The Relationship between Motivation, Perceived Stress and Academic Achievement in Students

Jana Rücker

BSc Psychologie,
Health Psychology

University of Twente

1de Begeleider: Marcel Pieterse
2de Begeleider: Annemarie Braakman

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Summary

Many studies point out that students are often prone to stress, which can have several negative impacts on their health and the way they accomplish tasks. Furthermore, not only perceived stress is an important factor students are faced with during their academic career and which may influence their academic performance. Many studies indicated that the academic motivation is one of the most important factors in order to succeed at the university. The present study is aimed to examine the relationship between motivation, perceived stress and academic performance. Therefore, 146 undergraduate psychology students at the University of Twente took part and filled in an online questionnaire, containing the Academic Motivation Scale, the Perceived Stress Scale and additional questions concerning their academic performance and possible stressors. It was found that both gender and native language affected the level of perceived stress. In addition to that, the feeling of stress was significant correlated with the failing rate of courses. Not being motivated was found to be associated with higher levels of stress and a lower Grade Point Average.

1 Introduction

The perception of high amounts of stress is a serious problem for many students at the university (Nandamuri & Ch, 2011). When students begin with their academic career, they are faced with more autonomy and have to handle new experiences and adapt to a new education system. Furthermore, they are also faced with a different lifestyle and an unfamiliar social environment (Elias, Ping & Abdullah, 2011). Studies show that students more often consulted a therapist compared to people at the same age who are employed (Techniker Krankenkasse, 2012). In addition to that, students are often confronted with burnout (Neumann, Finaly-Neumann & Reichel, 1990) which can be the result of being stressed (Bruce, 2009). Especially the pressure to receive high grades increases in order to start a successful career afterwards, and the first year at the university seems to bring stress and strain in particular (Gall, Evans & Bellerose, 2000).

The Department of Psychology at the University of Twente is highly international oriented and attracts many German students. Because most of them do not speak Dutch in the beginning of their studies, they are faced with additional challenges regarding the new language. Also Dutch students are confronted with a foreign language, because most of the lectures are hold, and most of the literature is written in English. Those circumstances, to handle a language which is not the mother tongue, may create stress for students and may also influence the academic performance.

But stress does not seem to be the only variable which is related to academic performance. Regarding the literature, motivation is also a highly important construct which can affect the performance of individuals (Fortier, Vallerand, Guay, 1995). Nevertheless, there are no studies yet, which focus on the relationship between motivation, perceived stress and performance.

Because those factors are highly important for the student's well-being and their academic success, this study aims to get new insights in the relationship between those constructs and will therefore hold benefits for both science and practice. It is important that Universities get a deeper view on how they can create an academic environment which provides the conditions for successful learning and focus on the students' needs and well-being. Regarding the fact, that especially students are a high risk group concerning the perception of stress, it is important to focus on this topic in science in order to gain further information.

Stressors

Several studies focused on the so called *stressors* which are defined as „such events that bring stress" (Elias, Ping & Abdullah, 2011, p. 646). Some of the reasons why students perceive stress are time pressure and the need to perform well in the exams (Erkutlu & Chafra, 2006). Other reasons why stress can occur are the fear of academic failure (Kolko, 1980), too many assignments or the competitions with other students (Fairbrother & Warn 2003). Mainly the period before the exams is perceived as highly stressful by students (Nandamuri & Ch, 2011).

Besides these stressors, there are also five other variables which this study will focus on. First of all, there are many students who have to work besides their study. The challenge to handle the double load of university and job may cause stress and can also affect the academic performance. In addition to that, it might be a difference if a student shares the household with other people, or has to handle the housework on his own. The third variable given attention to in this study is the native language, due to the fact, that studying in another language holds several challenges as mentioned before. Moreover, there may be a difference between male and female students or between students who are in different academic years at the university. Because those stressors may be important constructs for perceiving stress and performance, they will also be highlighted in this study.

Eustress and Distress

A stressful event can be either perceived as a challenge or as a threat (Lazarus & Folkman, 1984) which means that the perception of stress can occur in two different ways. Hans Selye

(1974) entitled the two kinds of stress *eustress* and *distress*. Due to the perception of an event, stress affects our thoughts, our feelings and our behavior (Nandamuri & Ch, 2011).

On the one hand, there is the positive perceived stress which activates us to act. The pleasing sort of stress is called "*eustress*" and is associated with positive emotions and a healthy behavior. This sort of stress is important for individuals as we often need to perceive stress in order to act and to grow with our tasks (Bruce, 2009). Furthermore, those positive perceived demands can lead to the experience of a "flow", a positive feeling we get when we extremely enjoy to perform a certain kind of activity (Heckhausen & Heckhausen, 2010).

Besides this positive side of being faced with stress, there are also events which we perceive as highly threatening. Negative stress is called "*distress*" and is associated with negative feelings. Distress may also have a negative impact towards our health and our behavior. Managing those stressful events is especially important as it may have a negative impact on the academic performance and the psychological distress of students (Dwyer & Cummings, 2001).

Because stress is perceived subjectively and individually, the response towards stress can be different among individuals and depends on how the person perceives and handle the stress (Morrison & Bennett, 2010). The reason why some stressors are valued as positive and others as negative is primarily depending on the person's individual perception. Thus, the individual evaluation and the amount of stress determines predominantly whether the situation causes physical or psychological symptoms of stress or not (Stevenson & Harper, 2006).

When the individual takes a stressful event as a challenge in life and find ways to handle the situation, the stress will fade away. Otherwise if the individual fails to handle the situation and therefore evaluates it as negative, the event may leave a prolonged emotional disturbance (Elias, Ping & Abdullah, 2011). Furthermore, individuals who do not know how to manage the stress perceive stress as more threatening (Morrison & Bennett, 2010).

Consequences of feeling stressed

Stress can lead to temporary effects as well as consequences which affects the individual on the long term. First of all, a high amount of stress has an impact on the ability to concentrate and to focus the attention on a certain task (Cohens, Evans, Stokols & Krantz, 1986). Temporary, perceiving stress can result in being unable to answer questions in an exam, reading the questions wrong or misinterpret their meaning. Therefore, only low or at least moderate levels of stress will lead to successful learning and the gain of good grades (Ryan & Deci 2000a).

Besides the short-term effects, stress can also have an impact in the long term. Nandamuri & Ch (2011) claim that if stress is perceived as negative and excessive, this can

result in physical and psychological impairment. Psychological impairment means that students may experience a feeling of inability to handle new stressful events in the future (Selye, 1976). This is of course a kind of impairment which may also affect their success at the university because handling new and stressful events are part of a study and students will often be faced with stressful situations within their academic career.

Furthermore the level of stress can become so high that there is a serious risk for illness because the immune system fails to work (Ader, 2001). Another negative outcome and a long-term effect of stress is the occurrence of a burnout syndrome. Especially if an individual is exposed to stress over a long period of time the risk increases to feel exhausted and burned out (Bruce, 2009). Also depression can be the result of being faced with a high amount of stress (Selye, 1976). Due to the fact that stress enhances the blood pressure, stress can also strengthen the risk of heart diseases (Smith, Gallo & Ruiz, 2003).

Motivation

Another important factor which can affect the effectiveness of learning is the motivation which an individual experiences while completing a task. Deci and Ryan (1985) explain three different kinds of motivation. They point out that there are both different amounts and different kinds of motivation which drive our actions.

Intrinsic Motivation

First of all, an individual can be intrinsically motivated. This kind of motivation is described as „doing an activity for its inherent satisfactions rather than for some separable consequences“ (Ryan & Deci, 2000a, p. 56). *Intrinsic motivation* is one of the most important factors when it comes to education. If individuals are motivated by their own, this will lead to high achievement and creativity. In this case, the student wants to learn because of the enjoyment experienced by the activity itself and not because of some external sources (Ryan & Deci, 2000a).

According to this theory intrinsic motivation is subdivided into three different kinds. M*otivation to know* is defined as the desire to perform a certain activity, because of the enjoyment one experiences while learning new tasks (Vallerand et al, 1992). This kind of motivation is the most important one in order to learn successfully and achieve high grades. In addition to that motivation to know is correlated with curiosity, the ability to set goals and intrinsic intellectuality (Gottfried, 1985). Being motivated in this way will yield positive effects on the academic performance.

The second one is the *motivation to accomplish*. This motivation refers the satisfaction an individual receives from creating new things and accomplish them (Vallerand et al, 1992). Third, Motivation *to experience stimulation* relates to the experience of physical

or intellectual stimulation (Ryan & Deci, 2000).

Extrinsic Motivation

The second kind of motivation is called extrinsic motivation. When individuals are externally motivated, they act because of the instrumental value of the activity and not because of the enjoyment resulting of the activity itself. Ryan & Deci (2000a) described three different kinds of extrinsic motivation.

The first one which is highly contrasted with intrinsic motivation is *external motivation*. This type of motivation only occurs when the individual is motivated through rewards or constrains. In*trojected motivation means that* the individual will only act to avoid pressure and fearful situations or because he wants to attain pride and enhancement (Ryan and Deci, 2000a). Another kind of extrinsic motivation, and the most autonomous of these different kinds of motivations, is *identification*. This sort of motivation happens when the individual values the behavior and judges the behavior as personal important (Vallerand et al., 1992).

Amotivation

An individual who is amotivated is neither externally motivated, nor intrinsically motivated. In contrast to the previous described kinds of motivation, amotivation is „the state of lacking an intention to act“ (Ryan & Deci, 2000, p.61). This means that the individual neither wants to act because of the pleasure experienced by the activity itself, nor because of external motivators.

The reasons to feel amotivated are diverse. The individual may not feel competent do act (Deci, 1975) or simply does not value a certain activity (Ryan, 1995). Also the disbelief that the action will yield to a desired outcome (Seligman, 1975) and not perceiving contingencies between the outcome and the own actions can result in amotivation (Valerand et al., 1992).

The Relationship between Motivation and Performance

There are several studies which focus on the relationship between motivation and its effect on performance. In general, those studies show that being motivated to perform well in education will lead to higher performance (Fortier, Vallerand & Guay, 1995). Broadhurst (1957) confirms this results and points out that the presence of intrinsic or extrinsic motivation leads to an increased number of successfully learned tasks and behaviors. But in

addition to that, he claims that the difficulty of the problem that has to be solved has also a high impact on the relationship between motivation and successful learning. Given the case that the problem is relatively simple, hence both extrinsic and intrinsic motivation enhances learning. But in contrast to that, high motivation can be harmful to more difficult problems and can even decrease the effectiveness of learning (Hochauser & Fowler, 1975).

This is an important result, due to the fact that students are more often faced with difficult tasks than with simple tasks in their studies. With a view to the literature intrinsic motivation has the most positive impact towards learning and is therefore the highly relevant for academic performance (Fortier et al., 1995; Boggiano, Shields, Barret, Kellam, Thompson, Simons, & Katz, 1992).

The Relationship between Motivation and Stress

Several studies show that motivation not only influences the effectiveness of learning, but that being intrinsically motivated is also associated with better well-being and an increased amount of satisfaction (Miserandino, 1996; Ryan & Deci, 2000b; Sheldon & Kasser,1998). If extrinsic and intrinsic motivation is thus correlated with positive psychological states, this raises the question if a lack of motivation, will lead to more negative states as being stressed.

The Relationship between Stress and Performance

The "*Yerkes-Dodson law*", describes that even though a moderate level of stress improves the individual's performance, too much stress results in less performance (Stevenson & Harper, 2006). Applied to students, a high amount of stress can have a heavy impact and will influence the student's performance negatively. When students perceive high levels of stress this often leads to the fact that they become overwhelmed with handling different tasks and responsibilities in their study (Vlisides, Eddy & Mozie, 1994). This is why high amounts of stress leads to a detrimental academic performance at the university (Sloboda, 1990). Bennett (2003) reports a similar finding in his study and points out that stress is significantly correlated with poor academic performance. As mentioned before, studies show that especially undergraduate students have to handle the possible negative effects of stress concerning their academic achievements (Elias, Ping & Abdullah, 2011).

The Relationship between Distal Variables and Stress

Besides the variables motivation, stress and performance, there are five other variables which will be highlighted in this study, because they may cause stress for students and therefore may influence their academic performance.

Native Language - First of all, the literature shows that international students often

experience more stress at the university because they have to handle additional difficulties such as learning a foreign language or because they are faced with another culture**.** Moreover, international students reported that another difficulty is to adapt a new educational system in a short period of time (Misra & Castillo, 2004). Because of the fact that the Psychology Department of the University of Twente is highly internationally oriented, this study wants to examine if students have struggles with the language and therefore are prone to stress or poor academic performance.

Gender – Furthermore, there are several studies which found out that women perceive more stress and anxiety than men in the general population (Allen & Hiebert, 1991; Rawson, Bloomer, & Kendall, 1994). Therefore, the amount of stress is estimated to differ between male and female students.

Academic Year - The literature shows that especially during the first year students experiences high levels of stress which was also the reason for a decrease in the overall grades students earned (Yaffe, 2000).

Student Job - Another stressor students have to struggle with is the financial situation. Many students have to work in order to gain financial support for their studies. The financial situation is often perceived as more stressful for international students (Mori, 2000). In the Netherlands, international students can only gain additional money from the state when they work besides their studies. This fact leads to the question if students are disadvantaged because of this commitment.

Housing situation - There is not much research focusing on this topic yet. But the place where a student lives may be also a stressor or may otherwise have a positive impact towards stress. It might be the case, that a student who still lives in the parents‘ household or with friends experiences less stress because the housework is divided up into only small tasks. On the other hand living together with someone else can also lead to other problems which might cause stress. In addition to that, it might be a difference for German students if they are living in the Netherlands or in Germany regarding their language skills and the handling of the foreign culture.

All those factors may contribute to the perceived stress of students and are therefore an important factor in this study.

Model

Regarding the described literature and former research this survey will focus on the following model as shown in figure 1.

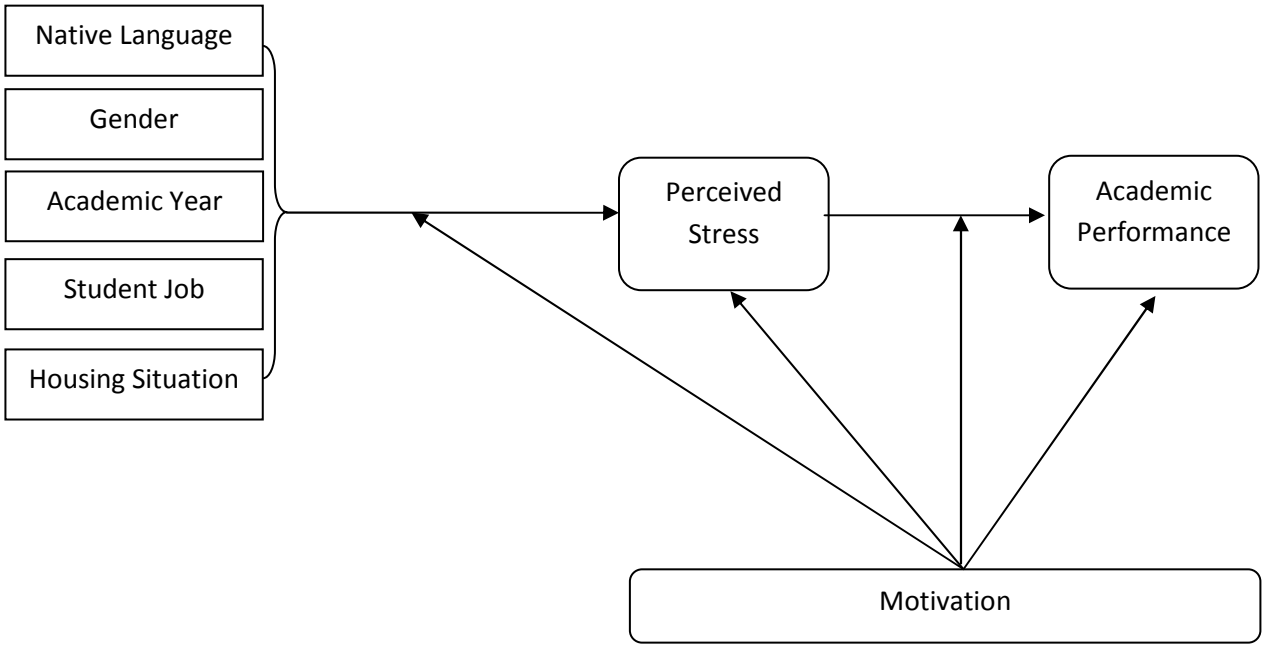

Fig 1: The proposed model between the distal variables, Motivation, Stress and Academic Performance.

Research Questions

The study aims to explore the relationship between the different kinds of motivation, perceived stress and the academic achievement of students. The hypotheses which are tested are the following:

1. What is the relationship between gender and stress?
2. What is the relationship between native language and stress?
3. What is the relationship between the housing situation and stress?
4. What is the relationship between having a job and stress?
5. What is the relationship between the academic year and stress?
6. Is there a relationship between stress and academic performance?
7. Is there a relationship between intrinsic motivation, extrinsic motivation, amotivation and perceived stress?
8. Is there a relationship between intrinsic motivation, extrinsic motivation, amotivation and academic performance?
9. Is motivation a mediator between stress and academic performance?
10. To what extend is GPA explained by the distal variables, amotivation and stress?

11. Are there interaction effects between distal variables, motivation, stress and performance?

2 Measurement:

Participants and Procedure

This study focuses on psychology students at the University of Twente, aged between 18 and 34 (M=21,53; SD=2,26). The respondents were recruited via sonasytems, an experimental subject pool at the University of Twente and with the help of personal promotion via e-mail and facebook. The sample size contains 146 respondents, consisting of 117 female and 29 male students. The online questionnaire was uploaded on the page www.surveymonkey.de. Because we expected that many German students will take part at the survey, the questionnaire was written in English to guarantee a high comprehensibility. Furthermore, we offered the opportunity to gain a half participation point in order to be rewarded for the time they spent with answering the questions. To show a valid image of the population, there were no restrictions for taking part at the study. It was only important that the psychology students had sufficient language skills in English to understand and answer our questions correctly.

Material

The online questionnaire was composed of different scales and subparts. After getting information about the study in general, the aims and the procedure, the survey started with questions concerning the demographic background. The student were asked to answer questions concerning gender, native language, housing situation, the academic year and the job-situation. In addition to that, two open questions were designed to gain specific information about stressors within and besides the university. To measure the motivation and the stress of the students, we included the Academic Motivation Scale (AMS) which was followed by the Percived Stress Scale by Cohen (1983).

At the end of the questionnaire, the respondents were asked if they would like take courses on stress prevention and if they had difficulties with the language comprehension. Finally, they had the opportunity to fill in their student number in order to gain participation credits and they e-mail address to receive the results of our study afterwards.

Measurement of demographic aspects and stressors

First, the students answered questions concerning the gender (male or female), their nationality (Dutch, German, Other) and the year in which the student entered the university. Afterwards, they found two questions which were related to the housing situation, thus in which country the student lives (the Netherlands or Germany) and with whom (alone, with parents, share a flat or other). The next questions were used to rank the students‘ language skills in English and Dutch on a 5-point Likert Scale (0=very bad, 1=bad, 2=average, 3=good, 4=very good). Because Dutch students do not have to rank their mother tongue, the questionnaire was designed in that way, that Dutch students skipped this question and automatically saw the question about their English language skills. To gain information about how many students work besides their studies, they were asked if they have a job, what the motivation is to work(financial reasons, fun, gather experiences or other) and how many hours they work (<10 hours, 10-20 hours, 20-32 hours, or > 32 hours per month, other).

Measurement of Motivation

In order to test motivation of the students, this survey included the Academic Motivation Scale which was introduced by Robert J. Vallerand in 1992 is widely used to measure the academic motivation in various student populations (Hegarty, 2010). The scale consists of 28 items which measures the different types of motivation.

Intrinsic motivation is measured with 12 items, with subscales of intrinsic motivation to know, toward accomplishment and to experience stimulation. Each of the three types of intrinsic motivation was measured with four items.

Furthermore, the scale contains questions concerning the extrinsic motivation. As by the measurement of intrinsic motivation, there are three subscales integrated in the questionnaire which focus on the identified external regulation, the introjected extrinsic motivation and the external motivation, each of them comprise four items.

The third kind of motivation which is measured via four items is amotivation. The respondents answer the questions by scoring on an 7-point likert scale which is ranged from point one which means „does not correspond at all“ to the statement „correspond exactly“ at point seven. The center of the scale is formed by point three which stands for „Corresponds moderately“.

The Academic Motivation Scale is rated as highly reliable in this study α=.88 and would not be higher if certain items would be deleted. More specific, the internal consistency was α=0.85 for intrinsic motivation to know, α=0.82 for Intrinsic motivation toward accomplishment, α=0.82 Intrinsic motivation to experience stimulation, α=0.75 for extrinsic motivation identified, α=0.85 for extrinsic motivation introjected, α=0.83 for extrinsic

motivation external regulation and α=0.83 for amotivation. Those findings are closely aligned with other studies (Fairchild, Horst, Finney, Barron, 2005). In addition to that, previous studies show, that the Academic Motivation Scale has a temporal stability over a one-month period with a test-retest correlation of α =.79 . Furthermore, there is adequate support for both the factorial validity and the discriminant validity (Vallerand et al., 1992).
To get a better comprehension of the items and what they measure, the following statements were examples of the items in the questionnaire:

What where your intentions to study at a university?:

- Because I experience pleasure and satisfaction while learning new things. (*Intrinsic Motivation - to know)*
- For the satisfaction I feel when I am in the process of accomplishing difficult academic activities. (*Intrinsic motivation - toward accomplishment*)
- For the pleasure that I experience when I feel completely absorbed by what certain authors have written. *(Intrinsic motivation - to experience stimulation)*
- Because eventually it will enable me to enter the job market in a field that I like. *(Extrinsic motivation - identified)*
- Because of the fact that when I succeed at the university I feel important. *(Extrinsic motivation - introjected)*
- In order to have a better salary later on. (*Extrinsic motivation - external regulation)*
- Honestly, I don't know; I really feel that I am wasting my time at the university. (Amotivation)

Measurement of Stress

To measure the amount of stress which is perceived by the student, the Perceived Stress Scale by Cohen, S. (1983) is used in this study. The Scale is one of the most used measurements to address the question of how much stress the subject perceives. The questionnaire consists of ten items which asks the participant how often he has had certain feelings and thoughts within the last month (for example „In the last month, how often have you felt that you were unable

to control the important things in your life?“) The students scored their answers on a 7-point Likert Scale which was ranged as follows: 0=Never, 1 = Almost Never, 2 = Sometimes, 3 = Fairly Often, 4 = Very Often. For the evaluation of the questionnaire, 4 items have to be reversed and the total score is calculated by summing up the ten items for each individual. That means, the higher the score, the higher the perceived stress. To evaluate the reliability of the stress scale, a reliability test was used which showed a crombach’s alpha of α=.86, which can be characterized as high.

Measurement of Performance

The academic performance was measured with three different questions α=0.67. First, the students were asked how many European Credit Points they reached until now. Because it might be difficult for some students to remember the accurate number of credit points, they were allowed to look it up via Osiris, a system, where all the points are listed up for the student.

Because failing a course, independent of how much credit points a student could have earned, is always a stressful event, there is an additional question which asks how often the student experienced to fail a course (never, seldom, sometimes, often, very often). The third and last question examines the grade point average (GPA) of the student (<6; 6-; 7; 7-8;8,or >8). With the help of these three factors, it will be possible to examine the academic performance of the student.

Plan of Analyses

The data analysis is determined to examine how the variables are related to each other and to rest the expected model. The results were analyzed with SPSS 18.0 which is a programme for Social Studies as Psychology. All the collected data was first analyzed with regard to the distribution in order to choose the correct statistical methods. The examination showed a normal distribution for all factors in the sample excepting amotivation, which demands non-parametric tests due to the non-normal distribution. In addition to that, outliners were excluded to guarantee a valid sample in this study.

In order to test the first four hypotheses, a t-test was used to examine if there were any significant differences between male students vs. female students, German vs. Dutch, living alone vs. Living with other and having a job vs. No job. Unless the questionnaire also focused on international students in general, the analysis will not pay attention to the three respondents who had another native language than Dutch or German.

The fifth hypothesis is related to differences in stress between the first, the second and the third year. To compare those three academic years with each other, an ANOVA was used. Because the questionnaire only asked about the year in which the student started with the study, it was first necessary to define which student is taking part in which academic year. Therefore, those students who started with their study in 2011 or 2012 were defined as 1st year. Those students who begun in 2010 were defined as 2nd year and those who started in 2009 were in the 3rd and final year. There were also 5 students who started earlier than 2009, but because this sample was too small to create valid results, the results will not give attention to those students.

Hypotheses 6 to 8 were tested with Pearson Correlation. For analyzing the correlation

between amotivation and the other factors, a Spearman Correlation was used because of the non-normal distribution. In hypothesis 6, where the correlation between stress and performance is measured, the European Credit Points had first to be calculated in another way to make them more comparable. Because the study took place at the end of the academic year, it is possible to calculate how many percent of the total possible credit points the student received. The percentage is more meaningful for the evaluation of academic performance.

Furthermore, even though intrinsic and extrinsic motivation consist of three constructs, this study will only focus on intrinsic and extrinsic motivation in total, with the exception motivation to know, which is a form of intrinsic motivation. As mentioned before, motivation to know as part of the intrinsic motivation is the most relevant construct for academic success. This is the reason why this construct will be highlighted in a separated Pearson correlation.

Research question 8 is tested with a regression analysis as explained in Baron and Kenny (1986). Important is that every variable which is tested correlates with the other variables. Otherwise it will not be possible to measure the mediation. At last, a stepwise regression was executed and several ANCOVA-analyses measured if there are any interaction effects between the variables.

3 Results

Research Question 1-5: What is the relationship between gender, native language, the housing situation, job, academic year and the dependent variable stress?

As predicted, females (M=18.2, SD=6.1) showed significant higher t(144)=3.6, p<.01) stress than males (M=13.8, SD=4.9). Also native language seems to be an important factor concerning stress. German students (M=18.2; SD=6.5) perceived significant more t(141)= 2.5, p<0.05 stress compared to Dutch students (M=15.5; SD= 5,0).

The next variable was the housing situation. Living alone (M=17.3; SD=6.9) was not perceived as more stressful than sharing a flat (M=17.3; SD=5.9), t(144)=0.2, p>0.05. Furthermore, the results indicate that it cannot be concluded t(126)=2.55, p=0.545, that having a job(M=17,0; SD=5,9) leads to a higher amount of perceived stress than not having a student job besides the study (M=17,6; SD=6,3). The analysis of the three academic years showed that there was no significant difference between first academic year (M=17,7; SD=6,1), the second year (M=16,4; SD= 6,1) and the last year (M=16,8; SD=6,1), F(2,143)= .571, p=0.56. The social demographics in this sample are reported in Table 1.

Table 1: Social demographics characteristics of the study population

		N	%	IM		EM		AM		Stress		ECTS		GPA		Failing	
				M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Total Score		146	100	18,6	(4,0)	20,4	(4,1)	6,8	(3,8)	17,3	(6,1)	59,5	(20,0)	3,1	(1,1)	2,3	(1,0)
Gender	male	29	20	18,6	(4,0)	20,5	(3,8)	6,8	(4,8)	13,8	(4,9)	61,0	(21,9)	3,1	(1,1)	2,2	(1,0)
	female	117	80	18,7	(4,0)	20,4	(4,2)	6,7	(3,5)	18,2	(6,1)	59,1	(19,6)	3,1	(1,1)	2,3	(1,0)
Year of entry at the university	2009 or before	31	21	18,7	(3,9)	21,1	(3,3)	5,7	(2,3)	16,8	(6,1)	54,7	(17,8)	3,1	(1,2)	2,2	(1,0)
	2010	23	16	18,1	(5,2)	18,6	(5,2)	7,4	(5,1)	16,4	(6,1)	57,8	(24,8)	3,1	(1,0)	2,5	(0,7)
	2011	92	63	18,8	(3,7)	20,7	(3,9)	7,0	(3,8)	17,7	(6,1)	74,0	(16,0)	3,2	(1,0)	2,5	(1,0)
Country of residence	The Netherlands	111	76	18,4	(3,9)	20,5	(4,3)	6,9	(3,8)	17,1	(6,0)	59,0	(20,4)	3,0	(1,0)	2,3	(1,0)
	Germany	35	24	19,4	(4,1)	20,2	(3,3)	6,4	(3,8)	17,9	(6,1)	61,2	(18,8)	3,4	(1,2)	2,3	(0,8)
Housing Situation	Live Alone	24	16	17,6	(4,2)	19,6	(5,7)	6,5	(3,7)	17,3	(6,9)	64,2	(19,9)	2,7	(1,0)	2,4	(0,9)
	Together with others	122	84	18,9	(3,9)	20,6	(3,7)	6,8	(3,8)	17,3	(5,9)	58,5	(20,0)	3,2	(1,1)	2,3	(1,1)
Native Language	Dutch	49	34	18,5	(4,0)	20,2	(4,4)	6,2	(3,1)	15,5	(5,0)	61,8	(20,3)	2,8	(1,0)	2,3	(1,0)
	German	94	64	18,7	(4,0)	20,7	(3,9)	7,0	(4,0)	18,2	(6,5)	58,2	(19,9)	3,3	(1,2)	2,3	(0,8)
Having a student job	Yes	71	49	19,0	(4,3)	20,3	(4,1)	7,0	(3,8)	17,0	(5,9)	61,7	(18,8)	3,0	(1,0)	2,3	(1,0)
	No	75	51	18,4	(3,7)	20,6	(4,1)	6,5	(3,8)	17,6	(6,3)	57,5	(21,0)	3,2	(1,2)	2,3	(1,0)

Note:IM = Intrinsic Motivation; EM = Extrinsic Motivation; AM = Amotivation; ECTS=European Credit Points; GPA=Grade Point Average

Research Question 6: Is there a relationship between stress and academic performance?

The results showed a significant correlation between "failing a course" and perceived stress $r(146)=0.18$, $p<0.05$. Non-significant results were found between the GPA and stress $r(146)=-0.10$, $p=0.23$, or ECTS and stress $r(134)=-0.02$, $p=0.81$. Thus, students who reported to fail more often in exams perceived significant more stress than students who failed less often in exams. The results of the correlation analysis is represented in table 2.

Because German students perceived significant more stress in this study, this analysis was done again for only German respondents. The analysis shows that unless they have to handle a higher amount of stress, the academic performance is not affected by this fact. There was no significant correlation between failing and stress $r(94)=0.19$, the GPA and stress $r(94)=-0.11$, $p=0.30$ or ECTS and stress $r(85)=-0.03$, $p=0.79$ for German students.

Table 2: Pearson Correlations between Stress and Academic Performance

	Failing	GPA	ECTS
Stress	,179*	-,100	-,020
Failing		-,555**	-,323**
GPA			,254**

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Note: GPA= Grade Point Average; ECTS=Credit Points

Research Question 7: Is there a relationship between intrinsic motivation, extrinsic motivation, amotivation and perceived stress?

The results, as shown in table 5 indicate, that intrinsic motivation does not correlate with perceived stress in students, $r(146)=-0.09$, $p=0.28$, the same result was found for extrinsic motivation, $r(146)=0.15$, $p=0.70$. But the results show that there is s a significant correlation between not being motivated and perceived stress $r(146)=0.28$, $p<0.01$. Thus, amotivation seems to be the most important factor with regard of feeling stressed, the higher the amotivation was for students, the higher was the perceived stress.

Table 3: Pearson Correlations between Stress, Intrinsic Motivation and Extrinsic Motivation. Spearman Correlations between Stress and Amotivation

	Intrinsic Motivation	Extrinsic Motivation	Amotivation
Stress	-,087	,150	,281**
Intrinsic		,353**	-,268**
Extrinsic			-,294**

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

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

Research Question 8: Is there a relationship between intrinsic motivation, extrinsic motivation, amotivation and academic performance?

As the analysis show, there is no significant relationship between intrinsic motivation and the GPA r(146)=0.81, p=0.33, the European Credit Points r(134)=-0.07, p=0.43 or failing r(146)=-0.03, p=0 .76. The same results were found for extrinsic motivation which did not correlate with the GPA r(146)=0.04, p=0.64, with the ECTS r(134)=-0.12, p=0.89 or with the failing rate r(146)=.05, p=.55. Although motivation to know was expected to correlate the highest with performance, the results indicate that this cannot be concluded. The correlation with GPA was not significant r(146)=0.12, p=0.14, just like the correlation with ECTS r(134)=-0.03, p=0.71, or with failing r(146)=0.01, p=1,0. It can thus be concluded, that intrinsic and extrinsic motivation do not correlate with any of the variables which measured performance. But the results of amotivation hold different results. Being amotivated was negatively correlated with GPA, r(146)=-0.22, p>0,001 which means every point in the increasing of amotivation leads to a decrease in the Grade Point Average. There is thus a significant relationship between being amotivated and the academic performance.

Table 4: Pearson Correlations between Intrinsic, Extrinsic Motivation and Performance; Spearman Correlation between Amotivation and Performance

	Intrinsic Motivation	Extrinsic Motivation	Amotivation
GPA	,081	,039	-,221**
ECTS	-.034	,075	-,144
Failing	-.026	,050	,025

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

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

Note: GPA= Grade Point Average; ECTS=Credit Points

Research Question 9: Is motivation a mediator between Stress and Performance?

The data in this study do reveal the necessary requirements for a mediator analysis. It is important that all variables were significantly correlated with each other, which is not the case as Figure 2 shows. Therefore, amotivation cannot be a mediator between stress and performance.

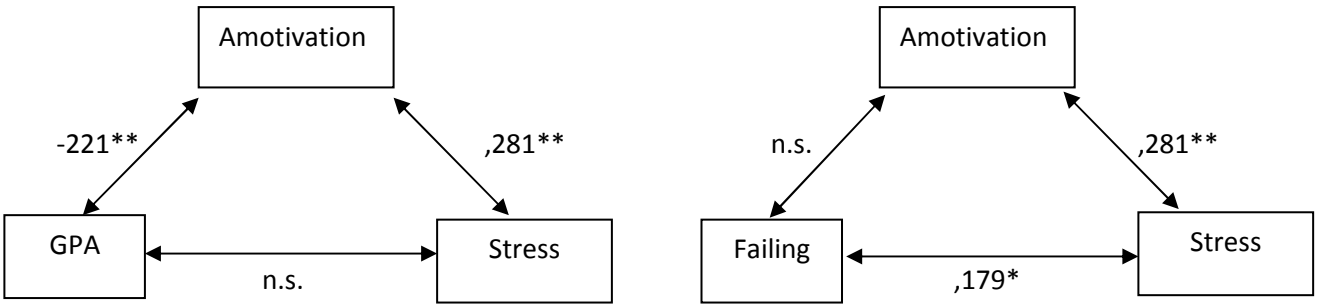

Fig. 2: Correlations between the variables Amotivation, Stress and Performance, N.s = Not significant

Research Question 9: To what extend is GPA explained by the distal variables, amotivation and stress?

A stepwise regression was conducted to analyze the relationship between the variables native language, gender, stress, amotivation and performance. In the first step, the independent variables gender and native language were introduced where only native language was significant concerning the dependent variable GPA β=.20, p<0.05. The native language can explain the variance in GPA for 3,9%, R^2 =.039. In the second step the variable amotivation was included, which had an added value of 6%, R^2= 0.60 which was not significant p>0.05. Also when added the variable stress there was no highly additional value for GPA R^2= 0.08.

Research Question 11: Are there interaction effects between distal variables, motivation, stress and performance?

Several moderation analyses were executed in order to detect possible moderation effects. The results show, that there were not interaction effects between the variables. For example the interaction between the variables academic year and amotivation with stress as dependent variable did not show a significantly interaction F(14, 146)=.91, p=.56. The same results were found for any other variables in this model. It can thus be concluded, that

besides the detected relationships, there were no more significant interactions between the distant variables, stress, motivation and performance.

4 Discussion:

In this study, Dutch and German undergraduate students' motivation was investigated, as well as their stress levels and the individual academic performance. The results in this study are partly aligned with the literature. First of all, as expected, the results revealed that there is a significant difference regarding the nationality of the students in the way that German students perceive more stress that Dutch students. This result is aligned with other studies (Misra & Castillo, 2004). A possible reason for this difference is that international students have to handle more struggles, like the language or the unfamiliar university system and are therefore prone to stress (Misra & Castillo, 2004).

Another variable which emphasizes the literature is the difference of perceived stress levels in male and female students. Female students perceived significant more stress in this study than male fellow students. That gender has an effect on the perception of stress is confirmed by prior research (Allen & Hiebert, 1991; Rawson, Bloomer, & Kendall, 1994). Although having a job was expected to be more stressful (Mori, 2000) for students, the results show a different outcome. Students who have a job did not feel more stress and in addition to that, they had no disadvantages concerning their academic performance. It can thus be the case, that working besides the study is more seen as a positive event, where students get additional money and can communicate with other people outside the university.

Misra et al (2000) concluded that students who just entered university had lower time management and slightly higher anxiety compared to the students who were more experienced with studying. Also Gall, Evans & Bellerose (2000) point out that especially the first year seems to be highly stressful for most students. In contrast to the literature, there was no result showed out that students perceive more stress if they are in the first academic year. This could have different reasons. Maybe it is difficult to determine a specific academic year which is especially prone to stress, because other factors play a more important role like the individual living conditions or private stressors. In addition to that, the stressors can be different in the third academic year. Thoughts about the career after the university may be as stressful as other stressors in the first year. Furthermore, this study took place a few days before the exams. The literature shows that exams are always a stressful event (Nandamuri & Ch, 2011) which might affect the stress levels of all students. The difference between new students and older students might be not significant because of these reasons. Other studies should not use our results to compare the studies with each other, because the results were

only valid for a short period of time.

In addition to that, this study was able to show that there is a significant correlation between amotivation and stress. There is not much literature about the relationship between amotivation and stress but this finding can be important for universities. Of course, there are many different reasons why students may feel amotivated during their studies. Therefore, it might be interesting to focus on this question in further studies. If amotivation is a reason for stress, there may be an opportunity to offer special courses which help students to become motivated again. If a reason to feel amotivated is for example that the student does not know which career to follow after the degree, it might be helpful to offer career services or to think about more guest lectures from people who tell students about their career after the university.

Moreover, a significant positive correlation was found between the failing rate and perceived stress. Although failing is an important factor to determine the academic success, there was no relationship between GPA or ECTS and stress. Because students were allowed to look up their grades and ECTS, these variables might be more objective. The variable failing may also be influenced through the memory of the students. Literature indicated that we remember negative events better that positive (Baumeister, Bratslavsky, Finkenauer, Vohs, 2001). This may lead to the fact that students estimated their failing rates as higher as they actually were. Further research should therefore use more objective variables to analyze the academic performance of students.

We expected that the distal variables lead to stress, stress lead to performance and those variables were influenced by motivation. Of course the variables can also have another direction as assumed. The stepwise regression indicated that the model is not highly useful in order to explain GPA. Further research can thus focus on other combinations of the variables.

There are some limitations concerning the study. First of all, both the Academic Motivation Scale and the Perceived Stress Scale are only valid for a short period of time. That means that this study was only able to measure levels of stress and motivation which are highly situational. It cannot be concluded, that those findings in this study are representative for every point in time. It may be the fact, that there are different results for different moments in time. Therefore, it seems to be interesting if further studies can implement those limitations and carry out this research again to see if they get different results.

Furthermore, stress can occur because of different reasons and therefore depends on many different influences. It is therefore difficult to say if students perceive stress because of the university or other variables which were also highlighted in this study. But because this study only focused on five distal variables, it may be he case that there are other influences

which causes the stress and which are not measured in this study. Therefore, further studies should focus on other variables which may also have an impact towards the perceived stress of students.

A problem which was mentioned before is that this survey was carried out during the exams period which lead to the fact, that some students filled in the questionnaire short before taking part at the exams and other students had just finished their exam period or already received their results. Those factors may have influenced the perceived stress and maybe also their motivation towards the university. In addition to that, a general limitation is the cross-sectional nature of the data. It was expected, that stress has an impact on the academic performance but it can also be the other way around. This is a problem concerning all the variables. In sum, the relation between motivation, stress and performance seems to be very interesting. If we are able to get a deeper insight in the relationship of those variables, we may help students to handle their stress more effectively and achieve better results. Therefore, further research should take the limitations of this study into account and try to get a few steps closer to reaching this goal.

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6 Appendix

Stepwise Regression

Model	R	R^2	Adjusted R^2	R^2 Change	F Change	Sig. F Change
1	,198[a]	,039	,026	,039	2,930	,057
2	,245[b]	,060	,040	,021	3,142	,078
3	,276[c]	,076	,050	,016	2,408	,123

a. Predictors: (Constant), nativelanguage, Gender

b. Predictors: (Constant), nativelanguage, Gender, Amotivation

c. Predictors: (Constant), nativelanguage, Gender, Amotivation, Stress

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7,156	2	3,578	2,930	,057[b]
	Residual	174,624	143	1,221		
	Total	181,781	145			
2	Regression	10,936	3	3,645	3,030	,031[c]
	Residual	170,845	142	1,203		
	Total	181,781	145			
3	Regression	13,804	4	3,451	2,897	,024[d]
	Residual	167,976	141	1,191		
	Total	181,781	145			

a. Dependent Variable: GPA

b. Predictors: (Constant), nativelanguage, Gender

c. Predictors: (Constant), nativelanguage, Gender, Amotivation

d. Predictors: (Constant), nativelanguage, Gender, Amotivation, Stress

Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2,292	,516		4,443	,000
	Gender	,084	,229	,030	,368	,713
	nativelanguage	,419	,174	,197	2,403	,018
2	(Constant)	2,567	,535		4,798	,000
	Gender	,082	,228	,029	,359	,720
	nativelanguage	,430	,173	,203	2,487	,014
	Amotivation	-,043	,024	-,144	-1,772	,078
3	(Constant)	2,669	,536		4,976	,000
	Gender	,193	,238	,069	,812	,418
	nativelanguage	,480	,175	,226	2,741	,007
	Amotivation	-,036	,024	-,120	-1,451	,149
	Stress	-,025	,016	-,136	-1,552	,123

a. Dependent Variable: GPA

Dear fellow students,

we are two psychology students at the University of Twente. As part of our Bachelorthesis, we focus on stress among students. Especially the characteristics of the group which is at high risk and the influence of stress on performance is interesting for us.

We kindly ask you to read the questions carefully and answer them as honest as possible. There are no true or false answers, we just want to know your individual opinion.

Please choose the answer that fits best in your opinion. To fill in our questionnaire will only take 30 minutes.
Your data will be treated and evaluated in confidence and anonymously.

If you want to receive participation credits ("proefpersonenpunten") for filling in this survey, please leave your identity code from Sona Systems behind at the end of the survey.

Thank you for your support!

Christina Wilbert & Jana Rücker

1. How old are you?

Age:

2. What's your gender?

3. In which year did you start to study Psychology in the Netherlands?

I started in

4. In which country do you live at the moment?

- ◯ The Netherlands
- ◯ Germany

5. Describe your current housing

- ☐ I live on my own
- ☐ I live with my parents/family
- ☐ I share a flat
- ☐ Other (please specify)

6. What's your native language?

- ◯ Dutch
- ◯ German
- ◯ Other (please specify)

7. How would you rank your language skills?

	very bad	bad	average	good	very good
My Dutch is...	◯	◯	◯	◯	◯

8. How would you rank your language skills?

	very bad	bad	average	good	very good
My English is...	◯	◯	◯	◯	◯

9. Besides your study, do you have a paid job?

- ◯ Yes
- ◯ No

10. What is your motivation to work? (Multiple answers possible)

- ☐ Financial reasons
- ☐ Fun
- ☐ Gather more experiences for my future career
- ☐ Other (please specify)

11. How many hours did you work the previous month?

- ◯ <10 hours per month
- ◯ 10-20 hours per month
- ◯ 20-32 hours per month
- ◯ >32 hours per month
- ◯ Other (please specify)

12. In order to estimate your performance, it would be great if you tell us how many European Credit Points (ECs) you have reached until now. (You are allowed to look this up via OSIRIS).

EC's

13. How often did you experience failing a course during your current study?

- ◯ Never
- ◯ Seldom
- ◯ Sometimes
- ◯ Often
- ◯ Very often

14. What's your average performance regarding all grades during your study? If you don't know your grades exactly please try to estimate your performance.

- ◯ <6
- ◯ 6-7
- ◯ 7
- ◯ 7-8
- ◯ 8
- ◯ >8

15. If you perceive/perceived stress, what are/were the most important stressors related to your study? (for example too many courses)

16. If you perceive/perceived stress, what are/were the most important stressors next to your study? (for example having a job)

17. The questions in this scale ask you about your feelings and thoughts during the last month. With each item, you are asked to indicate how often you felt or thought a certain way.

In the last month, how often have you:

	Never	Almost Never	Sometimes	Fairly Often	Very Often
been upset because of something that happened unexpectedly?	◯	◯	◯	◯	◯
felt that you were unable to control the important things in your life?	◯	◯	◯	◯	◯
felt nervous and "stressed"?	◯	◯	◯	◯	◯
felt confident about your ability to handle your personal problems?	◯	◯	◯	◯	◯
felt that things were going your way?	◯	◯	◯	◯	◯
found that you could not cope with all the things that you had to do?	◯	◯	◯	◯	◯
been able to control irritations in your life?	◯	◯	◯	◯	◯
felt that you were on top of things?	◯	◯	◯	◯	◯
been angered because of things that were outside of your control?	◯	◯	◯	◯	◯
felt difficulties were piling up so high that you could not overcome them?	◯	◯	◯	◯	◯

18. The questions in this scale also ask you about your feelings and thoughts during the last month. For each item, please choose how often you felt a certain way.

During the last month, how often did you feel ...

	Never	Once or twice	About once a week	About 2 or 3 times a week	Almost every day	Every day
happy	◯	◯	◯	◯	◯	◯
interested in life	◯	◯	◯	◯	◯	◯
satisfied	◯	◯	◯	◯	◯	◯
that you had something important to contribute to society	◯	◯	◯	◯	◯	◯
that you belonged to a community (like a social group, or your neighborhood)	◯	◯	◯	◯	◯	◯
that our society is becoming a better place for people like you	◯	◯	◯	◯	◯	◯
that people are basically good	◯	◯	◯	◯	◯	◯
that the way our society works makes sense to you	◯	◯	◯	◯	◯	◯
that you liked most parts of your personality	◯	◯	◯	◯	◯	◯
good at managing the responsibilities of your daily life	◯	◯	◯	◯	◯	◯
that you had warm and trusting relationships with others	◯	◯	◯	◯	◯	◯
that you had experiences that challenged you to grow and become a better person	◯	◯	◯	◯	◯	◯
confident to think or express your own ideas and opinions	◯	◯	◯	◯	◯	◯
that your life has a sense of direction or meaning to it	◯	◯	◯	◯	◯	◯

19. The questions in this scale also ask you about your feelings and thoughts. In each case, you will be asked to indicate by choosing how much the statement fits your own thoughts.

During the last month: What were your intentions to study at a university?

	Does not correspond at all	-	-	Corresponds moderately	-	-	Corresponds exactly
Because with only a high-school degree I would not find a high-paying job later on.	◯	◯	◯	◯	◯	◯	◯
Because I experience pleasure and satisfaction while learning new things.	◯	◯	◯	◯	◯	◯	◯
Because I think that a college education will help me better prepare for the career I have chosen.	◯	◯	◯	◯	◯	◯	◯
For the intense feelings I experience when I am communicating my own ideas to others.	◯	◯	◯	◯	◯	◯	◯
Honestly, I don't know; I really feel that I am wasting my time at the university.	◯	◯	◯	◯	◯	◯	◯
For the pleasure I experience while surpassing myself in my studies.	◯	◯	◯	◯	◯	◯	◯
To prove to myself that I am capable of completing my college degree.	◯	◯	◯	◯	◯	◯	◯
In order to obtain a more prestigious job later on.	◯	◯	◯	◯	◯	◯	◯
For the pleasure I experience when I discover new things never seen before.	◯	◯	◯	◯	◯	◯	◯
Because eventually it will enable me to enter the job market in a field that I like.	◯	◯	◯	◯	◯	◯	◯
For the pleasure that I experience when I read interesting authors.	◯	◯	◯	◯	◯	◯	◯
I once had good reasons for going to college; however, now I wonder whether I should continue.	◯	◯	◯	◯	◯	◯	◯
For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments.	◯	◯	◯	◯	◯	◯	◯
Because of the fact that when I succeed in college I feel important.	◯	◯	◯	◯	◯	◯	◯
	◯	◯	◯	◯	◯	◯	◯

Because I want to have "the good life" later on.	◯	◯	◯	◯	◯	◯	◯

20. These are the very last questions about your feelings and thoughts during the last month. In each case, you will be asked to indicate by choosing how much the statement fits your own thoughts.

During the last month: What were your intentions to study at a university?

	Do not correspond at all	-	-	Corresponds moderately	-	-	Corresponds exactly
For the pleasure that I experience in broadening my knowledge about subjects which appeal to me.	◯	◯	◯	◯	◯	◯	◯
Because this will help me make a better choice regarding my career orientation.	◯	◯	◯	◯	◯	◯	◯
For the pleasure that I experience when I feel completely absorbed by what certain authors have written.	◯	◯	◯	◯	◯	◯	◯
I can't see why I go to college and frankly, I couldn't care less.	◯	◯	◯	◯	◯	◯	◯
For the satisfaction I feel when I am in the process of accomplishing difficult academic activities.	◯	◯	◯	◯	◯	◯	◯
To show myself that I am an intelligent person.	◯	◯	◯	◯	◯	◯	◯
In order to have a better salary later on.	◯	◯	◯	◯	◯	◯	◯
Because my studies allow me to continue to learn about many things that interest me.	◯	◯	◯	◯	◯	◯	◯
Because I believe that a few additional years of education will improve my competence as a worker.	◯	◯	◯	◯	◯	◯	◯
For the "high" feeling that I experience while reading about various interesting subjects.	◯	◯	◯	◯	◯	◯	◯
I don't know; I can't understand what I am doing at the university.	◯	◯	◯	◯	◯	◯	◯
Because college allows me to experience a personal satisfaction in my quest for excellence in my studies.	◯	◯	◯	◯	◯	◯	◯
Because I want to show myself that I can succeed in	◯	◯	◯	◯	◯	◯	◯

my studies.

21. If there was the possibility to take courses on stress prevention (for example a time management course or relaxation training), would you follow such a course?

- ◯ Yes
- ◯ No
- ◯ Yes, if it is for free
- ◯ Other (please specify)

22. Did you have any difficulties with answering the questions because of language comprehension?

- ◯ Yes
- ◯ No

23. If you want to receive participation credits for this survey, please write down your identity code. Please note: we are only able to give you the credit if you signed up for our study on Sona Systems.

24. If you want to receive the results of our study afterwards, please write down your email address