

Individual's Time Perspectives and its Relation to Academic Performance and Career Aspiration Levels

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Abstract

This study addresses the question whether individuals' perception of time is related to academic performance. Using a unique data set of 471 students, I explore if the time perspectives of students have an effect on academic performance, certainty about future career choices and future career aspiration levels. The results indicate a positive relation between future-positive oriented students and their academic performance and a negative relation between present-hedonistic and present-fatalistic oriented students and their academic performance. The results contribute to the understanding of how individual deep-level characteristics affect academic performance. Moreover, future-positive and future-negative oriented students have a relation to the individual's certainty regarding future career choices. Also, future-positive oriented as well as present-hedonistic oriented individuals influence the future career aspiration level.

Keywords

Individual level, time perspectives, academic performance, certainty about future career choices, career aspiration level

1 Introduction

An important topic that arises relates to academic performance and why some individuals achieve a better performance than others (Stajkovic et al., 2018; Barnett et al., 2020; González et al., 2020). From the very beginning, personal traits such as extraversion, conscientiousness, neuroticism, openness, and agreeableness (Big Five) are relevant factors that can explain differences in academic performance (Laidra et al., 2007; Rammstedt, 2007; Poropat, 2009; Stajkovic et al., 2018). Lately, psychologists have discussed whether there are more than five traits. A new candidate for being a stable trait is the time perspective. The time perspective theory comprises the extent to which individuals are influenced by the future, present, and past (Lewin 1942; Zimbardo and Boyd 1999).

According to the socio-emotional selectivity theory, individuals differ in their ability to assess time and arrange different frames and periods (Carstensen et al., 1999). An individual's subjective perception of time has a far-reaching influence on human actions regarding motivation, emotions and objectives. Therefore, differences in individual time perspectives may contribute to the explanation as to why some students are more successful in their studies than others (Carstensen, 2006). There are several studies investigating the five time perspectives or, in particular, the future and present time perspectives and academic performance (Zimbardo and Boyd, 1999; Barber et al., 2009; Adelabu, 2007; Perkins et al., 2015; Barnett et al., 2020; González et al., 2020). Zimbardo and Boyd (1999), Adelabu (2007), Barber et al. (2009), Barnett et al. (2020) as well as González et al. (2020) found positive effects for future orientation and academic performance. Moreover, Perkins et al. (2015) explored a negative effect for present-fatalistic orientation of individuals and academic performance. Until now, research which includes all six time perspectives is in its infancy. There are only very few empirical studies on six time perspectives that show a significant relation to academic performance. Mello and Worell (2006) investigated in six time perspectives (see the approach of Gonzalez and Zimbardo, 1985) and found a positive relationship between future-positive orientation and academic performance as well as a negative relationship between present-fatalistic-orientated individuals and academic performance.

The main objective of this study is to analyze a multidimensional framework of time perspectives by considering all six time perspectives. In addition to the literature on the traditional model of Zimbardo and Boyd (1999), who considered five perspectives (future, present-hedonistic, present-fatalistic, past-positive and past-negative), this study adds a further recent differentiation of future time perspective. The classification by Košťál et al. (2016) is

used, which also considers two time perspectives for past and present orientation, but extends the approach of Zimbardo and Boyd (1999) by dividing the future time perspective into two perspectives: future-positive and future-negative. To the best of my knowledge, there are no studies as of yet that analyze the relation regarding the inventory of Košťál et al. (2016) regarding all six time perspectives and academic performance as well as the relation to the certainty about future career choices and career aspiration levels. This results in the underlying research question: Do time perspectives influence students' academic performance?

The remainder of the study is structured as follows. First, I outline the theoretical concept of time perspectives as stated by Zimbardo and Boyd (1999) and Košťál et al. (2016). Second, I outline the empirical construct of time perspectives predominantly used and review the literature on academic performance focusing on the different time perspectives. Subsequently, I present the used methods for the empirical analysis and test whether a certain time perspective can influence the individual's academic performance. In the chapter "Further Findings", I investigate if a certain time perspective can influence the certainty about future career choices as well as future career aspiration levels. Finally, I discuss the findings and conclude.

2 Time Perspective Theory

Time processes have been studied in a variety of ways by anthropologists, philosophers, sociologists and psychologists. There are different approaches regarding the perception of time. On the one hand, there is the objective time that is universal, measurable, and homogeneous, e.g., the clock or geographical time. It is used in time budgets or in research on time use (Robinson et al., 1999; Pentland et al., 1999). One approach is the pace of life from Levine and Norenzayan (1999). They measure the pace of life in different countries by using the walking and working speed as well as the clock accuracy in capital cities. On the other hand, there is the subjective time - in other words, lived or psychological time. The time is thereby processed by the individual human mind (Gorman and Wessman, 1977). According to this subjective paradigm, it has been investigated in subjective duration of experience, time estimation, time personality, time intensity, time congruity, time urgency, polychronicity and monochronicity as well as time perspectives (McGrath, 1988; Kaufman et al., 1991; Zimbardo and Boyd, 1999; Waller et al., 2001; Boniwell, 2005). In this study, I focus on time perspectives as described in the psychological literature.

Psychologists argue that it is possible to include temporal orientation, experiences and attitudes as persisting personality traits (Gorman and Wessman, 1977). Hence, the definition of time perspectives can be seen as a process where personal experiences flow into psychological time

frames of past, present, and future (Nuttin 1964; Zimbardo and Boyd 1999). Zimbardo and Boyd (1999) define time perspectives as “[...] the often non-conscious process whereby the continual flows of personal and social experiences are assigned to temporal categories, or time frames, that help to give order, coherence, and meaning to those events” (Zimbardo and Boyd, 1999, p. 1271). Time perspectives could be associated with cognitive processes. Individuals do not perceive this time oriented trait as much as they would be aware of personality traits like extraversion or conscientiousness. Zimbardo and Boyd (1999) focus on the psychological time perspective theory and ascribe individuals to particular “types” by dividing the time orientation of individuals into five time perspectives: future, present-hedonistic, present-fatalistic, past-positive as well as past-negative. These time perspectives are derived from a series of exploratory studies by using focus groups, feedback from participants and theoretical considerations (Zimbardo and Gonzalez, 1984; Gonzalez and Zimbardo, 1985; Zimbardo and Boyd, 1999).

Time perspectives develop at early stages in life through influences of familiar background, social class, education, culture and religion. Moreover, the time frame of an individual can also be affected by learning processes, peer interactions and other conditions that encourage the individuals to build a habitual focus on one or more time perspectives and omit the others (Nurmi, 1991; Zimbardo and Boyd, 1999; Zimbardo and Boyd, 2008). Zimbardo and Boyd (1999) agree that although time perspectives may be affected by situational forces, for instance by inflation, by being under survival stresses or by being on vacation, it can also develop a dispositional characteristic as a particular temporal bias comes to predominate a person’s response hierarchy (Zimbardo and Boyd, 1999). Gupta et al. (2012) support these findings by determining that 71.6% of individuals in their study were predominantly anchored in one of the five time perspectives.

In the following, I shed light onto the different characteristics dividing the concepts on the broader range of (1) future, (2) present, and (3) past orientation and sum up the results of previous literature regarding time perspectives and their relation to outcomes.

2.1 Future Orientation

Future orientation consists of a general long-term orientation towards life. Future oriented individuals think about consequences and unexpected outcomes of their future actions. They are dedicated to working for future goals by getting rewards, avoiding time-wasting attractions and postponing present enjoyment. These characteristics can lead to the refusal of social relationships and current enjoyment (Zimbardo and Boyd, 1999; Brislin and Kim, 2003;

Boniwell and Zimbardo, 2004). Furthermore, a future-negative orientation is associated with fear, anxiety, and doubts (Zaleski, 1996; Košťál et al., 2016). In previous literature, when scholars mention the future time perspective in their research, they actually mean the future-positive time perspective.

Klicperová-Baker et al. (2015) analyzed saving behavior and found higher regular savings when individuals are more future oriented. They eat healthy food, go to doctors regularly and are associated with a stronger positive health behavior (see. e.g., Zimbardo and Boyd, 1999; Boniwell and Zimbardo, 2004; Henson et al., 2006; Gellert et al., 2012; Visser and Hirsch, 2014; Hall et al., 2015). Moreover, researchers found that future oriented individuals consume less alcohol (Carey et al., 2007). Regarding long-term orientation, some researchers found positive relations between pro-environmental behavior and future orientation (Milfont and Demarque, 2015). Moreover, others observed negative effects due to procrastination (Jackson et al., 2003, Ferrari and Díaz-Morales, 2007), as well as positive effects due to conscientiousness (Goldberg and Maslach, 1996). The future time perspective is also related to low-risk health behavior (Henson et al., 2006). Individuals with future orientation tend to be happier and have good (psychological) wellbeing (Taber, 2013; Sailer et al., 2014; Cunningham et al., 2015). Concerning work, future oriented individuals are characterized as dependent on rewards, cooperative and concerned about future consequences of their actions (Zimbardo and Boyd, 1999).

There is a stream of literature on future time perspectives which finds a higher valence to goals: to study harder, to have higher motivating achievements in order to reach goals and therefore, improve academic performance (see, e.g., Teahan, 1958; de Volder and Lens, 1982; Shell and Husman, 2001; Honora, 2002; Phan, 2009). De Volder and Lens (1982) investigate GPA and 23 general motivational goals divided into near future, distant future, and open present. They outline that students with a high GPA and a high study persistence attach significantly higher valence to goals in the distant future. Moreover, these students perceive “studying hard” as more important for achieving goals in the distant future and open present than students with a low GPA and study persistence.

For example, Adelabu (2007) using the approach of Zimbardo and Boyd (1999), researches the link between present and future time perspectives and academic success for African American students between the age of 14 and 20 years. She points out that students have a better GPA when they are future oriented. This is in line with previous literature of Barber et al. (2009), who used Zimbardo and Boyd’s time perspective approach to investigate future and present

time perspectives and academic performance. They outline positive effects for future orientation and GPA in studies. King (2016) investigates the effect of academic performance for five time perspectives (approach of Zimbardo and Boyd) on students of an English course. It was found that only future orientation has a significant correlation with GPA in both the last and current semester as future orientation is associated with a higher GPA (King, 2016). These findings are further supported by Barnett et al. (2020) as well as González et al. (2020). They investigate five time perspectives but only find a positive effect on academic performance with the future orientation of students. Mello and Worrell (2006) investigate, among others, the effect of academic performance for six time perspectives (approach of Gonzalez and Zimbardo, 1985) and find positive effects for future-positive oriented individuals. Derived from the previous findings on future orientation, I propose hypothesis 1.

***Hypothesis 1 (H1):** The more future-positive oriented a student is, the better the academic performance.*

However, in current research, a distinction within the future time perspective gets much less attention. Even Zimbardo and Boyd (1999) argue that the future time perspective should have a sub factor: “By contrast, the ZTPI has but one future time perspective. Perhaps further factor analyses of our scale with a variety of non-college populations will again show a more complex set of future subfactors” (Zimbardo and Boyd 1999, p. 1284). The future time perspective in the ZTPI is linked with positive associations, while aspects like fear and anxiety are often neglected (Zaleski, 1996; Nurmi, 2005; Carelli et al., 2011). Splitting the future time perspective allows differentiating between positive and negative associations (Carelli et al., 2011).

Zaleski (1996) investigates the negative side of future orientation by establishing the concept of Future Anxiety. He finds that this orientation is related to the manipulative treatment of others in order to secure one’s own future and the tendency to use power strategies to influence superior or inferior individuals. Zaleski (1996) finds that future-negative oriented individuals are more pessimistic regarding future solutions to global problems. Carelli et al. (2011) investigate the scale of Zimbardo and Boyd (1999) by decomposing future orientation in future-positive and future-negative perspectives. Thus, the future-negative orientation of individuals involves thinking about the future with worry as well as anticipating negative outcomes similar to the past-negative time perspective, which is described in the scale of Zimbardo and Boyd (1999). According to the other time perspectives, the future-negative perspective also holds similarities to the present-fatalistic perspective, while notable differences must be drawn. A

present-fatalistic perspective implies beliefs of a pre-determined future resulting in a lack of consideration of future actions and hopelessness, whereas a future-negative perspective implies a negative view of the future embossed by anxiety about negative consequences of one's own actions (Zimbardo and Boyd, 1999; Carelli et al., 2011).

Mello and Worrell (2006) analyze the relationship between time perspective and academic achievement among academically talented adolescents at the age of 11 to 18 years while using the scale of Zimbardo and Boyd (1999) and additionally including future-negative as a time perspective. However, they find no significant correlation between a future-negative orientation and academic achievement (Mello and Worrell, 2006), whereas studies using different scales for time perspectives find opposing results. For instance, Andretta et al. (2014) investigate the relation of educational outcomes and time perspectives including the future-negative perspective by using the Adolescent Time Attitude Scale (Mello and Worrell, 2007). They find a significant negative relation between future-negative and GPA (Andretta et al., 2014). Thus, the second hypothesis regarding future-negative orientation is,

***Hypothesis 2 (H2):** The more future-negative oriented a student is, the worse the academic performance.*

2.2 Present Orientation

The present time perspective is divided into present-hedonistic and present-fatalistic. Both have some attributes in common, especially emotional instability, e.g., aggression or depression as well as behavioral expressions such as risk-taking and novelty-seeking. In general, present oriented individuals are more stimulus-driven (Zimbardo and Boyd, 1999, 2008).

Present-hedonistic oriented individuals tend to have little concerns for future consequences for one's actions, are less receptive to rewards in the future, and tend to be less cooperative in reaching goals (Zimbardo et al., 1997; Zimbardo and Boyd, 1999). Moreover, previous literature outlines that present-hedonistic oriented individuals are also more liable to a mania and are characterized by emotional instability and great depression but have much energy and, therefore, tendencies of bipolarity (Zimbardo and Boyd, 2008; Gruber et al., 2012). Furthermore, hedonistic-orientated individuals are associated with low perspectives for consistency, ego and impulsive control, high impulsive sensation, novelty-seeking, enjoying immediate pleasures, low conscientiousness, a high pursuit of excitement, pleasure (Zimbardo and Boyd, 1999, 2008; Boniwell and Zimbardo, 2004), and a high demand on leisure activities (Beatty et al., 1985). Gregory (2015) defines psychological hedonism as a characteristic that allows individuals to do things only if they expect positive experiences from it or to evade

negative effects. This argumentation is consistent with psychological theories in which hedonism is an important tenet of motivation for human actions (Higgins, 1997; Elliot and Covington, 2001).

Goldberg and Maslach (1996) state that hedonistic individuals show negative relations to emotional stability. Moreover, previous literature reports that individuals with a hedonistic orientation tend to be less interested in retirement planning (Earl et al., 2015) and are more pleasure oriented, e.g., towards consequential substance use (Keough et al., 1999; Fieulaine and Martinez, 2010; Chavarria et al., 2015). Furthermore, hedonists are more likely to take risks to achieve happy feelings or avoid boredom (Sailer et al., 2014). Hedonistic individuals have a higher risk-taking behavior, e.g., when driving (Zimbardo et al., 1997; Jochemczyk et al., 2017; Linkov et al., 2019), and are positively associated with arousal procrastination (Ferrari and Díaz-Morales, 2007). According to the afore-mentioned literature, Ksendzova et al. (2015) agree on the fact that hedonists prioritize pleasure more than other life values and add to it the Big Five personality traits, e.g., being neurotic, less conscientious and less agreeable. Zhang and Howell (2013) outline that high present-hedonistic oriented individuals show higher levels of life satisfaction when controlling for personality variables as well as demographic data.

According to the performance of students, Zimbardo and Boyd (1999) examine in their study inter alia GPA and time perspectives of students in the United States and find a negative but statistically insignificant relation for present-hedonistic oriented individuals and GPA. Adelabu (2007) researches, as mentioned before, the link between present and future time perspectives and academic success for African American students between 14 and 20 years of age. She notices a worse GPA when students are present oriented. Barber et al. (2009) investigate present time perspectives and academic performance. They also discover negative effects for present-hedonistic orientation and GPA.

***Hypothesis 3 (H3):** The more present-hedonistic oriented a student is, the worse the academic performance.*

In contrast, the present-fatalistic time perspective is reflected by negative emotions (Stolarski et al., 2013), low self-esteem, fate, depression, and low consideration for future consequences. These individuals think that there is hardly any relation between present and future (Zimbardo and Boyd, 1999). This emotional profile could develop from an external locus of control and trained helplessness. Rodermund (2012) proves that present-fatalistic oriented individuals are negatively associated with savings behavior and are associated with decreased wellbeing (Boniwell et al., 2010; Zhang et al., 2013). Avoidant procrastination was negatively associated

with present fatalistic time orientation (Ferrari and Díaz-Morales, 2007). Henson et al. (2006) discover that a fatalistic orientation is only related to health-destructive behaviors. Moreover, Lukavská (2012) elaborates a positive effect between present-fatalistic orientation and playing behavior. One explanation is that individuals forget their real life by playing games. According to the performance of students, Zimbardo and Boyd (1999) examine the relation between GPA and time perspectives for students in the United States and point out significant negative correlations of GPA and present-fatalistic oriented individuals. Perkins et al. (2015) examine the effects of time perspective and years in school on GPA for African American college students. They state that a higher present-fatalistic orientation of individuals predicts a low GPA. Mello and Worrell (2006) investigate among others the effect of academic performance for six time perspectives (approach of Zimbardo Gonzalez, 1985) and finds negative effects for present-fatalistic oriented individuals. Hence, hypothesis 4 is,

***Hypothesis 4 (H4):** The more present-fatalistic oriented a student is, the worse the academic performance.*

2.3 Past Orientation

The past time perspective implies a history oriented characteristic with a focus on traditions and family. It reflects a sentimental, warm, and nostalgic view on the past (Zimbardo and Boyd, 1999; Boniwell and Zimbardo, 2004). Individuals with a past orientation avoid change, are not open-minded towards new cultures or experiences and try to keep things running. Past-positive oriented individuals tend to have emotional, pleasurable, and nostalgic perspectives towards memories of the past. In contrast, past-negative oriented individuals remember aversive and uneasy situations of the past (Boniwell and Zimbardo, 2004) and have a lower level of life satisfaction (Sailer et al., 2014).

To the best of my knowledge, no results show a relation between past time perspectives and academic performance, but past-positive oriented individuals are positively associated with higher levels of wellbeing (Drake et al., 2008). However, as previous literature shows, wellbeing is a significant determinant of successful learning (Seligman et al., 2009; King et al., 2015). Moreover, King and Gaerlan (2015) highlighted a positive effect between the past-positive time perspective and vocational strategies. Thus, the past-positive time perspective may have a positive influence on academic performance.

***Hypothesis 5 (H5):** The more past-positive oriented a student is, the better the academic performance.*

With regard to the past-negative time perspective, Precin (2017) found a negative association with academic achievements. In contrast to the past-positive time perspective, the past-negative time perspective is associated with a lower level of wellbeing (Boniwell et al., 2010). Thus, a past-negative time perspective may relate negatively to academic performance, which leads to hypothesis 6.

***Hypothesis 6 (H6):** The more past-negative oriented a student is, the worse the academic performance.*

3 Methods

3.1 Participants and Procedure

For the analysis, I used a pen and pencil survey with a sample of 471 students (286 females, 185 males). The data was collected between 2017 and 2019 in 27 seminar classes at two universities in Germany (see Table 5 in the Appendix). After signing the informed consent, students were asked at the beginning of the seminar to fill out a questionnaire on time perspectives, GPA, certainty about future career choices, the aspiration of being a manager in the future and socio-demographic data.

3.2 Measures

Dependent Variables

Questions with regard to the dependent variable “academic performance” were asked in a questionnaire at the beginning of each seminar whereby the variable is measured by the self-reported cumulative average grade in studies (GPA). The GPA ranges from 1.0 (satisfactory) to 4.0 (very good).¹ The students can reach every grade in this range in steps of 0.1 points. In this sample, the average grade in studies lies between the minimum of 1.3 and the maximum of 3.9.

Table 1: Descriptive statistics of the dependent variables

Dependent variables	Min	Max	Mean	Std. dev.	N
GPA in studies	1.3	3.9	2.640	0.506	471

¹ The best grade in the grading system for studies in Germany is a 1. This grade stands for a very good performance. The rating ranges up to a 4 which stands for a sufficient performance. Moreover, the grades between 1 and 4 can differ by an intermediate value of 0.3, e.g., 1.3 or 3.7. If the grade is 5.0, the performance is insufficient (not passed). However, in order to follow the international standards for grading and to allow a better international interpretation of the performance of the students, I converted the German grades in order to use the international grading system in this study.

Independent Variables

For the measurement of time perspectives, a short version of the “Zimbardo’s Time Perspective Inventory” (Zimbardo and Boyd, 1999) by Košťál et al. (2016) was used. Košťál et al. (2016) focus on six time perspectives by adding future-negative to the inventory of Zimbardo and Boyd (1999). The inventory by Košťál et al. (2016) comprises 18 items. Each time perspective, i.e., future-positive (e.g., “When I want to achieve something, I set goals and consider specific means for reaching those goals,” $\alpha = 0.570$), future-negative (e.g., “Usually, I do not know how I will be able to fulfill my goals in life,” $\alpha = 0.546$), present-hedonistic (e.g., “It is important to put excitement in my life,” $\alpha = 0.570$), present-fatalistic (e.g., “Since whatever will be will be, it doesn’t really matter what I do,” $\alpha = 0.501$), past-positive (e.g., “Familiar childhood sights, sounds, smells often bring back a flood of wonderful memories,” $\alpha = 0.492$), and past-negative (e.g., “I often think of what I should have done differently in my life (2)”, $\alpha = 0.677$), is measured by three items through a confirmatory factor analysis referring to Zimbardo and Boyd’s approach (1999). Košťál et al. (2016) used a Likert-response format with five options that range from very uncharacteristic (1) to very characteristic (5). Table 6 in the Appendix shows the descriptive data of the six considered time perspectives. Moreover, in preparation for the regression models, a confirmatory factor analysis and a standardization of these data were conducted.

Control Variables

Table 2 below considers age as a control variable since Mello and Worrell (2006) and Sobol-Kwapinska et al. (2019) find different time perspective effects for different age groups. The participants’ age in this study ranges from 21 to 36 years (mean = 26.406, SD = 3.071). Moreover, the study also investigates the binomial variable gender (1 = male, 0 = female) to control the academic performance of men and women. In previous studies, female students maintained better average grades for their studies than male students (Chee et al., 2005; Chapell et al., 2005). This study also controls for participants in bachelor (= 0) or master studies (= 1), this might also influence the GPA in the course of study (Chapell et al., 2005; Harðardóttir, 2017)., Moreover controlling for the course of study by dividing in Business studies (0), Business engineering (1), and other courses of study (2) (Ulriksen et al., 2010; Komarraju et al., 2013). The study also controls for universities, as students of two universities are considered in the sample as a binomial variable: Brandenburg University of Technology (0) and Paderborn University (1). The specific circumstances of a university may affect the GPA (Jamelske, 2009; Ulriksen et al., 2010).

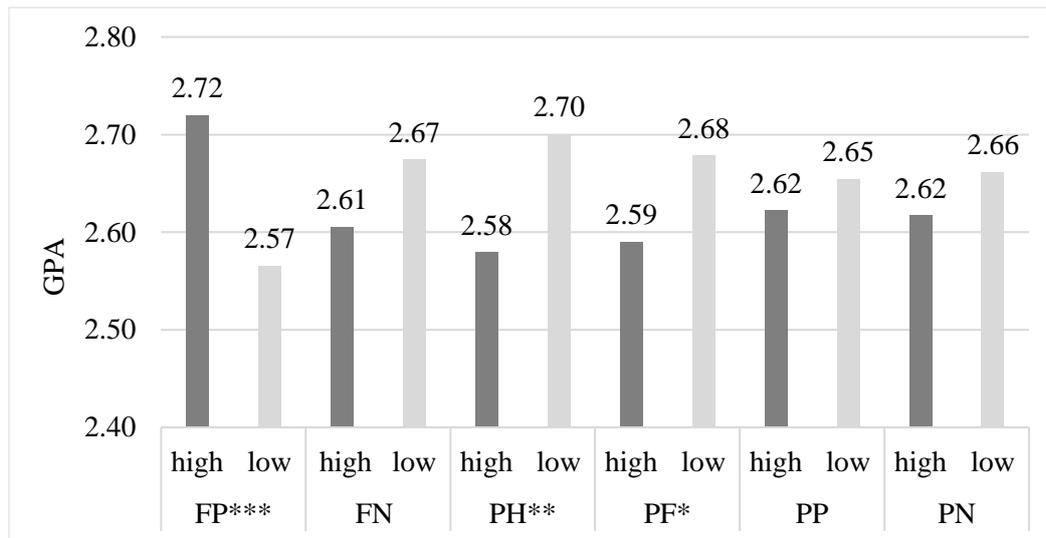
Table 2: Descriptive statistics of the control variables

Independent variables	Percent- age	Min	Max	Mean	Std. dev.	N
Age		21	36	26.406	3.071	471
Gender		0	1	0.393	0.489	471
Female (0)	60.72					
Male (1)	39.28					
Study maturity		0	1	0.524	0.500	471
Bachelor (0)	47.56					224
Master (1)	52.44					247
Course of study		0	2	0.864	0.960	471
Business studies (0)	53.72					253
Business engineering (1)	6.16					29
Other courses of study (2)	40.13					189
University		0	1	0.614	0.487	471
Brandenburg University of Technology (0)	38.64					
Paderborn University (1)	61.36					

4 Results

4.1 Descriptive Results

In Figure 1, median splits and Wilcoxon rank-sum tests are used to analyze whether there are significant differences between higher and lower orientation in time perspectives of individuals and their academic performance. There are significant differences between future-positive and present-hedonistic time perspectives regarding academic performance when high or low oriented. A high future-positive orientation results in a significantly better academic performance than a low future-positive orientation. Furthermore, a higher present-hedonistic as well as present-fatalistic orientation results in a significantly lower academic performance than a low present-hedonistic or present-fatalistic orientation.



Note. Using the median split to examine high and low time perspective orientation, on x-axis z-transformed time perspectives: FP = future-positive, FN = future-negative, PH = present-hedonistic, PF = present-fatalistic, PP = past-positive, PN = past-negative, on y-axis GPA in studies (1.0 = satisfactory to 4.0 = very good). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, $n = 471$.

Figure 1: GPA in courses of study when having a high or low orientation on time perspectives

Figure 1 shows that high future-positive oriented individuals achieve better academic performance, with a mean grade in studies of 2.720, than lower future-positive oriented individuals who on average achieve a GPA in studies of 2.566. Moreover, the Wilcoxon rank-sum test shows that this effect is statistically significant on a 1% level (0.002). However, for future-negative orientated students, there is no statistically significant effect between high and low future-negative oriented individuals regarding academic performance.

Moreover, a high present-hedonistic orientation of students leads to worse academic performance with a mean grade in studies of 2.579. Lower present-hedonistic oriented individuals achieve on average a better academic performance of 2.700. According to the Wilcoxon rank-sum test, this effect is statistically significant on a 5% level (0.012). The same relation can be highlighted for high present-fatalistic oriented students. With a GPA in studies of 2.590 they achieve worse academic performance than lower present-fatalistic oriented individuals with an academic performance of 2.654. Moreover, the Wilcoxon rank-sum test shows that this effect is statistically significant on the 10% level (0.099). This shows that high present-hedonistic as well as high present-fatalistic oriented students achieve low academic performance.

The Wilcoxon rank-sum test shows no statistically significant effect between high and low future-negative, past-positive, and past-negative oriented individuals regarding academic performance (see Table 7 in the Appendix). According to these results and the correlations of

the time perspectives (see Table 8 in the Appendix), it is notable that there are no exceptionally high correlations between time perspectives. This supports the idea of analyzing a multidimensional framework with all six time perspectives, which is shown in the following multivariate analysis.

4.2 Multivariate analysis

In a next step, the models in table 3 show the effects of individual time perspectives (measured through confirmatory factor analysis and z-transformation, according to Zimbardo and Boyd, 1999 and Košťál et al., 2016) and academic performance of students (GPA in course of study) by running a linear regression model to find out if a certain time orientation of students influences their academic performance.

Table 3: Linear regression on the dependent variable GPA in studies

	(1)	(2)
Time Perspectives		
Future-positive	0.073*** (0.023)	0.054** (0.022)
Future-negative	-0.020 (0.029)	-0.023 (0.028)
Present-hedonistic	-0.072*** (0.025)	-0.062** (0.024)
Present-fatalistic	-0.032 (0.024)	-0.034 (0.024)
Past-positive	0.002 (0.024)	0.006 (0.023)
Past-negative	0.002 (0.028)	-0.011 (0.025)
Age		-0.006 (0.009)
Gender [Ref. = Female]		-0.051 (0.047)
Study maturity [Ref. = Bachelor]		0.390*** (0.059)
Course of study [Ref. = Business studies]		
Business engineering (1)		-0.057 (0.103)
Other courses of study (2)		-0.034 (0.054)
University [Ref. = Brandenburg University of Technology]		0.114* (0.069)
Constant	2.640*** (0.023)	2.569*** (0.249)
Observations	471	471
R ²	0.047	0.160

Note. Gender (0 = Female, 1 = Male), Study maturity (0 = Bachelor, 1 = Master), University (0 = Brandenburg University of Technology, 1 = Paderborn University). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

On the one hand, the effect of future-positive oriented individuals on academic performance is significantly positive. If the individual score for future-positive orientation rises by one standard deviation, the GPA in studies will increase by 0.054 standard deviations and is significant on a five percent level ($p < .05$). This indicates a better academic performance when students are more future-positive orientated. Consequently, hypothesis 1 can be accepted. On the other hand, for future-negative oriented individuals, an insignificant negative effect on academic performance can be found. This leads to the rejection of hypothesis 2.

For present-hedonistic oriented students, the effect on academic performance is significantly negative. If the individual score for present-hedonistic orientation rises by one standard deviation, the GPA in studies will decrease by -0.062 standard deviations. This effect is significant on a five percent level ($p < .05$). This highlights that more hedonistic oriented students achieve a lower academic performance. Thus, hypothesis 3 can be accepted.

Regarding present-fatalistic orientated students, there is no significant effect on academic performance in the performed regression models. However, using a median split, students with a high present-fatalistic orientation were found to on average achieve worse academic performance (GPA of 2.590) than students with a low present-fatalistic orientation (GPA of 2.654). According to the Wilcoxon rank-sum test, this is statistically significant on the 10% level (0.099). Thus, hypothesis 4 can be accepted.

For the past time perspectives, past-positive orientation of individuals tend to have a positive effect and past-negative orientation tend to have a worse academic performance, but none of them are statistically significant. This leads to the rejection of hypotheses 5 and 6.

For socio-demographic factors (e.g., age and gender), no significant effects can be reported. The control variable “Study maturity” reports a significant positive effect, which shows that the overall academic performance in studies is better for bachelor than for master students.² Moreover, one could assume that the number of students with a high hedonistic orientation is more representative in the bachelor than in the master seminars due to their given characteristics (Zimbardo and Boyd, 1999). However, this is not the case for this sample (see Table 10 in the Appendix).

² Table 9 and 10 in the appendix show linear regression models for both, bachelor students only (Table 9) and master students only (Table 10).

4.3 Further findings

The study shows that certain time orientations of students impact academic performance. Hence, this highlights that present achievements can be affected by certain time perspectives. According to these results, it is of further interest for my study to understand if certain time perspectives also influence future career attitudes, as well as the certainty about future career choices and the future career aspiration levels of individuals.

Scholars argue that future-positive oriented individuals tend to control their behavior, actively set expectations and goals, and steadily evaluate their performance in working processes (Husman and Shell, 2008; Jung et al., 2015). Hence, the future-positive time perspective is likely to motivate individuals to achieve goals, which may increase individual's confidence in career decision-making and, at the same time, decrease their career indecision. Most of the previous literature shows an influence of the future-positive time perspective on career intentions and beliefs as well as on career choice anxiety, career-searching-behavior and career indecision (Walker and Tracey, 2012; Taber, 2013; Jung et al., 2015; Park et al., 2019; Kiani et al., 2020). Only few scholars also found a relation between past-time- or present-time perspectives and career beliefs or indecision of students (Lukacs and Orosz, 2013; Kvasková and Almenara, 2019).

Walker and Tracey (2012), and Jung et al. (2015) highlight the relation of future orientation (see the approach of Shell (1984) and Carstensen and Lang (1996)) and career decision-making self-efficacy of students. The career decision self-efficacy scale measures the beliefs of students regarding career decision making. They find that future orientation results in more self-efficacy regarding career decision-making. Walker and Tracey (2012) argue that perceiving the future as valuable is a basic element of self-efficacy. This is related to the fact that individuals, who do not understand how their behavior influences the achievement of their goals, do not try to really complete their tasks effectively. Moreover, Jung et al. (2015) highlight the relation of future orientation and career choice anxiety and find future orientation to result in less career choice anxiety. More recently, Park et al. (2019) derived the Career Future Time Perspective Scale (CFTP) by examining various scales, including Zimbardo and Boyd's approach (1999). CFTP thereby results in more career decision-making, self-efficacy and less career indecision (Park et al., 2019). Taber (2013) analyzed the influence of time perspective (according to the approach of Zimbardo and Boyd, 1999) and indecisiveness in career decision-making for adults aged between 18 and 80 years and found future-orientated individuals to be more decisive in their career decision-making process (Taber, 2013). Lukacs and Orosz (2013) analyze the effect of time perspective by using the approach of Zimbardo and Boyd (1999) on career indecision

among high school students. They find a significant negative relationship between future time perspective, career choice anxiety, as well as general indecisiveness to argue that a future time perspective does not guarantee an individual to have all relevant information for career decisions. However, the tendency to plan more extensively leads to less general indecisiveness. Moreover, they found an individual's past-negative orientation to be related to higher career indecision (Lukacs and Orosz, 2013). Kvasková and Almenara (2019) also investigated the relationship between time perspectives (see the approach of Zimbardo and Body, 1999; Czech version: Lukavská et al., 2011) and career decision-making self-efficacy for young adults. They demonstrated a positive relation to career decision-making self-efficacy for future-positive oriented and present-hedonistic oriented individuals. For present-fatalistic and past-negative oriented individuals, they demonstrated a negative relation to career decision-making self-efficacy. Moreover, Kiani et al. (2020) investigated the relationship of future-positive time perspective (short version of the approach from Janeiro et al., 2017) and entrepreneurial career intention. They found that a future-positive orientation of individuals enhances learning ambitions and therefore stimulated entrepreneurial career intentions.

Hence, I aim to find an influence of a certain time perspective on the certainty about future career choices and career aspiration levels. Moreover, this study extends the literature not only by investigating in past-positive, past-negative, present-hedonistic, present-fatalistic and future-positive orientation, but also by considering the relationship of future-negative orientation (see the approach of Košťál et al., 2016), certainty about future career choices as well as the aspiration level of individuals of becoming a manager in the future.

Table 4 shows in model (1) an ordered probit regression on the dependent variable "certainty about future career choice" which is queried by: How confident are you in your future career choices? (certain = 4, less certain = 3, uncertain = 2, no decision = 1). Moreover, Table 4 shows in model (2) a probit regression on the dependent variable "aspire to be a manager in the future" queried by: Do you aspire to be a manager in the future? (yes = 1, no = 0). For descriptive information on these dependent variables, see Table 11 in the Appendix.

Table 4: Ordered probit regression for certainty about future career choice (1) and probit regression for aspiring to be a manager in the future (2)

	(1)	(2)
Time Perspectives		
Future-positive	0.144*** (0.055)	0.211*** (0.070)
Future-negative	-0.140** (0.062)	-0.090 (0.127)
Present-hedonistic	0.036 (0.055)	0.127* (0.068)
Present-fatalistic	-0.069 (0.056)	0.019 (0.069)
Past-positive	-0.079 (0.057)	-0.022 (0.069)
Past-negative	-0.065 (0.061)	0.016 (0.074)
Age	0.022 (0.009)	-0.030 (0.027)
Gender [Ref. = Female]	0.048 (0.114)	0.342** (0.137)
Study maturity [Ref. = Bachelor]	-0.006 (0.140)	-0.001 (0.170)
Course of study [Ref. = Business studies]		
Business engineering (1)	-0.217 (0.235)	-0.659** (0.322)
Other courses of study (2)	-0.015 (0.142)	0.159 (0.176)
University [Ref. = Brandenburg University of Technology]	0.065 (0.159)	-0.405** (0.194)
Constant		0.199 (0.727)
Observations	471	471
Pseudo R2	0.028	0.054
Loglikelihood	-539.494	-255.812

Note. Study maturity (0 = Bachelor, 1 = Master), Course of study (0 = Business studies, 1 = Business engineering, 2 = other courses of study, University (0 = Brandenburg University of Technology, 1 = Paderborn University). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The ordered probit regression model (1) shows that being more future-positive orientated is associated with an increase in the likelihood of choosing category 4 (certain). Deriving marginal effects at the means of the participants, an increase of future-positive orientation by one unit increases the probability regarding the certainty about future career choices by about 5.510 percentage points (4 = certain), see Table 12 in the Appendix. However, model (1) also shows that being more future-negative orientated is associated with a decrease in likelihood of choosing category 4 (certain). Deriving marginal effects at the means of the participants, an increase of future-negative orientation by one unit decreases the probability regarding the

certainty about future career choices by about 5.362 percentage points (4 = certain), see Table 12 in the Appendix.

The probit regression model (2) shows that the more future-positive orientated or present-hedonistic orientated an individual is, the more likely it is for that individual to aspire to be a manager in the future. Deriving marginal effects at the means of the participants, an increase of the future-positive orientation by one unit increases the probability of aspiring to be a manager by about 6.455 percentage points. Moreover, an increase of the present-hedonistic orientation by one unit increases the probability of aspiring to be a manager by about 3.902 percentage points. The positive correlation between the future-positive and present-hedonistic time perspective in the data set supports these findings (see Table 8 in the Appendix). The control variable gender reports a significant positive relation which shows that the probability of aspiring to be a manager is higher for men than for women (in margins by about 10.497 percentage points). Moreover, there is also a significant relation for the variable course of study, which shows that the probability of aspiring to be a manager in the future in Business Engineering is lower than in Business Studies (in margins by about 15.402 percentage points). The control variable university reports a significant negative relation which shows that the probability of aspiring to be a manager in the future is lower for students from Paderborn University (in margins by about 12.421 percentage points) see Table 13 in the Appendix.

5 Discussion

After shedding light on the relationship between time perspectives and academic performance as well as certainty about future career choices and future career aspiration levels, it is obvious that certain time perspectives should not be neglected.

Individuals who are more future-positive oriented achieve on average a better GPA in studies. These results match with the appropriate characteristics aforementioned, which show that future oriented individuals think about consequences and the unexpected outcomes of their actions for the future. They are also dedicated to working for future goals by getting rewards and postpone present enjoyment to have better average grades in their studies (Zimbardo and Boyd, 1999; Boniwell and Zimbardo, 2004). Hence, the results of my study are in line with the research from Zimbardo and Boyd (1999) as well as Adelabu (2007) and González et al. (2020). They also state that future oriented individuals are more likely to have a good academic performance in their studies.

Moreover, this study extends the literature by finding a significant negative effect for more present-hedonistic oriented students and their academic performance. This result extends previous literature and is supported by the research of Zimbardo and Boyd (1999), who found the same relation which, however, was not statistically significant in their study (see also Barber et al., 2009). Furthermore, the result of a worse academic performance when more present-hedonistic oriented can be supported by the fact that hedonistic oriented individuals focus on enjoying immediate pleasures and have a high demand for leisure activities (Beatty et al., 1985). Hedonists seem to have little concern for future consequences for one's actions, are less receptive to rewards in the future, and tend to be less cooperative in reaching goals (Zimbardo et al., 1997; Zimbardo and Boyd, 1999). Analyzing the relationship between present-fatalistic orientated individuals and academic performance, this study found, according to the linear regression, no significant effect. However, when using the Wilcoxon-rank-sum test, a significant difference between a low and a high present-fatalistic orientation appeared. This difference shows that high present-fatalistic oriented individuals achieve a worse academic performance than low present-fatalistic oriented individuals. These results are in line with the research of Zimbardo and Boyd (1999), Adelabu (2007), as well as Perkins et al. (2015), where high present fatalistic oriented individuals are more likely to have a worse GPA in studies.

Regarding further findings, this study found a higher probability for certainty about future career choices if individuals were more future-positive oriented. These results are aligned with the characterization of Zimbardo and Boyd (1999) and Košťál et al. (2016) that future-positive oriented individuals are characterized as being concerned about future consequences of their actions and are dedicated to working for future goals by getting rewards (Zimbardo and Boyd, 1999; Boniwell and Zimbardo, 2004). Moreover, the results are supported by Lukacs and Orosz, (2013), who find a significant negative relation between future time perspective, career choice anxiety, as well as general indecisiveness. Furthermore, Tarber (2013) also shows a positive effect of future-positive orientation and decisiveness in career choices.

For future-negative orientated individuals, this study extends the literature by finding a lower probability for certainty about future career choices if the individuals are more future-negative oriented. These findings can be supported by the characteristics of future-negative oriented individuals as these are associated with fear, anxiety, and doubts (Zimbardo and Boyd, 1999; Zaleski, 1996; Košťál et al., 2016). Hence, the doubts of future-negative oriented individuals may be one explanation of why this study found uncertainty regarding individual's future career choices.

Moreover, this study extends the literature by showing that certain time perspectives have an influence on an individual's future career aspiration level. This study found a higher probability of aspiring to be a manager in the future if individuals were more future-positive oriented. This is in line with the characterization of Zimbardo and Boyd (1999) that future oriented individuals are characterized as dedicated to working for future goals by getting rewards and postpone present enjoyment (Zimbardo and Boyd, 1999; Boniwell and Zimbardo, 2004). Moreover, the probit regression also finds a higher probability of aspiring to be a manager in the future if individuals were more present-hedonistic oriented. Previous literature points out that present-hedonistic oriented individuals are characterized as more pleasure oriented. Therefore, one explanation could be that they aspire to be a manager because it is much more fun to be a manager and earn more money. However, compared to the future-positive oriented individuals, they may not be willing to put much effort into these plans. Another explanation could be that the pleasure orientation of hedonists can also be transferred to a specific type of work that hedonists really enjoy, where they aspire to be a manager in that specific area because this triggers their intrinsic motivation.

6 Conclusion

To summarize, this study shows that in situations where individuals can benefit from a propensity towards planning and scheduling, e.g., at school, university and work, being more future-positive orientated can lead to an advantage as regards the individual's performance. Hence, this study highlights a positive significant effect regarding future-positive oriented individuals and a better academic performance. Moreover, more future-positive orientation increases the likelihood of aspiring to be a manager in the future as well as the individual's certainty about future career choices. However, the study explores that individuals who are more future-negative orientated are more likely to be uncertain about future career choices.

For more present-hedonistic oriented individuals, a significant negative effect for academic performance in studies is found. However, this study also shows a positive relation between more present-hedonistic oriented students and the likelihood of aspiring to be a manager in the future. Moreover, by using a median split, this study found a worse academic performance for present-fatalistic oriented individuals than for low present-fatalistic oriented individuals. Regarding the past-positive and past negative time perspectives for this data set, no significant relation to academic performance, certainty about future career choices or future career aspiration levels can be found.

The study has limitations, as the GPA in studies is self-reported by the students (for validity of such measures, see Kuncel et al., 2005). Additionally, certainty about future career choices and the future career aspiration of students is asked by one question. According to the results of this study, future research regarding the differentiation of future-positive and future-negative oriented individuals and its influence on various outcomes should be expanded as we see that there are significant effects and differences between the influence of future-positive and future-negative orientation, especially regarding the certainty about future career choices. Moreover, it would also be interesting to investigate the relation between time perspectives and individual performance on a more detailed information basis for individuals from different countries. Another aspect that could be of further interest for the relation between time perspectives and academic performance is: (1) if the students are working to finance their studies or (2) if they have enough money to concentrate on their course of study. Another topic for further research could be to investigate time perspectives and academic performance when students do a course of study where most subjects are free of choice. This could be a good case to find out if present-hedonistic oriented individuals achieve a better academic performance in comparison to their academic performance on a course of study which includes mostly mandatory subjects. Additionally, for further research, it would be interesting to do a field study to focus on individuals in working life in order to strengthen the findings of hedonistic individuals who can aspire to be a manager later in life. Moreover, more research is needed regarding the relation of time perspectives and performance in working teams, e.g., if a team with two high future-positive oriented members generate a higher academic performance than other time perspective constellations in teams.

In addition, this study highlights that certain time perspectives are statistically relevant characteristics that influence the academic performance, the certainty about future career choices and future career aspiration levels of students in Germany. Moreover, this study extended the literature by finding a significant effect between present-hedonistic oriented individuals and academic performance as well as by using the short version of the approach of Zimbardo and Body (1999) by Košťál et al. (2016) to investigate this relation. The results of the ordered probit regression (see Table 4) support and justify the differentiation of future time perspective (future-positive and future-negative) regarding the certainty about future career choices. As can be seen, this study added to the literature that more future-positive oriented individuals are more likely to be certain about their future career choices, whereas more future-negative oriented individuals are less likely to be certain about future career choices. Therefore,

this study extended the literature by showing that time perspectives and especially future-negative orientation have a significant influence on future career attitudes.

Therefore, we need to know more about assessing time perspectives. Practitioners should exercise caution when choosing a time perspective measure intended to provide predictive information about employee behavior and performance. However, according to the results of this study, practitioners may assume a relation between future-positive oriented, present-hedonistic oriented and present-fatalistic oriented individuals and academic performance. Regarding certainty about future career choices, future-positive oriented and future-negative oriented individuals are of interest. Whereas future-positive and present-hedonistic orientated individuals are of interest when it comes to future career aspiration levels. Thus, certain time perspectives may be an indicator for individuals to understand why they achieve a certain academic performance or why they have higher or lower future career aspirations levels.

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Appendix

Table 5: Information on the 27 considered seminars in the sample

University	Semester	Study maturity	Professorship	Participants
Brandenburg University of Technology Cottbus	Winter 17/18	Master	Chair of General Business Administration, in particular Aspects of Organisation and Corporate Governance	30
Brandenburg University of Technology Cottbus	Winter 17/18	Master	Chair of General Business Administration, in particular Aspects of Organisation and Corporate Governance	7
Brandenburg University of Technology Cottbus	Winter 17/18	Bachelor	Chair of General Business Administration, in particular Aspects of Organisation and Corporate Governance	8
Brandenburg University of Technology Cottbus	Summer 18	Master	Chair of General Business Administration, in particular Aspects of Organisation and Corporate Governance	9
Brandenburg University of Technology Cottbus	Summer 18	Master	Chair of General Business Administration, in particular Aspects of Organisation and Corporate Governance	11
Brandenburg University of Technology Cottbus	Summer 18	Master	General Business Administration, in particular Marketing	14
Brandenburg University of Technology Cottbus	Summer 18	Master	Business Statistics and Econometrics	20
Brandenburg University of Technology Cottbus	Summer 18	Master	General Business Administration, in particular Marketing	4
Paderborn University	Summer 18	Master	Organizational Behavior	12
Paderborn University	Summer 18	Bachelor	Organizational Behavior	11
Paderborn University	Winter 18/19	Master	Organizational Behavior	12
Paderborn University	Winter 18/19	Bachelor	Taxation, Accounting & Finance	22
Paderborn University	Winter 18/19	Bachelor	Chair of Service Management & Technology Marketing	65

Brandenburg University of Technology Cottbus	Winter 18/19	Master	Chair of General Business Administration, in particular Aspects of Organisation and Corporate Governance	7
Brandenburg University of Technology Cottbus	Winter 18/19	Master	Chair of General Business Administration, in particular Aspects of Organisation and Corporate Governance	5
Brandenburg University of Technology Cottbus	Winter 18/19	Master	Chair of General Business Administration, in particular Aspects of Organisation and Corporate Governance	15
Brandenburg University of Technology Cottbus	Winter 18/19	Master	Chair of General Business Administration, in particular Aspects of Organisation and Corporate Governance	11
Paderborn University	Summer 19	Bachelor	Chair of Organization-, Media- and Sports Economics	24
Paderborn University	Summer 19	Master	Business Administration, in particular Marketing	19
Paderborn University	Summer 19	Bachelor	Chair of Human Resources Management	15
Brandenburg University of Technology Cottbus	Summer 19	Master	General Business Administration, in particular Marketing	13
Paderborn University	Winter 19/20	Bachelor	Chair of Service Management & Technology Marketing	66
Paderborn University	Winter 19/20	Master	Business Education, in particular University didactics and development	17
Paderborn University	Winter 19/20	Master	Organizational Behavior	12
Paderborn University	Winter 19/20	Master	Business Administration, in particular Marketing	16
Brandenburg University of Technology Cottbus	Winter 19/20	Master	Chair of General Business Administration, in particular Aspects of Organisation and Corporate Governance	14
Brandenburg University of Technology Cottbus	Winter 19/20	Master	General Business Administration, in particular Marketing	14

Table 6: Time perspectives (means) of the 471 considered students

Time perspectives	Min	Max	Mean	SD	N
Future-positive	2.000	5.000	3.700	0.623	471
Future-negative	1.000	4.667	2.275	0.692	471
Present-hedonistic	1.333	5.000	3.418	0.641	471
Present-fatalistic	1.000	4.667	2.117	0.642	471
Past-positive	1.333	5.000	3.653	0.632	471
Past-negative	1.000	5.000	2.757	0.842	471

Table 7: Differences in GPA regarding high and low orientation in time perspectives

Time perspectives	Median Split GPA for High orientation	Median Split GPA for Low orientation	Wilcoxon rank-sum test (differ- ence of GPA for high and low orientation)
Future-positive	2.720	2.566	0.002
Future-negative	2.605	2.674	0.132
Present-hedonistic	2.579	2.700	0.012
Present-fatalistic	2.590	2.678	0.099
Past-positive	2.622	2.654	0.574
Past-negative	2.617	2.661	0.450

Note. Time perspectives are analyzed through confirmatory factor analysis and z-transformation.

The correlations for time perspectives (derived from confirmatory factor analysis and z-transformation) and academic performance show significant positive correlations between future-positive orientation and academic performance and significant negative correlations between the present time perspectives and academic performance. Therefore, one could assume that future-positive oriented individuals can achieve higher academic performance than present oriented individuals.

Table 8: Correlations on the dependent variable academic performance and the independent time perspective variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Future-positive	1.000						
(2) Future-negative	-0.187***	1.000					
(3) Present-hedonistic	0.092**	-0.122***	1.000				
(4) Present-fatalistic	-0.195***	0.302***	-0.074	1.000			
(5) Past-positive	0.146***	-0.142***	0.255***	-0.143***	1.000		
(6) Past-negative	-0.117**	0.500***	-0.031	0.220***	-0.031	1.000	
(7) Academic performance	0.151***	-0.067	-0.120***	-0.093**	0.003	-0.043	1.000

Note. Using a confirmatory factor analysis and z-transformation for the time perspectives. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Comparing the correlations of time perspectives from this study with the results of Košťál et al. (2016), there are four correlations that are only significant within this study. On the one hand, future-positive and present-hedonistic orientations show a significant positive correlation. On the other hand, past-positive orientation shows a significant negative correlation with both future-positive and present-fatalistic orientation. Future-positive shows a significant correlation to past-negative. Furthermore, there are two correlations that are no longer significant within this study compared to the results of Košťál et al. (2016). This includes the correlation between present-fatalistic and present-hedonistic, and between past-positive and past-negative where both correlations include a change of sign compared to the results of Košťál et al. (2016). Additionally, a change of sign can be observed for the correlation between past-negative and present-hedonistic orientation.

Table 9: Linear regressions on the dependent variable GPA in studies, only bachelor (model 1,2) and only master (model 3,4) students

	(1) only Bachelor students	(2) only Bachelor students	(3) only Master students	(4) only Master students
Time Perspectives				
Future-positive	0.073** (0.031)	0.061** (0.031)	0.045 (0.032)	0.039 (0.032)
Future-negative	-0.018 (0.041)	-0.034 (0.040)	-0.046 (0.038)	-0.045 (0.036)
Present-hedonistic	-0.069** (0.033)	-0.069** (0.032)	-0.056 (0.035)	-0.035 (0.035)
Present-fatalistic	-0.028 (0.035)	-0.051 (0.032)	-0.037 (0.034)	-0.031 (0.031)
Past-positive	0.010 (0.031)	0.019 (0.032)	0.022 (0.033)	-0.008 (0.031)
Past-negative	-0.011 (0.035)	-0.016 (0.035)	-0.018 (0.037)	-0.020 (0.034)
Age		0.002 (0.013)		-0.024** (0.012)
Gender [Ref. = Female]		-0.036 (0.061)		-0.041 (0.067)
Course of study [Ref. = Business studies]				
Business engineering (1)		-0.319 (0.240)		-0.100 (0.116)
Other courses of study (2)		-0.053 (0.070)		0.078 (0.084)
University [Ref. = Brandenburg University of Technology]		-0.432*** (0.122)		0.214*** (0.079)
Constant	2.475*** (0.032)	2.883*** (0.371)	2.796*** (0.031)	3.414*** (0.337)
Observations	224	224	247	247
R ²	0.053	0.127	0.047	0.157

Note. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Hedonists in bachelor and master seminars

	Percentage	N
Bachelor students	100	224
High hedonistic orientation	27.23	61
Others	72.77	163
Master Students	100	247
High hedonistic orientation	25.51	63
Others	74.49	184
Observations		471

Note. The binomial variable hedonist was divided in 1 = the hedonistic orientation is the highest value in comparison to the other time perspectives, 0 = the hedonistic orientation is not the highest value.

Table 11: Descriptive statistics on the dependent variables “certainty about future career choice” and “aspire to be a manager in the future”

Dependent variables	Percentage	Min	Max	Mean	Std. dev.	N
Aspire to be a manager (Ref. = no)	26.11	0	1	0.261	0.440	471
Certainty about future career choice		1	4	1.868	1.031	471
4 (certain)	47.13					222
3 (less certain)	32.27					152
2 (uncertain)	7.22					34
1 (no decision)	13.38					63

Note. Aspire to be a manager (no = 0, yes = 1).

The participants were asked “Do you aspire to be a manager in the future?” and had to answer with yes (= 1) or no (= 0). Another aspect was captured by a question regarding the certainty about subsequent career choice. Students were asked “How confident are you in your future career choices?” and had to answer with certain (= 4), less certain (= 3), uncertain (= 2) or no decision (= 1). Table 1 summarizes the descriptive statistics

Table 12: Marginal effects of the dependent variable “certainty about future career choice” (model 1)

	no decision = 1	uncertain = 2	less certain = 3	certain = 4
Time Perspectives				
Future-positive	-0.030*** (0.011)	-0.010** (0.004)	-0.016** (0.006)	0.055*** (0.021)
Future-negative	0.029** (0.013)	0.010** (0.004)	0.015** (0.007)	-0.054** (0.024)
Present-hedonistic	-0.007 (0.011)	-0.002 (0.004)	-0.004 (0.006)	-0.014 (0.021)
Present-fatalistic	0.014 (0.012)	0.005 (0.004)	0.008 (0.006)	-0.026 (0.021)
Past-positive	0.016 (0.118)	0.005 (0.004)	0.009 (0.006)	0.030 (0.022)
Past-negative	0.013 (0.013)	0.004 (0.004)	0.007 (0.007)	-0.025 (0.023)
Age	-0.004 (0.005)	-0.001 (0.001)	-0.002 (0.002)	-0.008 (0.008)
Gender [Ref. = Female]	-0.009 (0.024)	-0.003 (0.008)	-0.005 (0.013)	0.018 (0.044)
Study maturity [Ref. = Bachelor]	0.001 (0.029)	0.000 (0.009)	0.001 (0.015)	-0.002 (0.053)
Course of study [Ref. = Business studies]				
Business engineering (1)	0.049 (0.058)	0.014 (0.015)	0.019 (0.016)	-0.082 (0.087)
Other courses of study (2)	0.003 (0.029)	0.001 (0.009)	0.002 (0.016)	-0.006 (0.054)
University [Ref. = Brandenburg University of Technology]	-0.013 (0.033)	-0.004 (0.010)	-0.007 (0.018)	0.025 (0.061)
Observations	63	34	152	222

Note. The average marginal effects are computed on the base of the ordered probit model (1) in Table 4. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 13: Marginal effects of the dependent variable “aspire to be a manager in the future” (model 2)

	(2)
Time Perspectives	
Future-positive	0.065*** (0.021)
Future-negative	-0.028 (0.024)
Present-hedonistic	0.039* (0.021)
Present-fatalistic	0.006 (0.021)
Past-positive	-0.007 (0.021)
Past-negative	0.005 (0.023)
Age	-0.009 (0.008)
Gender [Ref. = Female]	0.105** (0.041)
Study maturity [Ref. = Bachelor]	-0.000 (0.052)
Course of study [Ref. = Business studies]	
Business engineering (1)	-0.154*** (0.057)
Other courses of study (2)	0.050 (0.056)
University [Ref. = Brandenburg University of Technology]	-0.124** (0.059)
Observations	471

Note. The average marginal effects are computed on the base of the probit regression model (2) in Table 4. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.