

**Do Study Habits Acquired at Secondary School Persist? The Effect of Transitioning to
University and Different Assessment Methods.**

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Abstract

As habitual creatures, students are bound to repeat what they repeatedly practiced. However, the transition from secondary school to university may constitute a cue-breaking experience, and thus previously acquired study habits may not persist. Then, if old habits are broken, the opportunity to nudge students towards better and more effective habits may arise. Therefore, this thesis aimed to investigate whether study habits acquired at secondary school persist and whether students change their study habits in response to formative (i.e., courses including mandatory assignments) or summative (i.e., courses including a final exam but no mandatory assignments) assessment. For this purpose, 211 students, majoring in Psychology at the University of Groningen, had been sampled and administered a questionnaire. The results obtained show that most students do abandon their old study habits and improve upon them during the course of their program. Moreover, a significant difference between the two assessment methods was found. The evidence indicates that formative assessment aids students in increasing their study frequency, perceived appropriateness of study habits, and satisfaction with their study habits.

Keywords: study habits, habit formation, transition experience, formative assessment, summative assessment

Do Study Habits Acquired at Secondary School Persist? The Effect of Transitioning to University and Different Assessment Methods.

What is higher education, its purpose, and its value in this day and age? Institutions, educators, and students alike struggle to give a clear-cut answer to this question. And it is quite likely that there is no clear answer to this question since universities have long been a conglomerate of grand ideals, autonomous individual decisions, societal demands, and social realities which have shaped universities into what they are now but left them questioning what they are ought to be. Therefore, there is no agreed-upon definition for a university in the 21st century (Denman, 2005). Nevertheless, no matter the particular purpose or goal attributed to universities, it is undeniable that they, to meet current societal demands, and in a way to justify their position and value, are required to create standards that categorize students by certain criteria such as field of study and grades, which allow academic or professional advancement. In order to succeed and obtain their degrees, or rise within the hierarchy of academia, students are then obliged to adapt themselves and their way of studying (i.e., study habits) to the demands of university. But students are no *tabula rasa* when starting a university degree. Having spent most of their lives in a school environment, they have deeply ingrained concepts of learning and often struggle to study independently and in a self-regulated manner (Hodgson et. al, 2011). The question then arises, are students who had been familiarized with a particular learning environment at school, unwilling to learn new tricks, or are they prone to change? In the following, to investigate this question, it will be studied whether students change their study habits either in response to the transition experience or different assessment methods.

Study Habits

An estimated 45% of people's behavior qualifies as habitual (Neal et al., 2006). If one assumes that a similar percentage holds true for study habits, then understanding the mechanics of study habits is an important direction to explore for universities. However, it may not be distinctly clear what is meant by study habits. Therefore, for explanatory purposes and terminological clarity, it shall be described what constitutes study habits and what differentiates study habits from other common terminology. This is important as terminology to describe student learning is diverse, yet often used interchangeably (Bickerdike et al., 2016). Firstly, the particular contents of study habits do not concern this investigation and therefore, the term study habits should not be confused with learning approaches, which describe how students approach material (Entwistle & Karagiannopoulou, 2013). Secondly, study habits, as the term suggests, rather concern themselves with what a student does habitually, meaning on a regular basis. This includes a students' time management, learning techniques, and study environment among many things (Tus, 2020).

As mentioned earlier, students who have spent most of their lives in school acquired deeply ingrained study habits. This is because habits, which are in essence behavioral tendencies to repeat a certain behavioral response, form through repeated practice (Wood et al., 2002). People, and students alike, tend to fall back on habits, especially under circumstances where they lack resources to make a nonhabitual decision (Neal et al., 2012). In particular, under stress established habits are favored over novel cognitive processes (Wirz et al., 2018). This is crucial, as exam periods are typically stressful for students (Šimić & Manenica, 2012). Therefore, if study habits are inappropriate problems arise, through the influence, they exert on academic performance (Walck-Shannon et al., 2021). Thus, students often need to adapt their study habits according to the demands of the academic environment. If they fail to do so, it may lead to further undesired outcomes such as dropout and underachievement (Lowe & Cook, 2003).

It is unfortunate that a substantive needed change in study habits comes about rather difficult since faulty unwanted habits often impede and lie at the core of failed behavior change (Wood & Rüniger, 2016). If students are hardly able to change their habitual behaviors, then interventions targeting their study habits do not stand much of a chance. However, hope lies within the mechanisms of habit formation. As individuals repeat behaviors in stable contexts, they are likely to form context-behavior associations, so-called cues, which trigger practiced behavior when encountered (Wood et al., 2002; Wood & Neal, 2009). Accordingly, even though study habits formed through years-long practice are likely to be very strong and hard to break, circumstances that grant reduced exposure to these habits triggering cues (Verplanken et al., 2008), may allow students to abandon old habits and form new ones.

Transition to University

The experience of transitioning to university is a crucial one. Many students are not adequately prepared and do not know what to expect from the new learning environment they are about to enter. They often assume teaching would be similar to what they had experienced in school (Lowe & Cook, 2003). But the crucial importance of this experience lies exactly in this lack of familiarity and inexperience that students bring to the new environment. The transition to university as a life transition, offers an opportunity to act on intentions and develop new habits without interference from old habits triggered by old familiar environmental cues (Wood et al., 2005). Habits allow people to benefit from environmental regularities (Wood & Rüniger, 2016). Therefore, as the academic environment is relatively fixed, if students master their habits, they are enabled to thrive academically.

If the transition experience does truly break off old habits and make room for new to come, then it is of importance how to promote the arrival of this better “new”. As habits are deeply intertwined with the environment, it is likely that for change to last, the environment

needs to be adapted in some way. One possible way to adapt the academic environment may be through employing different assessment methods according to the desired outcomes.

Types of Assessment

In general, assessment entails judging the quality of student performance (Weurlander et al., 2012). There exist two main types of assessment, formative and summative assessment (Weurlander et al., 2012). Summative assessment, the most common form of assessment (Gikandi et al., 2011), entails a single final (graded) exam, without any mandatory assignments during the course to improve the students' learning (Weurlander et al., 2012). Formative assessment on the other hand is a type of assessment method in which throughout the duration of the course several mandatory assignments are used to help the student learn the material more thoroughly (Weurlander et al., 2012).

However, this classification is not always so distinct. Often the dichotomy, postulating the traditional view of formative assessment to mainly support learning, becomes blurry when several (graded) summative assessments are assigned regularly (Stiggins & Chappuis, 2006). Also, exams can have formative components as well, if they are later used to inform and adjust studying and teaching (Gikandi et al., 2011). Moreover, formative courses often also have a grade-determining summative assessment at the end. It can be seen that formative and summative assessment, although theoretically distinct, are in practice more often applied in combination. Therefore, for purposes of this study, a course was considered to be summative if only an exam followed at the end of the course without any mandatory assignments and a course was considered formative if it encompassed several mandatory assignments to complete and maybe also an exam at the end.

In addition, it has to be mentioned that no matter what form of assessment is used, even if it suits the goals of higher education, problems in the general execution of assessment remain. Most university professors have not even had any specific training in assessment

(Birenbaum, 2003), but had rather learned it on the job (Garrow & Tawse, 2009). Moreover, when grading, staff may have to consider several stakeholders (Hornby, 2003), which further introduces bias into the issue of unstandardized assessment procedures. But no matter the minutiae of assessment methods, it is of great interest whether or not assessment influences students' study habits.

Research suggests that how students perceive assessment significantly influences their approaches to learning (Entwistle & Karagiannopoulou, 2014). Although learning approaches concern themselves rather qualitatively with the contents of studying, it is very possible that what is practiced in preparation for certain assessments, eventually becomes habitual. In particular with formative assessment, there may be greater potential for certain study habits to become habitual as students seem to study more regularly when confronted with several formative assessments within a course (Weurlander et al., 2012). This is supported by research on habit formation, which suggests that forming a habit requires repetition of a particular behavior in a stable context (Wood et al., 2002). Similarly, if the new learning environment confronts the student with unfamiliar tasks, they may not be able to apply study habits that had been habitualized at school and are thus forced to adapt (Gijbels et al., 2008). If this is the case, then educators may be able to make use of the habit-breaking transition experience, and nudge students towards better study habits by intelligently applying assessment methods.

Aim of the Thesis

At the faculty of Behavioral and Social Sciences at the University of Groningen the COVID-19 pandemic has brought more variety into the types of assessments used. Educators at the University have tried to find ways to continue education in an online or hybrid format, all while attempting to prevent cheating and assuring the quality of the program. This thesis is part of a Bachelor Thesis project which aims at investigating students' experiences of

university assessment. In line with this aim, students majoring in Psychology at the University of Groningen have been chosen as the population of interest and asked to fill out a questionnaire.

As part of this project, this thesis aims at investigating how students change their study habits in response to two important parts of student experience: the transition experience and the assessment environment. In line with the theory outlined in this introduction, we expect that the transition experience to university does indeed function as a habit-breaking experience and that formative assessment, does influence study habits. This should mean that students will display more improvement and less persistence in their study habits since enrolling in the Psychology program. It is also hypothesized that there is a significant difference between formative and summative assessment in relation to study habits.

Hypothesis 1. For general study habits students will display more improvement and less persistence since enrolling in the Psychology program.

Hypothesis 2. For assessment specific study habits there is a significant difference between formative and summative assessment.

Methods

Participants

Participants in this study were all students majoring in Psychology. In total, 211 students completed the questionnaire (162 females, 47 males, 1 other, 1 unknown, age 17-28, $M_{age} = 20.54$, $SD_{age} = 2.2$). Different cohorts of students were included, respectively, 143 students were in their first year, and 68 in higher years of their program. Participants were recruited as a convenience sample. First-year students were recruited through the department's SONA system and rewarded with SONA credits for their participation. The remaining students were recruited from student groups and participated without any reward.

Materials

The study consisted of one questionnaire administered online, using the survey-software Qualtrics. It took about 16 minutes to complete (Mdn = 15.6). The questionnaire was split into three main parts: general questions and questions concerning each of the two different methods of assessment. All items were presented in the form of statements and evaluated by a five-point scale with differing answer options depending on the content of the scale. Apart from the subscale on cheating, the answer options inquired degree of agreement on a five-point scale in regard to the given statement and scenario. All questions had to be answered by the participant in order to finish. In the following paragraphs, background information on the origin, reasoning and aim of each set of questions will be given.

Questions on general study habits were specifically designed for this questionnaire and aimed at investigating students' habits independent of the assessment method. There was no assessment done to check for reliability and validity of the subscale prior to the study. In total 6 statements were given, to which participants were asked to indicate their degree of agreement by choosing from "Strongly agree" to "Strongly disagree". The questions inquired students' different dimensions of their study habits in general, such as whether or not they had improved since enrolling into the program or if they rely on memorization techniques to study. Two questions were reverse coded, as positive answers indicated stagnation in study habits.

The general procrastination questions and the reasons for procrastination questions were both adapted from the Procrastination Assessment Scale - Students (PASS) (Solomon & Rothblum, 1984). The original PASS consists of 44 items and has a 0.80 overall reliability and good concurrent validity. The adapted versions of the PASS used in this study were not assessed in terms of reliability and validity. The general procrastination subscale included three questions inquiring about procrastination behavior on university activities in general. The reasons to procrastinate subscale, included nine questions, inquiring students' reasons for

procrastinating on university activities independent of the assessment method. For both types of assessment methods, an additional three questions were included, to assess procrastination behavior in relation to each assessment method. The questions here were in essence identical to the general procrastination questions.

Questions on self-efficacy took inspiration from the Motivation Strategies for Learning Questionnaire (MSLQ) (Pintrich & De Groot, 1990), but were freely adapted. Reliability and validity of the adapted version was not assessed prior to the study. In total, six questions inquiring students self-reported self-efficacy, in relation to the type of assessment used, were inquired. Response options ranged from “Strongly disagree” on the left to “Strongly agree” on the right. Two of the questions used reverse coding.

Questions on engagement were partly taken and adapted from two separate studies (Krause & Coates, 2008; Schaufeli et al., 2002), and partly completely self-constructed. The validity and reliability of the questions were not assessed for this questionnaire. Overall, six questions were included in this subscale, inquiring about how involved students are with the material, their fellow students, lectures and teaching staff in order to yield a score on their engagement. Two of the statements were reverse coded.

Items assessing student’s satisfaction with the course were identical for both the formative and summative part of the questionnaire. Adapted from the “Students Evaluation of Educational Quality” – Questionnaire (SEEQ), the seven items assess different factors that were found to have a significant impact on student satisfaction. Namely, these include learning/value, enthusiasm, organization, group interaction, individual rapport, breadth of coverage, examinations/grading, assignments, and workload/difficulty (Marsh, 1982).

In order to assess perceived retention of course material a subscale containing four questions was designed. It was identical for both the formative and summative of the questionnaire. Due to the nature of this study, directly assessing memory or retention, was not

a viable option. The items used were based on modes of learning that determine the depth of processing and the degree of integration of knowledge (Simpson et al, 1994). The questions were aimed at inquiring students' retention of the general topic, central concepts and theories, their ability to communicate learned material, and their grades received. No reverse coding was used.

The questions on learning approaches consisted of two parts but were presented as one. This was done in order to simplify the design of the questionnaire. The first part of the questions relating to learning approaches was partly based on the Approaches and Study Skills Inventory for Students (ASSIST), which originally encompassed 52 items, and reported reliability scores ranging from 0.65 to 0.82 depending on the learning approach (Entwistle et al., 1997). In total, this part encompassed five questions, inquiring students about their approaches to learning, that is, how they make sense of their material and what study methods they apply when encountered with either type of assessment. The second part was derived from the beforementioned questions on general study habits and aimed at investigating students' study habits in response to specific assessment demands. It included four additional questions. Questions in this scale were not assessed for reliability or validity.

The well-being subscale was completely self-constructed. In total six questions were included. They inquired about students' perceived stress, workload, and anxiety in relation to course type, as research has found these constructs to be factors influencing or being influenced by assessment types (Struyven et al., 2005)

The subscale on cheating included a single question per assessment method for the participants to answer with yes or no. Students had to indicate whether or not they had cheated before in exams or assignments depending on the type of assessment. Cheating in exams included prohibited behaviors such as the usage of notes, copying answers, having someone else to take one's exam, and collaborating with others during the exam. Cheating in

assignments included behaviors such as receiving help, plagiarism, copying answers from someone who had already done the assignment and letting someone else complete the assignment. In order to ensure anonymity, a coin toss was digitally administered as a randomized response method. This method was first introduced by Warner (1965) and had been shown to provide a framework in which participants are significantly more willing to admit to embarrassing behavior e.g., cheating than in direct surveys (Feth et al., 2017). The ‘no’ answers represented true responses for those who got ‘head’ and the ‘yes’ responses represented partly true responses from a coin flip outcome of ‘head’ and partly from ‘tail’ as those were instructed to indicate ‘yes’ regardless of the truth.

Design and procedure

The present study utilized a descriptive research design. The study was administered fully online. Participants entered the study either through a link sent to them or through the SONA system. On opening the link, participants were presented with a welcome message, including information about the length and purpose of the study (see Appendix A). Then an information form was presented giving details on the procedure, purpose of the study, risks and benefits of participating, an explanation on the voluntary participation and contact information of the researchers (see Appendix B). In case participants had any questions a phone number and e-mail address were provided for them. Participants were then directed to a consent form (see Appendix C). Consent was given by clicking “forward”. Participants unwilling to consent were instructed to close the page. At any point during the questionnaire participants were free to stop participating without having to fear any consequences. The questionnaire started with inquiring demographic information, followed by questions on general study habits questions and questions on procrastination habits in general.

On the next page, information on the two assessment methods, summative and formative, was provided. Participants were asked to reflect on their experience with those

different assessment methods in general. To statistically counter any learning effects, participants either started with the part on formative assessment or with the summative assessment part of the questionnaire. This was randomly determined by Qualtrics. Students were then asked about their assessment specific learning approaches, procrastination, satisfaction, self-efficacy, engagement, mental well-being, and cheating behavior. After finishing the questions on one type of assessment, every participant was asked to now answer almost identical questions on the other type of assessment. At the end of the questionnaire participants were asked whether they had answered all questions truthfully and given the opportunity to add any comments they liked to share. At last, they were thanked for their time and either redirected to SONA or requested to close the page.

Statistical analysis

The study mainly used descriptive statistical methods. For the main hypotheses as well as other important investigations t-tests were used. Students were separated into different cohorts depending on their experience with higher education. In general, this encompassed a separation of students into first-year students, higher year students and students with previous higher education experience. For each of the relevant dimensions, percentages were calculated by pooling responses together. This means that “Strongly disagree” and “Disagree” were pooled together indicating negative responses and “Strongly agree” and “Agree” as positive responses. The response option “Neither agree nor disagree” was not included as part of the analysis. To calculate the Cronbach’s Alpha, scores for reverse coded questions were reversed before calculation. For the other scales included in the questionnaire, the means and standard deviation as well as internal validity were reported.

Results

Overall, 45 students did not finish the questionnaire and were removed from the data set. Three students indicated that they did not answer the questions truthfully and were

therefore removed. It may be possible that those students were referring to the coin flip section, and therefore did indeed answer truthfully, but yet again, this would possibly stand as an identifying factor to whether a student cheated or not, which corroborated the decision to remove their data. Students who had claimed to have answered mostly truthfully were kept in the data, for the same exact reason. Another two students did not completely fill in their demographic information, and have therefore been removed as well, leaving 211 valid responses to the questionnaire in total.

Retention

For the scale a Cronbach's alpha of $\alpha=.689$ was found. The total mean for summative courses was $M = 3.5$ with $SD = 0.6$. For formative courses the total mean was $M = 3.8$ with $SD = 0.483$.

Learning approaches

A value of 1 was indicative for surface learning approaches and a value of 5 for deep learning approaches. For summative assessment we have found a mean of $M = 3.2$ and $SD = 0.4$. For formative assessment a mean of $M = 3.3$ and a $SD = 0.4$ was found. Cronbach's alpha: $\alpha=.536$

Satisfaction

In this subscale, for summative courses the mean was $M = 3.3$ with $SD = 0.5$ and for formative courses the mean was $M = 3.8$ with $SD = 0.5$. Cronbach's alpha for this subscale was $\alpha=.788$.

Wellbeing

For this subscale, a value of 1 indicates lower stress whereas a value of 5 indicates higher stress levels. For summative assessment the mean stress rating was $M = 3.7$ with $SD = 0.6$. For formative assessment the mean was $M = 3.3$ with $SD = 0.5$. Cronbach's alpha for this subscale was $\alpha=.668$.

Self-efficacy

For this subscale a higher score indicates more self-efficacy than a lower score. The mean self-efficacy score was higher for formative assessment ($M = 3.64$; $SD = 0.57$) than for summative assessment ($M = 3.31$; $SD = 0.71$). The Cronbach's Alpha was $\alpha = .681$ for formative and $\alpha = .795$ for summative assessment.

Engagement

In this a higher a score of 5 indicated a high degree of engagement with the course. A low score indicates disinterest or disengagement with the course and its materials. For formative assessment students indicated to be more engaged with the course ($M = 3.16$; $SD = 0.57$) than with summative assessment ($M = 2.96$; $SD = 0.60$). The Cronbach's Alpha was $\alpha = .560$ for summative assessment and $\alpha = .479$ for formative assessment.

Cheating

Participants were inquired about their cheating behavior. For purposes of anonymization, they had to do so by using a coin toss method based on the randomized response method (Warner, 1965), whereby the 'yes' responses included those that were instructed to answer 'yes' regardless of the truth ('tail') but also those were instructed to respond truthfully ('head'). The 'no' responses reflect the score for those that only had 'head' came up and were instructed to answer truthfully. Hence, the 'no' responses displayed the true score for half of the total responses. This was under the assumption that the participants had an equal chance of 50% of getting either 'heads' or 'tails'.

To determine the actual percentage of cheaters, the number of 'no' responses (e.g., 94) were doubled (e.g., 188) and the percentage of the total number of responses (e.g., 211) determined (89.1%). Then, the percentage of 'no' answers (89.1%) was subtracted from 100% to obtain an estimation of actual cheaters (10.9%).

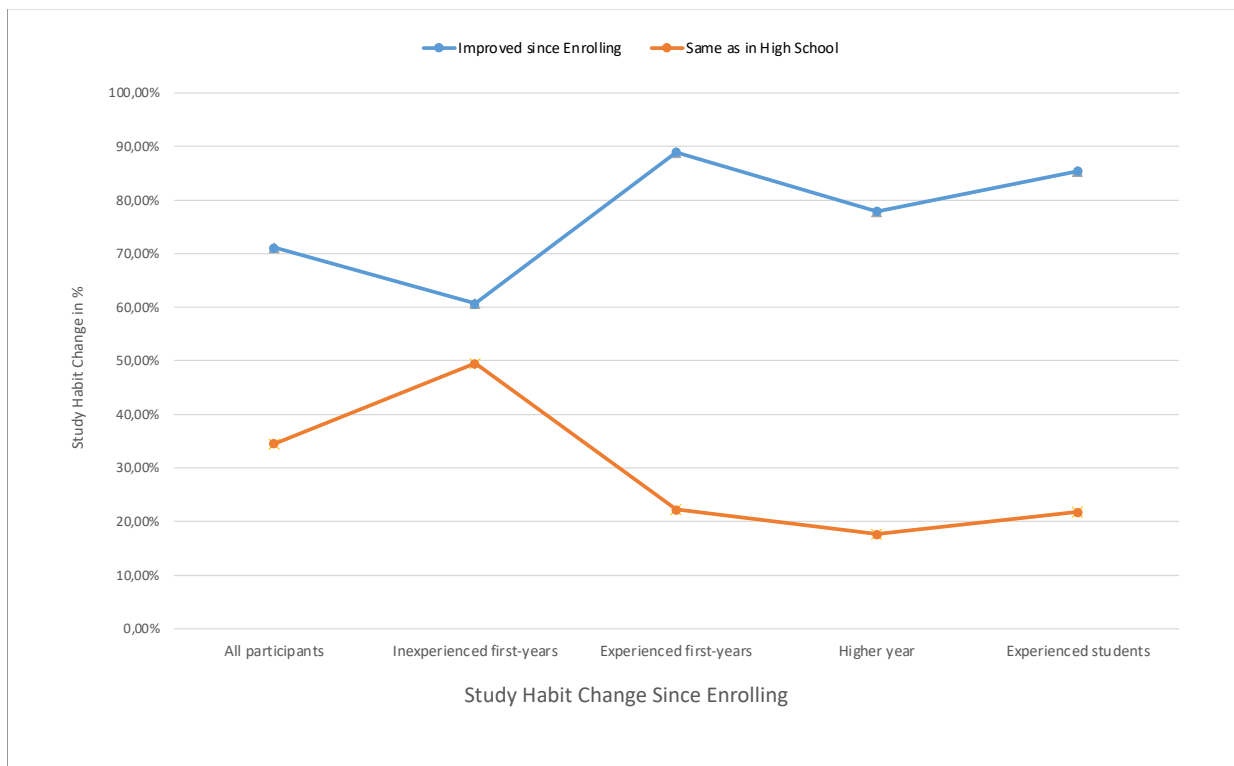
Hence, in summative courses approximately 10.9% of the participants admitted to cheating in some way or form during exams. In contrast, 6.2% indicated to have cheated in some form during assignments in formative courses when applying the same calculation method. However, the online coin toss website did not seem to produce a fair 50% distribution of 'head' or 'tail' when the participants were asked about exams in formative courses. This resulted in fewer participants than expected getting 'tail' and led to a negative percentage of -4% when using the above-mentioned calculation method. This result was treated as 0% in this paper. Hence, about 0% indicated to have cheated in exams in formative courses. Taking a closer look at these results, 6.2% of participants indicated to have cheated in assignments in the formative condition when also exams were administered. In those exams, 0% of students indicated to have cheated in some form. This stands in contrast to the exams without additional assignments, in which about 10.9% of participants indicated to have cheated in some way.

General Study Habits

In the following section the results for the general study habits part of the questionnaire will be presented and analyzed. For this subscale, a value of 1 indicates a higher likeliness of not having improved one's study habits, not having received helpful information, relying on memorization techniques and having persisted in study habits since high school. A value of 5 signifies a higher likelihood of having improved one's study habits, having received helpful information, not relying on memorization techniques and not having persisted in study habits since high school. The mean score was $M = 3.7$ with $SD = 0.4$. The Cronbach's alpha yielded for this subscale was $\alpha = .218$. A Shapiro-Wilk test for this subscale showed a significant violation of normality ($W(210) = .97, p < .001$).

Figure 1

Change in Study Habit by Student Cohort



Note. This figure illustrates the relationship between student cohort and the change of study habits in percentage.

The results displayed in Figure 1, seem to indicate that the more experience a student had with higher education the more likely it was that his study habits improved, since enrolling in the Psychology program. Consequently, the percentage of students applying the same study habits as in high school also decreased. In Table 1, the percentages are displayed in more detail.

Table 1

Study Habit Change Since Enrolling

| Student Group | Improved since Enrolling | Same as in High School |
|---------------------------|--------------------------|------------------------|
| All participants | 71.1 | 34.6 |
| Inexperienced first-years | 60.7 | 49.5 |

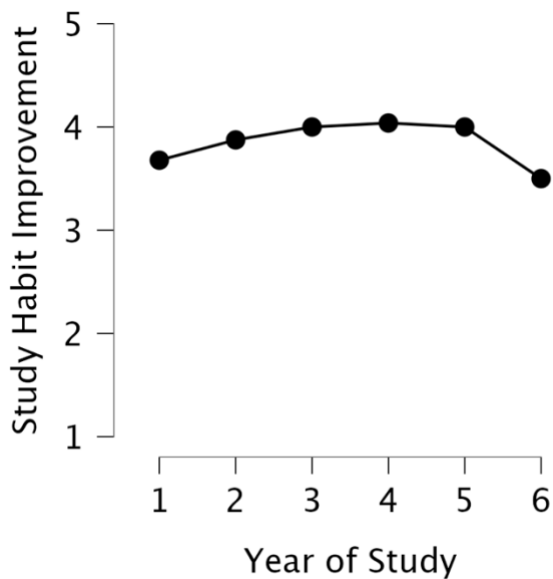
| | | |
|-------------------------|------|------|
| Experienced first-years | 88.9 | 22.2 |
| Higher years | 77.9 | 17.6 |
| Experienced students | 85.4 | 21.8 |

Note. Displayed numbers are percentages. Percentages were rounded to the first decimal.

In Table 1, it can be seen that the most unchanged students were inexperienced first-years, of which 49.5% stated to have persisted in their study habits since high school. Surprisingly, the group whose study habits had improved most dramatically are first-years who had been enrolled in higher education before. Further analysis shows that 86.3% of those students who had persisted in their study habits were first-year students (86.9% when filtering out students who had previously been enrolled in a different program in higher education).

Figure 2

The Relationship between Study Habit Improvement and Year of Study



Note. This figure shows the relationship between improvement of study habits and year of study. It can be seen that with an increase in study year, study habits also slightly improve.

A one-way ANOVA analysis yielded that year of study was not a significant predictor in determining study habit improvement [$F(5, 205) = 1.53, p = .181$].

Table 2

Year Distributions

| Year of Study | 1 st | 2 nd | 3 rd | 4 th or higher |
|---------------|-----------------|-----------------|-----------------|---------------------------|
| First-Program | 68.6 | 3.8 | 12.2 | 15.4 |
| Experienced | 65.4 | 3.6 | 14.5 | 14.5 |

Note. Percentage of students enrolled in the Psychology program ordered by having studied a higher education program before (Experienced) or not (First-Program).

According to our results (see Table 2), the year distributions of students who had been previously enrolled in a higher education program and those who haven't are very similar.

Table 3*Who Helped to Improve Study Habits?*

| Student Group | University | Other Students |
|------------------|------------|----------------|
| All participants | 56 | 48.3 |
| First-years | 62.9 | 42 |
| Higher years | 41.2 | 61.8 |
| Experienced | 63.6 | 50.1 |

Note. Displayed numbers are percentages.

The question arises who aids this change in the students. Based on Table 3, it seems to be the case that as students' progress in the Psychology program they seem to benefit more from study advice provided by their fellow students than by the University. From first-year to higher year students, 19.8% more students indicated to have taken helpful advice taken by, and 21.7% more by the University. With students who had previous experience with higher education it seems to be the case that more of them make use of advice provided by the University (63.6%) and less of them take advice from other students (50.1%) than the non-first year students.

Table 4

Exclusive Use of Memorization Techniques

| Student Group | Yes | No |
|------------------|-----|------|
| All participants | 7.1 | 78.7 |
| First-years | 6.3 | 77.6 |
| Higher years | 8.8 | 80.9 |
| Experienced | 9.1 | 78.2 |

Note. Displayed numbers are percentages.

According to our results (see Table 4), experience with higher education does not seem to make much of a difference when it comes to whether or not students solely rely on memorization techniques (instead of trying to understand the material) to study. This indicates that most students do attempt to understand subject material instead of just relying on rote memorization techniques to pass their exams.

Table 5*Wish To Improve One's Study Habits*

| Student Group | Yes | No |
|------------------|------|------|
| All participants | 66.3 | 15.2 |
| First-years | 65.7 | 17.5 |
| Higher years | 67.6 | 17.6 |
| Experienced | 69.1 | 7.3 |

Note. Displayed numbers are percentages.

Our results (see Table 5) indicate that with more higher education experience, slightly more students seem to wish to improve their study habits.

Assessment-Specific Study Habits

Now that we have analyzed the results of the general study habit scale, the focus will be shifted onto the assessment specific study habits. For this subscale, in both scenarios, for

formative and summative assessment, a score of 1 indicates a lower likelihood to study more regularly, have more desire to study differently, less satisfaction with one's study habits, more tendency to use memorization techniques, and a lower feeling of appropriateness of one's study habits. On the contrary, a score of 5 indicates a higher likelihood to study more regularly, have less desire to study differently, more satisfaction with one's study habits, less tendency to use memorization techniques, and a higher feeling of appropriateness of one's study habits.

For formative assessment the mean was $M = 3.7$ with $SD = 0.7$. The Cronbach's alpha yielded was $\alpha = .609$. For summative assessment the mean of this subscale was $M = 3.5$ with $SD = 0.3$. The Cronbach's alpha was $\alpha = .493$. Between formative assessment and summative assessment a significant difference was found ($t(210) = 4.163, p < .001$). In the following, for each relevant dimension a table will be presented comparing results between summative and formative assessment.

Table 6

Statement: I study regularly

| Assessment Form | Summative | | Formative | |
|------------------|--------------|-----------------|--------------|-----------------|
| | <i>Agree</i> | <i>Disagree</i> | <i>Agree</i> | <i>Disagree</i> |
| All participants | 54 | 23.2 | 67.8 | 18.5 |
| First-years | 54.5 | 21 | 69.2 | 14 |
| Higher years | 53 | 30 | 64.7 | 19.1 |
| Experienced | 67.3 | 12.7 | 78.2 | 14.5 |

Note. Displayed numbers are percentages.

As it can be seen in Table 6, when taking a formative course, all types of students seem to study more frequently.

Table 7

Statement: I wish I could study differently for this type of course

| Assessment Form | Summative | | Formative | |
|------------------|--------------|-----------------|--------------|-----------------|
| | <i>Agree</i> | <i>Disagree</i> | <i>Agree</i> | <i>Disagree</i> |
| All participants | 46.4 | 31.3 | 39.3 | 42.6 |
| First-years | 46.8 | 29 | 39.9 | 42.6 |
| Higher years | 45.6 | 35.3 | 38.2 | 42.6 |
| Experienced | 33.4 | 40 | 34.5 | 27.3 |

Note. Displayed numbers are percentages.

The results in Table 7 seem to indicate that slightly less first-year and higher year students wish to improve their study habits when faced with a course using formative assessment.

Table 8

Statement: I am satisfied with my study habits for this type of course.

| Assessment Form | Summative | | Formative | |
|------------------|--------------|-----------------|--------------|-----------------|
| | <i>Agree</i> | <i>Disagree</i> | <i>Agree</i> | <i>Disagree</i> |
| All participants | 43.6 | 35.1 | 55.9 | 26.1 |
| First-years | 43.3 | 35.3 | 52.4 | 25.9 |
| Higher years | 44.1 | 36.7 | 63.2 | 26.5 |
| Experienced | 51 | 25.4 | 63.6 | 27.3 |

Note. Displayed numbers are percentages.

The results (see Table 8) show quite clearly that formative assessment possibly induces study habits with which students are more satisfied with. This effect is even stronger when students had more experience with higher education, as more students in higher years and with previous higher education experience indicated to be satisfied with their study in a formative setting. Further, the difference in the scores between formative ($M = 3.36$, $SD = 1.0$) and summative assessment ($M = 3.13$, $SD = 1.0$) on this item proved to be significant $t(210) = 3.27$, $p < .001$.

Table 9

Statement: My study habits are appropriate for this type of assessment.

| Assessment Form | Summative | | Formative | |
|------------------|--------------|-----------------|--------------|-----------------|
| | <i>Agree</i> | <i>Disagree</i> | <i>Agree</i> | <i>Disagree</i> |
| All participants | 61.1 | 18 | 68.7 | 12.8 |
| First-years | 59 | 16.1 | 69.2 | 11.2 |
| Higher years | 64.7 | 22 | 67.6 | 16.2 |
| Experienced | 72.7 | 14.5 | 70.9 | 14.5 |

Note. Displayed numbers are percentages.

The results displayed in Table 9, seem to indicate that there is a slight difference how students feel towards their study habits when faced with a formative course. Slightly more students assessed their study habits as appropriate for a formative course.

Table 10

Statement: I concentrate on memorizing a good deal of what I have to learn.

| Assessment Form | Summative | | Formative | |
|------------------|--------------|-----------------|--------------|-----------------|
| | <i>Agree</i> | <i>Disagree</i> | <i>Agree</i> | <i>Disagree</i> |
| All participants | 51 | 28.4 | 38.9 | 42.2 |
| First-years | 49.6 | 26.6 | 43.3 | 36.4 |
| Higher years | 52.9 | 32.3 | 29.4 | 54.4 |
| Experienced | 61.8 | 27.3 | 47.3 | 36.4 |

Note. Displayed numbers are percentages.

Surprisingly, in this part of the questionnaire, more students indicated to use memorization techniques (see Table 10 and 4). A possible reason could have been the different wording used in the sections. In Table 10, it can be seen that the percentage of students who use memorization techniques to study decreases in formative courses.

Discussion

This thesis had two major aims. Firstly, to investigate whether or not study habits acquired at school persist after transferring to university. Secondly, to determine if formative and summative assessment has an effect on study habits. It was broadly hypothesized that the transition to university would function as a study habit-breaking experience. For this purpose,

a questionnaire was administered which asked students majoring in Psychology to reflect and report on the development of their study habits since they enrolled in the program and in relation to formative and summative assessment.

The results we observed suggest that a majority of students do change their study habits after enrolling in higher education (see Table 1). This is good news, insofar, it indicates that students are responsive to change. This stands counter to research conducted by Oreopoulos & Petronijevic (2019) indicating that students are very unresponsive to study treatments and hardly change their study habits. A possible explanation could be that students are more responsive to changes in the environment than to interventions targeted at their study habits. This notion is supported by a study done on heroin addiction of Vietnam veterans. Of those soldiers addicted to heroin in Vietnam, only a tiny fraction remained addicted once they returned to their home country (Robins et al., 2010). In a similar fashion, it is likely, that the environmental change from secondary school to university differed enough in the cues it presents to be able to break students' former study habits. Through long-term repeated exposure, typical features of secondary school as well as of their usual home study environment could have turned into powerful cues to trigger habitual study habit responses. Like a smoker who is triggered to smoke at the entrance of his workplace, because he has smoked there countless of times (Spiegel, 2012). This repeated access of one behavioral option reduces cognitive accessibility of other options over time (Danner et al. 2007). Therefore, once students arrive at university where they are often far away from their familiar home environment as well as school environment, these cues lack, and study habits are free to change as other alternatives become cognitively accessible. Support for this notion further comes from a study conducted on people attempting to change their everyday behavior. In the study around 36% of people who reported a successful change had recently moved while only 13% of those who reported unsuccessful change had done so (Heatherton & Nichols, 1994).

Our results further suggested that the determining factor in the change of study habits or persistence was rather the amount of experience with higher education than one's particular year of study. Experienced first-years were the group who improved their study habits the most after enrolling in the program (88.9%). A possible explanation for this particular finding could be that first-years who had been enrolled in higher education before are more experienced with studying at university but also more aware of the mistakes they committed in their previous programs. Furthermore, it could be hypothesized that they are more secure in their choice of the Psychology program, and therefore more motivated to succeed. These students are naturally also older on average, which may give them an advantage, as older students are typically found to be more diligent in their studies than younger students (Power et al., 1987). In contrast, the most unchanged and unimproved students were inexperienced first years (see Table 1). Around 49.5% of this group used the same study habits as in high school. In comparison, to students who were in higher years (17.6%) and students who had been previously enrolled in higher education (21.8%), this is a huge difference.

This notion is further corroborated by the results of those experienced students, who had been enrolled in higher education, in which 85.4% of them improved their study habits. Here, one may argue that the student distribution of those students who had been enrolled in higher education before is different from those who have not. As Table 2 shows, this is not the case. The distributions were roughly the same. Furthermore, it can be seen that a higher percentage of higher year students indicated to have improved their study habits as first-year students (see Table 1). It has to be mentioned that the relationship between study habit improvement and study year did not yield a significant effect. Nevertheless, it is still worth pursuing this notion, since the number of people in higher years sampled was quite low and therefore power may have been limited. The results, in consideration with this limitation, thus partly indicate that a difference in year distributions between experienced and inexperienced

students or the particular year of enrollment is likely not the reason that more students who had previous experience with higher education improved their study habits since enrolling in the Psychology program. Rather it seems to be the case that experience with higher education fosters change in study habits. Therefore, this partly suggests that while the transition to university may act as a habit-breaking experience, it is the assimilation to the new environment which leads to the formation of new and sometimes better habits. It further suggests that if students had adapted to an academic environment before enrolling in the program, they are then even more able to do so.

Another noteworthy finding is that some first-years gave contradictory answers, as in that their study habits had improved since enrolling, but they still use the same study habits. There are several reasons for this. One reason could be that students still use the same study habits as in high school, but they improved upon those exact habits since enrolling in the program. Another possibility could be that first-year students are more aware of their improvements in study habits but also more aware of how they had studied in high school since a lot of them started studying directly after graduating.

Nevertheless, a minority of all students (34.6%) did persist and did not improve their study habits. Giving the results a closer look, it can be seen that, of those students, nearly all of them were first-year students. These results stand in line with the results of a survey study conducted by Cook & Leckey (1999), indicating that study habits formed in school do persist until the end of the first semester of university. A possible reason for this could be that established study habits need some time to weaken. It also could be that although the carried over study habit did break; students fell back on it as a strategy because they did not yet learn about a better strategy or did not see the need to do so. It is, therefore, unclear at which point study habits break after the transition to university. However, it is quite clear that they eventually do.

Taking the hitherto evidence into account, it can be suggested that, in general, with advancing in the degree program, students do not stick to the old study habits they had acquired at school but change, as well as improve them in response to the academic environment. The first-year students sampled in this study had only experienced one full block of higher education. Therefore, they might not have had yet enough time to adapt themselves and their study habits to their new environment. As beforementioned, it may also be possible that a certain amount of those students already entered university with appropriate study habits, to begin with. Another reason that could explain why barely any students in higher years stuck to their old study habits may be that students who fail to appropriately adapt or are unmotivated to do so receive a negative binding study advice at the end of the first academic year and are therefore removed from the program. Others may have had their spirits dampened by the lack of academic success or were unable to adapt and decided to drop out.

In light of the presented evidence, one may take a theory of planned behavior (TPB) stance (Fishbein & Ajzen, 1975), and argue that the behavior observed within the students was a direct result of their own intention and motivation to engage in new or better study habits. However, the difference between formative and summative assessment was significant. Moreover, the majority of participants (66.3%) stated that they wish to improve their study habits in general (see Table 5). This discontent state in combination with the evidence suggesting that students are more satisfied with their study habits in formative courses (see Table 8) as well as that they perceive their study habits as more appropriate in formative courses (Table 9), does indicate that the mere intention to change one's study habits is not enough. If intention alone were sufficient then we should have observed similar numbers of satisfaction and appropriateness in both forms of assessment and no significant difference between the two. The most parsimonious answer to the question of why students

who wish to improve their study habits and perceive them as inappropriate and unsatisfactory do not change them, is that their habits and environment do not allow them to. Therefore, when external circumstances are beneficial, such as in a formative course, students are more likely to change their study habits according to the perceived demands. Of course, this does not mean that intentions do not count. But it indicates as Clear (2021) postulates, that environment is stronger than willpower in shaping behavior.

Another interest of this study was to examine from which sources students receive helpful information on their study habits and whether or not students rely on memorization techniques to study. Interestingly, more first-year students indicated that they received helpful information from the university (62.9%) than from fellow students (42%). This stands in contrast with higher year students where the opposite pattern was observed (see Table 3). A possible reason for this might be that first-years are more unfamiliar with the university than higher year students and therefore listen to the advice provided by the university more attentively. In the first year of the program, students are typically involved in courses such as “Academic Skills” which try to provide the new students some assistance. Furthermore, students in this cohort may have not yet found a lot of close friends or study buddies, as they only had completed one full block at the time of the study. It also has to be considered that it is hard to draw advice from people who are as inexperienced with an environment as you are, therefore, the university is the logical choice for first-years. Higher year students had time to familiarize themselves with the academic environment and build friendships from which they are able to draw advice in regard to studying. Also, in the higher years, the direct advice provided by the university decreases, and students are rather required to seek assistance services, such as free coaching, themselves if they feel that they struggle. Although past research conducted by Balch (2001), postulates that providing students with study tips is

ineffective, our results seem to indicate that especially first-year students do seem to perceive them as helpful. Therefore, this may require further investigation.

Another surprising finding suggests that the majority of students do not rely on memorization techniques to study; only a tiny minority indicated to do so (see Table 4). A recent study conducted by Karagiannopoulou (2020) suggests that students may rely on rote learning techniques if they perceive the material as inconceivable. In light of the results, this suggests that either the material presented within the Psychology program does not leave most students flabbergasted due to being straightforward or not complicated, or that the teaching staff presents the material in a conceivable manner. Furthermore, if students do not rely on memorization, it is likely that they tend to aim at a more conceptual understanding of the topic or at mere recognition of correct answer options. While the former is more desirable in an informational age where critical reflection and problem-solving are important, the latter is probably the more likely option as students within the program almost exclusively face multiple-choice exams where recognition of the right answer is sufficient.

However, when taking a look at memorization in relation to formative and summative assessment it does become apparent that these percentages do rise quite significantly (see Table 10). This could be a consequence of the different wording used in the questions targeting general study habits compared to the assessment-specific scales. As the general scale worded it as “exclusive use” of memorization techniques, while the assessment-specific scales rather focused on “memorization of a good deal of what I have to learn”. Therefore, as students may apply more than one study strategy, they may disagree with a statement indicating that they solely rely on that particular strategy to study in general, but at the same time agree with memorizing some of the course contents when asked in this manner.

Nevertheless, the assessment-specific results do constitute preliminary evidence, indicating that students in formative assessment make less use of memorization techniques

than in summative courses (see Table 10). Interestingly, students who had previous higher education experience were the biggest group indicating to use memorization techniques for both types of assessment. A possible reason might be that success in the study programs in which those students previously had been enrolled in, dependent more upon memorization. For instance, it may be the case that these students encountered more open question exams, and they, therefore, got used to memorizing the material in order to succeed in the examination. This could also explain why in regard to formative assessment courses the percentage of experienced students (47.3%) applying memorization techniques is rather close to those of first-year students (43.3%). The secondary school environment often also relies more on open question examination than multiple choice. The results, also stand counter to the earlier presented evidence that more experienced students changed and improved their study habits since enrolling in the program. Here, an additional question inquiring this cohort of students whether or not they still use the same study habits as in their previous higher education program could have given further insight.

As mentioned earlier, the present study aimed to investigate the change of students' study habits in relation to formative and summative assessment. It was therefore of interest if formative assessment, which is typically characterized by a series of ungraded learning-assisting assignments, would induce a higher study frequency within the students than summative assessment. Indeed, the results indicate that students do study more regularly when faced with formative assessment (see Table 6). This suggests that students within the Psychology program are responsive to assessment demands and formative assessment may be helpful when trying to nudge students towards effective learning techniques, such as distributed practice, which is to spread out the study load over the course of a semester (Dunlosky et al., 2013). Here, it also does not seem to be the case that responsiveness to formative assessment is a function of experience with higher education, as more first-year

students indicated to study more frequently than higher-year students. This indicates that although change and persistence of study habits may function in close relationship to experience with higher education, students are nevertheless already perceptive to change in the first year of their studies if the academic environment promotes it. This also constitutes further evidence suggesting that for some students the transition experience did function as habit-breaking early on in the first year.

Conclusion

This study provided evidence indicating that the transition to university does function as habit-breaking for students. Nevertheless, the effects of the transition do not seem to set in at an instant, but rather cumulate as students gain experience with the academic environment. After transitioning students' repeated behaviors start to adapt and interlink with the academic environment. These features of the various environments, students inhabit, whatever they may be, eventually manifest themselves as study habit triggering cues. The results in this study suggest that in this process of adaption, assessment methods play a crucial role. Formative assessment can induce students to study more regularly in comparison to summative assessment. Thus, creating circumstances for habit-formation. Further, fewer participants applied memorization techniques and more found their study habits appropriate and satisfying when reflecting on a course using formative assessment. This constitutes preliminary evidence that not only does formative assessment assist habit-formation but also assists students in forming better habits in relation to the demands at hand. To what degree this is the case, is for future studies to explore.

On the basis of this study, we advise universities to be aware of the environments their student body inhabits. As a consequence of the transition experience, the majority of students will inevitably change their study habits as familiar cues are absent. Universities should therefore attempt to change the academic environment in ways that benefit the students'

habits. One of these components that are ought to be changed are assessment methods, as examined by this study, others are for future studies to further explore. Moreover, it should also provide a manifold of environments, such as study facilities, for students to choose from, so students have the opportunity to break maladaptive habits they built up in different contexts.

In order to gain further insights into the mechanisms of study habits and their interactions with the environment, future studies should attempt to opt for longitudinal designs in which the specific contents of study habits are also assessed. The current study gave insight into the improvement of study habits mostly at a broad scale. Defining and assessing the changes of important components of study habits is important to understand in order to advance insight. Tracking students over longer periods of time, may give further insight into the development of their study habits but also allows to assess whether or not students experience a negative regression in their study habits over time. Moreover, all scales used should be carefully designed, ideally by building upon qualitative studies on student experience and then be validated. It is suspected that this more meticulous design would also lead to more clarity in the questions administered, and therefore, improve significantly upon the present study. Nevertheless, despite these limitations, we believe that this study has provided important insight into the mechanisms of study habits in relation to the transition experience and different assessment methods of Psychology students at the University of Groningen.

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Appendix A

Welcome Message

Dear participant, welcome to this study! In the following, we would like to understand your experiences of different assessment types as a student majoring or minoring in Psychology. Ultimately, we would like to give a recommendation to the faculty as to what kind of courses are most beneficial for the students in this programme, which is why your help matters. In order to do this, we kindly ask you to fill out our questionnaire. This will take you about 20 minutes. More detailed information about the study itself, your participation, and the way we will treat your data will follow on the next page.

Appendix B

Information Form

Why do I receive this information?

You are kindly invited to participate in our current research on student experiences of university assessment. You are in the Bachelor or Minor programme of Psychology and have experienced assessments in this programme.

This study started in November 2021 and will continue until January 2022. The study has been evaluated by the Ethics Committee of Psychology (ECP) of the University of Groningen.

Principal investigator of the study is Dr. A. Sarampalis, additional researchers are L.M. Duiverman, S.A.A. Fritzsche, O. Konradt, M.K. Kuhnert, J. Wulf, T. Mueller-Scholtz.

Do I have to participate in this research?

Participation in the research is voluntary. However, your consent is needed. Therefore, please read this information carefully. Ask all the questions you might have, for example, because you do not understand something. Only afterwards decide if you want to participate. If you decide to not participate, you do not need to explain why, and there will be no negative consequences for you. You have this right at all times, including after you have consented to participate in the research.

Why this research?

During the COVID-19 lockdowns, assessment at the university has gone through some changes. There has been more focus on assessments for learning purposes (formative assessment) in addition to assessment for grading purposes (summative assessment). Through this study, we would like to discover how these different types of assessment are experienced by you, the students, in order to make recommendations to the faculty to improve on their assessments.

What do we ask of you during the research?

Before beginning with the study please read this information thoroughly. If you decide to participate in this study you will first be asked to provide informed consent. Then you will fill out a few short questionnaires on procrastination, your experiences with assessment for grading, and assessment for feedback.

What are the consequences of participation?

This research might provide the faculty members with new information on how students experience their exams and different types of assessment. In the future, this could help to improve the assessment types used by the faculty.

We do not foresee any significant negative effects or discomfort as a consequence of this study.

How will we treat your data?

For SONA participants

Your data will be treated confidentially. Because we ask you for your SONA number, the data collection is not completely anonymous: your SONA number is linked to your name and email address. However, we do not have access to your name and email address; only the SONA administrator does. Nonetheless, your data will only become anonymous once we delete your SONA number, which we will do at the end of data collection, i.e. 14-12-2021.

Until this date, you can ask to have your data removed from the dataset. Afterwards this is no longer possible.

For other participants

Data collection is designed to be anonymous, in other words, we do not ask you for any information that could be used to identify you as a person.

The questionnaire data are collected using online software which uses secure servers.

After the study ends all data will be stored anonymously according to the Faculty of Behavioural and Social Sciences data management protocol.

For SONA participants

You have the right to access, rectify, and erase your data for as long as your data remains linked to your SONA number, i.e. until 14-12-2021. To exercise this right you can send an email to the Principal investigator stating your SONA number and that you wish to have your data removed. Please do so before 14-12-2021.

What else do you need to know?

You may always ask questions about the research: now, during the research, and after the end of the research. You can do so by emailing the researchers at l.m.duiverman@student.rug.nl or by emailing (a.sarampalis@rug.nl) or phoning (+31 50 36 36778) the principal investigator.

Do you have questions or concerns regarding your rights as a research participant? For this you may also contact the Ethics Committee of Psychology of the University of Groningen: eep@rug.nl

For SONA participants

Do you have questions or concerns regarding your privacy, or the handling of your personal data? For this, you may also contact the Data Protection Officer of the University of Groningen: privacy@rug.nl.

As a research participant, you have the right to a copy of this research information.

Appendix C

Consent Form

Please indicate below whether you consent with the following statements:

I have read the information about the research and I have had the opportunity to ask questions about it.

The information provided gave me a sensible idea about ...

... the **content** of the research.

... my **involvement** in the research.

... possible **consequences** of participating.

... how my **data** is handled.

... my **rights**.

I understand that my participation is voluntary and I can stop participating at any moment without having to give an explanation. This will have no negative consequences for me.

If you **consent** to participate, please click "→" to go to the questionnaire.

If you **do not consent** to participate, please close this qualtrics window to stop participating.