inventory (MBI-SS). These two measurement tools both assessed two core elements of burnout, namely exhaustion and disengagement (Schaufeli & Taris, 2005). Both exhaustion scales are significantly and positively related to academic demands and both disengagement scales are

significantly and negatively related to academic resources. Also, the exhaustion scales are significantly and positively related to the disengagement scales. The significant and strong correlations between MBI-SS and BAT-SS show that both tools are measuring the same phenomenon. This means that the concurrent validity between the two scales is high and they measure the same construct, namely exhaustion and disengagement.

Comparing the factor structure of the two measurement tools, the two factors – exhaustion and disengagement – of MBI-SS explained 77.29% of the variance, while the two factors of BAT-SS explained 60.21% of the variance. According to Hair, Black, Babin, and Anderson (2014, p. 107), a factor structure that accounts for at least 60% of the total variance can be regarded as a satisfactory solution. In terms of reliability, the internal consistencies (Cronbach's α) for the two scales measured by MBI-SS were 0.91 and 0.92, respectively, while the internal consistencies (Cronbach's α) for the two scales measured by BAT-SS were 0.89 and 0.87. Therefore, in terms of explained variance and internal consistency, MBI-SS scores slightly better than the newly-developed BAT-SS. However, taking into account that the Maslach Burnout Inventory is otherwise outdated and suffers from other psychometric deficiencies (Desart et al., 2017), BAT-SS offers an adequate substitute for MBI-SS.

Theoretical implications

Our results agree with previous research on the JD-R Model in the sense that academic demands are positively linked to exhaustion and academic resources are negatively associated with disengagement from one's studies (Demerouti et al., 2001). This suggests that students who are coping with a lot of academic demands and who have little access to academic resources are at risk of getting exhausted or being less engaged in their studies.

Xanthopolou and colleagues (2007) first noted that the concept of psychological capital (i.e. *hope, optimism, resilience* and *self-efficacy*) might play an important role in the JD-R Model. According to the conservation of resources theory, resources are used in accumulation in order to get the best results (Hobfoll, 1980), which means that psychological capital would reinforce the effect of high academic resources on lowering disengagement through moderation. Our findings show that psychological capital neither had a moderating role in the relationship between academic demands and exhaustion, nor in the relationship between academic resources and disengagement. However, the role of psychological capital should not

be discarded altogether in analysing the JD-R Model, nor the burnout syndrome. Our results did indicate that psychological capital was a direct predictor of both exhaustion and disengagement, instead of interacting with other variables such as academic demands and academic resources. Hence, it appears that enhancing psychological capital might directly affect the burnout syndrome through both dimensions, namely exhaustion and disengagement.

Practical implications

Our findings highlight the fact that lowering academic demands as well as increasing academic resources and enhancing hope, optimism, resilience and self-efficacy might all contribute to preventing students from getting burned out or helping them to cope with being burned out. Universities or other educational institutions could try to reduce exhaustion or disengagement among students by offering coaching to improve students' written expression or by ensuring small-size tutorial groups and offering practical solutions, such as good transport to the university and timetable flexibility. Another practical example of an intervention that could be implemented by universities in order to decrease burnout and increase self-efficacy, engagement and ultimately performance among students can be found in a quasi-experimental study by Bresó, Schaufeli & Salanova (2011). Their results indicate that students' well-being, performance and engagement with their studies can be improved by offering coaching to students in four two-hour one-on-one sessions focused on treating anxiety.

Additionally, the advantage of the concept of psychological capital is that it has proven guidelines for its enhancement (Luthans, Luthans & Luthans, 2004) and students can actively invest in increasing their hope, optimism, feeling of self-efficacy or resilience. This in turn can prevent exhaustion or disengagement from one's studies and enhance their well-being. In this sense, academic burnout could be prevented or reduced by making changes in practical matters, such as demands and resources, but also in personal matters, such as students' psychological capital. The finding that psychological capital has a significant and direct effect on the two core elements of the burnout syndrome, namely exhaustion and disengagement, suggests that it offers a fruitful area to be targeted by interventions that in turn will benefit all students, instead of only students who are coping with high academic demands or low academic resources.

Finally, it is of importance to be able to clinically assess the burnout syndrome among the student population. Since our scientific knowledge on and experience with burnout has evolved in the last 35 years, this urgently called for a revision of the traditional Maslach Burnout

Inventory. Our research determines that the newly developed Burnout Assessment Tool-Student Survey offers a feasible alternative for the student version of the MBI.

Limitations and future research

As any study, the present study is subject to limitations that need to be acknowledged. Most importantly, although the findings claim to study the processes in the JD-R Model in an academic setting, they are measured in a study of cross-sectional design. Therefore, it is not possible to draw conclusions on the causality between the study variables. Longitudinal research designs are needed to examine the sequence of the effects and to validate our findings over time.

Furthermore, we used self-report questionnaires in order to measure academic demands, academic resources, exhaustion, disengagement and psychological capital, which means that there are potential effects of common method variance. Future research could extend our knowledge on burnout in the academic context by using objective measurement tools, such as observer ratings, or by combining self-report questionnaires with objective measurement tools.

A third limitation of this study can be found within the different natures of some of the variables that were examined. For example, students can extract resources from different facilitators, such as the organisational and social resources that were included in the present study. Therefore, it was difficult to construct one scale including all items that tapped into demands or resources, respectively. Also, some subscales, such as *resilience*, only contained two or three items, which made it difficult to assess the reliability and the validity of the scale. Future research could extend our knowledge on the effects of academic demands, academic resources and psychological capital by using more extensive questionnaires and by studying different kinds of resources or demands separately.

A fourth limitation of the present study can be found in the newly developed BAT-SS which taps into the two core elements of burnout – exhaustion and disengagement (Schaufeli & Taris, 2005). This was done deliberately in order to examine both MBI-SS and BAT-SS within the context of the JD-R Model, which only looks into exhaustion and disengagement. However, research has shown that burnout can also be associated with impaired cognitive and emotional control, depression, psychological distress and psychosomatic complaints (Desart et al., 2017). In order to develop a new measurement tool that enables clinicians to assess burnout among a

student population, future research should focus on including these aspects in their studies on burnout.

Lastly, our data from the focus group study and the self-report questionnaires was collected during the summer. Previous research has shown that sun exposure is associated with socializing with friends and feeling better outdoors (Robinson, Rademaker, Sylvester & Cook, 1997). This suggests that the respondents might perceive their academic resources, which also included social support from family and friends, as higher than during other seasons and might report lower levels of exhaustion. Longitudinal research with multiple periods of data collection during the year is called for in order to examine whether findings differ from one season to another.

Despite these limitations, the results from the present study still support the notion that academic demands are positively associated with exhaustion, that academic resources are negatively associated with disengagement from one's studies and that psychological capital has a direct influence on both exhaustion and disengagement. To conclude, the present study sheds more light on the serious problem of burnout among student populations and points to new areas that could be targeted in order to help exhausted and disengaged students.

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Appendix A

Maslach Burnout Inventory-Student Survey (0 'never,' 1 'a few times a year,' 2 'monthly,' 3 'a few times a month,' 4 'every week,' 5 'a few times a week,' 6 'every day')

I. Exhaustion

- I feel emotionally drained by my studies
- I feel used up at the end of a day at university
- I feel tired when I get up in the morning and I have to face another day at the university
- Studying or attending a class is really a strain for me
- I feel burned out from my studies

II. Cynicism (*disengagement*)

- I have become less interested in my studies since my enrolment at the university
- I have become less enthusiastic about my studies
- I have become more cynical about the potential usefulness of my studies
- I doubt the significance of my studies

Appendix B

Burnout Assessment Tool-Student Survey (0 'never,' 1 'rarely,' 2 'sometimes,' 3 'often,' 4 'always')

Please indicate how you feel about the following statements. NOTE: The concept of *studying* includes attending lectures and practicals, making assignments, conducting research and participating in a (medical) internship.

I. Exhaustion

- When I'm studying, I feel mentally exhausted
- Everything I do in my studies requires a great deal of effort
- After a day of studying, I find it hard to recover my energy
- When I'm studying, I feel physically exhausted
- When I get up in the morning, I lack the energy to start a new day of studying
- I want to be active in my studies, but somehow I am unable to manage
- When I exert myself in my studies, I get tired quicker than normal
- After a day of studying, I feel mentally exhausted and drained

II. Mental distance (*disengagement*)

- I struggle to find any enthusiasm for my studies
- When I'm studying, I do not think much and I function on autopilot
- I feel a strong aversion towards my studies
- I feel indifferent about my studies
- I'm cynical about what my studies mean to others

Appendix C

Study demands, Inventory of College Students' Recent Life Experiences (ICSRLE)

Following is a list of experiences which many students have some time or other. Please indicate for each experience how much it has been a part of your life *over the past month*.

Intensity of experience over the past month, 0 = *not at all part of my life*, 1 = *only slightly part of my life*, 2 = *distinctly part of my life*, 3 = *very much part of my life*

I. Developmental Challenge

- Struggling to meet your own academic standards
- Lower grades than you hoped for
- Hard effort to get ahead
- Important decisions about your education
- Dissatisfaction with your ability at written expression
- Important decisions about your future career*
- Struggling to meet the academic standards of others
- Dissatisfaction with your mathematical ability*
- Dissatisfaction with your physical appearance*
- Finding courses too demanding

II. Time Pressure

- Not enough leisure time
- Not enough time to meet your obligations
- A lot of responsibilities
- Too many things to do at once
- Heavy demands from extracurricular activities
- Not enough time for sleep
- Interruptions of your school work

* These items were later discarded from the questionnaire in order to conduct reliable scales

Appendix D

Academic recourses (*performance facilitators*)

Following is an inventory of two sets of social and organizational facilitators. Please indicate for each facilitator if it is either *present* or *not present* (dichotomous scoring system).

I. Organisational facilitators (organisational resources)

- Access to students' grants*
- Access to computer labs (e.g. Internet, e-mail)*
- Information about the study program prior to enrolment
- Information Services for students
- Sunny and properly lighted and ventilated classrooms*
- Practicals with few students
- Transport to/from the university (e.g. frequent buses)
- Timetable flexibility for doing practical classes
- Having autonomy to determine what tasks I will perform everyday*
- Granted cultural activities (e.g. theatre, sports)*
- Administrative services being located in the same building*
- Getting immediate feedback from the task about my performance
- Student association*

Organisational facilitators that were added as a result of the focus group:

- Holidays off that can be spent on leisure time, without scheduled exams or resits*
- Variation in studying (e.g. lectures, workgroups, projects)

II. Social facilitators (social resources)

- Tolerance and group cohesion among fellow students
- Social support from family and friends
- Tutoring time available
- Good social relationships with teachers
- Feedback from teachers or fellow-students*
- Existence of the figure of student delegate
- Good relationships with staff and services employees

* These items were later discarded from the questionnaire in order to conduct reliable scales

Appendix E

Psychological capital (personal resources), CPC-12

Psychological capital is measured with the CPC-12, using a 6-point response format ranging from 0 = *strongly disagree*, 1 = *disagree*, 2 = *slightly disagree*, 3 = *slightly agree*, 4 = *agree* to 5 = *strongly agree*.

Items 1, 2 and 3 refer to *hope*,

items 4, 5 and 6 refer to *optimism*,

items 7, 8 and 9 refer to *resilience*,

items 10, 11 and 12 refer to *self-efficacy*

- If I should find myself in a jam, I could think of many ways to get out of it.
- Right now, I see myself as being pretty successful.
- I can think of many ways to reach my current goals.
- I am looking forward to the life ahead of me.
- The future holds a lot of good in store for me.
- Overall, I expect more good things to happen to me than bad.
- Sometimes, I make myself do things whether I want to or not*
- When I'm in a difficult situation, I can usually find my way out.
- It's okay if there are people who don't like me.
- I am confident that I could deal efficiently with unexpected events.
- I can solve most problems if I invest the necessary effort.
- I can remain calm when facing difficulties because I can rely on my coping abilities.

* These items were later discarded from the questionnaire in order to conduct reliable scales

Appendix F

Factor analysis MBI-SS and BAT-SS (separately) constructs.

Item	Factor Loading	
	1	2
Factor 1: Exhaustion, measured by MBI-SS ($\alpha = .909$)		
1. I feel emotionally drained by my studies	<u>.886</u>	.208
2. I feel used up at the end of a day at university	<u>.847</u>	.149
3. I feel tired when I get up in the morning and I have to face another day at the university	<u>.831</u>	.278
4. Studying or attending a class is really a strain for me	<u>.694</u>	.390
5. I feel burned out from my studies	<u>.806</u>	.365
Factor 2: Disengagement, measured by MBI-SS ($\alpha = .919$)		
6. I have become less interested in my studies since my enrolment at the university	.357	<u>.770</u>
7. I have become less enthusiastic about my studies	.322	<u>.849</u>
8. I have become more cynical about the potential usefulness of my studies	.203	<u>.898</u>
9. I doubt the significance of my studies	.213	<u>.894</u>

Extraction method: Principal Component Analysis

Rotation method: Varimax with Kaiser Normalization

Item	Factor Loading	
	1	2
Factor 1: Exhaustion, measured by BAT-SS ($\alpha = .880$)		
1. When I'm studying, I feel mentally exhausted	<u>.743</u>	.176
2. Everything I do in my studies requires a great deal of effort	<u>.553</u>	.265
3. After a day of studying, I find it hard to recover my energy	<u>.781</u>	.147
4. When I'm studying, I feel physically exhausted	<u>.703</u>	.192
5. When I get up in the morning, I lack the energy to start a new day of studying	<u>.636</u>	<u>.475</u>
6. I want to be active in my studies, but somehow I am unable to manage	<u>.506</u>	<u>.570</u>
7. When I exert myself in my studies, I get tired quicker than normal	<u>.713</u>	.332
8. After a day of studying, I feel mentally exhausted and drained	<u>.738</u>	.265
Factor 2: Disengagement, measured by BAT-SS ($\alpha = .867$)		
9. I struggle to find any enthusiasm for my studies	.297	<u>.815</u>
10. When I'm studying, I do not think much and I function on autopilot	.258	<u>.582</u>
11. I feel a strong aversion towards my studies	.220	<u>.826</u>
12. I feel indifferent about my studies	.207	<u>.843</u>
13. I'm cynical about what my studies mean to others	.204	<u>.757</u>

Extraction method: Principal Component Analysis

Rotation method: Varimax with Kaiser Normalization.

Note: double-loaded items are denoted in bold font

Appendix G

Factor analyses MBI-SS and BAT-SS (simultaneously) constructs

Item	Factor Loading		
	1	2	3
Factor 1: Exhaustion, measured by MBI-SS ($\alpha = .909$)			
1. I feel emotionally drained by my studies	<u>.774</u>	.313	.198
2. I feel used up at the end of a day at the university	<u>.795</u>	.214	.156
3. I feel tired when I get up in the morning and I have to face another day at the university	<u>.733</u>	.385	.242
4. Studying or attending a class is really a strain for me	<u>.686</u>	.229	.356
5. I feel burned out from my studies	<u>.714</u>	.367	.344
Factor 2: Exhaustion, measured by BAT-SS ($\alpha = .880$)			
6. When I'm studying, I feel mentally exhausted	.369	<u>.585</u>	.159
7. Everything I do in my studies requires a great deal of effort	.190	<u>.618</u>	.138
8. After a day of studying, I find it hard to recover my energy	<u>.502</u>	<u>.491</u>	.165
9. When I'm studying, I feel physically exhausted	<u>.502</u>	<u>.417</u>	.195
10. When I get up in the morning, I lack the energy to start a new day of studying	.338	<u>.669</u>	.308
11. I want to be active in my studies, but somehow I am unable to manage	.217	<u>.602</u>	<u>.435</u>
12. When I exert myself in my studies, I get tired quicker than normal	<u>.446</u>	<u>.616</u>	.206
13. After a day of studying, I feel mentally exhausted and drained	.392	<u>.710</u>	.101
Factor 3: Disengagement, measured by MBI-SS and BAT-SS ($\alpha = .922$)			
14. I struggle to find any enthusiasm for my studies	.034	<u>.488</u>	<u>.731</u>
15. When I'm studying, I do not think much, and I function on autopilot	.150	.373	<u>.443</u>
16. I feel a strong aversion towards my studies	.129	.391	<u>.708</u>
17. I feel indifferent about my studies	.145	.329	<u>.761</u>
18. I'm cynical about what my studies mean to others	.048	.329	<u>.728</u>

19. I have become less interested in my studies since my enrolment at university	.361	.122	<u>.756</u>
20. I have become less enthusiastic about my studies	.327	.153	<u>.813</u>
21. I have become more cynical about the potential usefulness of my studies	.331	.005	<u>.821</u>
22. I doubt the significance of my studies	.336	-.018	<u>.831</u>

Extraction method: Principal Component Analysis

Rotation method: Varimax with Kaiser Normalization.

Note: double-loaded items are denoted in bold font

Appendix H

Factor analysis academic demands and academic resources constructs.

Item	Factor Loading	
	1	2
Factor 1: Academic demands ($\alpha = .887$)		
1. Struggling to meet your own academic standards	<u>.695</u>	.076
2. Lower grades than you hoped for	<u>.574</u>	-.066
3. Hard effort to get ahead	<u>.651</u>	.040
4. Important decisions about your education	<u>.527</u>	-.048
5. Dissatisfaction with your ability at written expression	<u>.645</u>	.066
6. Struggling to meet the academic standards of others	<u>.607</u>	.099
7. Finding courses too demanding	<u>.662</u>	.053
8. Not enough leisure time	<u>.599</u>	-.292
9. Not enough time to meet your obligations	<u>.681</u>	-.201
10. A lot of responsibilities	<u>.636</u>	-.220
11. Too many things to do at once	<u>.657</u>	-.237
12. Heavy demands from extracurricular activities	<u>.446</u>	-.276
13. Not enough time for sleep	<u>.484</u>	-.354
14. Interruptions of your school work	<u>.662</u>	-.101
Factor 2: Academic resources ($\alpha = .731$)		
15. Information about the study program prior to enrolment	-.042	<u>.449</u>
16. Information Services for students	.091	<u>.540</u>
17. Practicals with few students	-.121	<u>.472</u>
18. Transport to/from the university (e.g. frequent buses)	.108	<u>.495</u>
19. Timetable flexibility for doing practical classes	.000	<u>.439</u>
20. Getting immediate feedback from the task about my performance	-.034	<u>.434</u>
21. Variation in studying (e.g. lectures, practicals, projects)	-.099	<u>.465</u>
22. Social support from family and friends	-.090	<u>.472</u>

23. Tutoring time available	-0.097	<u>.530</u>
24. Good social relationships with teachers	-0.157	<u>.464</u>
25. Existence of the figure of a student delegate	-0.001	<u>.451</u>
26. Good relationships with staff and services employees	-0.278	<u>.437</u>
27. Tolerance and group cohesion among fellow students	-0.032	<u>.570</u>

Extraction method: Principal Component Analysis

Rotation method: Varimax with Kaiser Normalization.

Note: double-loaded items are denoted in bold font

Appendix I

Factor analysis psychological capital constructs.

Item	Factor Loading	
	1	2
Factor 1: Psychological capital ($\alpha = .889$)		
1. If I should find myself in a jam, I could think of many ways to get out of it	<u>.662</u>	.012
2. Right now, I see myself as being pretty successful	<u>.709</u>	-.337
3. I can think of many ways to reach my current goals	<u>.747</u>	-.110
4. I am looking forward to the life ahead of me	<u>.802</u>	-.280
5. The future holds a lot of good in store for me	<u>.753</u>	-.435
6. Overall, I expect more good things to happen to me than bad	<u>.665</u>	-.447
7. When I'm in a difficult situation, I usually find my way out	<u>.713</u>	.049
8. It's okay if there are people who don't like me	<u>.455</u>	<u>.463</u>
9. I am confident that I could deal efficiently with unexpected events	<u>.733</u>	<u>.466</u>
10. I can solve most problems if I invest the necessary effort	<u>.693</u>	.334
11. I can remain calm when facing difficulties because I can rely on my coping abilities	<u>.690</u>	.498

Extraction method: Principal Component Analysis

Note: double-loaded items are denoted in bold font