# A Thesis Presented to The Faculty of Alfred University 

# How sleep, stress and diet affect students' academic motivations 

## By

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#### Abstract

Many students do not eat a healthy diet, do not meet recommended amounts of sleep, and experience high perceived stress. It is possible that students lose their sense of intrinsic (selffulfilling) motivation as their biological needs are ignored for academic work. I tested the hypothesis that students who experience healthier sleep, stress and diet will have higher levels of intrinsic motivation, while students who experience unhealthier sleep, stress, and diet will have higher extrinsic motivation and amotivation. Eighty-one participants were recruited and asked to take the same survey twice in the semester, two weeks apart. The survey measured sleepiness, perceived stress, diet behavior, and academic motivation. A 3 (Motivation) x2 (Time) within subjects ANCOVA was used to analyze the relationship between the covariates (sleep, stress and diet) across the levels of motivation (intrinsic, extrinsic and amotivation) and time (week 9 and week 11 of the semester). The main finding was that there were no significant relationships between sleep, stress or diet across motivation or time. However, diet was marginally significant to motivation type and time together $(p=0.062)$. Diet has a stronger effect than sleep and stress on student motivation over time, but none of these variables can be correlated to the change in motivation over time by themselves. The results found in this study show the importance of having more participants, and should the design be repeated with more participation, significant results may be found between Change in Diet and motivation over time. Extraneous variables caused by the COVID-19 pandemic, such as online schooling, social and athletic restrictions, and an increase in screen time could have influenced the data and participation of this study.


## Honors Thesis Introduction

Alfred University has provided me with the opportunity to study higher levels of psychology for the last four years. As psychology advances as a field through research, so does our collective knowledge of how people learn and behave. Therefore, psychological research has the potential to shape our modern educational systems and behaviors by providing new perspectives, tools, and techniques that are supported by empirical evidence. As someone who has been a student for the majority of their life, and still is, I have a lot of firsthand experience with the complaints and praise that people give academics, as well as their general experiences and attitudes. I have also challenged my own experiences and attitudes as I have passed through the educational process of preschool, elementary school, middle school, high school and now college undergraduate studies. Many times, I have experienced an overwhelming amount of stress, a severe lack of proper sleep, and poor and quickly made diet choices with the intent of having higher grades and better academic performance. It is common knowledge that humans have regular amounts of sleep that they must get every night, diets that they must maintain, and stress thresholds to avoid for long periods of time in order to maintain proper functioning, yet I have noticed myself and many other students often sacrifice these things because they think it will help them with their school work. The intent of my undergraduate research is to find the relationship that students keep between their academic motivations and their biological needs/behaviors.

The inspiration for this study comes from my own personal experiences with academic related stress, sleepiness, and workload. If someone were to ask me why I attend school on a day that I skipped breakfast, did not sleep well, and was highly stressed, my answer would vary from the same question being asked on a day when I ate a healthy breakfast, slept well, and had less
stress. I attend school because my identity is dominantly composed of being a good student, and most of my developed skills are directed towards academics. I would like to believe that I am mostly intrinsically motivated to attend school. I enjoy learning for the sake of gaining new skills, tools and experience, and get a lot of internal pride when I finish a semester or year with high grades and accomplishments. However, as stated above, this often comes with the price of slowly sacrificing more and more of my biological/psychological needs. Myself and other students have been guilty of thinking that by taking only a couple hours of sleep rather than the recommended eight hours, we will have that many more hours to complete our work, take on a sport, or take on more advanced classes. Myself and some other students have been guilty of thinking that a stressed student equals a hard-working/good student. As for diet, I have always kept a good habit of eating well by finding the time to get up for breakfast and pack my own lunch, but many of my friends and peers often skip breakfast, go without lunch, and only break to eat a granola bar or some form of snacking food. Everything mentioned to this point has been from anecdotal evidence from talking to friends, peers, professors, advisors, and parents in casual and academic settings.

I noticed that sacrificing sleep, stress relief, diet and other factors (that were not focused on in my study) created a self-feeding cycle that slowly got worse over the course of a semester or year. If I only got four out of the known CDC recommended eight hours of sleep, then I was tired and unable to complete my work the next day with efficiency. In order to counteract this, I had to work longer on my homework, which left me with less time to sleep the next night and so on. As sleep declined, and a sleep debt was built, I would catch myself slipping by not packing enough for lunch, or not eating enough for breakfast. With less free time, a tired body, and the same amount of academic and athletic work every day, burnout became my reality. Burnout can
be related to anything, but in this case, it refers to a student who feels that they cannot keep up with their responsibilities and has little to no motivation to complete them. I have seen burnout affect students the same, and it felt especially relevant to discuss during the COVID-19 20202021 semesters. The hypothesis that students who experience prolonged high stress, poor sleep, and unhealthy diet would experience more extrinsic and amotivation, while students who experienced healthier stress, sleep, and diet would be more intrinsically motivated came from my experiences with burnout at the end of my high school senior year and the end of the 2020 spring college semester. Both of those times were when my sleep, stress and diet were at their worst, and my body was signaling that it was tired from the minute I woke up. Both of those times also happened to be when I gave the most thought to giving up my university studies for a time. I had considered a gap year between senior year of high school and my first semester of college because I felt that I would not be able to do well if I continued on that path too soon, and I almost took a gap year between my third and fourth years of college studies (spring 2020-fall 2020) from how damaging the COVID-19 pandemic was to my mental health. I wondered if all students would have a similar reaction to psychological burnout and poor biological functioning, and if they would feel less motivated for the joy of learning, and more motivated for outside rewards, or just lose all motivation entirely.

This study really started to come together after running an initial pilot study for Psych Research and Design 411. That study measured students' responses for daytime sleepiness, diet behavior, and perceived stress across their three separate motivation scores at a single time. After that study yielded statistically nonsignificant results and a few meetings with my advisors Dr. Cardinale and Dr. Johnson, we decided that it may be better to test students across time over a semester. Many people would agree that academic workload tends to increase as time passes
through the semester with the first week having little to no work, and the weeks leading up to finals being the most of the semester. To save time and ensure that the process was able to be carried out, I chose to test students just after midterm grades were returned to them, and then two weeks later, which would be closer to finals. Since I was testing the relationship between three separate motivation types and three covariates over two time periods, this study took on the design of a 3(motivation)x2(time) Within Subjects design, which would use an ANCOVA for data analysis. This design was chosen by myself and my committee as the best way to test whether or not a change in sleep, stress and diet scores could be correlated to a change in motivation type.

This kind of research is important to me because I think the world can always improve upon its foundations of education. There is no reason that students should struggle to balance their academics, athletics, and biological needs. We should always be striving to work smarter and not harder, and it should be a university's top priority to engage a student's ability to learn from the holistic view that they need a healthy mind and body to function at their best rather than just putting in more time and effort alone. Although my research has shown nonsignificant results between sleep, stress, diet and motivation over time, I believe with more experimental power, a relationship can be found. If a relationship is found that supports my hypothesis, potential implications could be more funding towards meal plans that provide students with healthy options, and a reworking of graduation and course requirements that allow for more creative freedom and less busy work. An academic institution's main goals should be to educate and grow a competent young adult population, rather than teach them how to work for a number or letter grade at any cost to themselves or their own health.

The main thing I wished I had kept in mind throughout the design process of my thesis was the entire impact that COVID-19 would have on each part of the design process. Data collection started much later than I originally wanted it to due to a delay in the approval for use of human subjects. I had originally planned on having a third data collection time that would begin near the first two-four weeks of the Spring 2021 semester. This data collection time would have been used as a controlled or baseline time since students would be fresh from their previous semester burnout after their winter break, in theory. Unfortunately, doing research in the time of the COVID-19 pandemic has many problems from; delaying projects or review processes to potentially throwing off psychological data.

## How sleep, stress and diet affect students' academic motivations

Students seem to have a hard prioritizing their own personal health over good grades, especially around midterms, finals and days before tests. Despite this common occurrence in university students, it is generally well known that people who have healthier biological and psychological functioning do better in academic areas such as attention span, learning and problem solving. If this change can be felt from a day-to-day level, how could it affect long-term academic performance if these needs are met or ignored over the course of a whole semester or even years of schooling? This study aims to find a relationship between perceived stress, daytime sleepiness and diet behavior as biological influences on students' academic motivations to attend and complete their college courses. The research question being explored is; how does a change in a student's biological functioning due to stress, sleep, and diet affect their perception of their own motivation over time in a single semester? It is important to look at each variable and how they affect someone's behavior and physiological functioning.

Motivation is often separated into 3 categories: Intrinsic, Extrinsic, and Amotivation. Intrinsic motivation is when one gains enjoyment and personal accomplishment from completing a task, or where they believe that the experience is a reward in itself (Vallerand, Pelletier, Blais, Briere, Senecai, Vallieres 1004-1008, 1992). Intrinsic motivation is considered the highest form of motivation, and everyone should strive to find ways to become intrinsically motivated with their schooling. Extrinsic motivation is what someone feels when the task itself is not necessarily enjoyable but there is a reward or payment for completion (Vallerand, Pelletier, Blais, Briere, Senecai, Vallieres 1004-1008, 1992). Extrinsic motivation in academics can come in the form of receiving a good grade on a test, praise from family members for working hard, or being given the promise that jobs will hire you for quality and quantity of work. Although extrinsic
motivation can help one to get their work done, if the reward is not given or if it is removed, then often times students will find the work less enjoyable over time. This can lead to dissatisfaction which will result in burnout and a lower quality of the completed tasks. In the event that a student has no real reason or motivation at all to do the work ahead of them, then that student would be considered amotivated. Amotivated students find little to no satisfaction or enjoyment in their course work and often feel excess stress when deciding on a major, going to class, studying for a test, or advancing themselves professionally (Vallerand, Pelletier, Blais, Briere, Senecai, Vallieres 1004-1008, 1992). It is possible that when basic biological needs are not met, either through availability or behavioral choice, then students could become less motivated to pursue an education for the enjoyment they receive from doing the work.

If students are experiencing lots of sleepiness, a lack of healthy diets and high stress for prolonged periods of time while doing their work, they may lose their intrinsic motivation to complete their education, and will rely more on extrinsic factors to compel themselves to finish, such as the promise of a degree and a higher paying job. The hierarchy of needs and theory of motivation were produced in the early 1940's and concluded that a person must satisfy physiological (biological) needs before they can satisfy their needs for self-actualization, which can take the form of a higher university education (Maslow, 1943). This suggests that students' who struggle to efficiently complete their academic responsibilities over the course of a semester due to the effects of lack of sleep, high stress, and unhealthy diet will begin to lose their intrinsic motivation to complete their course work and advance their higher education. Therefore, assessing the biological effects of sleep, stress and diet individually is necessary to understanding the extent that they can hinder advanced motivation for academics.

Diet is the easiest factor to discuss with relation to its chemical and biological effect on a person's functioning. The contents of a person's diet have chemical interactions with their body that can hinder or help homeostasis (Galland, 2014). This can take the form of breaking down proteins, sugars, fats, and other chemically bonded substances that, when broken down, are used by the body to send chemical-electrical signals through the nervous system, signaling hormones used in vital organs such as the stomach, liver and brain, and for material components used to build and grow the body (Galland, 2014). A healthy diet for a young adult is one that consists of a regular daily consumption of fruits, vegetables, fiber, water, and protein (Vilaro, Colby, Riggsbee, Zhou, Byrd-Bredbenner, Olfert, Barnett, Horacek, Sowers, Mathews, 2018) which all play a role in assisting the proper functioning of the nervous system and brain, which aids attention span, memory, and positive moods (Galland, 2014). Oftentimes students will anecdotally complain about their campus food choices or about the qualilty of the options they have available to them between activities and responsibilities. A busy lifestyle makes it difficult for students to prepare and eat healthy types and amounts of foods on a regular basis. One study conducted found that students were more likely to choose unhealthy dietary options and sugar sweetened beverages in response to a busy lifestyle and better price (Vilaro, et al., 2018). Class and Athletic schedules are often made with the intention to fit wherever they can within the time that a student has available in the day, which has forced myself and many peers to eat quick or no meals around these times, rather than making athletic and class schedules around meal times that would allow consideration for healthy dietary options.

Not only does a busy lifestyle make healthy dieting more difficult, but it may also lead to an inability to escape stressors or properly take the time to relieve them. Students can experience a number of stressors throughout their college semesters that stem from work/school, personal
life, relationships, identity formation, and more. From anecdotal evidence, some students seem to believe that experiencing high amounts of stress is equivalent to being a higher-level learner, but prolonged stress can impair many cognitive functions (Henckens, Wingen, Joels, Fernandez, 2010). Prolonged activation of cortisol hormones in the human body can block receptors involved with working and emotional memory (Henckens, Wingen, Joels, Fernandez, 2010). This group of researchers ran a study to measure cortisol across working memory and higher cognitive function and found that prolonged exposure to cortisol had a negative effect on both outcomes (Henckens, Wingen, Joels, Fernandez, 2010). Students may experience burn-out and poorer/slowed learning from their exposure to chronic stressors, which seems to lead to an increase in risk taking behaviors (Yamakawa, Ohira, Matsumaga, Isowa, 2016). Risk taking behaviors could be procrastination, cheating on exams or homework, staying up later, eating unhealthy foods, smoking etc. which are all harmful to biological functioning (Yamakawa et al., 2016). If learning and schoolwork becomes stressful then student motivation to continue with their field may become less intrinsic and enjoyable for the sake of completion or for the experience. Because the physiological response to stress is involuntary, it is important to understand how it may negatively impair learning and motivation for university students who experience it from many different sources and who may not have the appropriate interventions to prevent or reduce their stress.

It is becoming common knowledge that a majority of people in the US do not meet the recommended amount of daily sleep. This is especially true for university students who receive an average of five to six hours when they should be getting around eight to nine hours of sleep (Center for Diseases Control and Prevention, 2021). Poor sleep can lead to poorer moods and daytime anxiety, as well as predict unhealthy behavior (Wong, Yuet Ying Lau, Ho Yin Wan,

Cheung, Hui, Shui Ying, 2013). Many students experience disruptions to their sleep, or report high levels of sleep disturbances which would impair their ability to rest and repair their brain and body from day to day (Nyer, Farabaugh, Fehling, Soskin, Holt, Papakostas, Pedrelli,Fava, Pisoni, Vitolo, Mishoulon, 2013). Not getting enough sleep can diminish neural plasticity and memory functions which are crucial for academic achievement and learning, while also leading to an increase in depressive symptoms and tendencies (Nyer, et al., 2013). Interventions focused on teaching students the importance of sleep on bodily repair and learning, as well fostering an environment that caters to healthy sleep, low noise and late-night disruptions could be useful for students who experience lots of daytime sleepiness and poor memory, focus and attention.

The effects of sleep, stress and diet on proper brain functioning are important for understanding the effect they may have on students' motivations if they are not satisfied to a healthy standard. There is sufficient evidence to suggest that ignoring or sacrificing good sleep, diet and stress would result in a decrease in problem solving skills, healthy physiological functioning, attention and positive moods. If these factors can hinder the learning of students and potentially change their performance for worse, it may also have significant effect in increasing their expression of extrinsic motivation and amotivation while decreasing their intrinsic motivation to achieve a higher education. All educational institutions should strive to maximize the intrinsic motivation that students experience while decreasing the amount of amotivation experienced.

## Method

## Design

This study utilized a $3 \times 2$ Within Subjects quasi experimental design. The first within groups variable is motivation (3 levels: Intrinsic Motivation, Extrinsic Motivation, and Amotivation). The second within groups variable is time (2 levels: Week 8 and Week 12 of the semester). The focus of the study was the relationship between motivation and the three covariates (Perceived Stress, Daytime Sleepiness, and Diet Behavior) that may influence students' motivation.

## Participants

I recruited 81 students from a small, private liberal arts university for the first wave of the survey. Forty-Seven participants returned, and one new participant joined to take the survey two weeks later. Thirteen participants' data were not counted from the first survey. One returning participant's data was removed from the second. Fourteen total participants' data were not counted in the final analysis for failing to complete at least $25 \%$ of the survey.

Participants were recruited from liberal arts and sciences courses at the local university. Professors teaching the courses were emailed and asked to recruit students from their classes. I emailed students who provided their academic emails with the information of when the second survey would become active. Academic majors/minors were not considered for the selection process; therefore, any student enrolled in any program (engineering, art, liberal arts and sciences, or business) could have their data counted. Participants' age, gender identity and year in school was collected as demographic data, and did not affect the use of their data. Sixteen participants identified as male, 46 as female, and six identified as other/non-binary. Twenty-four participants were in their first year of college, seven in their second, 14 in their third, 18 in their fourth, and five were in their fifth or higher year of college. The average age of the 78
participants was 21.19 years old, with a standard deviation of 5.978 . Two participants failed to fill out demographic information, but the rest of their survey data was kept for the final analysis.

Since participants were recruited from a local university from many liberal arts and science courses, there were three options for compensation that a participant could select. Participants completing a Psych 101 course could receive required experiential credit for their course for each time they took the survey (two credits for the first or second time, full credit for both). Participants could opt for extra credit in a course whose professor was offering that option for students who completed the surveys. Lastly, students could earn entries into a gift card drawing (10x \$20 Amazon gift cards) for completing one or both of the surveys (one for the first or second time, three for both).

## Materials

Perceived Stress Scale (PSS). Stress was measured using the 10-item Perceived Stress Scale where all responses were added together to give one total stress score ranging from 0 (No stress) to 40 (Extreme Stress). Participants were prompted with a question where they will rate the frequency in which they felt or behaved in accordance to the question/scenario. One example question from the PSS is; 4. In the last month, how often have you felt confident about your ability to handle your personal problems? ( 0 - never, 1 - almost never, 2 - sometimes, 3 - fairly often, 4 - very often) (Cohen, Kamarek and Mermelstein, 1983). See Appendix B for questions 1-10 which pertain to the Perceived Stress Scale.

The reliability of the currently used, multidimensional 10 -item Perceived Stress Scale is supported by the results which indicate that its reverse wording, two-factor structure has significantly stronger loading than the previous unidimensional 10-item PSS (Perera et al., 2017). The PSS-4 Item scale is unreliable in differentiating between general experienced stress and coping with stress measures. The PSS-10 Item scale is more reliable for measuring stress when there is more time to do data analysis, and there is a smaller sample being tested, which was the case for this study (Demkowicz, O., Panayiotou, M., Ashworth, E., Humphrey, N., \& Deighton, J. 2020).

Healthy Diet Questionnaire (self-made). Diet behavior was measured on an 8 -item scale, and all responses were added together to give one total healthy student diet behavior score ranging from 0 (Unhealthy diet behavior) to 32 (Very healthy diet behavior). The total final score for each participant was reversed at both times to ensure that the direction of measurement matched that of the Perceived Stress Scale and the Epworth Sleepiness Scale, making the score range 0 (Very healthy diet behavior) to 32 (Unhealthy diet behavior). Four of the eight responses were reversed to make the responses directionally consistent. Participants were prompted with questions where they reported the frequency that they engage in certain diet behaviors. An example question from the diet questionnaire is; 16. In the last month, how often have you skipped lunch because of class, athletics, or other scheduled events? ( 0 - never, 1 - almost never, 2 - sometime, 3 - fairly often, 4 - very often). See Appendix B for questions 11-18 which pertain to the Healthy Diet Questionnaire.

The Eating Habits Questionnaire, by the Dana Farber Cancer Institute (no publication year or author could be found) influenced the design of this new diet behavior scale. It was important to determine what a standard, healthy diet should look like for college aged men and women. This
questionnaire inspired the questions that prompted students to recall how much of something they ate such as; fruits and vegetables in a given time frame. The study by Vilaro, that analyzed the food choice priorities of college first year students, was insightful to the creation of the Healthy Diet Questionnaire as it found "Busy daily life and preferences (taste, convenience, routine, ability to feel full) predicted lower FV (fruits and vegetables), higher added sugar, and higher SSB consumption." (Viliaro, 2018) which is consistent with the research background that students may sacrifice a healthy diet for their academic work and responsibilities. This led the researcher to create questions that asked how often students skip meals for academic/athletic reasons, and how often they mindfully choose to eat meals with fruits, vegetables and fiber.

Epworth Sleepiness Scale (ESS). Daytime sleepiness was measured on the 8-item Epworth Sleepiness Scale where all responses were added together to give one total daytime sleepiness score ranging from 0 (No daytime sleepiness) to 24 (Extremely fatigued). Participants were asked the likelihood of dozing off in particular scenarios where it would be unfavorable to be tired. One example question from the ESS is; 23. Lying down to rest in the afternoon when circumstances permit ( 0 - No chance of dozing, 1 - slight chance of dozing, 2 - moderate chance of dozing, 3 - high chance of dozing) (John, 1991). See Appendix B for questions 19-26 which pertain to the ESS.

One study showed the effectiveness of the Epworth Sleepiness Scale as a valid scale for differentiating sleepiness between a normal control population, and a population with sleep disorders (Johns, 1991). This study shows discriminate validity which is important in making sure that abnormal sleep disorders are accounted for when using this scale to measure general sleepiness from a local convenience sample.

Academic Motivation Scale (AMS). Motivation was measured using The AMS which asks for participants to report their correspondence with 28 situations that could describe why they may currently be attending college. Responses to certain questions are separated into groups that pertain to one of three types of motivation (Intrinsic, Extrinsic and Amotivation), and the highest average score from the three categories shows how any one participant is dominantly motivated to attend/continue college. Each question is in relation to a prompt at the start of the survey which says "indicate to what extent each of the following items presently corresponds to one of the reasons why you go to college." An example question from the AMS is; 53. Because college allows me to experience personal satisfaction in my quest for excellence in my studies (1-Does not correspond at all, 2 - Mostly does not correspond, 3 - Slightly does not corresponds, 4 Moderately corresponds, 5 - Slightly corresponds, 6 - Mostly corresponds, 7 - Corresponds completely) (Vallerand, Pelletier, Blais, Senecai, Vallieres, 1992). See the Appendix B for questions 27-54 which pertain to the Academic Motivation Scale.

A study tested the construct validity of the 28 -item, 7 -factor AMS with vocational students in Norway (Utvær, 2016). Each of the 28 items in the AMS were tested for reliability using factor loading measures with scores ranging from $0.16-0.88$. Scores greater than or equal to 0.50 were considered to have fair or good reliability which 12 of the 28 items met (Utvær, 2016).

## Procedure

Participants were recruited from undergraduate liberal arts and sciences courses. In the case of this study, participants were recruited by the professors of these courses on behalf of the researcher. There was no experimentally controlled grouping.

The surveys were accessible by Esurveyspro using the research institution's private account. Participants were given the link to both of the surveys at their respected times via email, and they were completed online.

Participants signed the consent form outlining the details of their participation. See Appendix $\mathbf{A}$ for the consent form. Once the consent form was signed, participants answered three demographic questions asking for their age, year in school, and gender identity. Demographic questions were followed by the Perceived Stress Scale, then the healthy diet questionnaire, then the Epworth Sleepiness Scale, and lastly the Academic Motivation Scale.

Participants were given two opportunities to take the survey. The first was one week after midterm exam grades were returned, and the other was two weeks later, about a month before final exams. The survey was open for seven days each time from Thursday to Thursday. The surveys took around 30 minutes for a participant to finish in its entirety.

When participants finished the survey, they were presented with the debriefing form which outlined the use of their data, confidentiality, and compensation. See Appendix $\mathbf{C}$ for the debriefing form.

## Analyses

The data were analyzed with a 3 (Motivation) x2 (Time) Within Subjects ANCOVA with three continuous covariates (Perceived Stress, Daytime Sleepiness, and Diet Behavior). I calculated the change scores for Sleep, Stress and Diet by subtracting the first scores from the second scores, which were used for the main hypothesis test. Sleep, stress and diet scores were also compared across both times to see any change.

Participants who took the surveys had their type of motivation (Intrinsic, Extrinsic, or Amotivated) determined by the responses given to the Academic Motivation Scale which is embedded within the surveys. There will be between subject's analysis for each group to determine any difference in sleep, stress, or diet across types of motivation.

## Results

This study used a 3 (Intrinsic Motivation, Extrinsic Motivation, Amotivation) x 2 (Week 9, and Week 11) Within Subjects ANCOVA with three covariates (change of; daytime sleepiness, diet behavior, perceived stress) to test the hypothesis that students who reported healthier sleep, diet and stress over time would also report more intrinsic motivation and less extrinsic motivation over time. A change in covariate scores from time 1 to time 2 (Time 2 scores - Time 1 scores) were used for the data analysis.

Mauchly's test of sphericity was violated, therefore the Greenhouse Geisser values were used. All standards of statistical significance are in relation to $\mathrm{p}<0.05$.

## Descriptive Analysis

|  | Mean | Standard |  |
| :--- | :--- | ---: | :--- |
|  | Score | Deviation | N |
| Intrinsic Motivation (time 1) | 3.9178 | 1.5439 | 45 |
| Intrinsic Motivation (time 2) | 3.9894 | 1.364 | 45 |
| Extrinsic Motivation (time 1) | 4.9852 | 1.338 | 45 |
| Extrinsic Motivation (time 2) | 4.9796 | 1.3003 | 45 |
| Amotivation (time 1) | 1.7056 | 1.0796 | 45 |


| Amotivation (time 2) | 1.8444 | 1.3445 | 45 |
| :--- | :--- | :--- | :--- |

Table 1. Mean scores, standard deviations, and total number of responses for Intrinsic Motivation, Extrinsic Motivation, and
Amotivation from time one and time two.

Participants did not experience significant change in motivation proportions over the course of time one to time two.

|  | Standard <br> Deviation |  |  |
| :--- | ---: | ---: | ---: |
| Perceived Stress 1 | 20.94 | 6.872 | N |
| Perceived Stress 2 | 20.66 | 7.179 | 68 |
| Change_Stress | 0.1304 | 5.084 | 46 |
| Sleepiness Score 1 | 8.29 | 4.129 | 46 |
| Sleepiness Score 2 | 8.55 | 3.81 | 68 |
| Change_Sleep | 0.0652 | 3.568 | 46 |
| Diet Score 1 | 18.78 | 5.294 | 46 |
| Diet Score 2 | 18.62 | 5.375 | 68 |
| Change_Diet | -0.1304 | 3.145 | 46 |

Table 2. Mean scores, standard deviations, and total number of responses for Perceived Stress Scores at time 1 and time 2, Change in Stress scores, Sleepiness Scores at time 1 and time 2, Change in Sleep scores, Diet scores at time 1 and time 2, and Change in Diet scores.

Participants experienced a nonsignificant increase in unhealthy perceived stress from time one to time two. Participants also experienced a nonsignificant increase in unhealthy diet behavior from time one to time two. Participants experienced a nonsignificant decrease in unhealthy sleepiness from time one to time two.

## Motivation based interactions

| Interactions | df | F | p | $\mathrm{np}^{2}$ | Observed |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |
| Power |  |  |  |  |  |
| Motivation*Change_Stress | 1.617 | 0.771 | 0.441 | 0.018 | 0.163 |
| Motivation*Change_Diet | 1.617 | 2.739 | 0.083 | 0.063 | 0.47 |
| Motivation*Change_Sleep | 1.617 | 2.906 | 0.072 | 0.066 | 0.494 |

Table 3. Motivation based interactions across Change in Stress, Change in Diet, and Change in Sleep scores. Shown; degrees of
freedom (df), F-distribution (F), Significance (Sig), Partial Eta Squared, Observed Power

There was a statistically nonsignificant main effect of students' perception of their stress on their motivation proportional levels. The change in students' perceived stress was valued at .1778 , and students' intrinsic motivation ( $\mathrm{M}=3.954, \mathrm{SE}=.201$ ) was lower than their extrinsic motivation $(\mathrm{M}=4.4982, \mathrm{SE}=.182)$ levels, and higher than amotivation $(\mathrm{M}=1.775, \mathrm{SE}=.167)$. There was a marginally significant main effect of students' diet quality on their proportions of motivation type. The change in students' diet quality was valued at .2222 . Finally, there was a marginally significant main effect of students' daytime sleepiness on their levels of motivation, and daytime sleepiness was valued at -.1111 . This suggests that a change in motivation types by proportion were not influenced by changes in students' perceived stress, diet quality, or feelings of sleepiness.

## Time based interactions

| Interactions | df | F | p | $\mathrm{np}^{2}$ | Observed |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |
| Power |  |  |  |  |  |
| Time*Change_Stress | 1 | 3.399 | 0.072 | 0.077 | 0.437 |
| Time*Change_Diet | 1 | 0.896 | 0.349 | 0.021 | 0.152 |
| Time*Change_Sleep | 1 | 2.62 | 0.113 | 0.06 | 0.352 |

Table 4. Time based interactions across Change in Stress, Change in Diet, and Change in Sleep scores. Shown; degrees of freedom (df), F-distribution (F), Significance (Sig), Partial Eta Squared, Observed Power

There was a marginally significant main effect between participants' perception of their stress across time one and time two. Participants' change in stress was valued at .1778 , and participants generally reported healthier change scores at time one $(\mathrm{M}=3.536, \mathrm{SE}=0.111)$ than at time two ( $\mathrm{M}=3.604, \mathrm{SE}=0.102$ ). There was no significant main effect between participants' change in diet behaviors and a change in time. Participants' change in diet behaviors was valued at .2222 . There were statistically nonsignificant main effects between participants' daytime sleepiness and time.

Participants' change in sleepiness was valued at -.1111. This suggests that a change in perceived stress, daytime sleepiness, or diet behavior had no effect on overall motivation from time one to time two.

## Motivation*Time based interactions

| Interactions | df | F | p | $\mathrm{np}^{2}$ | Observed |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |
| Power |  |  |  |  |  |
| Motivation*Time | 1.803 | 0.415 | 0.641 | 0.01 | 0.112 |
| Motivation*Time*Change_Stress | 1.803 | 0.259 | 0.75 | 0.006 | 0.088 |
| Motivation*Time*Change_Diet | 1.803 | 2.529 | 0.092 | 0.058 | 0.466 |
| Motivation*Time*Change_Sleep | 1.803 | 0.568 | 0.552 | 0.014 | 0.136 |

Table 5. Motivation by Time based interactions across Change in Stress, Change in Diet, and Change in Sleep scores. Shown;
degrees of freedom (df), F-distribution (F), Significance (Sig), Partial Eta Squared, Observed Power

There was no significant effect between participants' perceived stress on their motivation type proportions from time one to time two. Participants' perceived stress was valued at .1778 , and extrinsic motivation had the highest proportions at both times, followed by intrinsic motivation, and then amotivation. Extrinsic motivation was slightly higher at time one ( $\mathrm{M}=4.985, \mathrm{SE}=.187$ ) than it was at time two ( $\mathrm{M}=4.980, \mathrm{SE}=.197$ ), intrinsic motivation was slightly higher at time two $(\mathrm{M}=3.989, \mathrm{SE}=.199)$ than it was at time one $(\mathrm{M}=3.918, \mathrm{SE}=.224)$, and amotivation was slightly higher at time two $(\mathrm{M}=1.844, \mathrm{SE}=.202)$ than it was at time one $(\mathrm{M}=1.706, \mathrm{SE}=.153)$. There was a marginally significant effect between participants' diet behavior and motivation proportions from time one to time two. Participants' change in diet behavior was valued at .2222 . There was no significant effect between participants' daytime sleepiness and their motivation proportions from time one to time two. Participants' change in sleepiness was valued at -.1111 . This suggests
that motivation proportions did not change from time one to time two as a result of a change in perceived stress, diet behavior, or sleepiness levels.

## Discussion

The results showed very slight changes in perceived stress, daytime sleepiness, diet behavior, or motivation proportions from time one to time two. There were four marginally significant interactions; between Motivation and Change in Diet, Motivation and Change in Sleep, Time and Change in Stress, and Time, Motivation, and Change in Diet. The remaining interactions were all statistically nonsignificant. This suggests that the findings do not support the hypothesis that students who experience healthier stress, sleepiness and diet behavior from time one to time two will experience an increase in intrinsic motivation and a decrease in extrinsic motivation and amotivation.

The interaction results between motivation types, time, and change in sleep, stress and diet scores contradict the pre-existing literature about the effects of sleepiness, stress, and diet on academic functioning and motivation. It was expected that higher sleepiness, unhealthy diet, and higher stress would all negatively impact academic functioning, while less sleepiness, healthier diet, and lower stress would positively impact academic functioning, which would lead to a change in the proportions of motivation types (Intrinsic, extrinsic, amotivation) being expressed. Prolonged exposure to stress and the hormones produced as a result such as; cortisol and adrenaline, are linked to increased risk-taking behaviors (Yamakawa, et al., 2016) with some common examples for students such as procrastination and cheating on exams/homework. A lack of sleep, or prolonged nights of sleep disturbance have been linked to the formation of depression and anxiety in college students, which is suggested to be a result of compromised brain function and hormone balancing which happens when someone receives healthy amounts
of sleep daily (Nyer, et al., 2013). Nyer, et al. (2019) also conclude that the majority of college students experience poor sleep, and a small proportion experience very unhealthy sleep. The contents of someone's diet affects and changes the chemical balance and functioning of their stomach, nervous system and other vital organs (Galland, 2014). There are findings that suggest that students who have busy daily academic schedules actively choose unhealthier dietary options such as; less fruits and vegetables, less fiber, more saturated fats, and drinks with added sugars (Vilaro, et al., 2018), which when paired with the findings from Galland (2014) suggests that busy college students will experience poorer nervous system and other vital organ functioning. Since motivation type proportions did not significantly increase or decrease over time, it is unclear how the biological factors of change in sleep, diet, and stress actually affected them. It was expected that students would experience a change in their sleep, stress and diet scores over the course of the semester as outside influences such as exams, projects and athletics changed their schedules in a way that would allow for more or less sleep, stress relief, and healthy diet choices. Since the power of the study was low, it is impossible to see conclude potential reasons why these scores would not change over the course of the semester, or how they could have impacted motivation by affecting academic functioning.

There are possible extraneous variables that could have contributed to the marginally significant interactions. Participants' change in sleep and diet scores could have a stronger relationship with a change in their motivation type proportions due to athletic seasons starting or ending. Participants' change in stress scores could have had a stronger general relationship with motivation from time one to time two due to an increase in the amount or difficulty of assigned academic or athletic work. Participants' change in diet score could have a stronger relationship with motivation type proportions from time one to time two due to athletic seasons starting or
ending as well. Fatigue effects due to year in school or pandemic restrictions could affect any of these interactions. It is also important to note that there may have been a mortality (attrition) effect on the participation of this study, which means that participants who may have been experiencing a higher amount of stress, sleep or diet around time two did not take the survey the second time for that exact reason, and therefore, would not have been able to contribute to the within subject's data. Further testing and larger sample sizes are needed before any conclusions can be determined for any of the above marginally significant interactions.

## Limitations and future research

Although the results do not support the hypothesis as it is written, it is still unclear whether a relationship exists between these interactions. The power of the analysis was relatively low which suggests that more participants and more data are required to make any conclusions about the relationships between change in sleep, stress and diet, time, and motivation type proportions.

Since some of the interactions were marginally significant, this suggests that a relationship possibly exists due to extraneous and uncontrolled factors. This study was designed and executed during the time of the ongoing COVID-19 pandemic which has affected the daily lives and processes of many students in the US. Pandemic effects such as; online courses, restriction of activities and socialization, increased screen times, and restrictions to athletics and exercise, were not controlled during the study and could have limited the power of each interaction. Repeating this study design under a normal academic year is necessary to find results that would be generalizable and applicable to a wider population of students.

Modifications to the design of this study should include ways to increase participation, retention of those participants, and more time between survey waves as well as a third, earlier survey dissemination. Increased participation, three survey times about three weeks apart instead of two survey times two weeks apart, and no COVID-19 or other pandemic academic and social restrictions are all things that should be controlled, added or changed to increase power and allow for generalizable and applicable conclusions. Participation can be increased by recruiting from other schools of learning instead of only liberal arts and sciences as well as recruiting from other nearby universities and colleges. Recruiting from a mix of regional, state and private universities and engineering, business, art and liberal arts and sciences programs would allow for increased randomization in a much larger sample size.

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## Appendix A

## Consent Form

Dear Research Participant:

This study is being conducted to measure different aspects of your motivation and health behavior over the course of an academic semester. You will be asked to take the same survey 2 times during the Spring semester. The survey should take approximately 30 minutes to complete each time. If you are in PSYC 101, you will receive course credit for your participation. If you are not in PSYC 101, you will be eligible to enter a drawing for 1 of $10 \$ 20$ Amazon gift cards. If your professor is offering extra credit for completion of the survey, you may choose to have your name used for the gift card drawing OR the extra credit. We ask that you be open and honest in your responses, and answer the survey promptly when you receive the link.

There are no known risks associated with your agreement to participate in this research; you will only be experiencing situations and asked to complete tasks that carry the same level of risk you
can expect in everyday educational activities. If, however, you experience any emotional distress as the result of participating in this study, psychological treatment is available through Alfred University Counseling Services (607) 871-2300, which is part of the free health services in the Crandall Wellness Center. This project has undergone independent review by the University's Human Subjects Research Committee (HSRC).

This study is not intended to benefit any individual participant, but rather to add to knowledge about the responses of people in general. Participation in this study will provide you with an opportunity to learn more about research methods in psychology. If you so desire, you may also contact the researchers at the emails listed below to obtain information about the results of the study.

The records in this study will be kept private and stored in the secured Alfred University cloud storage. The results and data of this study will also be kept private and secured with myself, the researcher, on a locked laptop in a locked room. Names will be recorded for a short time in order to identify persons who are eligible for class participation and extra credit. Names and emails will be removed from any record before data analysis. In any published report of this research, we will not include information that would make it possible to identify a participant.

You will receive 2 research credits in your psychology course to compensate you for the time you spent participating in the study. This form will be located before the questionnaire on esurveyspro. Signing this form and continuing onto the questionnaire implies your consent for your data to be used in analysis. You will receive credit even if you choose to leave certain questions unanswered or if you choose at any time to discontinue participation after signing the consent form. At the conclusion of the study, you still have the option to withdraw your data
without penalty. If you choose not to participate in this study, you may fulfill your course research requirement by participating in other studies or through alternative assignments. Contact your instructor for information about alternatives to participating in research.

The primary researcher for this study is Kyle McGlynn, and you may contact the researcher at ktm1@alfred.edu for answers to questions about the study. Dr. Beth Johnson is the faculty supervisor, who may be contacted via email at JohnsonBC@Alfred.edu or by phone (607) 8712854 if you have questions or concerns about the study. If you have questions about research participants' rights, you may contact the Human Subjects Research Committee chair, Dr. Danielle Gagne, at (607) 871-2873 or hsrc@alfred.edu.

Your signature indicates that you have read the material presented above and agree to participate.

Signature
Date
$\qquad$
$\qquad$

## Appendix B

## Study Questionnaire

Legend: Demographic Questions=3 unnumbered questions (beginning of survey), Perceived Stress Scale=questions 1-10, Diet Questionnaire=questions 11-18, Epworth Sleepiness

Scale=questions 19-26, Academic Motivation Scale=.questions 27-54
(58 Total Questions)

What is your gender identity?

1. Female
2. Male
3. Non-Binary/Other
4. Prefer not to say

How old are you? $\qquad$

What year of college are you currently in? (Your time, in years, spent attending college)

1. First
2. Second
3. Third
4. Fourth
5. Fifth or higher

All questions after this point will be presented as an ordinal scale response. Please answer all questions as accurately as possible with the answers provided.

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. 0 - never
3. 1 - almost never
4. 2 - sometimes
5. 3-fairly often
6. 4 - very often
7. In the last month, how often have you felt that you were unable to control the important things in your life?
8. 0 - never
9. 1 -almost never
10. 2 - sometimes
11. 3-fairly often
12. 4 - very often
13. In the last month, how often have you felt nervous and stressed?
14. 0 - never
15. 1 - almost never
16. 2 - sometimes
17. 3-fairly often
18. 4 - very often
19. In the last month, how often have you felt confident about your ability to handle your personal problems?
20. 0 - never
21. 1 - almost never
22. 2 - sometimes
23. 3-fairly often
24. 4 - very often
25. In the last month, how often have you felt that things were going your way?
26. 0 - never
27. 1 - almost never
28. 2 -sometimes
29. 3-fairly often
30. 4 - very often
31. In the last month, how often have you found that you could not cope with all the things that you had to do?
32. 0 - never
33. 1 -almost never
34. 2 - sometimes
35. 3-fairly often
36. 4 - very often
37. In the last month, how often have you been able to control irritations in your life?
38. 0 - never
39. 1 - almost never
40. 2 - sometimes
41. 3-fairly often
42. 4 - very often
43. In the last month, how often have you felt that you were on top of things?
44. 0 - never
45. 1 - almost never
46. 2 - sometimes
47. 3-fairly often
48. 4 - very often
49. In the last month, how often have you been angered because of things that happened that were outside of your control?
50. 0 - never
51. 1 -almost never
52. 2 - sometimes
53. 3-fairly often
54. 4 - very often
55. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?
56. 0 - never
57. 1 -almost never
58. 2 - sometimes
59. 3-fairly often
60. 4 - very often
61. In the last month, how often have you eaten meals (breakfast, lunch and dinner) at the same times everyday?
62. 0 - never
63. 1 -almost never
64. 2 - sometimes
65. 3-fairly often
66. 4-very often
67. In the last month, how often have you consciously made the decision to eat something with high fiber at least once a day?
68. 0 - never
69. 1 - almost never
70. 2 - sometimes
71. 3-fairly often
72. 4 - very often
73. In the last month, how often have you snacked between meals?
74. 0 - never
75. 1 -almost never
76. 2 -sometimes
77. 3-fairly often
78. 4 - very often
79. In the last month, how often have you eaten within an hour of going to sleep?
80. 0 - never
81. 1 -almost never
82. 2 - sometimes
83. 3-fairly often
84. 4 - very often
85. In the last month, how often have you skipped breakfast because of class, athletics, or other scheduled events?
86. 0 - never
87. 1 -almost never
88. 2 - sometimes
89. 3-fairly often
90. 4 - very often
91. In the last month, how often have you skipped lunch because of class, athletics, or other scheduled events?
92. 0 - never
93. 1 -almost never
94. 2 - sometimes
95. 3-fairly often
96. 4 - very often
97. In the last month, how often have you eaten fruit? (At least one whole fruit in a day)
98. 0 - never
99. 1 - almost never
100. 2 - sometimes
101. 3-fairly often
102. 4-very often
103. In the last month, how often have you drunk enough water? (8 glasses, 1 liter, half your body weight in ounces)
104. 0 - never
105. 1 -almost never
106. 2 - sometimes
107. 3-fairly often
108. 4 - very often

Record the likelihood that you will doze off in each scenario
19. Sitting and Reading

1. 0 - No chance of dozing
2. 1 - slight chance of dozing
3. 2 - moderate chance of dozing
4. 3 - high chance of dozing
5. Watching TV
6. 0 - No chance of dozing
7. 1 - slight chance of dozing
8. 2 - moderate chance of dozing
9. 3 - high chance of dozing
10. Sitting inactive in a public place (e.g., a theater or a meeting)
11. 0 - No chance of dozing
12. 1 - slight chance of dozing
13. 2 - moderate chance of dozing
14. 3 - high chance of dozing
15. As a passenger in a car for an hour without a break
16. 0 - No chance of dozing
17. 1 - slight chance of dozing
18. 2 - moderate chance of dozing
19. 3 - high chance of dozing
20. Lying down to rest in the afternoon when circumstances permit
21. 0 - No chance of dozing
22. 1 - slight chance of dozing
23. 2 - moderate chance of dozing
24. 3 - high chance of dozing
25. Sitting and talking to someone
26. 0 - No chance of dozing
27. 1 - slight chance of dozing
28. 2 - moderate chance of dozing
29. 3 - high chance of dozing
30. Sitting quietly after a lunch without alcohol
31. 0 - No chance of dozing
32. 1 - slight chance of dozing
33. 2 - moderate chance of dozing
34. 3 - high chance of dozing
35. In a car, while stopped for a few minutes in traffic
36. 0 - No chance of dozing
37. 1 - slight chance of dozing
38. 2 - moderate chance of dozing
39. 3 - high chance of dozing

Answer all following statements in relation to the question:
"Why do you go to college?"
27. Because with only a high-school degree I would not find a high-paying job later on.

1. 1 - Does not correspond at all
2. 2-Mostly does not correspond
3. 3 - Slightly does not corresponds
4. 4-Moderately corresponds
5. 5 - Slightly corresponds
6. 6 - Mostly corresponds
7. 7 - Corresponds completely
8. Because I experience pleasure and satisfaction while learning new things.
9. 1 - Does not correspond at all
10. 2-Mostly does not correspond
11. 3 - Slightly does not corresponds
12. 4-Moderately corresponds
13. 5-Slightly corresponds
14. 6 - Mostly corresponds
15. 7 - Corresponds completely
16. Because I think that a college education will help me better prepare for the career I have chosen.
17. 1 - Does not correspond at all
18. 2-Mostly does not correspond
19. 3 - Slightly does not corresponds
20. 4-Moderately corresponds
21. 5 - Slightly corresponds
22. 6 - Mostly corresponds
23. 7 - Corresponds completely
24. For the intense feelings I experience when I am communicating my own ideas to others.
25. 1 - Does not correspond at all
26. 2-Mostly does not correspond
27. 3 - Slightly does not corresponds
28. 4-Moderately corresponds
29. 5 - Slightly corresponds
30. 6 - Mostly corresponds
31. 7 - Corresponds completely
32. Honestly, I don't know; I really feel that I am wasting my time in school.
33. 1 - Does not correspond at all
34. 2-Mostly does not correspond
35. 3 - Slightly does not corresponds
36. 4-Moderately corresponds
37. 5 - Slightly corresponds
38. 6 - Mostly corresponds
39. 7 - Corresponds completely
40. For the pleasure I experience while surpassing myself in my studies.
41. 1 - Does not correspond at all
42. 2-Mostly does not correspond
43. 3 - Slightly does not corresponds
44. 4-Moderately corresponds
45. 5-Slightly corresponds
46. 6 - Mostly corresponds
47. 7 - Corresponds completely
48. To prove to myself that I am capable of completing my college degree.
49. 1 - Does not correspond at all
50. 2-Mostly does not correspond
51. 3 - Slightly does not corresponds
52. 4-Moderately corresponds
53. 5 - Slightly corresponds
54. 6 - Mostly corresponds
55. 7 - Corresponds completely
56. In order to obtain a more prestigious job later on.
57. 1 - Does not correspond at all
58. 2-Mostly does not correspond
59. 3-Slightly does not corresponds
60. 4-Moderately corresponds
61. 5 - Slightly corresponds
62. 6 - Mostly corresponds
63. 7 - Corresponds completely
64. For the pleasure I experience when I discover new things never seen before.
65. 1 - Does not correspond at all
66. 2-Mostly does not correspond
67. 3-Slightly does not corresponds
68. 4-Moderately corresponds
69. 5-Slightly corresponds
70. 6 - Mostly corresponds
71. 7 - Corresponds completely
72. Because eventually it will enable me to enter the job market in a field that I like.
73. 1 - Does not correspond at all
74. 2-Mostly does not correspond
75. 3 - Slightly does not corresponds
76. 4-Moderately corresponds
77. 5-Slightly corresponds
78. 6 - Mostly corresponds
79. 7 - Corresponds completely
80. For the pleasure that I experience when I read interesting authors.
81. 1 - Does not correspond at all
82. 2-Mostly does not correspond
83. 3 - Slightly does not corresponds
84. 4-Moderately corresponds
85. 5 - Slightly corresponds
86. 6 - Mostly corresponds
87. 7 - Corresponds completely
88. I once had good reasons for going to college; however, now I wonder whether I should continue.
89. 1 - Does not correspond at all
90. 2-Mostly does not correspond
91. 3 - Slightly does not corresponds
92. 4-Moderately corresponds
93. 5 - Slightly corresponds
94. 6 - Mostly corresponds
95. 7 - Corresponds completely
96. For the pleasure that I experience while I am surpassing myself in one of my personal accomplishments.
97. 1 - Does not correspond at all
98. 2-Mostly does not correspond
99. 3-Slightly does not corresponds
100. 4-Moderately corresponds
101. 5 - Slightly corresponds
102. 6 - Mostly corresponds
103. 7 - Corresponds completely
104. Because of the fact that when I succeed in college I feel important.
105. 1 - Does not correspond at all
106. 2 - Mostly does not correspond
107. 3 - Slightly does not corresponds
108. 4-Moderately corresponds
109. 5-Slightly corresponds
110. 6 - Mostly corresponds
111. 7 - Corresponds completely
112. Because I want to have "the good life" later on.
113. 1 - Does not correspond at all
114. 2-Mostly does not correspond
115. 3 - Slightly does not corresponds
116. 4-Moderately corresponds
117. 5-Slightly corresponds
118. 6 - Mostly corresponds
119. 7 - Corresponds completely
120. For the pleasure that I experience in broadening my knowledge about subjects which appeal to me.
121. 1 - Does not correspond at all
122. 2-Mostly does not correspond
123. 3 - Slightly does not corresponds
124. 4-Moderately corresponds
125. 5-Slightly corresponds
126. 6 - Mostly corresponds
127. 7 - Corresponds completely
128. Because this will help me make a better choice regarding my career orientation.
129. 1 - Does not correspond at all
130. 2 - Mostly does not correspond
131. 3 - Slightly does not corresponds
132. 4-Moderately corresponds
133. 5 - Slightly corresponds
134. 6 - Mostly corresponds
135. 7 - Corresponds completely
136. For the pleasure that I experience when I feel completely absorbed by what certain authors have written.
137. 1 - Does not correspond at all
138. 2-Mostly does not correspond
139. 3 - Slightly does not corresponds
140. 4-Moderately corresponds
141. 5 - Slightly corresponds
142. 6 - Mostly corresponds
143. 7 - Corresponds completely
144. I can't see why I go to college and frankly, I couldn't care less.
145. 1 - Does not correspond at all
146. 2-Mostly does not correspond
147. 3-Slightly does not corresponds
148. 4-Moderately corresponds
149. 5-Slightly corresponds
150. 6 - Mostly corresponds
151. 7 - Corresponds completely
152. For the satisfaction I feel when I am in the process of accomplishing difficult academic activities.
153. 1 - Does not correspond at all
154. 2-Mostly does not correspond
155. 3 - Slightly does not corresponds
156. 4-Moderately corresponds
157. 5 - Slightly corresponds
158. 6 - Mostly corresponds
159. 7-Corresponds completely
160. To show myself that I am an intelligent person.
161. 1 - Does not correspond at all
162. 2-Mostly does not correspond
163. 3 - Slightly does not corresponds
164. 4-Moderately corresponds
165. 5-Slightly corresponds
166. 6 - Mostly corresponds
167. 7 - Corresponds completely
168. In order to have a better salary later on.
169. 1 - Does not correspond at all
170. 2-Mostly does not correspond
171. 3-Slightly does not corresponds
172. 4-Moderately corresponds
173. 5 - Slightly corresponds
174. 6 - Mostly corresponds
175. 7 - Corresponds completely
176. Because my studies allow me to continue to learn about many things that interest me.
177. 1 - Does not correspond at all
178. 2-Mostly does not correspond
179. 3 - Slightly does not corresponds
180. 4-Moderately corresponds
181. 5-Slightly corresponds
182. 6 - Mostly corresponds
183. 7 - Corresponds completely
184. Because I believe that a few additional years of education will improve my competence as a worker.
185. 1 - Does not correspond at all
186. 2-Mostly does not correspond
187. 3 - Slightly does not corresponds
188. 4-Moderately corresponds
189. 5-Slightly corresponds
190. 6 - Mostly corresponds
191. 7 - Corresponds completely
192. For the "high" feeling that I experience while reading about various interesting subjects.
193. 1 - Does not correspond at all
194. 2-Mostly does not correspond
195. 3 - Slightly does not corresponds
196. 4-Moderately corresponds
197. 5 - Slightly corresponds
198. 6 - Mostly corresponds
199. 7-Corresponds completely
200. I don't know; I can't understand what I am doing in school.
201. 1 - Does not correspond at all
202. 2-Mostly does not correspond
203. 3 - Slightly does not corresponds
204. 4-Moderately corresponds
205. 5 - Slightly corresponds
206. 6 - Mostly corresponds
207. 7 - Corresponds completely
208. Because college allows me to experience personal satisfaction in my quest for excellence in my studies.
209. 1 - Does not correspond at all
210. 2-Mostly does not correspond
211. 3-Slightly does not corresponds
212. 4-Moderately corresponds
213. 5 - Slightly corresponds
214. 6 - Mostly corresponds
215. 7 - Corresponds completely
216. Because I want to show myself that I can succeed in my studies.
217. 1 - Does not correspond at all
218. 2-Mostly does not correspond
219. 3 - Slightly does not corresponds
220. 4-Moderately corresponds
221. 5-Slightly corresponds
222. 6 - Mostly corresponds
223. 7 - Corresponds completely

Which type of compensation would you like to receive for participation?

1. Psych 101 Experiential Credit
2. Course Extra Credit (IF provided by your professor)
3. 1(2) entry(ies) in the $\$ 20$ Amazon gift card drawing

Thank you for completing this! Your participation is greatly valued!

Please enter name and email for course credit and drawing entry

Name $\qquad$

Email $\qquad$

THANK YOU!

## Appendix C

## Debriefing Form

This survey was given to measure amounts of sleepiness, stress, diet, and academic motivation types of undergraduate liberal arts and sciences students. You earned 1-2 entry(entries) for the gift card drawing by completing this survey, and you can earn up to 3 total entries by
completing both of the repeated measures of this survey. If you are taking this survey from the Psych 101 experiential pool, you earned 2 research credits for participating in this study. This survey will be given a total of two times during the Spring Semester. An email will be sent to the winners of the drawing, following the second data collection time, that will detail when and where to claim their prize.

There were no known risks associated with your agreement to participate in this research; you only experienced situations and completed tasks that carry the same level of risk you can expect in daily life. If, however, you experience any emotional distress as the result of participating in this study, psychological treatment is available through Alfred University Counseling Services (607) 871-2300, which is part of the free health services in the Wellness Center.

The primary researcher for this study is Kyle McGlynn, and you may contact the researcher at ktm1@alfred.edu for answers to questions about the study. Dr. Beth Johnson is the faculty supervisor of Kyle McGlynn. You may also contact Dr. Johnson via email at JohnsonBC@Alfred.edu or by phone (607) 871-2854 with questions or concerns about the study. If you have questions about research participants' rights, you may contact the Human Subjects Research Committee chair, Dr. Danielle Gagne, at (607) 871-2873 or hsrc@alfred.edu.

Please do not discuss the details of this study with any of your classmates or friends.

