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„The role of first-generation students' self-perceived talent in intellectual performance"

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Mag. Thomas Gebetsberger, BSc

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Abstract

First-generation students (FGS) – people whose parents have not earned a bachelor's degree - form the largest group of disadvantaged undergraduates besides women. Their families often have low socioeconomic status and struggle with financial difficulties. FGS must invest more resources than their colleagues and might wrongfully attribute this additional effort to a lack of talent. Lower self-perceived talent could explain why they have lower grades, take longer to complete their studies and are less likely to graduate. Prior studies have mainly focused on retrospective performance data forming a gap in the literature concerning the mechanism at play. This thesis tests the effects of perceived ability on performance predicted by the Motivational Intensity theory in a quasi-experimental design. The sample, 200 psychology students, was examined at a laboratory of the Faculty of Psychology at the University of Vienna. Based on their affiliation to FGS and continuing-generation students (CGS), I compared participants regarding performance, self-perceived talent, and perceived threat. The results indicate that student status did not influence performance, self-perceived talent, or perceived threat. This outcome supports my first hypothesis stating that students do not vary in performance at the beginning of an intellectual ability task. However, those invariances conflict with my second hypothesis in which I predicted a more rapid decline in performance for FGS. A possible explanation for the lack of performance difference might originate in the sample composition comprising merely psychology students. The obligatory admission procedure preselects students. Thus, the self-perceived talent in our sample of FGS could deviate from the extent shared within the population of FGS. Finally, I draw conclusions and future ideas that derive from the master's thesis.

Introduction

Educational institutions like universities host a wide variety of social groups and thus, inherit problems stemming from inequalities amongst these groups. Apart from women, first-generation students (FGS) make up the largest group of minority students accounting for about one-third of all students in U.S. universities (Cataldi et al., 2018).

FGS tend to originate from families with low socioeconomic status (SES). Thus, they encounter financial issues (Pratt et al., 2019) and work long hours alongside their studies. With this additional workload, FGS are prone to have higher stress and depression symptoms (Stebleton et al., 2014). In line, they feel less connected with their colleagues. FGS also struggle with cultural mismatch - between their families' culture and the competitive worldview at Western universities (LeBouef & Dworkin, 2021).

FGS perform worse at university, depicted in lower grade averages (Holmes & Slate, 2017) and longer time to complete studies (Cataldi et al., 2018). Students of low status tend to attribute their increased difficulties to achieve the same as their more privileged counterparts to a lack of ability and talent (Major et al., 2003). One might conclude that lower intelligence and talent in FGS cause these findings. However, FGS have illustrated the ability to perform on par with their CGS counterparts (Jury, Smeding, & Darnon, 2015; Stephens et al., 2012). Thus, maybe the performance decrements are not produced by a lack of ability or talent, but instead a perceived lack of ability or talent. If FGS assess their ability as low, they should perceive task difficulty as higher, even if their actual ability is adequate to accomplish the task. In this case, a person will believe they need to invest more resources to engage in the task, and this increased resource requirement will increase the likelihood that the task will exceed their potential motivation, resulting in disengagement (see Motivational Intensity Theory; MIT; Brehm & Self, 1989). Previous research has illustrated that experimentally manipulating one's ability perception can reverse performance patterns (Wright et al., 1997). This gives rise to the assumption that it is not predominantly actual ability that is decisive for performance but the perceived ability. Even when statistically controlling for performance, FGS reported lower self-perceived talent than continuing-generation students (CGS). Those downstream effects seem to be more detrimental in an environment that indicates the importance of talent over effort (Bauer & Hannover, under review). In this thesis, I investigate the influence of FGS' self-perceived talent on their performance as predicted by MIT within a talent-based environment.

First Generation Students

A FGS is commonly defined as a student whose parents did not obtain a university degree, but currently, a single agreed-upon definition does not exist for what constitutes a FGS. Toutkoushian and colleagues (2021) investigated studies with eight different definitions. The spectrum of definitions used in research reaches from none of the parents enrolling at any post-secondary educational institution to at least one having a 2-year associate degree or even 4-year bachelor's degree. Other studies also included socio-economic factors such as "underrepresented first-generation low-income college students" for defining FGS (Tate et al., 2015). In the following thesis, we rely on a definition by Collier and Morgan (2008); FGS is assigned to students whose parents have not completed a bachelor's degree.

Status quo

After defining the term, we must address various psychological and contextual constraints that FGS face in the university context. Like racial minority groups or women, FGS face adversity regarding studying at the university (Cataldi et al., 2018). Minority groups share lower self-efficacy and diminished intellectual confidence (Ramos-Sánchez & Nichols, 2007; Tellhed et al., 2017). In line, FGS have difficulties connecting to student peers and share doubts about their fit into university (House et al., 2020).

In addition, FGS tend to hold elevated stress levels when entering college, operationalized as heightened systemic inflammation markers (Jones & Schreier, 2022). Apart from physiological factors, they also report higher levels of depressive symptoms than CGS which is exacerbated by FGS's lower use of provided mental health services (Stebleton et al., 2014). FGS tend to live in low-income households (Pratt et al., 2019). Therefore, they often have long work hours along with their studies and worry about financial issues more frequently (Pratt et al., 2019; Stebleton et al., 2014).

These struggles manifest in lower performance levels across various performance measures. FGS have lower average grades in the US-metric Grade Point Average (GPA) (Holmes & Slate, 2017) as well as in STEM studies (Blatt et al., 2020) and underperform in selection tasks (Jury, Smeding, Court, et al., 2015). These tasks should determine suitable candidates for a specific topic.

Lower performance also relates to a lower retention rate and a higher probability of dropouts, especially in the first years of college. If they remain in college, FGS need more time to complete their studies. Specifically, only 56% of FGS complete their bachelor's degree within six years compared to 74% of their CGS colleagues (Cataldi et al., 2018).

Family background

One reason for the lower retention rate and performance at the university level might be due to a lack of social capital in the networks that FGS can build on (Wittner & Kauffeld, 2021). None of their parents went to university or completed a degree. Subsequently, FGS cannot fall back on information provided by their parents, while CGS can grow from their parents' experiences (Palbusa & Gauvain, 2017; Sy et al., 2011). FGS even tend to feel guilty because they exceed previous family academic achievements (Covarrubias et al., 2015).

Families without academic experience talk less about those topics. When FGS students talk about college, it was associated with positive outcomes, such as higher perceived academic ability and better grades (Covarrubias et al., 2020). Those conversations might be vital for FGS in their transition to college. FGS gain emotional support from their parents when talking about college. This promotes academic engagement and psychological well-being (Roksa & Kinsley, 2019). Parents might be an inspiration and an important reason, why FGS attend college (Palbusa & Gauvain, 2017). Covarrubias and colleagues (2020) assume that the "novel experience" of going to college or university and regular conversations with their parents might be of great importance for FGS.

Cultural Separation and sense of belonging

Differences between family background and university culture could lead to a "cultural mismatch" (Jones & Schreier, 2022; Stephens et al., 2012) that persists throughout a student's college career (Phillips et al., 2020). LeBouef and Dworkin (2021) describe this mismatch as the feeling of being "part of two separate worlds" that might be conflicting or incompatible (Jetten et al., 2008). University comes with a clash of the previous identity and the culture lived at university.

FGS report cultural separation after entering college (Engle & Tinto, 2008) and even tend to conceal their background. As FGS often come from low-income families with low SES, they could try to hide their origin to increase their fit. Veldman and colleagues (2022) postulate that these students experienced a decrease in their well-being due to social background concealment (Engle & Tinto, 2008). This cultural divergence affects family climate but also influences the sense of belonging, which describes whether someone feels part of a university or a class. Self-perception in academic or school environments impacts the likelihood of pursuing further education. In a longitudinal study by Lecy and colleagues (2021), low-income and FGS were less likely to attend college if they reported a lower sense of belonging in middle or high school. Hence, pupils who feel out of place at an early stage, have a lower probability of attending secondary education.

Those FGS that make it to college, report a lower perceived sense of fit and belonging, as being split between home and university identity (Stebleton et al., 2014). This effect remains, even if one parent has a university degree compared to their colleagues whose parents both completed university (Pedler et al., 2022). Lacking a sense of belonging leads to lower grades and lower social standing than continuing-generation students (Phillips et al., 2020). Financial burden, distress and stereotypes are factors that occur more frequently among FGS and can constrain the perception of belonging beyond that (Duffy et al., 2020).

Gillen-O'Neel (2021) measured FGS's sense of belonging to their respective university. According to the results, FGS are more sensitive to daily fluctuations in their perception than CGS. If they perceived a high sense of belonging to their university on that day, they had a higher participation in academic discussions during class. Further, the relationship between a daily sense of belonging and academic self-efficacy is stronger for FGS (Gillen-O'Neel, 2021). Thus, a sense of belonging could impact their engagement and motivation for academic discussions and possibly their retention rate (Pedler et al., 2022).

Identification and self-perceived efficacy

Successful cultural integration and a high sense of belonging foster high academic self-efficacy (Freeman et al., 2007). This concept describes "the perceived capability to perform a given behaviour" (Doménech-Betoret et al., 2017; Freeman et al., 2007). High levels contribute to better academic performance. Furthermore, integrating both identities reduce stress in adapting to university. This promotes life satisfaction and general health for FGS (Phillips et al., 2020).

A study by Chen and colleagues (2021) extended this assumption toward scientific identity in minority students. Obtaining such an identity could increase the performance of minority students. While the authors argue a lack of FGS in their sample, they suggest these results might translate to FGS. Thus, identification with the subject or science in general as well as a sense of belonging to the class at university, act as key determinants for FGS in their academic success.

Moreover, environmental support, and having close friends, indicate self-efficacy at university and heighten college outcome expectations as well as academic satisfaction (Garriott et al., 2015). When first-year FGS frequently have contact with their peers and friends on campus, they report higher academic self-efficacy. This relationship is mediated by school connectedness (Cheong et al., 2021). Hence, communicating with your peers might strengthen your belonging to your university and further enhance your academic self-efficacy.

Stereotypes and ability perception

Another factor influencing FGS can be stereotypical assumptions, which can make social classes impermeable and reinforce existing conditions that hamper minorities like FGS. When a course was described as “male-dominant”, women thought, they would have to exert more effort to pass the course. This perception of how much effort must be brought forth was also an indicator of whether women see themselves as member of the science community (Banchefsky et al., 2019; Stout & Blaney, 2017). Participants that have to invest more effort in a subject or task, tend to perceive a lack of ability (Banchefsky et al., 2019). This translates to the assessment of others. The more women must invest to achieve a task, the less she believes to be successful in the future. Those assumptions did not occur for male colleagues (Stout & Blaney, 2017).

Beyond stereotypical domains, implicit prejudice and ambiguity could be detrimental to FGS. Stigmatized groups like FGS are more prone to attribute their failure to a lack of ability in these situations (Major et al., 2003). This attribution changed when individuals recognized stereotypes towards them (Wang et al., 2012). Creating awareness of these processes could mitigate such attribution errors. FGS might be caught in a vicious cycle in uncommon domains like universities. As a result of their higher effort to compensate for disadvantages like financial constraints and lack of networks, they attribute this additional effort to a lack of ability (Bauer & Hannover, under review). This, in turn, leads them to put forth more compensatory effort for their perceived lack of ability starting the cycle anew. As discussed, this attribution error also applies to the judgement of others. Thus implicit, and explicit prejudice at the university level could further consolidate low perceived ability in FGS.

Self-perceived ability and natural talent

FGS, in particular those that perform well at university, might be afraid of revealing their perceived lack of ability (Jury, Smeding, Court, et al., 2015). They tend to possess higher performance-avoidance goals than their CGS counterparts. Instead of presenting existing abilities, someone with high performance-avoidance goals intends to hide inferior ability when doing a task. Especially those FGS with high levels of academic achievement showed higher performance-avoidance goals than CGS. Interestingly, there was no difference in performance-avoidance goals between student status when achievement levels were low.

High performance-avoidance goals were associated with entity beliefs in areas such as sports (Cury et al., 2002). According to Elliot and McGregor (2001), you perceive your ability to be stable when holding entity beliefs. In contrast, incremental beliefs describe the

approach that you can change and increase your abilities. At the core, an entity belief also assumes natural talent. According to this, everyone has a constant level of talent and ability. This amount varies between people (Cimpian et al., 2012).

This point of view is destructive, especially for young adults. The theory circulates the notion that one's talent level is out of their control. Thus, FGS with entity beliefs avoid performance-related situations. For them, underperformance would expose them as inferior and untalented in the long run. Emphasizing that an activity or environment is uncommon for a social group might reinforce entity beliefs and stereotypes for FGS. This can have an effect on academic performance (Cimpian et al., 2012)

Talent environment

How disadvantaged groups such as FGS perceive the environment plays an important role. Park and colleagues (2017) investigated the impact of statements about social class in an unfamiliar task. In this case, they varied the task instruction, emphasizing talent or ability regarding social groups such as gender ("Girls/Boys are good at this game"). Those stereotypical statements influenced performance levels. This effect persisted, even when the experimenter, who made the statement, left the room. Subsequently, those children adapted by choosing easier tasks. When statements explained success in a task, based on effort, participants showed higher performance ("Girls/Boys are good at this game because they try really hard when they draw"). Park and colleagues (2017) argue that the focus on ability or talent might lead to different types of stereotypes depending on social class. A study at a Norwegian university examined the effects of task instruction that were either focused on the entity or incremental theory of intelligence. The results are in line with Cimpian and colleagues (2012) findings. Instructions that put stable abilities into focus hindered the performance of those students in the presented task (Bråten et al., 2017). Stereotypical talent assumptions, such as men are better at STEM (science, technology, engineering, and mathematics) subjects, can also lead to stereotype threat (Bian et al., 2018). Hence, talent-focused statements could impair people, lead to helplessness, and even impose a threat on minorities.

Bauer and Hannover (under review) considered talent and effort environments for the first time based on student status. FGS faced environmental signals indicating either talent or effort focus. When task instructions focused on talent, students whose parents do not have a college degree, performed worse. The competitive, talent-focused climate at Western universities paired with the reduced self-perceived talent of FGS might facilitate the performance disadvantage FGS have to face today (Bauer & Hannover, under review;

Sommet et al., 2015). Existing studies only measured the state of FGS before or after tasks while relying on self-reports. This current project includes data during intellectual tasks. Further, we incorporate understanding derived from a theory specifically designed to predict the influence perceived ability has on engagement levels (i.e. Motivational Intensity Theory; MIT). In doing so we aim to provide a more nuanced level of understanding concerning the mechanistic pathway FGS statues uses to reduce performance in academic settings.

Effort prediction and measurement

I utilized MIT as a theoretical approach to predict engagement levels amongst FGS in intellectual tasks. Brehm originally intended the MIT to predict the valence of a goal. Over time the focus shifted towards predicting task engagement (i.e. effort). Thus, the MIT tries to explain "mobilization in goal attainment" (Brehm & Self, 1989). According to MIT, the primary function of effort is to sustain behaviour. Since the availability of resources is critical to survival, we tend to use only as much effort as is necessary to complete a task to avoid wasting valuable resources. The indicator of the required resources is one's perceptions about task difficulty. As a result, task difficulty directly determines the effort required to engage in a task (Brehm & Self, 1989). That means you must try harder to stay engaged in tasks one perceives as increasingly difficult. Success importance thereby creates an upper limit for the potential motivation. Once someone reaches their upper limit of importance to succeed or perceives the task as impossible, they will withhold effort because it is no longer worthwhile and thus disengage from the task (Richter et al, 2016; Wright, 2009). Perceived ability influences the relationship between effort and task difficulty in a way that individuals with low perceived ability perceive all tasks as more difficult than those with high perceived ability. As discussed above, people sustain behaviour if they presume success as possible and worthwhile. Since individuals with low perceived ability in a specific task have to put forth more effort to remain engaged in it, they reach their upper limit of potential motivation earlier and thus, disengage at lower objective difficulty levels (Wright, 1996, 2009).

While MIT predicts when effort will occur, Obrist's active coping approach provides the framework to measure effort (Obrist, 1981). To reach a goal, we engage in a behaviour that is designed to help us reach that goal, called instrumental behaviour (Fragaszy & Liu, 2012). If you engage in instrumental behaviour, your body needs to work more to accomplish the challenge, for example, your heart will contract more forcefully. In line with Obrist (1981), we can measure myocardial contraction to measure effort in a task. There are two ways to measure this contraction.

One approach is to measure systolic blood pressure - the more accessible of the two measurements. Systolic blood pressure indicates the peak pressure when the heart pushes blood through the arteries to the rest of the body. The more reliable way is to examine the pre-ejection period (PEP) - the time from the electrical stimulation of the left ventricle to the beginning of the ejection period (Lanfranchi et al., 2017). In the case of effort, a shorter PEP indicates higher effort in the specific task (Richter et al., 2008).

Wright (2009) combined these two theories in an integrative analysis. The Motivational intensity theory predicts when effort will occur, while the active coping approach by Obrist lays the foundation on how to measure the predicted effort in an experiment. Previous studies have provided evidence for the integrated analysis (Richter et al., 2008; Silvia et al., 2010).

As explained above, FGS perceive themselves as less talented. According to MIT, you must exert more effort to remain engaged on a given task if you perceive yourself as less talented. This is in line with various studies on minorities and FGS that link low self-perceived ability to higher effort expenditure and provides a clear mechanistic pathway to how FGS statues result in lower academic performance.

A study by Wright and colleagues (1997) manipulated the ability perception of males and females and measured their cardiovascular response. They described tasks of incremental difficulty (low, high, and extreme) suiting either men or women. As predicted, the group supposedly more capable showed less engagement in the low difficulty condition and mobilized more effort in the highly demanding task. Participants with low perceived ability showed the reverse pattern. They exerted more physiological effort in the easy variation and less when difficulty was high. The extreme condition led both groups to a similar, low engagement.

As FGS perceive their ability as lower than their CGS counterparts, they perceive the difficulty of any task as higher. Thus, the necessary amount of effort to engage in any task is higher. When an FGS perceives a task as worthwhile and chooses to engage, they should be able to perform on par with their CGS counterparts. However, when the difficulty of a task increases, so should the likelihood that an FGS perceives a task as excessively difficult given their level of potential motivation resulting in them disengaging. Ultimately this higher level of disengagement amongst FGS compared to their CGS counterparts results in the performance decrements observed previously.

Present research

The current project examines the ability of MIT to predict performance differences between FGS and CGS in academic situations. This thesis links research on the self-perceived

talent of FGS with an understanding derived from MIT to precisely predict the mechanistic pathway at play in the phenomenon.

Previous studies included student performance in a retrospective manner (Cataldi et al., 2018; Holmes & Slate, 2017) or self-reports on prior performance levels (Bauer & Hannover, under review). Yet, a direct measurement of performance was scarce. Further, many studies investigated the relationship between FGS and their motivational and psychological disadvantages focusing on the transition to university or college. Nevertheless, most research relied on self-reports concerning the effort of FGS (Stout & Blaney, 2017).

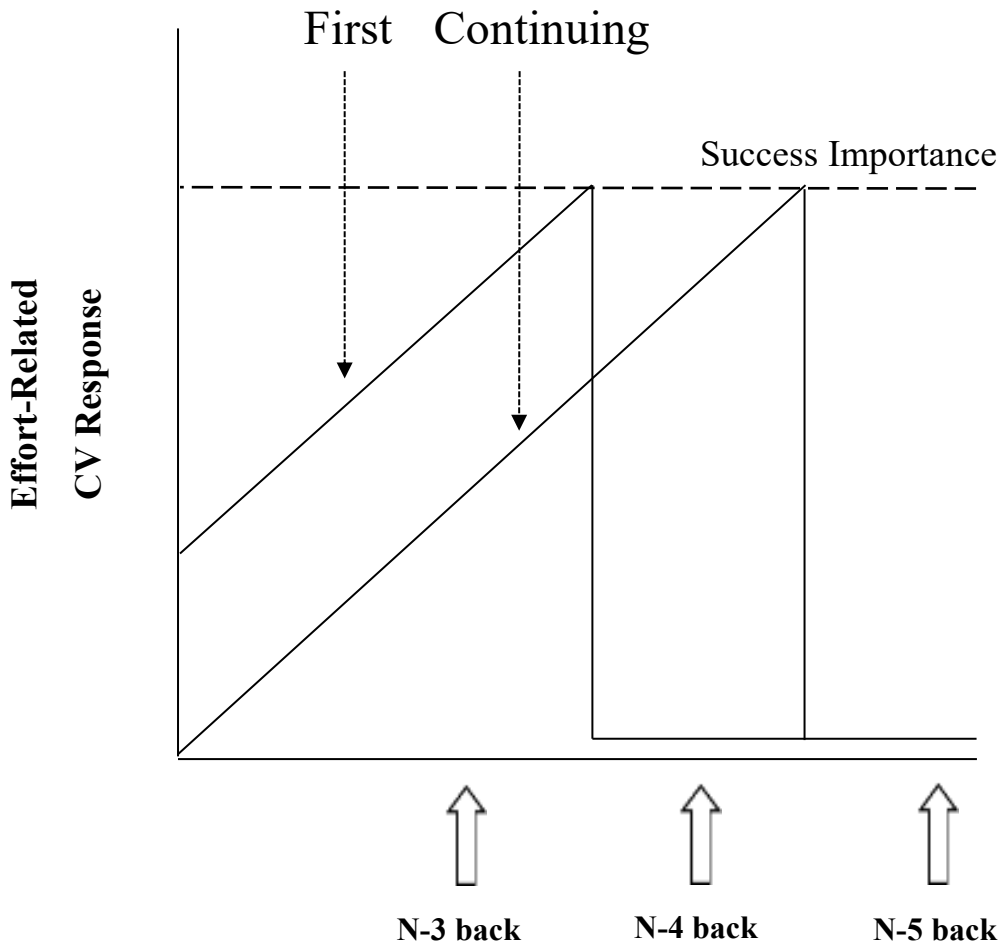
The following project assesses performance levels during a an intellectual ability test that of increased in difficulty in a talent-focused environment. As explained above, FGS perceive themselves as less talented and self-perceived talent will be used as equivalent to perceived ability in the MIT. In line with the MIT, FGS act as low and CGS as high perceived talent.

While FGS should have to put forth more effort to engage in the task of low difficulty, they should perform on par with their CGS counterparts if both choose to engage in the task. Thus, I predict that with the overall high level of potential motivation, both CGS and FGS will engage at the beginning difficulty level, resulting in no difference in performance when starting the intellectual ability test (Hypothesis 1).

As the difficulty of the ability test increases, so should the likelihood that FGS reach their success importance threshold earlier than their CSG counterparts resulting in earlier disengagement (see Figure 1). Since more FGS should disengage at an objectively lower difficulty level than their CGS counterparts, I predict that a more rapid decline in performance will occur amongst FGS compared to CGS as the difficulty of the intellectual ability test increases (Hypothesis 2).

Figure 1

Overview of my study



Methods

Sample

The sample comprises 200 participants (53 male, 144 female, 3 diverse) and their age ranges from 17 to 45 (M = 21.99, SD = 3.61). According to the power analysis, the sample should include at least 210 participants. All of which were acquired via a bachelor's program called LABS for psychology students. During the bachelor's programme, students must participate in laboratory studies – such as this research project - for approximately 10 hours. We were not able to examine 210 participants as intended due to multiple Covid restrictions.

Procedure

The study took place in a research facility of the Institute of Motivation Psychology in Vienna between March 10th and May 12th, 2022. Some adjustments were made to create a talent-oriented environment with potential stereotype threats. In this notion, the instructors paid attention to showing serious facial expressions such as no smiling, no small talk and wearing white lab coats. The intellectual tasks should further impose pressure on participants.

First, participants had to give informed consent at the beginning. This was followed by the first part of the mood questionnaire (MDBF) and then continued with watching video clips to allow everyone to adjust to the same rest level. Before the task, participants answered questions about their self-perceived talent.

The intellectual tasks started with an N-1 training round while the main task consisted of three different variations of the N-Back task. Each variation comprised approximately 60 trials.

After the intellectual task, participants completed the second part of the mood questionnaire (MDBF). Further, they were asked for their perceived importance and perceived threat during the task. Questionnaires concerning demographic and social class concluded the main section of the study. Subsequently, there was a debriefing regarding potential conflicts during the task fulfilment.

Materials

Self-perceived talent

Two items such as “I consider myself gifted” were assessed on a seven-point Likert scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”) to examine self-perceived talent. Those questions were gathered from a study by Bauer and Hannover (under review).

N-Back task

Three variations of the N-Back (Kirchner, 1958) acted as the performance task. Depending on the variation of the N-Back, participants had to choose whether the current character matched the one n letters previous. The higher the number for n, the more difficult was the task. In this study, I used the 3-,4- and 5-back.

In the beginning, participants were briefed that they are about to do an intellectual ability task. The training and actual task consisted of 60 counted trials. One trial was comparing a present letter to another previously shown letter. Thus, approximately 60 cue letters were used depending on the variation. The N-5 had the most letters with 64.
Before the actual trial, participants completed one training round using the N-1 variation. Thus, participants chose whether the letter before matched the current one. The participants

were instructed to achieve at least 80% of the trial correct to pass the test. During each N-back variation, 25% of letters were target letters while the rest was non-target. A target meant the current letter matched the letter N-back.

Mood questionnaire

Before and after the intellectual tasks, I measured fatigue with the German version of the Multidimensional Mood State Questionnaire called Mehrdimensionaler Befindlichkeitsfragebogen / MDBF (Steyer et al., 1997). The questionnaire includes 24 items on three subscales - mood, awake-tired and calm-nervous. One half was presented before and a half after the tasks. Participants should rate words like "satisfied" or "tired" on how those apply to their current state on a Likert scale from 1 (not applicable at all) to 5 (very applicable). Cronbach's alpha ranged from $\alpha = .86$ to $\alpha = .94$ which indicates good to very good internal consistency (Döring & Bortz, 2016, p. 443).

Perceived threat, success importance and perceived difficulty

Following the intellectual tasks, the perceived threat was examined with a set of seven items (e.g. "I felt tense") based on an anxiety questionnaire by Bian and colleagues. (2018). Items were rated on a nine-point Likert scale that ranged from 1 (strongly disagree) to 9 (strongly agree).

One question ("How important was it to you to succeed in the intellectual ability test?") assessed the importance to succeed on a scale from 0 (not important at all) to 10 (very important). The same applied to the item on perceived difficulty ("How difficult was it for you to succeed in the intellectual ability test?").

Demographics, social and student status

To conclude, I assessed various items on demographics. Participants should estimate the number of books at their childhood home (Hopstock & Pelczar, 2011). In addition, they were asked about their subjective affiliation to social class with a ladder. On the bottom are those with the lowest education, worst jobs, or no jobs at all and at the top are those with high amounts of money, high levels of education and the best jobs. Participants should rate where they would place themselves on the ladder (Adler et al., 2000).

Demographic items consisted of age, gender, and area of study. Besides, the time spent studying at university, as well as prior performance levels at university and the end of school, were collected.

Two items determined student status by assessing the highest level of parental education, one respectively being about their mother and one being about the father.

Participants were categorized as CGS if one parent completed at least one degree at university.

Analysis

As for the statistical analysis, I conducted two separate analyses. First, to test Hypothesis 1 I completed an independent samples t-test to determine if performance on the initial N-back difficulty level (i.e., N3) differed between the FGS and CGS in the sample. Student status acted as the between-subjects factor and the N-back hit rate on the N3 was my dependent variable. Secondly, to test Hypothesis 2, I completed a repeated-measures ANOVA to determine if performance rates declined more rapidly amongst the FGS of the sample. Student status acted as the between-subjects factor. The N-back difficulty defined the within-subjects factor and the N-back hit rate on all N-back levels was my dependent variable.

Analysis was performed using R version 4.1.2, SPSS 25 and JASP version 0.16.3, an open-source alternative with a graphical user interface based on R.

Results

Data preparation

None of the participants reported problematic outliers. Apart from the items on students' grade average, the data set contained no missing values.

An exploratory factor analysis of the items on perceived threat revealed two distinct factors (see Table 1). Factors with Eigenvalues exceeding 1 were considered and the elbow criterion was inspected with the Scree plot. Thus, two items were removed from the proceeding analysis ("I felt motivated" and "I felt enthusiastic"). The remaining ones had a Cronbach's α of .889 indicating good internal reliability (Cronbach, 1951).

Table 1

Exploratory factor analysis on perceived threat

	Factor 1	Factor 2	Uniqueness
PT2	.89		.20
PT1	.84		.29
PT7	.80		.33
PT3	.76		.42
RPT5	.66		.56
RPT6		.97	.05
RPT4		.47	.78

Note. Applied rotation method is promax.

Descriptive analysis

One participant was excluded from the descriptive analysis that claimed to be 12 years old. Yet, only university students could use the LABS system as it requires a university email address. Therefore, this participant remained in the study for performance analysis.

The sample of 200 participants splits up into 82 FGS (41%) and 118 CGS (59%). 53 participants described themselves as male (26.5%), 144 as female (72%) and 3 as diverse (1.5%). Descriptive statistics on performance results are displayed by N-back variation and student status in Table 2.

Table 2

Mean values in performance

Difficulty	Student Status	Mean	SD
N-3	Continuing-Generation	0.50	0.22
	First-Generation	0.55	0.26
N-4	Continuing-Generation	0.47	0.22
	First-Generation	0.51	0.21
N-5	Continuing-Generation	0.43	0.21
	First-Generation	0.43	0.21

Perceived threat and self-perceived talent

First, participants were compared in perceived threat and self-perceived talent by their student status. The remaining five items on perceived threat deviated from normal distribution as the Shapiro-Wilk Test was significant ($p = .04$). The non-parametric Mann-Whitney U test was insignificant ($U = 5115.50$, $p = .49$). Thus, no difference in perceived threat between FGS and CGS could be assumed.

Concerning self-perceived talent, the Shapiro-Wilk test of normality suggested a violation ($p < .01$). Again, the Mann-Whitney U test was insignificant ($U = 5025.50$, $p = .63$). As a result, there is no indication that the groups differ in self-perceived talent.

Performance

I completed an independent samples t-test to test hypothesis 1 that performance between FGS and CGS would not differ at the initial difficulty level of the intellectual ability test. Results indicated that performance in the N-3 task did not vary significantly based on student status ($t(154.29) = 1.40$, $p = .16$, see Table 3).

Table 3

Independent samples t-Test on difference in N-3 performance by student status

	t	**df**	**p**[a]
N3 Performance	1.40	154.29	.16

[a] Levene's Test for Equality of Variance indicates that the assumption of homogeneity of variance is violated ($p < .05$).

A repeated-measures ANOVA was conducted to test my second hypothesis that performance would decline more rapidly amongst FGS as difficulty increased. Student status acted as the between-subjects factor, while hit rate in the N-3 to N-5 was assigned as the within-subjects factor.

Since Mauchly's Test of Sphericity was significant ($p =. 03$), the assumption of sphericity was violated. Therefore, I used more restrictive tests like the "Lower bound". The ANOVA revealed that performance varied significantly between variations of n-back task ($F(2, 396) = 20.04$, $p < .001$, partial $\eta^2 = .09$). When I included the between-subjects factor Student Status, the model was insignificant ($p = .27$, see Table 4). Therefore, we cannot claim

that performance varied overall between the different groups at different time points (see Figure 1)[1].

Table 4

Repeated Measures ANOVA on the relationship between performance and student status

Cases	Sum of Squares	df	Mean Square	F	p
N-Back Difficulty	0.83 [a]	2 [a]	0.42 [a]	20.04 [a]	< .01 [a]
N-Back Difficulty ✻ Student Status	0.05 [a]	2 [a]	0.03 [a]	1.31 [a]	0.27 [a]
Residuals	8.24	396	0.02		

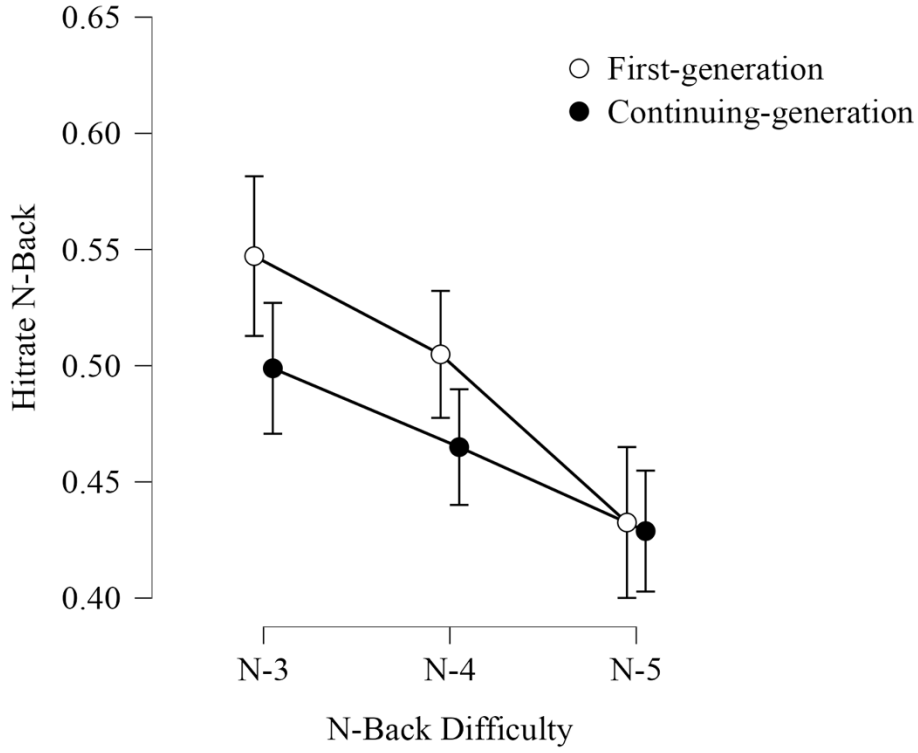
Note. Type III Sum of Squares

[a] Mauchly's test of sphericity indicates that the assumption of sphericity is violated ($p < .05$).

[1]After excluding all participants that did not report their average grade at university, 32 FGS and 36 CGS were tested for differences in grade average with the Mann-Whitney U test. This test was not significant ($p = .59$, see Table 5 in the Supplemental Materials).

Figure 1

Performance levels across N-back variations by student status

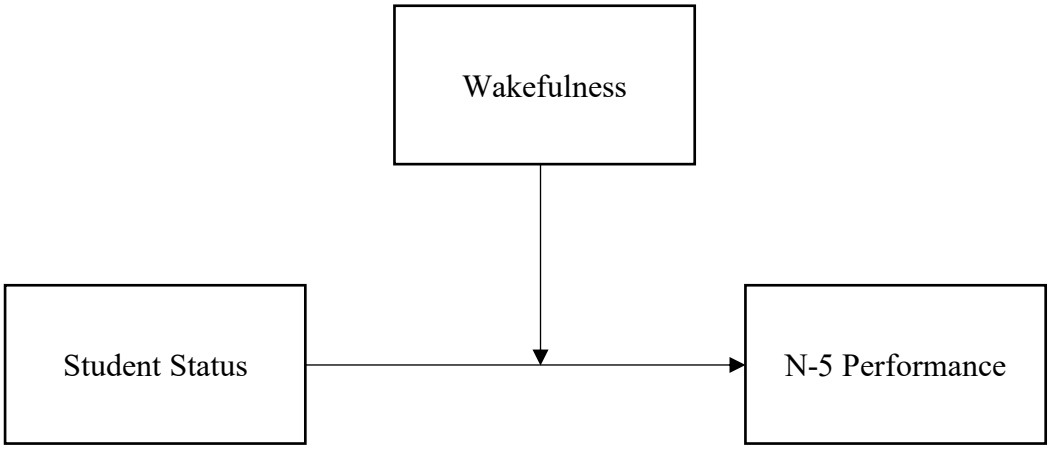


Exploratory analysis

As an exploratory analysis, wakefulness before doing the N-back task was examined for its effect on the relationship between student status and performance in the N-5 task (see Figure 2). The variables were scrutinized for problematic multicollinearity. The variable inflation factor (VIF) did not meet the considerable cut-off of 2.5 (Johnston et al., 2018). Thus, no relevant multicollinearity was present.

Figure 2

Moderation of Wakefulness on the Relationship of Student Status and N-5 Performance



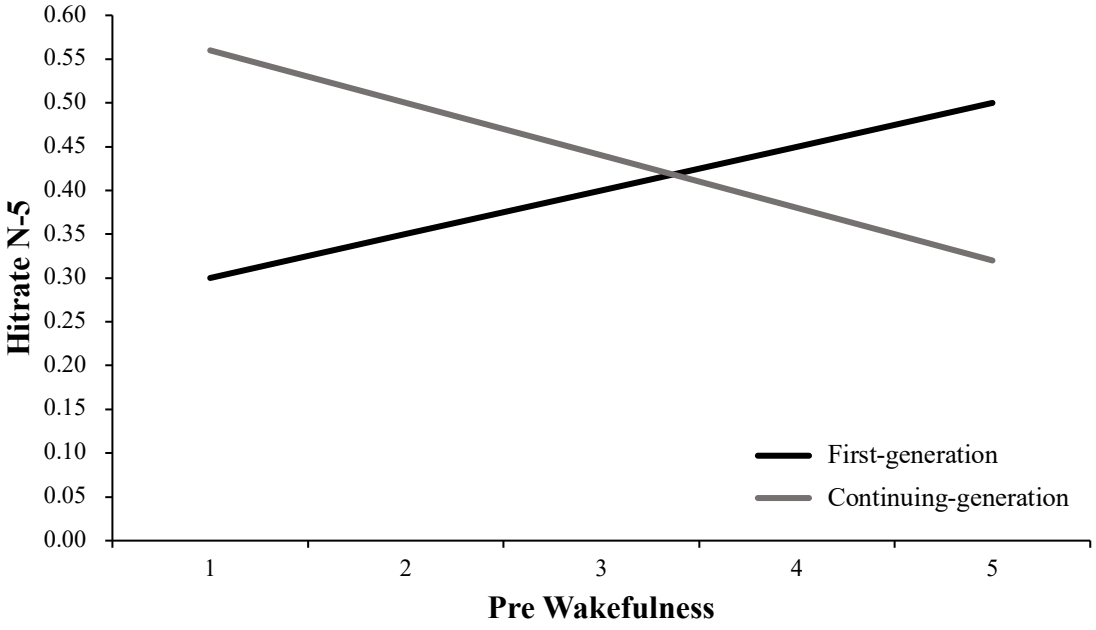
In the first step, student status and fatigue before doing the N-back task are included in the model. Wakefulness was measured using the MDBF. These main effects were insignificant ($p = .86$).

Next, the interaction between student status and wakefulness was entered into the regression model. This model explained a significant proportion of variance ($\Delta R^2 = .04$, $F(1, 196) = 8.78$, $p < .01$). According to Cohen (1988), the 4.4% explained variance is a rather small effect.

Finally, the conditional effects at 1 *SD* above and below the mean were considered. FGS reporting wakefulness 1 *SD* below the mean performed worse than CGS students at that wakefulness level ($b = .08$, $p = .04$). When having high wakefulness (1 *SD* above mean), FGS performed better than their counterparts ($b = -.09$, $p = .03$), on the contrary (see Figure 3).

Figure 3

Effect of the interaction between student status and wakefulness on N-5 performance



Importance to succeed and perceived difficulty by student status

Participants' importance to succeed and perceived difficulty were examined for group differences using two independent-sample t-tests with student status acting as an independent variable. The Shapiro-Wilk test for Normality was significant ($p < .01$) for both analyses; Mann-Whitney U-tests showed that perceived importance (PI1; $U = 5427.00$ $p = .12$) and perceived difficulty (PI2; $U=4690.50$ $p =.69$) did not vary significantly between FGS and CGS.

Also, the importance to succeed was inspected for a correlation with the N-5 task performance. Success importance did not significantly correlate with the N-5 task performance ($r(198) = -.01$, $p = .95$).

Discussion

Prior research on FGS focused mainly on describing the circumstances FGS face in their transition to college. FGS come from a culture driven by interdependent motives. Western universities share a culture of independence and competitiveness, which leads to a cultural separation during the start of their studies (Engle & Tinto, 2008). Thus, they feel out of place as they struggle to connect with their colleagues (House et al., 2020; Stebleton et al., 2014). Nevertheless, integrating those identities is crucial to alleviate the burden and enhance

academic self-efficacy. Adversities, such as cultural integration or financial concerns, could require additional effort for FGS to pass their studies. Like other marginalized groups (Major et al., 2003), FGS might attribute this needed extra effort to a lack of ability and talent (Bauer & Hannover, under review). Those challenging conditions are also reflected in performance data like average grades (Holmes & Slate, 2017) or lower grades in STEM studies (Blatt et al., 2020). Previous studies targeted performance data in a retrospective manner (Bauer & Hannover, under review; Blatt et al., 2020; Holmes & Slate, 2017).

This thesis investigated whether performance differences only occur in the overall grades, or specific tasks as well. More than that, this project sought to investigate the role of self-perceived talent behind FGS' decrements in performance. Thus, the results could help understand the underlying mechanics leading to worse performance for FGS.

As predicted in the first hypothesis there was no significant deviation in performance between the two student groups in the easy N-3 variation of the intellectual ability test. In line with previous studies (Wright et al., 1997), FGS engaged at the initial difficulty level and thus performed on par with CGS.

The second hypothesis states that FGS' performance should decline more rapidly than CGS's as difficulty in the intellectual ability test increases. Contrary to my conjecture, performance did not vary significantly between FGS and CGS - neither in performance levels during the higher difficulty level of the intelligence ability task nor in grade average at university.

One aspect in explaining these results could be the lack of sample group diversity, as it merely consists of bachelor-level psychology students. This study was conducted at a public university with many courses being accessible to anybody. However, psychology has a highly competitive admission procedure that only accepts between 10% to 20% of applicants. FGS tend to doubt succeeding in intellectual admission tests. As a result, fewer of those students might apply for psychology in the first place (Bauer et al., under review). FGS and low-SES students further underperform in selection tasks. Those effects only occurred in tasks described as a tool to compare them to others (Jury, Smeding, & Darnon, 2015; Smeding et al., 2013). In line, fewer FGS ended up in this psychology sample compared to a recent survey by Hunt-White (2018) in the US (51.5% of FGS and 48.5% of CGS in social and behavioural studies) or an Austrian study (Unger et al., 2019).

Those who make it through the procedure might have a higher perception of their academic capabilities than the general population of FGS in Austria. Thus, this sample might be biased since only applicants that pass a strenuous and stressful test make it to the

bachelor's program. The same could apply to their perception of their academic talent which does not deviate significantly from CGS in this sample. Higher academic confidence might translate to talent perception as well.

Furthermore, questions also persist about how the students perceived the focus of the experimental environment. While I took preconscious to create a talent-focused environment (e.g. wore white lab coats, and referred to the task as an intellectual ability test), no measures of perceptions about the environment were included and, thus, cannot be tested within the sample. Self-perceived talent would have a negligible impact if the participants perceived the environment as different from a talent-based environment. Western universities are a talent-focused competitive environment which I wanted to emulate as best as possible. This environment should put FGS at a disadvantage since they generally perceive themselves as less talented (Bauer & Hannover, under review). Nevertheless, one might think an N-back task to be feasible if you try hard. Further, the experiment was completed under the banner of the motivational psychology lab. Students learn that motivation psychology commonly studies effort-focused environments and, thus, could have perceived this environment to be effort focused as well. As a result, those participants should be able to make that connection which might have changed the perceived environment and confounded my results. The lack of difference in feelings of threat between student statuses underlines that reasoning.

Existing research links FGS to higher feelings of threat during tasks that compare themselves to others, such as admission tests (Bauer et al., under review; Jury, Smeding, & Darnon, 2015). Within this sample, FGS do not feel more threatened by the situation than their colleagues. Diverging educational systems could cause this result. In the USA, where most research is conducted, college comes with high expenses. This creates a barrier for students of lower income such as FGS. Austria, on the other hand, offers free university access. Lower costs and better accessibility could explain the higher rate of FGS in Austria. In total, 67% of Austrian students have parents without a bachelor's degree (Unger et al., 2019). When looking at the US, 55.5% are FGS while 45.5% come from an academic family (Hunt-White, 2018). This has clear implications for FGS in Austria. Since those students comprise the majority of students at Austrian universities, previously described feelings of threat or lack of sense of belonging could vanish having many colleagues from comparable family backgrounds.

The exploratory analysis investigated the mediating effect of fatigue before the tasks on the relationship between student status and performance of the N-5 variation. Wakefulness influenced the relationship between students of differing parental education and performance

significantly. FGS performed worse when being more tired and better than CGS if they reported high wakefulness. According to Wright (2009), fatigue influences performance more in demanding tasks. If your depleted resources lead to the perception that success is not possible or worthwhile, participants will disengage (Wright, 2009).

Implications

The key finding of this thesis is that FGS and CGS do not deviate in performance in this sample of psychology students. This applies to the intellectual task and the general grade average at university. As discussed previously, this sample had a lower percentage of FGS when compared to other studies. Again, this may be due to the competitive admission procedure. Drawing from my results, we need to encourage and foster FGS in their application process for admission tests.

Those kinds of affirmative actions must occur early since the mere existence of an admission test might keep FGS from applying in the first place (Bauer et al., under review). Thus, we must support FGS in building their academic confidence early on. One approach is to intensify a growth mindset at Western universities and even earlier. This theory claims that those intellectual abilities are modifiable. This mindset could help shift the predominant negative worldview from not performing worse than others (performance goals) to valuing learning new skills as well as mastering those (mastery goals). Turning away from the competitive environment at universities helps keep FGS motivated to surpass themselves and progress personally (Sommet et al., 2015; Wolcott et al., 2021). These growth mindset interventions have led to desirable outcomes such as improving educational striving in students (Yeager & Dweck, 2020) and enhancing student performance (Darnon et al., 2018; Miller & Srougi, 2021; Stephens et al., 2014).

Moreover, FGS might profit from study groups focusing on topics relevant to their majors when preparing for admission tests or in their transition to college more than their colleagues. FGS face diverging cultures at the beginning of their studies (Phillips et al., 2020). The competitive, independence-centred culture at Western universities opposes the interdependent values (such as community beliefs) common in FGS (Stephens et al., 2014). Formerly mentioned spirit leads to a decline in learning desire in FGS (Sommet et al., 2015). For FGS, focusing on interdependent motives like being a community is especially useful. Those learning communities can support FGS in their “intellectual and interpersonal development” and support confrontation with differing standpoints (Markle & Stelzriede, 2020; Phillips et al., 2020).

More than that, programs that foster such cooperative communities help reduce the performance gap between students of different statuses, as well as enhance FGS' well-being and sense of fit (Cheong et al., 2021; Phillips et al., 2020; Stephens et al., 2012). As a result, such communities might help close the intellectual and social gaps between FGS and CGS (Markle & Stelzriede, 2020).

The exploratory moderation analysis revealed a tendency of FGS to be influenced by wakefulness. Students with low economic resources might have to work beside their studies which applies to FGS more often (Stebleton et al., 2014). As a result, this difference could have a real-world impact in a highly demanding, academic setting.

Limitations

In the following section, I consider the limitations of this thesis. The sample composition, including only psychology students, might not represent the population of university students in Austria for the previously discussed reasons. More than that, the sample of this thesis comprised twice as many females as male participants, which deviates from the general student population (54% female) in Austria (Unger et al., 2019).

During the baseline video clips, technical issues occurred. The hardware in the lab used for the data collection was unable to process the video and audio of the video clips adequately. Some participants reported lagging images while the audio kept on playing. As a result, the audio finished about two minutes earlier than the video clip. Several participants mentioned during debriefing that they were confused and irritated. Some even thought the video issues were staged and part of the study. Thus, those issues could have disturbed them. Even more so, these incidences might have distorted the purpose of the baseline and raised their stress levels before starting the study.

Additional limitations concern the methodology of the study. The questions regarding self-perceived talent ask the participant to describe their intellectual talent in two items on a seven-point Likert scale. The underlying construct can only be tested with an Exploratory Factor Analysis on questionnaires containing three or more items, such as items regarding the university environment. Without testing the questionnaire on its statistical fit to one factor, one cannot assume those items illustrate the construct of self-perceived talent. As of now, it is theoretically possible that the first item measures self-perceived talent and the other one academic self-efficacy.

Questionnaires themselves could pose a limitation. Students might be inclined to answer in a socially acceptable manner, rather than their actual thoughts. Besides, one might not know the answer to a question or could distort the perception of the past to keep them in

line with their beliefs. Participants were asked about their importance of success after the N-Back task. According to the cognitive dissonance theory (Festinger, 1957), people want to keep their attitudes and behavior consistent. In this case, participants might have changed their perception based on the feeling of how hard the task was. Contrary to this assumption, performance on the difficult N-5 task did not correlate with the importance of completing the task. Therefore, I cannot infer that this type of bias is present in this case.

Conclusion

Despite the mixed results, this thesis offers informative insights. Previously observed differences between FGS and CGS might not be present in European psychology student samples. For one, fewer FGS were present in this sample of psychology students compared to the student population in Austria. As discussed, this could be related to the strenuous admission test that might have even kept FGS from applying in the first place. Only those students that are highly resilient or have the resources to pay for specialized preparation are likely to pass the procedure. Those remaining students could gain confidence from their successful transition and deviate from other FGS.

Upcoming research could examine study programmes with and without admission tests regarding relationships between student status and performance. Nonetheless, FGS might feel less anxiety and threat since they make up two-thirds of students at Austrian universities. Thus, FGS are more likely to find other colleagues that share similar experiences. As a result, they might be able to build a social network more quickly which plays a more central role for FGS (Phillips et al., 2020). Such a network could help them cope better with adversity when moving to university.

Finally, an educational shift must occur to support and foster FGS - from a talent-focused environment with a worldview of fixed intelligence to an emphasis on effort and a growth mindset. If implemented early in high school and in their transition to university, this could enable learning motivation and close the gap between FGS and CGS. To further guide FGS, communities will be profitable and lessen the strain in their transition to university.

References

Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, White women. *Health Psychology*, *19*(6), 586–592. https://doi.org/10.1037/0278-6133.19.6.586

Banchefsky, S., Lewis, K. L., & Ito, T. A. (2019). The Role of Social and Ability Belonging in Men's and Women's pSTEM Persistence. *Frontiers in Psychology*, *10*. https://www.frontiersin.org/article/10.3389/fpsyg.2019.02386

Bauer, C., & Hannover, B. (under review). *Am I talented enough? How systematic differences in self-perceived talent contribute to first-generation students' academic disadvantage*.

Bauer, C., Hannover, B., & Job, V. (under review). *Threatening admission tests—May the introduction of intellectual admission tests deter prospective first-generation students from university?*

Bian, L., Leslie, S.-J., Murphy, M. C., & Cimpian, A. (2018). Messages about brilliance undermine women's interest in educational and professional opportunities. *Journal of Experimental Social Psychology*, *76*, 404–420. https://doi.org/10.1016/j.jesp.2017.11.006

Blatt, L., Schunn, C. D., Votruba-Drzal, E., & Rottman, B. M. (2020). Variation in which key motivational and academic resources relate to academic performance disparities across introductory college courses. *International Journal of Stem Education*, *7*(1), 58. https://doi.org/10.1186/s40594-020-00253-0

Bråten, I., Lien, A., & Nietfeld, J. (2017). Examining the Effects of Task Instructions to Induce Implicit Theories of Intelligence on a Rational Thinking Task. *Zeitschrift Für Psychologie*, *225*(2), 146–156. https://doi.org/10.1027/2151-2604/a000291

Brehm, J. W., & Self, E. A. (1989). The Intensity of Motivation. *Annual Review of Psychology*, *40*(1), 109–131. https://doi.org/10.1146/annurev.ps.40.020189.000545

Cataldi, E., Bennett, C., & Chen, X. (2018). First-Generation Students: College Access, Persistence, and Postbachelor's Outcomes. *National Center for Education Statistics*, *2018*(421).

Chen, S., Binning, K. R., Manke, K. J., Brady, S. T., McGreevy, E. M., Betancur, L., Limeri, L. B., & Kaufmann, N. (2021). Am I a Science Person? A Strong Science Identity Bolsters Minority Students' Sense of Belonging and Performance in College. *Personality and Social Psychology Bulletin*, *47*(4), 593–606.

https://doi.org/10.1177/0146167220936480

Cheong, Y., Gauvain, M., & Palbusa, J. A. (2021). Communication With Friends and the Academic Adjustment of First- and Non-First-Generation Students in the First Year of College. *Journal of College Student Retention-Research Theory & Practice*, *23*(2), 393–409. https://doi.org/10.1177/1521025119834253

Cimpian, A., Mu, Y., & Erickson, L. C. (2012). Who Is Good at This Game? Linking an Activity to a Social Category Undermines Children's Achievement. *Psychological Science*, *23*(5), 533–541. https://doi.org/10.1177/0956797611429803

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed). L. Erlbaum Associates.

Collier, P. J., & Morgan, D. L. (2008). "Is that paper really due today?": Differences in first-generation and traditional college students' understandings of faculty expectations. *Higher Education*, *55*(4), 425–446. https://doi.org/10.1007/s10734-007-9065-5

Covarrubias, R., Jones, J., & Johnson, R. (2020). Exploring the Links Between Parent–Student Conversations About College, Academic Self-Concepts, and Grades for First-Generation College Students. *Journal of College Student Retention: Research, Theory & Practice*, *22*(3), 464–480. https://doi.org/10.1177/1521025118770634

Covarrubias, R., Romero, A., & Trivelli, M. (2015). Family Achievement Guilt and Mental Well-being of College Students. *Journal of Child and Family Studies*, *24*(7), 2031–2037. https://doi.org/10.1007/s10826-014-0003-8

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297–334. https://doi.org/10.1007/BF02310555

Cury, F., Fonséca, D. D., Rufo, M., & Sarrazin, P. (2002). Perceptions of Competence, Implicit Theory of Ability, Perception of Motivational Climate, and Achievement Goals: A Test of the Trichotomous Conceptualization of Endorsement of Achievement Motivation in the Physical Education Setting. *Perceptual and Motor Skills*, *95*(1), 233–244. https://doi.org/10.2466/pms.2002.95.1.233

Darnon, C., Jury, M., & Aelenei, C. (2018). Who benefits from mastery-approach and performance-approach goals in college? Students' social class as a moderator of the link between goals and grade. *European Journal of Psychology of Education*, *33*(4), 713–726. https://doi.org/10.1007/s10212-017-0351-z

Doménech-Betoret, F., Abellán-Roselló, L., & Gómez-Artiga, A. (2017). Self-Efficacy, Satisfaction, and Academic Achievement: The Mediator Role of Students' Expectancy-Value Beliefs. *Frontiers in Psychology*, *8*.

https://doi.org/10.3389/fpsyg.2017.01193

Döring, N., & Bortz, J. (2016). *Forschungsmethoden und Evaluation in den Sozial- und Humanwissenschaften*. Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-41089-5

Duffy, R. D., Kim, H. J., Gensmer, N. P., Pendleton, L. H., Boren, S., & Garriott, P. O. (2020). Testing a Critical Cultural Wealth Model of Well-Being Among First-Generation Students. *Journal of Counseling Psychology*, *67*(2), 171–183. https://doi.org/10.1037/cou0000388

Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology*, *80*(3), 501–519. https://doi.org/10.1037/0022-3514.80.3.501

Engle, J. L., & Tinto, V. (2008). *Moving Beyond Access: College Success for Low-Income, First-Generation Students.* Pell Institute for the Study of Opportunity in Higher Education. https://www.semanticscholar.org/paper/Moving-Beyond-Access%3A-College-Success-for-Students.-Engle-Tinto/95d14b8d1d2c4a3ddec3a0a957458ce8e6cdfaab

Festinger, L. (1957). *A Theory of Cognitive Dissonance*. Stanford University Press. https://doi.org/10.1515/9781503620766

Fragaszy, D., & Liu, Q. (2012). Instrumental Behavior, Problem-Solving, and Tool Use in Nonhuman Animals. In N. M. Seel (Ed.), *Encyclopedia of the Sciences of Learning* (pp. 1579–1582). Springer US. https://doi.org/10.1007/978-1-4419-1428-6_928

Freeman, T. M., Anderman, L. H., & Jensen, J. M. (2007). Sense of Belonging in College Freshmen at the Classroom and Campus Levels. *The Journal of Experimental Education*, *75*(3), 203–220. https://doi.org/10.3200/JEXE.75.3.203-220

Garriott, P. O., Hudyma, A., Keene, C., & Santiago, D. (2015). Social cognitive predictors of first- and non-first-generation college students' academic and life satisfaction. *Journal of Counseling Psychology*, *62*(2), 253–263. https://doi.org/10.1037/cou0000066

Gillen-O'Neel, C. (2021). Sense of Belonging and Student Engagement: A Daily Study of First- and Continuing-Generation College Students. *Research in Higher Education*, *62*(1), 45–71. https://doi.org/10.1007/s11162-019-09570-y

Holmes, D. L., & Slate, J. R. (2017). Differences in GPA by Gender and Ethnicity/Race as a Function of First-Generation Status for Community College Students. *Global Journal of Human-Social Science Research*. https://socialscienceresearch.org/index.php/GJHSS/article/view/2232

Hopstock, P. J., & Pelczar, M. P. (2011). Technical Report and User's Guide for the Program for International Student Assessment (PISA): 2009 Data Files and Database with US Specific Variables. NCES 2011-025. *National Center for Education Statistics*.

House, L. A., Neal, C., & Kolb, J. (2020). Supporting the Mental Health Needs of First Generation College Students. *Journal of College Student Psychotherapy*, *34*(2), 157–167. https://doi.org/10.1080/87568225.2019.1578940

Hunt-White, T. (2018). *2015-16 National Postsecondary Student Aid Study (NPSAS:16)*. https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2018484

Jetten, J., Iyer, A., Tsivrikos, D., & Young, B. M. (2008). When is individual mobility costly? The role of economic and social identity factors. *European Journal of Social Psychology*, *38*(5), 866–879. https://doi.org/10.1002/ejsp.471

Johnston, R., Jones, K., & Manley, D. (2018). Confounding and collinearity in regression analysis: A cautionary tale and an alternative procedure, illustrated by studies of British voting behaviour. *Quality & Quantity*, *52*(4), 1957–1976. https://doi.org/10.1007/s11135-017-0584-6

Jones, E. J., & Schreier, H. M. C. (2022). First-generation College Students Have Greater Systemic Inflammation than Continuing-Generation College Students Following the Initial College Transition: A Brief Report. *Annals of Behavioral Medicine*, kaac008. https://doi.org/10.1093/abm/kaac008

Jury, M., Smeding, A., Court, M., & Darnon, C. (2015). When first-generation students succeed at university: On the link between social class, academic performance, and performance-avoidance goals. *Contemporary Educational Psychology*, *41*, 25–36. https://doi.org/10.1016/j.cedpsych.2014.11.001

Jury, M., Smeding, A., & Darnon, C. (2015). First-generation students underperformance at university: The impact of the function of selection. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.00710

Kirchner, W. K. (1958). Age differences in short-term retention of rapidly changing information. *Journal of Experimental Psychology*, *55*(4), 352–358. https://doi.org/10.1037/h0043688

Lanfranchi, P. A., Pépin, J.-L., & Somers, V. K. (2017). Cardiovascular Physiology. In *Principles and Practice of Sleep Medicine* (pp. 142-154.e4). Elsevier. https://doi.org/10.1016/B978-0-323-24288-2.00014-3

LeBouef, S., & Dworkin, J. (2021). First-Generation College Students and Family Support: A Critical Review of Empirical Research Literature. *Education Sciences*, *11*(6), 294.

https://doi.org/10.3390/educsci11060294

Lecy, N. (2021). The role of relationships and sense of belonging among first-generation, low-income youth on future college entrance. *Social Psychology of Education*, *24*(3), 679–689. https://doi.org/10.1007/s11218-021-09625-y

Major, B., Quinton, W. J., & Schmader, T. (2003). Attributions to discrimination and self-esteem: Impact of group identification and situational ambiguity. *Journal of Experimental Social Psychology*, *39*(3), 220–231. https://doi.org/10.1016/S0022-1031(02)00547-4

Markle, G., & Stelzriede, D. D. (2020). Comparing First-Generation Students to Continuing-Generation Students and the Impact of a First-Generation Learning Community. *Innovative Higher Education*, *45*(4), 285–298. https://doi.org/10.1007/s10755-020-09502-0

Miller, H. B., & Srougi, M. C. (2021). Growth mindset interventions improve academic performance but not mindset in biochemistry. *Biochemistry and Molecular Biology Education*, *49*(5), 748–757. https://doi.org/10.1002/bmb.21556

Obrist, P. A. (1981). *Cardiovascular Psychophysiology*. Springer US. https://doi.org/10.1007/978-1-4684-8491-5

Palbusa, J. A., & Gauvain, M. (2017). Parent–Student Communication About College and Freshman Grades in First-Generation and Non–First-Generation Students. *Journal of College Student Development*, *58*(1), 107–112. https://doi.org/10.1353/csd.2017.0007

Park, D., Schaeffer, M. W., Nolla, K. M., Levine, S. C., & Beilock, S. L. (2017). How do generic statements impact performance? Evidence for entity beliefs. *Developmental Science*, *20*(2). https://doi.org/10.1111/desc.12396

Pedler, M. L., Willis, R., & Nieuwoudt, J. E. (2022). A sense of belonging at university: Student retention, motivation and enjoyment. *Journal of Further and Higher Education*, *46*(3), 397–408. https://doi.org/10.1080/0309877X.2021.1955844

Phillips, L. T., Stephens, N. M., Townsend, S. S. M., & Goudeau, S. (2020). Access is not enough: Cultural mismatch persists to limit first-generation students' opportunities for achievement throughout college. *Journal of Personality and Social Psychology*, *119*(5), 1112–1131. https://doi.org/10.1037/pspi0000234

Pratt, I. S., Harwood, H. B., Cavazos, J. T., & Ditzfeld, C. P. (2019). Should I Stay or Should I Go? Retention in First-Generation College Students. *Journal of College Student Retention: Research, Theory & Practice*, *21*(1), 105–118. https://doi.org/10.1177/1521025117690868

Ramos-Sánchez, L., & Nichols, L. (2007). Self-Efficacy of First-Generation and Non-First-Generation College Students: The Relationship With Academic Performance and College Adjustment. *Journal of College Counseling*, *10*(1), 6–18. https://doi.org/10.1002/j.2161-1882.2007.tb00002.x

Richter, M., Friedrich, A., & Gendolla, G. H. E. (2008). Task difficulty effects on cardiac activity. *Psychophysiology*, *45*(5), 869–875. https://doi.org/10.1111/j.1469-8986.2008.00688.x

Roksa, J., & Kinsley, P. (2019). The Role of Family Support in Facilitating Academic Success of Low-Income Students. *Research in Higher Education*, *60*(4), 415–436. https://doi.org/10.1007/s11162-018-9517-z

Silvia, P. J., McCord, D. M., & Gendolla, G. H. E. (2010). Self-focused attention, performance expectancies, and the intensity of effort: Do people try harder for harder goals? *Motivation and Emotion*, *34*(4), 363–370. https://doi.org/10.1007/s11031-010-9192-7

Smeding, A., Darnon, C., Souchal, C., Toczek-Capelle, M.-C., & Butera, F. (2013). Reducing the Socio-Economic Status Achievement Gap at University by Promoting Mastery-Oriented Assessment. *PLoS ONE*, *8*(8), e71678. https://doi.org/10.1371/journal.pone.0071678

Sommet, N., Quiamzade, A., Jury, M., & Mugny, G. (2015). The student-institution fit at university: Interactive effects of academic competition and social class on achievement goals. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.00769

Stebleton, M. J., Soria, K. M., & Huesman Jr., R. L. (2014). First-Generation Students' Sense of Belonging, Mental Health, and Use of Counseling Services at Public Research Universities. *Journal of College Counseling*, *17*(1), 6–20. https://doi.org/10.1002/j.2161-1882.2014.00044.x

Stephens, N. M., Fryberg, S. A., Markus, H. R., Johnson, C. S., & Covarrubias, R. (2012). Unseen disadvantage: How American universities' focus on independence undermines the academic performance of first-generation college students. *Journal of Personality and Social Psychology*, *102*(6), 1178–1197. https://doi.org/10.1037/a0027143

Stephens, N. M., Hamedani, M. G., & Destin, M. (2014). Closing the Social-Class Achievement Gap: A Difference-Education Intervention Improves First-Generation Students' Academic Performance and All Students' College Transition. *Psychological Science*, *25*(4), 943–953. https://doi.org/10.1177/0956797613518349

Steyer, R., Schwenkmezger, P., & Eid, M. (1997). *Der mehrdimensionale Befindlichkeitsfragebogen: (MDBF)* (UBHD-65713173). Test.

Stout, J. G., & Blaney, J. M. (2017). "But it doesn't come naturally": How effort expenditure shapes the benefit of growth mindset on women's sense of intellectual belonging in computing. *Computer Science Education*, *27*(3–4), 215–228. https://doi.org/10.1080/08993408.2018.1437115

Sy, S. R., Fong, K., Carter, R., Boehme, J., & Alpert, A. (2011). Parent Support and Stress among First-Generation and Continuing-Generation Female Students during the Transition to College. *Journal of College Student Retention: Research, Theory & Practice*, *13*(3), 383–398. https://doi.org/10.2190/CS.13.3.g

Tate, K. A., Fouad, N. A., Marks, L. R., Young, G., Guzman, E., & Williams, E. G. (2015). Underrepresented First-Generation, Low-Income College Students' Pursuit of a Graduate Education: Investigating the Influence of Self-Efficacy, Coping Efficacy, and Family Influence. *Journal of Career Assessment*, *23*(3), 427–441. https://doi.org/10.1177/1069072714547498

Tellhed, U., Bäckström, M., & Björklund, F. (2017). Will I Fit in and Do Well? The Importance of Social Belongingness and Self-Efficacy for Explaining Gender Differences in Interest in STEM and HEED Majors. *Sex Roles*, *77*(1–2), 86–96. https://doi.org/10.1007/s11199-016-0694-y

Toutkoushian, R. K., May-Trifiletti, J. A., & Clayton, A. B. (2021). From "First in Family" to "First to Finish": Does College Graduation Vary by How First-Generation College Status Is Defined? *Educational Policy*, *35*(3), 481–521. https://doi.org/10.1177/0895904818823753

Unger, M., Zaussinger, S., Binder, D., Dibiasi, A., Engleder, J., Schubert, N., Terzieva, B., Thaler, B., & Zucha, V. (2019). *Studierenden-Sozialerhebung 2019 Kernbericht*. 469.

Veldman, J., Meeussen, L., & van Laar, C. (2022). Social background concealment among first-generation students: The role of social belonging and academic achievement concerns. *Group Processes & Intergroup Relations*, 13684302221089116. https://doi.org/10.1177/13684302221089116

Wang, K., Stroebe, K., & Dovidio, J. F. (2012). Stigma consciousness and prejudice ambiguity: Can it be adaptive to perceive the world as biased? *Personality and Individual Differences*, *53*(3), 241–245. https://doi.org/10.1016/j.paid.2012.03.021

Wittner, B., & Kauffeld, S. (2021). Social capital and career planning amongst first generation and non-first generation high school and college students in Germany: A

social network analysis approach. *International Journal for Educational and Vocational Guidance*. https://doi.org/10.1007/s10775-021-09513-z

Wolcott, M. D., McLaughlin, J. E., Hann, A., Miklavec, A., Beck Dallaghan, G. L., Rhoney, D. H., & Zomorodi, M. (2021). A review to characterise and map the growth mindset theory in health professions education. *Medical Education*, *55*(4), 430–440. https://doi.org/10.1111/medu.14381

Wright, R. (1996). Brehm's theory of motivation as a model of effort and cardiovascular response. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 424–453). The Guilford Press.

Wright, R. (2009). Drained: Studies of Fatigue Influence on Engagement and Associated Cardiovascular Responses. In L. Sher (Ed.), *Psychological factors and cardiovascular disorders: The role of stress and psychosocial influences*. Nova Science.

Wright, R., Murray, J. B., Storey, P. L., & Williams, B. J. (1997). Ability analysis of gender relevance and sex differences in cardiovascular response to behavioral challenge. *Journal of Personality and Social Psychology*, *73*(2), 405–417. https://doi.org/10.1037/0022-3514.73.2.405

Yeager, D. S., & Dweck, C. S. (2020). What can be learned from growth mindset controversies? *American Psychologist*, *75*(9), 1269–1284. https://doi.org/10.1037/amp0000794

Figures

Tables

Abbreviations

Abbreviation	Term
CGS	Continuing-generation students
GPA	Grade Point Average
FGS	First-generation student
PEP	Pre-ejection period

Supplemental Material

Abstract

First-generation students (FGS) – people whose parents have not earned a bachelor's degree - form the largest group of disadvantaged undergraduates besides women. Their families often have low socioeconomic status and struggle with financial difficulties. FGS must invest more resources than their colleagues and might wrongfully attribute this additional effort to a lack of talent. Lower self-perceived talent could explain why they have lower grades, take longer to complete their studies and are less likely to graduate. Prior studies have mainly focused on retrospective performance data forming a gap in the literature concerning the mechanism at play.

This thesis tests the effects of perceived ability on performance predicted by the Motivational Intensity theory in a quasi-experimental design. The sample, 200 psychology students, was examined at a laboratory of the Faculty of Psychology at the University of Vienna. Based on their affiliation to FGS and continuing-generation students (CGS), I compared participants regarding performance, self-perceived talent, and perceived threat.

The results indicate that student status did not influence performance, self-perceived talent, or perceived threat. This outcome supports my first hypothesis stating that students do not vary in performance at the beginning of an intellectual ability task. However, those invariances conflict with my second hypothesis in which I predicted a more rapid decline in performance for FGS.

A possible explanation for the lack of performance difference might originate in the sample composition comprising merely psychology students. The obligatory admission procedure preselects students. Thus, the self-perceived talent in our sample of FGS could deviate from the extent shared within the population of FGS. Finally, I draw conclusions and future ideas that derive from the master's thesis.

Abstract German

„First-generation students“ (FGS) - deren Eltern keinen Bachelor-Abschluss erworben haben - bilden neben den Frauen die größte Gruppe benachteiligter Studierender. Ihre Familien haben oft einen niedrigen sozioökonomischen Status und kämpfen mit finanziellen Schwierigkeiten. FGS müssen daher mehr Ressourcen investieren als ihre Kollegen und könnten diesen zusätzlichen Aufwand fälschlicherweise einem Mangel an Talent zuschreiben. Eine geringere Selbsteinschätzung des Talents könnte erklären, warum sie schlechtere Noten haben, länger brauchen, um ihr Studium abzuschließen, und eine geringere Wahrscheinlichkeit haben, es zu beenden. Frühere Studien haben sich hauptsächlich auf die Einbeziehung retrospektiver Leistungsdaten konzentriert.

In dieser Arbeit werden die von der Theorie der Motivationsintensität vorhergesagten Auswirkungen der wahrgenommenen Fähigkeit auf die Leistung in einem quasi-experimentellen Design getestet. Die Stichprobe, 200 Psychologiestudierende, wurde in einem Labor der Fakultät für Psychologie der Universität Wien untersucht. Basierend auf ihrer Zugehörigkeit zu FGS- und „continuing-generation students“ (CGS) verglich ich die Teilnehmer hinsichtlich Leistung, selbst wahrgenommenem Talent und wahrgenommener Bedrohung.

Die Ergebnisse zeigen, dass die Zugehörigkeit keinen Einfluss auf die Leistung, das selbst wahrgenommene Talent oder die wahrgenommene Bedrohung hatte. Dieses Ergebnis stützt meine erste Hypothese, die besagt, dass sich die Schüler zu Beginn der intellektuellen Aufgabe in ihrer Leistung nicht unterscheiden. Die fehlenden Differenzen stehen jedoch im Widerspruch zu meiner zweiten Hypothese, in der ich einen schnelleren Leistungsabfall für FGS voraussagte.

Eine mögliche Erklärung für das Fehlen von Leistungsunterschieden könnte in der Zusammensetzung der Stichprobe liegen, die nur aus Psychologiestudenten besteht. Das obligatorische Aufnahmeverfahren führt zu einer Vorselektion der Studierenden. Somit könnte das selbst wahrgenommene Talent in unserer Stichprobe aus FGS von dem in der Population der FGS geteilten Ausmaß abweichen. Abschließend ziehe ich Schlussfolgerungen und zukünftige Ideen, die sich aus der Masterarbeit ergeben.

Additional tables

Table 5

Difference between FGS and CGS in grades average at university

	W	**p**
Grade averages	617.50	.59

Note. Mann-Whitney U test.

Test of Normality (Shapiro-Wilk) deviation from normality in both groups (p <. 01)

Table 6

Correlation between N-5 performance and perceived importance

	Pearson's r	**p**
Importance – N-5 performance	-.01	.95

Materials

MDBF - Pre-Task

Bitte geben Sie an, wie Sie sich jetzt in diesem Moment fühlen.

	gar nicht				**sehr**
1. zufrieden	1	2	3	4	5
2. schlecht	1	2	3	4	5
3. gut	1	2	3	4	5
4. unwohl	1	2	3	4	5
5. ausgeruht	1	2	3	4	5
6. schlapp	1	2	3	4	5
7. müde	1	2	3	4	5
8. munter	1	2	3	4	5
9. ruhelos	1	2	3	4	5
10. gelassen	1	2	3	4	5
11. unruhig	1	2	3	4	5
12. entspannt	1	2	3	4	5

MDBF - Post-Task

Bitte geben Sie an, wie Sie sich jetzt in diesem Moment fühlen.

	gar nicht				**sehr**
1. wohl	1	2	3	4	5
2. unglücklich	1	2	3	4	5
3. unzufrieden	1	2	3	4	5
4. glücklich	1	2	3	4	5
5. schläfrig	1	2	3	4	5
6. wach	1	2	3	4	5

7. frisch	1	2	3	4	5
8. ermattet	1	2	3	4	5
9. ausgeglichen	1	2	3	4	5
10. angespannt	1	2	3	4	5
11. nervös	1	2	3	4	5
12. ruhig	1	2	3	4	5

Self-perceived talent

In Bezug auf Ihre **intellektuellen Fähigkeiten**: Wie sehr treffen die folgenden Aussagen Ihrer Meinung nach auf Sie zu?

	Trifft gar nicht zu (1)	Trifft sehr wenig zu (2)	Trifft eher nicht zu (3)	Trifft mittelmäßig zu (4)	Trifft eher zu (5)	Trifft sehr zu (6)	Trifft völlig zu (7)
Ich halte mich für intellektuell begabt. (1)	○	○	○	○	○	○	○
Ich halte mich für intellektuell talentiert. (2)	○	○	○	○	○	○	○

Perceived importance of task

1. Wie wichtig war es Ihnen, im intellektuellen Fähigkeitstest erfolgreich zu sein?

0 1 2 3 4 5 6 7 8 9 10

Überhaupt nicht wichtig — Sehr wichtig

Perceived difficulty

2. Wie schwierig war es für Sie, im intellektuellen Fähigkeitstest erfolgreich zu sein?

0 1 2 3 4 5 6 7 8 9 10

Nicht schwierig — sehr schwierig

Perceived threat during first task

Wenn Sie daran denken, wie Sie sich gerade bei der Aufgabe gefühlt haben- inwiefern treffen die folgenden Aussagen zu?

	Trifft gar nicht zu (1)	Trifft sehr wenig zu (4)	Trifft eher nicht zu (5)	Trifft mittelmäßig zu (6)	Trifft eher zu (7)	Trifft sehr zu (8)	Trifft völlig zu (9)
Ich habe mich nervös gefühlt. (1)	○	○	○	○	○	○	○
Ich habe mich angespannt gefühlt. (4)	○	○	○	○	○	○	○
Ich habe mich eingeschüchtert gefühlt. (5)	○	○	○	○	○	○	○
Ich habe mich begeistert gefühlt. (6)	○	○	○	○	○	○	○
Ich habe mich entspannt gefühlt. (7)	○	○	○	○	○	○	○
Ich habe mich motiviert gefühlt. (8)	○	○	○	○	○	○	○
Ich habe mich gestresst gefühlt. (9)	○	○	○	○	○	○	○

Number of books at home

Wenn Sie an Ihre Kindheit denken und wie Sie aufgewachsen sind: Wie viele Bücher gab es bei Ihnen zu Hause? (Hinweis: Auf einen Meter Regalbrett passen ungefähr 40 Bücher)

- keine
- 1-10
- 11-50
- 51-100
- 101-250
- 251-500
- mehr als 500

Subjective class:

Stellen Sie sich bitte einer Leiter mit 10 Sprossen vor, die zeigen soll, wo die Menschen in Österreich stehen.

Ganz oben stehen die Menschen mit dem meisten Geld, der höchsten Bildung und den besten Jobs. Ganz unten stehen diejenigen mit dem wenigsten Geld, der niedrigsten Bildung und den schlechtesten Jobs oder ohne Job. Je höher man auf der Leiter steht, desto näher ist man den Personen ganz oben, je niedriger, desto näher den Personen ganz unten.

Wo würden Sie sich auf der Leister platzieren?

Bitte kreuzen Sie an, auf welcher Sprosse Sie Ihrer Meinung nach in Ihrer aktuellen Lebensphase im Verhältnis zu anderen Menschen in Österreich stehen.

- ○ 1 (1)
- ○ 2 (2)
- ○ 3 (3)
- ○ 4 (4)
- ○ 5 (5)
- ○ 6 (6)
- ○ 7 (7)
- ○ 8 (8)
- ○ 9 (9)

Age

Wie alt sind Sie? _____

Gender

Mit welchem Geschlecht identifizieren Sie sich?

Männlich, weiblich, sonstiges

Area of study

Was studieren Sie?

- Psychologie
- Sonstiges, und zwar:

  _____

Time spent studying

Im wievielten Semester studieren Sie gerade? (**Gesamt-Anzahl** der Semester an einer Hochschule)

- ○ 1 (4)
- ○ 2 (5)
- ○ 3 (6)
- ○ 4 (7)
- ○ 5 (8)
- ○ 6 (9)
- ○ 7 (10)
- ○ 8 (11)
- ○ 9 (12)
- ○ 10 (13)
- ○ Anderes, und zwar: (14) _____

Prior performance levels (at uni etc)

Was ist Ihre momentane Durchschnittsnote im Studium?

_____

Was war Ihre Durchschnittsnote bei Ihrer Hochschulzugangsberechtigung (z.B. Abitur)?

_____

First-generation student status

Was ist der höchste Bildungsabschluss Ihrer Mutter? (Wenn Ihre Mutter außerhalb Deutschlands ausgebildet wurde: Welchem Abschluss entspricht der Abschluss am ehesten?)

- ○ kein Schulabschluss (1)
- ○ Hauptschulabschluss (2)
- ○ Realschulabschluss (3)
- ○ abgeschlossene Lehre/ Berufsausbildung (4)
- ○ Abitur/ Matura (5)
- ○ Abschluss einer Fachhochschule (6)
- ○ Abschluss einer Universität (z.B. Bachelor, Master, Diplom, Staatsexamen) (7)
- ○ Promotion (8)
- ○ Habilitation (9)
- ○ Sonstiges, und zwar: (10) _____

Was ist der höchste Bildungsabschluss Ihres Vaters? (Wenn Ihr Vater außerhalb Deutschlands ausgebildet wurde: Welchem Abschluss entspricht der Abschluss am ehesten?)

- ○ kein Schulabschluss (1)
- ○ Hauptschulabschluss (2)
- ○ Realschulabschluss (3)
- ○ abgeschlossene Lehre/ Berufsausbildung (4)
- ○ Abitur/ Matura (5)
- ○ Abschluss einer Fachhochschule (6)
- ○ Abschluss einer Universität (z.B. Bachelor, Master, Diplom, Staatsexamen) (7)
- ○ Promotion (8)
- ○ Habilitation (9)
- ○ Sonstiges, und zwar: (10) _____