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Motivational Beliefs Specific to Business Studies Subfields: Interrelations, Antecedents, and Change in the Introductory Study Phase

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Motivational Beliefs Specific to Business Studies Subfields: Interrelations, Antecedents, and Change in the Introductory Study Phase

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Abstract

Self-concepts of ability (SCA) and intrinsic task values (ITV) are key determinants of students' choice of study program and dropout. Both constructs are multidimensional (i.e., specific to curricular learning content) and hierarchically structured (i.e., aggregate into one or more higher-order factors). The present study investigated German business studies students' ($N = 375$; age: $M (SD) = 21.8 (5.51)$; 59% female) subfield-specific SCAs and ITVs. Longitudinal data collected at the transition into higher education (t1) and toward the end of the first semester (t2) gave insight into (changes in) interrelations and antecedents of subfield-specific SCAs and ITVs during the introductory study phase, when students likely had to review their hitherto anticipated motivational beliefs. Results from confirmatory factor analyses and structural equation modelling revealed that interrelations of SCAs and ITVs decrease over time. SCAs correlate increasingly strongly within a mathematical and a verbal domain compared to cross-domain correlations. Accordingly, mathematics, but not German SCA, from high school predicts all subfield-specific SCAs at t1, but only mathematical subfield SCAs at t2. However, the pattern of results for ITVs is less systematic. Curricular and practical implications of the subfield-specific formation of motivational beliefs at the transition into higher education are discussed.

Keywords: motivation; self-concept of ability; intrinsic task value; higher education; structural equation modeling

Creencias Motivacionales Específicas a Subcampos de Estudios de Empresa: Interrelaciones, Antecedentes y Cambio en la Fase Introductoria de un Estudio

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Resumen

Los auto conceptos de habilidad (ACA) y los valores intrínsecos a la actividad (VIA) son determinantes clave de la elección del alumnado de un programa de estudio y del abandono. Ambos constructos son multidimensionales (específicos al contenido de aprendizaje curricular) y están estructurados jerárquicamente agregados en uno o más factores de orden superior). Este estudio investigó los ACA específicos del subcampo y los VIA en alumnado de estudios de empresa alemanes ($N = 375$; edad: $M (DS) = 21.8 (5.51)$; 59% mujeres). Datos longitudinales recogidos en la transición a la educación superior (t1) y hacia el final del primer semestre (t2) arrojaron luz sobre los cambios en las interrelaciones y los antecedentes de los ACA específicos del subcampo y de los VIA durante la fase introductoria del estudio, cuando los estudiantes tenían que revisar sus creencias motivacionales anticipadas previas. Resultados de los análisis factoriales confirmatorios y modelos de ecuaciones estructurales revelaron que las interrelaciones de los ACA y los VIA disminuyeron a lo largo del tiempo. ACA correlacionaron más fuertemente con el dominio matemático y verbal comparado con correlaciones cros-dominio. De este modo, las matemáticas y no las ACA relativas al Alemán, del instituto predicen todos los ACA específicos del subcampo en t1 pero solo el ACA del subcampo matemático en t2. Sin embargo, el patrón de resultados para VIA es menos sistemático. Se discuten implicaciones curriculares y prácticas de la formación específica del subcampo de creencias motivacionales en la transición a la educación superior.

Palabras clave: motivación; autoconcepto de habilidad; valor intrínseco de la actividad; educación superior; modelo de educaciones estructurales.

Researchers and practitioners alike recognize motivational beliefs as determinants of students' choice of study program, engagement, persistence, and achievement in higher education (Bean & Eaton, 2000; Crosling, Thomas, & Heagney, 2008; Seidman, 2005; Trautwein & Bosse, 2017). Expectancy of success and subjective task value (Wigfield & Eccles, 2000) are key motivational beliefs predicting achievement and task choice, such as choosing a study program or dropping out of a study program (Bong, 2001; Eccles, Vida, & Barber, 2004; Heublein & Wolter, 2011; Malgwi, Howe, & Burnaby, 2005; Musu-Gillette, Wigfield, Harring, & Eccles, 2015; Tolciu & Sode, 2011; Shernoff & Hoogstra, 2001; T. R. Stinebrickner & Stinebrickner, 2009). Both expectancy of success—reflected by self-concepts of ability (Marsh, 1990a) or self-efficacy (Bandura, 1997; Eccles, 1983; Eccles & Wigfield, 1995)—and intrinsic task value, which is closely related to interest and intrinsic motivation (Eccles, 1983; 2005; Krapp, 1999; Ryan & Deci, 2000), are multidimensional constructs specific to curricular learning contents (e.g., subjects at school; Bong, 2001; Marsh, 1990a). Zooming out, subject-specific self-concepts and intrinsic task values accumulate to more abstract academic self-concepts and intrinsic task values (Chanal & Guay, 2015; Shavelson, Hubner, & Stanton, 1976; Vallerand & Ratelle, 2002).

In students' everyday life at university, lectures and seminars on different specialized subfields (Tempelaar, Gijsselaers, van der Loeff, & Nijhuis, 2007; Yeung, Chui, & Lau, 1999) constitute the overall field of study. However, higher education researchers often use fields of study as counterparts of school subjects (Bråten & Olaussen, 2005; Gorges, 2016; Gorges & Göke, 2015; Shernoff & Hoogstra, 2001; Brahm, Jenert, & Wagner, 2017) or focus on groups of fields of study (e.g., into math-intensive versus non-math-intensive; Musu-Gillette et al., 2015). Thus, previous research appears to neglect the subfield-related multidimensionality of motivational beliefs in higher education, that is, the idea that motivational beliefs are specific to subfields of study (i.e., subjects within a study program) in addition to fields of study.

Compared to high school, the range of subfields students may encounter in higher education is much broader and diverse, including novel and specialized academic learning content. The diversity of higher education subfields should be especially relevant during the transition into higher education. When high

school graduates leave the well-known high school curriculum to choose their study program, they need to think about their motivation regarding unknown learning content and make decisions based on vague motivational beliefs. In spite of—or maybe due to—the diversity in learning content, many studies within students’ transition into higher education focus on broader fields of study and work around the fact that students’ face novel academic learning contents (Nagy et al., 2008; Musu-Gillette et al., 2015; Shernoff & Hoogstra, 2001).

Against this backdrop, the present study seeks to extend our understanding of motivation at the transition into higher education in three ways. First, I focused on the multidimensionality of motivational beliefs specific to subfields of a field of study, namely business studies. Second, I used a longitudinal database that reveals how subfield-specific motivational beliefs and their interrelations change over the course of the introductory phase at university. Third, I investigated potential antecedents of subfield-specific motivational beliefs taken from students’ experience in high school—namely school subject-specific motivational beliefs—at the beginning and toward the end of the first semester. The study focused on self-concept of ability as an indicator of expectancy of success (Eccles & Wigfield, 1995) and intrinsic task value (i.e., a component of task value that is closely linked to students’ experience), which are subsumed under the term motivational beliefs.

The findings presented here offer a more fine-grained account of how first-year students form and change their subfield-specific motivational beliefs when they enter higher education. Understanding formation and change of motivational beliefs, in turn, may support counselors’ and higher education institutions’ efforts to help students make good choices and retain their motivation throughout their transition into higher education.

Students’ Subfield-Specific Self-Concepts of Ability and Intrinsic Task Values and Their Interrelations

Research from primary and secondary school has documented that self-concepts of ability and intrinsic task values are multidimensional and hierarchically structured (Bong, 2001; Chanal & Guay, 2015; Marsh, 1990a, 1990b; Shavelson et al., 1976; Vallerand & Ratelle, 2002). That is to say, students form motivational beliefs specific to a particular learning content within the curriculum (i.e., mathematics, biology, history) and aggregate them into higher-order (i.e., academic) motivational beliefs. Going beyond the high

school curriculum, motivational beliefs may be specific to specialized subsections of broader competence areas (e.g., self-concept regarding dance, dramatic art, visual art, and music are subordinate to an overall arts self-concept; [Vispoel, 1995](#)). Thus, students in higher education likely develop motivational beliefs, such as self-concepts of ability and intrinsic task value specific to subfields that are part of their study program ([Tempelaar et al., 2007](#); [Yeung et al., 1999](#)).

Regarding hierarchy, motivational beliefs may cluster into one or more higher-order factors depending on the coherence of the learning contents ([Marsh, 1990](#); [Yeung et al., 1999](#)). That is to say, students develop subject-specific self-concepts as well as superordinate domain-specific self-concepts. With respect to the broad range of diverse subjects in high school, [Marsh \(1990a\)](#) found two uncorrelated higher-order factors that cluster students' self-concepts of ability into a mathematical and a verbal domain. In the case of business studies, [Yeung et al. \(1999\)](#) argued that a specialized educational context, such as a commercial college covering a more homogenous range of subjects, promotes the formation of only one higher-order factor. By contrast, [A. Y. Kolb and Kolb \(2005\)](#) argued that business studies, in particular, is a diverse study program combining mathematics, economics, and behavioral science.

Diversity in subfields may, on the one hand, lead to well-differentiated subfield-specific motivational beliefs because each subfield is clearly distinguishable. On the other hand, however, groups of relatively similar subfields within a broad range of diverse subfields may foster the formation of more than one higher-order factor (e.g., mathematical and verbal motivational beliefs). Distinct higher-order factors, in turn, may lead to dimensional comparison effects, as outlined by [Marsh \(1990b\)](#). In dimensional comparisons, students develop their self-concepts of ability by evaluating their achievement in the respective domain and by comparing their achievement across domains, which typically shows negative effects. For example, a good grade in mathematics would increase a students' mathematical self-concept, but decrease his or her verbal self-concept.

Looking at existing empirical findings regarding subfield-specific motivational beliefs, results from [Yeung et al. \(1999\)](#) have supported the proposition of only one higher-order factor (but do not speak to a possible two-factor model). However, the correlational pattern suggests a distinction between mathematical and verbal subfields: Correlations were systematically

higher within the mathematical ($.28 < r < .41$) and verbal domain ($r = .38$), respectively, compared to cross-domain correlations ($r = .07$ and $.15$ for accounting; $r = .31$ and $.33$ for mathematics & statistics, and $r = .22$ and $.23$ for economics). These findings lend support to the assumption that students may distinguish a mathematical and verbal self-concept in commercial education.

Focusing on both self-concepts in terms of cognitive competence and value, Tempelaar et al. (2007, 2011) investigated subfield-specific motivational beliefs regarding five business studies subfields: Statistics, Finance & Accounting (both related to the mathematical domain), Marketing Management, Organizations & Human Resources Management (HRM; both related to the verbal domain), and Business Strategy (related to both the mathematical and the verbal domain). Confirmatory factor analyses demonstrated subfield-specificity for both cognitive competence and value (Tempelaar et al., 2007). Hence, students appear to distinguish clearly between subfield-specific motivational beliefs regarding these five subfields.

With respect to the underlying structure of subfield-specific motivational beliefs, Tempelaar et al. (2007) reported unanimously significant (all $p < .05$) small to moderate correlations between subfield-specific cognitive competence beliefs. Surprisingly, the correlation between cognitive competence regarding Finance & Accounting, and Statistics, which may both be considered mathematical subfields, was only $r = .10$, whereas correlations between cognitive competence regarding Marketing & Management, and Organization & HRM, two verbal subjects, were $r = .25$. Statistics cognitive competence correlated more strongly with cognitive competence regarding Business Strategy ($r = .25$), Marketing & Management ($r = .21$), and Organization & HRM ($r = .21$), whereas correlations between Finance & Accounting cognitive competence and both verbal cognitive competences were weaker ($r < .14$; and $r = .15$ with Business Strategy cognitive competence). Thus, cross-domain correlations were weaker compared to within-domain correlations for verbal subfields and Finance & Accounting.

Value correlations were unanimously significant (all $p < .05$), as well, but higher overall. The correlational pattern showed stronger correlations within the mathematical ($r = .44$) and verbal domain ($r = .41$), respectively, and weaker correlations across domains ($.14 < r < .27$). Business Strategy value correlated strongly with Marketing & Management value ($r = .47$) but less so ($.30 < r < .37$) with the rest of the subfield-specific cognitive competences.

The findings by Tempelaar et al. (2007) thus have suggested a distinction between mathematical and verbal motivational beliefs at least regarding task value.

Interpretation of these correlations should consider that the sample in Tempelaar et al.'s study (2007) were students from the first/second through fourth semester. Hence, participants predominantly had an extensive amount of experience with the study program. It is unclear whether first-year students' initial anticipation of subfield-specific beliefs would turn out to be as sophisticated as the ones reported by Tempelaar et al. (2007) and Yeung et al. (1999).

Antecedents of Students' Self-Concepts of Ability and Intrinsic Task Values

Researchers typically use subject-specific self-concepts and task values to predict subsequent educational task choice, such as choosing a college major (e.g., for science, Shernoff & Hoogstra, 2001; for math-intensive subjects, Musu-Gillette et al., 2015). Such studies may assume that study programs match school subjects at the university level. However, a broad range of study programs in higher education does not correspond to a school subject at secondary school (German Rectors' Conference, 2014; Schröder, 2015). Therefore, at the transition into higher education, students have to form motivational beliefs with respect to largely unknown learning content. It seems unlikely that students would do so out of thin air; but *how* do students form motivational beliefs in light of unknown learning content?

Tackling this question, Gorges & Kandler (2012) argued that students *anticipate* their motivational beliefs specific to a field of study that does not correspond to a well-known school subject. They suggested that such anticipated motivational beliefs may build on existing motivational beliefs derived from students' experience with high school subjects they perceive to be similar to the unknown learning content, a process they call *generalization*. In other words, first-year students are expected to use their school subject-specific motivational beliefs as a *best guess* (Gorges & Kandler, 2012, p. 611) for their field-of-study-specific motivational beliefs if they perceive both to be similar. So far, empirical findings support the generalization hypothesis. For example, physics-specific self-concept predicted self-concept specific to mechanical engineering (Gorges & Göke, 2015), and mathematics-specific

intrinsic task value predicted intrinsic task value specific to business studies (Gorges, 2016).

The idea of students generalizing their school subject-specific motivational beliefs to anticipate motivational beliefs specific to study programs implies that anticipated motivational beliefs may turn out to be wrong. Following this line of reasoning, students probably need to revise their motivational beliefs once they have gathered experience with the novel learning content (Gorges & Kandler, 2012). Accordingly, motivational beliefs in high school are increasingly stable (Denissen, Zarrett, & Eccles, 2007; Musu-Gillette et al., 2015; see Tempelaar et al., 2011 on the stability of motivational beliefs in higher education), whereas anticipated motivational beliefs in higher education probably need revising during the introductory phase of a study program, which leads to substantial variation in students' motivational beliefs during the introductory phase in higher education (Gorges, 2017). Revising may be rather frustrating for students, who assume that they have chosen the right study program based on their motivational beliefs. Thus, the need to revise one's initial motivational beliefs might explain why students often report lack of interest and lack of cognitive competence as major reasons for dropout (T. R. Stinebrickner & Stinebrickner, 2009; Heublein & Wolter, 2011), and why so many students drop out early (Barefoot, 2004; Holder, 2007; Tolciu & Sode, 2011).

As is the case with most studies, existing research investigating the hypothesized processes of generalization and revision in higher education contexts focused on broad (groups of) fields of study (Gorges, 2016, 2017; Gorges & Göke, 2015; Musu-Gillette et al., 2015), although fields of study reflect higher-order entities grouping a number of subfields rather than subjects. Nevertheless, at the transition into higher education, students' probably anticipate motivational beliefs specific to the field of study instead of forming motivational beliefs specific to hitherto unknown subfields. Hence, motivational beliefs specific to subfields likely develop in a top-down process (Marsh & Yeung, 1998), leading to similar motivational beliefs across all subfields. For example, research on anticipated motivational beliefs has suggested that most high school graduates associate business studies with mathematics and, consequently, use their mathematics-specific motivational beliefs—and not their verbal motivational beliefs—to anticipate their business studies-specific motivational beliefs (Gorges, 2016; Gorges & Göke, 2015). Thus, students initially appear to ignore the composition of business studies

from a diverse range of learning contents, which includes subfields from the verbal domain. However, interpretation of these findings should bear in mind that linking school subjects to fields of study neglects the multidimensionality of motivational beliefs in higher education. Results on the level of subfields may differ when students face a range of both mathematical and verbal subfields.

The Present Study

The present study seeks to extend our knowledge about students' potentially subfield-specific motivational beliefs, their interrelations, and antecedents thereof. Revising motivational beliefs carries the risk of frustration, self-worth threat, and, eventually, dropout. Therefore, further insight into subfield-specific motivational beliefs at the transition into higher education may be useful for building a supportive higher education environment, to help students to anticipate adequate expectancies of success and intrinsic task values for a study program, and to provide support for careful revisions of motivational beliefs.

The goal of this study was threefold. First, it investigated the correlational pattern of distinct subfield-specific self-concepts of ability and intrinsic task values. Second, it investigated potential changes of the correlational pattern between anticipated subfield-specific self-concepts of ability and intrinsic task values at the very beginning of the study program and experience-based self-concepts of ability and intrinsic task values toward the end of the first semester. Third, it tested the predictive validity of school-based motivational beliefs—namely mathematics-specific and German-specific self-concepts of ability and intrinsic task values—for students' anticipated subfield-specific motivational beliefs at both measurement points.

The study used longitudinal data from the German research project ValCom (“Value and Competences in Adulthood”) that offers insight into (changes of the) interrelations, and changes and antecedents of first-year students' motivational beliefs specific to four subfields of business studies, namely accounting, business arithmetic, human resources, and law. Assuming that first-year students initially develop self-concepts of ability and intrinsic task values regarding business studies as a whole *anticipated* subfield, specific motivational beliefs were expected to correlate strongly and unanimously. By contrast, correlations between *experience-based* motivational beliefs were expected to show a more differentiated pattern, with moderate to strong

correlations only within the mathematical and verbal domain, respectively, whereas correlations across domains were expected to be weak. Drawing on previous findings on the stability of field-of-study-specific motivational beliefs (Gorges, 2017), stability coefficients for subfield-specific motivational beliefs were expected to be moderate for the mathematical subfield (i.e., because of the link students perceive between business studies and mathematics; Gorges & Göke, 2015) and low for verbal subfields, which students should not expect in a business studies program.

In line with this reasoning, mathematics-specific motivational beliefs, but not German-specific motivational beliefs, were expected to predict *anticipated* subfield-specific motivational beliefs at the beginning of the study program. With time and experience, students should discover that business studies cover a broad range of diverse subject matters, some of which are rather similar to mathematics (e.g., business arithmetic, accounting), whereas others are not (e.g., human resources, law). Accordingly, German-specific motivational beliefs were expected to predict *experience-based* motivational beliefs specific to human resources and law (see Gorges, 2017, on the revision of motivational beliefs).

Method

Participants and Procedure

Participants were first-year students from six universities of applied sciences in Germany enrolled in study programs labeled *business studies* (in German “Betriebswirtschaft” or “Betriebswirtschaftslehre”). Online data collection took place during the weeks preceding the first semester up to the first weeks after the start of the study program (t1), and three to four months afterwards (i.e., toward the end of the first semester; t2). As is common in longitudinal research, participants’ data was linked across measurement points via a participant-generated personal code.

Overall, 408 students started the survey (response rate: 34%). All participants were informed about the purposes for which their data would be used and gave their consent. We excluded participants with missing data on all variables. The final sample contained $n_{t1} = 375$ students (age: $M (SD) = 21.8 (5.51)$; 59% female). Of these participants, 49.6% took part in wave two ($n_{t2} = 189$; $M (SD) = 21.41 (3.68)$; 66.5% female). Comparisons of those participants that were retained to those that dropped out indicated no

systematic difference between these groups, with the exception of self-concept of ability in business arithmetic, which was higher for those who dropped out of the study. Thus, attrition did not appear to bias the findings.

The survey first asked for students' sociodemographic characteristics followed by self-concept and task value measures regarding school subjects (among others mathematics and German), fields of study (among others business studies), four business studies subfields (business arithmetic, accounting, human resources, and law), and two subfields of the remaining fields of study, per survey page. Throughout the survey, participants were actively encouraged to anticipate their responses regardless of their personal experience with the learning content. Completion of the survey took approximately 20 minutes.

Measures

Self-concept of ability. All items were adapted from the literature (Dickhäuser, Schöne, Spinath, & Stiensmeier-Pelster, 2002) and used parallel wording to tap students' academic self-concepts for business studies and for the different subjects (e.g., "I consider my aptitude for business studies/mathematics/human resources/ ... to be high"). Items and mode of presentation were consistent at both measurement points. To have the same subject label across all participating universities, the major headings were consistent across all surveys, but examples were tailored to the specific curriculum. Students' self-concept was measured with respect to business arithmetic, law, accounting, and non-mathematical basic economics, which was human resources in all but one curricula. Items were presented in terms of a matrix where business studies shared a survey page with three more fields of study, and the four subjects were presented on the same survey page. Answers to all items were recorded using a four-point Likert-type scale (1 = *absolutely not true*, 2 = *rather not true*, 3 = *somewhat true*, 4 = *absolutely true*). Internal consistency was good for all subfields at both measurement points (see Table 1).

Intrinsic task value. All items were adapted from the literature (Steinmayr & Spinath, 2010) and used parallel wording to tap students' academic self-concepts for business studies and for the different subjects (e.g., "I have fun doing mathematics/human resources/ ..."). The mode of presentation was identical to the measurement of self-concept of ability. Internal consistency was good for all subfields at both measurement points (see Table 2).

Analyses

The analyses started with confirmatory factor analyses addressing the goodness of the hypothesized measurement models and bivariate correlations between self-concepts and intrinsic task values, respectively, regarding the four business studies subfields at each measurement point and over time. Correlations over time reflect stability coefficients (see [Gorges, 2017](#), on the stability of initial motivational beliefs in higher education). Regarding self-concept of ability and intrinsic task value, respectively, the model contained all constructs included in the subsequent structural equation models. Next, two structural models covering only t1 and t1 and t2 measures, respectively tested the predictive validity of t1 school subject-specific motivational beliefs for t1 and t2 subfield-specific motivational beliefs. Separate models were specified for self-concepts of ability and intrinsic task values (see [Fig.1](#) and [Fig. 2](#)).

The data was fitted to the specified models using the statistical software R ([R Core Team, 2015](#)) and the lavaan package ([Rosseel, 2012](#)). Robust maximum likelihood estimation and model-based handling of missing data made use of the full sample for model estimation regarding both measurement points. Model fit was evaluated based on the following fit indices: the comparative fit index (CFI, good $>.95$; acceptable $>.90$), the root mean square error of approximation (RMSEA; good $<.05$; acceptable $<.08$), and the standardized root mean residual (SRMR; acceptable $<.10$; good $<.05$; [Schermelleh-Engel, Moosbrugger, & Müller, 2003](#)).

Results

Measurement Models

Results from confirmatory factor analyses revealed at least acceptable model fit for the self-concept measurement model ($\chi^2(df)= 1444.509(695)$, $p < .01$, CFI = .917, RMSEA = .056, RMSEA 90%-CI: .052 – .060, SRMR = .047) and for the intrinsic task value measurement model ($\chi^2(df)= 1109.56(695)$, $p < .01$, CFI = .957, RMSEA = .042 RMSEA 90%-CI: .037 – .047, SRMR = .054). All factor loadings were significant ($p < .05$). Thus, the proposed measurement models were used in the following analyses.

Table 1
Internal Consistency, Descriptive Statistics, and Latent bivariate Correlations Across All Self-Concepts

| | α | $M(SD)$ | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|--------------------------------|----------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| t1 mathematics SCA (1) | .93 | 2.80 (.77) | | | | | | | | | |
| t1 German SCA (2) | .88 | 2.91 (.62) | 0.081 | | | | | | | | |
| t1 business arithmetic SCA (3) | .90 | 2.64 (.69) | 0.744* | 0.012 | | | | | | | |
| t1 accounting SCA (4) | .88 | 2.88 (.74) | 0.341* | -0.054 | 0.448* | | | | | | |
| t1 law SCA (5) | .91 | 2.73 (.67) | 0.134* | -0.006 | 0.368* | 0.604* | | | | | |
| t1 human resources SCA (6) | .92 | 2.92 (.71) | 0.437* | 0.043 | 0.556* | 0.414* | 0.401* | | | | |
| t2 business arithmetic SCA (7) | .95 | 2.67 (.83) | 0.668* | 0.054 | 0.618* | 0.207* | 0.156* | 0.351* | | | |
| t2 accounting SCA (8) | .93 | 2.71 (.77) | 0.321* | -0.047 | 0.243* | 0.608* | 0.347* | 0.207* | 0.249* | | |
| t2 law SCA (9) | .90 | 2.66 (.60) | -0.020 | 0.168 | 0.001 | 0.010 | 0.083 | 0.171 | 0.237* | 0.175* | |
| t2 human resources SCA (10) | .88 | 2.97 (.56) | 0.077 | 0.071 | 0.124 | 0.204* | 0.150 | 0.219* | 0.174 | 0.367* | 0.465* |

Note. SCA = self-concept of ability, * $p < .05$.

Descriptive Statistics and Correlational Patterns

Tables 1 and 2 show the mean, standard deviations, and latent factor correlations for all variables. Overall, self-concepts did not show a clear upward or downward trend over time, whereas all intrinsic task values decreased. As expected, correlations between mathematical versus verbal subfields of business studies decreased over time. The correlation between law and human resources self-concept slightly increased, whereas the correlation between business arithmetic and accounting self-concept substantially decreased. Stability coefficients were high for the mathematical subfields, but low for the verbal subfields. Mathematics and German self-concept were uncorrelated.

Table 2
Internal Consistency, Descriptive Statistics, and Latent Bivariate Correlations Across All Intrinsic Task Values

| | α | $M(SD)$ | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|--------------------------------|----------|------------|--------|--------|--------|--------|--------|--------|--------|-------|--------|
| t1 mathematics ITV (1) | .94 | 2.83 (.77) | | | | | | | | | |
| t1 German ITV (2) | .84 | 2.72 (.65) | -0.022 | | | | | | | | |
| t1 business arithmetic ITV (3) | .94 | 2.85 (.70) | 0.428* | 0.003 | | | | | | | |
| t1 accounting ITV (4) | .96 | 2.79 (.81) | 0.271* | 0.075 | 0.409* | | | | | | |
| t1 law ITV (5) | .94 | 2.81 (.74) | 0.019 | 0.211* | 0.238* | 0.598* | | | | | |
| t1 human resources ITV (6) | .93 | 3.24 (.60) | 0.145* | 0.022 | 0.486* | 0.461* | 0.461* | | | | |
| t2 business arithmetic ITV (7) | .92 | 2.72 (.76) | 0.664* | -0.080 | 0.250* | 0.103 | -0.090 | -0.004 | | | |
| t2 accounting ITV (8) | .95 | 2.71(.83) | 0.419* | -0.013 | 0.145 | 0.471* | 0.175* | 0.162* | 0.313* | | |
| t2 law ITV (9) | .93 | 2.77 (.71) | 0.070 | 0.185 | 0.016 | 0.199* | 0.356* | 0.120 | 0.150* | 0.083 | |
| t2 human resources ITV (10) | .91 | 3.04 (.61) | 0.033 | 0.042 | 0.192* | 0.217* | 0.148 | 0.214* | 0.209* | 0.157 | 0.371* |

Note. ITV = intrinsic task value, * $p < .05$.

The overall correlational pattern for intrinsic task values was somewhat different compared to the pattern for self-concepts. Both within-domain correlations and cross-domain correlations decreased over time. However, within-domain correlations remained moderate and significant, whereas most cross-domain correlations at t2 were small, and only half of them were significant. Compared to self-concept correlations, stability coefficients were a little lower. Furthermore, the stability coefficients did not vary depending on the subfield being mathematical or verbal. Instead, accounting and law intrinsic task value showed high stability, whereas business arithmetic and human resources intrinsic task value showed moderate stability at best. Again, mathematics and German self-concept were uncorrelated.

Predicting Subfield-Specific Self-Concepts and Intrinsic Task Values

To investigate the predictive validity of mathematics- and German-specific motivational beliefs for subfield-specific motivational beliefs, two models were specified. The first model used t1 school subject-specific motivational beliefs to predict t1 subfield-specific motivational beliefs (i.e., anticipated motivational beliefs); the second model used t1 school subject-specific motivational beliefs to predict t2 subfield-specific motivational beliefs (i.e., experience-based motivational beliefs).



Figure 1. Results from structural equation models regarding self-concepts of ability. *Note.* The figure shows standardized coefficients; significant paths/correlations and coefficients are printed in bold ($p < .05$), marginally significant coefficients ($p < .10$) are printed in italics; for further description, see text.

Model fit was acceptable for the first self-concept model ($\chi^2(df)=866.352(237)$, $p < .01$, CFI = .890, RMSEA = .096, RMSEA 90%-CI: .089–0.103, SRMR = .076) and slightly better for the second self-concept model ($\chi^2(df)=528.737(237)$, $p < .01$, CFI = .932, RMSEA = .061, RMSEA 90%-CI: .054 – .068, SRMR = .049). By contrast, both intrinsic task value models showed at least acceptable model fit (first model: $\chi^2(df)=493.220(237)$, $p < .01$, CFI = .961, RMSEA = .060, RMSEA 90%-CI: .053 – .067, SRMR = .056; second model: $\chi^2(df)=395.391(237)$, $p < .01$, CFI = .961, RMSEA = .047, RMSEA 90%-CI: .039 – .055, SRMR = .068).

As expected, mathematics self-concept of ability predicted all four anticipated subfield-specific self-concepts. Not surprisingly, its predictive validity was highest for business arithmetic self-concept and lowest for law self-concept (see [Figure 1](#)). German self-concept did not show a significant effect on any of the subfield-specific self-concepts. Predicting the same subfield-specific self-concepts three to four months later, however, showed a different pattern of results. More specifically, the predictive validity of mathematics self-concept for experience-based law and human resources self-concept decreased and was no longer significant. Effect sizes for German self-concept predicting law and accounting for self-concept increased markedly and revealed a trend toward significance for law self-concept ($\beta = -.18$; $p = .076$).

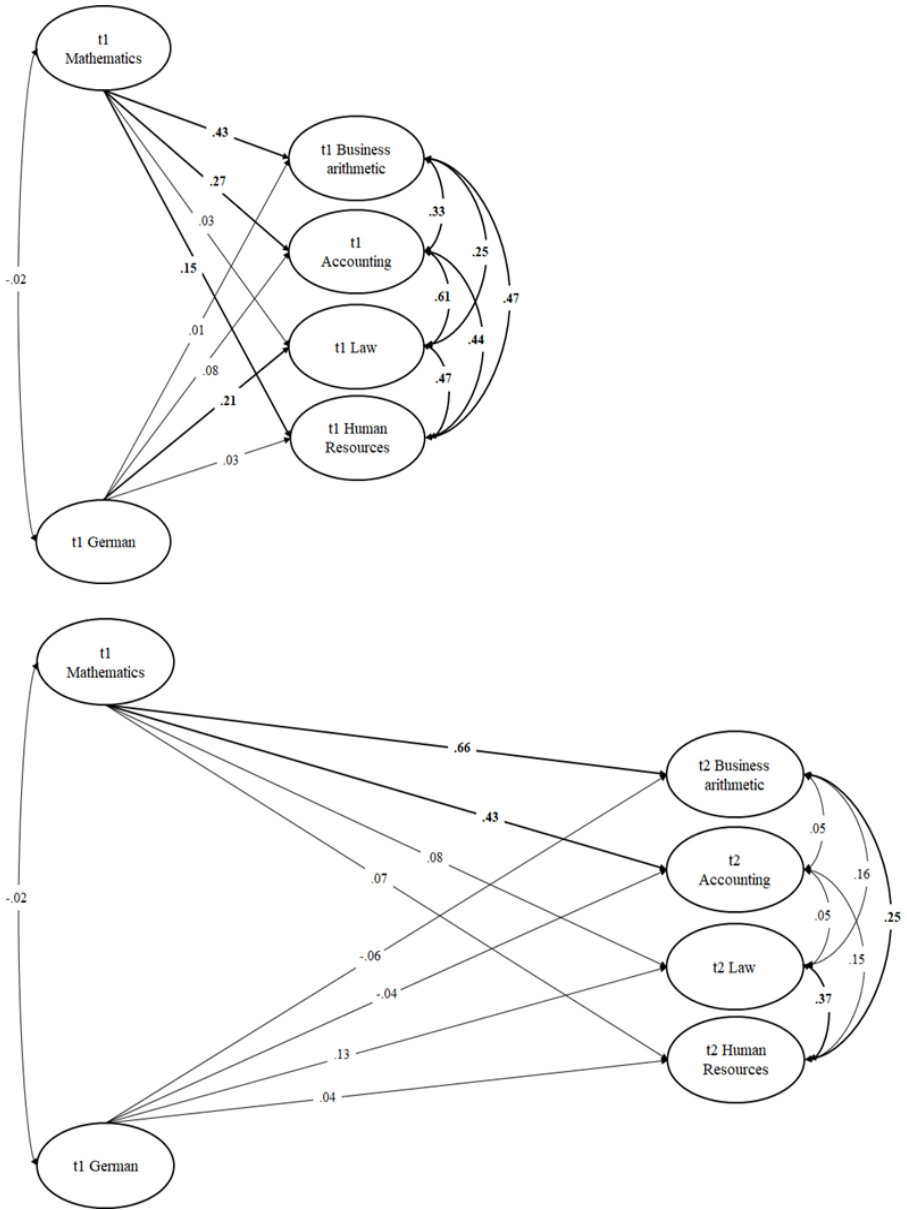


Figure 2. Results from structural equation models regarding intrinsic task values.

Note. The figure shows standardized coefficients; significant paths/correlations and coefficients are printed in bold ($p < .05$), marginally significant coefficients ($p < .10$) are printed in italics; for further description, see text.

Turning to intrinsic task value (see [Figure 2](#)), the pattern looked different. In particular, mathematics intrinsic task value predicted anticipated business arithmetic, accounting, and human resources intrinsic task values, but not law intrinsic task value. Law intrinsic task value, in turn, was predicted by German intrinsic task value. This pattern of results changed markedly when looking at experience-based intrinsic task value. Mathematics intrinsic task value continued to predict business arithmetic and accounting intrinsic task value, but none of the other paths reached significance. That is to say, German intrinsic task value lost its predictive validity over time.

Discussion

The present study investigated business studies students' subfield-specific motivational beliefs—that is, self-concepts and intrinsic task values—across students' first semester in higher education. Results show that students differentiate subfield-specific motivational beliefs during the transition into higher education, and even more so toward the end of the first semester. The correlational patterns suggest that students begin to distinguish subfields belonging to the mathematical versus verbal domain. Mathematical self-concepts are rather stable, whereas verbal self-concepts are highly unstable across the introductory study phase. These changes may be explained by uncertainties students face when they encounter novel academic learning content in higher education.

Investigating the predictive validity of mathematics- and German-specific motivational beliefs, two school subjects that students know well and differentially associate with business studies subfields, showed some changes over time as well. As expected, the predictive validity of mathematics-specific motivational beliefs decreased over time, whereas the predictive validity of German-specific motivational beliefs increased a little. Hence, these changes largely corresponded to the changes in the correlational pattern of subfield-specific motivational beliefs. Overall, results from the present study emphasize the need for students to anticipate motivational beliefs when entering higher education—likely by generalizing motivational beliefs from

well-known school subjects—and the hypothesized revision of motivational beliefs based on experience, which apparently affects the structure of self-concepts of ability and intrinsic task values.

Students' Motivational Beliefs at the Transition into Higher Education

A number of studies have addressed students' transition into higher education (Coertjens, Brahm, Trautwein, & Lindblom-Ylänne, 2017; Gale & Parker, 2014) and the role of school-based motivational beliefs for educational (e.g., Musu-Gillette et al., 2015; Shernoff & Hoogstra, 2001) and occupational decisions (e.g., Eccles et al., 2004; Mortimer, Zimmer-Gembeck, Holmes, & Shanahan, 2002). However, investigations that take the subfield-related multidimensionality of motivational beliefs and the diversity and novelty of academic learning content in higher education into account are rare. Hence, the present study provides a substantive extension of our understanding of students' motivational beliefs at the beginning of their career in higher education in two regards. First, the results emphasize the importance of investigations of motivational beliefs on the level of subfields, in addition to the level of fields of study. Changes in the correlational patterns of students' subfield-specific self-concepts of ability and intrinsic task values demonstrate that subfield-specific motivational beliefs may not be well-differentiated at the beginning, but certainly develop when students' experience with the subfields increases. This finding is especially important because self-concepts of ability and intrinsic task values are key factors for student retention and dropout (T. R. Stinebrickner & Stinebrickner, 2009; Heublein & Wolter, 2011).

Second, the present study offers insight into antecedents of anticipated motivational beliefs. As expected, stereotypes about which school subject is similar to a field of study affect students' anticipations of motivational beliefs (Gorges, 2016; Gorges & Göke, 2015). Such perceptions may lead students to use specific school-based motivational beliefs as predictors of their field-of-study-specific motivational beliefs, which may or may not turn out to be right. Thus, this study extends empirical findings on antecedents of field-of-study-specific motivational beliefs when students encounter novel learning contents on the level of subfields.

The Case of Business Studies

With respect to the field of study under investigation—business studies—the results confirm that common stereotypes (e.g., business studies contain a lot of mathematics) may lead first-year students to form inadequate motivational beliefs. More specifically, students’ apparently use their mathematics-specific self-concept and intrinsic task value to anticipate their business studies-specific self-concept and intrinsic task value (Gorges, 2016; Gorges & Göke, 2015). As can be seen from the results, students use their mathematics-specific motivational beliefs to anticipate their business studies subfield-specific motivational beliefs as well. Thus, due to a lack of differentiation among business studies subfields, students seem to assume that mathematics competence and task value are important for every learning content in a business studies program. Such inadequate anticipations of motivational beliefs may lead to discontented and frustrated students.

Later in their first semester, students apparently discover that business studies subfields are quite diverse and seem to realize that competence and value related to German are just as important. In particular, the increase of the correlation between law and human resources self-concept suggests that students may develop a verbal self-concept factor to organize their subfield-specific self-concepts. By contrast, the correlation between business arithmetic and accounting self-concepts decreases, suggesting that students scrutinize their initial idea of many mathematical subjects in business studies as well. Overall, students appear to get to know their field of study better and develop self-concepts specific to each subfield, especially in the verbal ones, which they may not have expected. This, in turn, may lead to dropout.

In recent years, attempts have been made to integrate the diverse subfields within business studies by modifying the curriculum to increase students’ employability in modern companies (Campbell et al., 2006). Critics of this development have argued that the traditional function-based curriculum allows students to quickly develop specialized competences, whereas pedagogical measures may foster teamwork and integrated competence across subfields (Campbell et al., 2006; Tempelaar et al., 2011). From a motivational perspective, students develop subject-specific motivational beliefs even in an integrated curriculum (Jansen, Schroeders, Lüdtke, & Pant, 2014). Thus, integrating different subfields to make distinctions less obvious will not necessarily lead to different processes of motivational development or to higher levels of motivation per se.

Practical Implications

With respect to higher education institutions' goals to attract and retain students that are successful in their study programs—and, in addition, students' goals to find the right study program—the present study draws attention to the significance of student counseling and provision of information prior to the decision to enroll. For example, it may help students to anticipate adequate business studies self-concepts and intrinsic task value if they know that business studies cover both mathematical and verbal content. For higher education teachers, it is important to know that students will develop motivational beliefs specific to every subfield they encounter at college or university. Therefore, every lecturer should foster motivation for his/her part of the curriculum; only then do more integration and cross-references add to students' motivation.

Comparison of the stability of motivational beliefs documented in this study to Tempelaar et al.'s (2011) results reveals that motivation becomes more stable rather quickly. Therefore, it is important to seize the opportunity to foster motivation at the beginning of a study program. Although students may be occupied with organizing their new life at university and blending in with the new environment, intrinsic task values may decline soon after students have entered higher education, which may lead to doubts regarding students' choice of study program. Given that all motivational beliefs are anticipated, some variation, including decreases, may not necessarily mean that students' have chosen the wrong study program. Programs that help students with adapting to the new social environment and prepare students who have to revise their motivational beliefs, which is a normal process, may prevent overly hasty reactions, such as early dropout. In addition, lectures should be aware of such motivational development and help students to retain or rebuild their motivation based on experience. Overall, these results emphasize that every lecture counts and may help students to gather information about their aptitude by providing feedback and promoting intrinsic task value (Hidi & Harackiewicz, 2000).

Limitations and Outlook

The present study draws on a longitudinal database. Students have been questioned at the beginning of their study program and toward the end of the first semester. This study design thus warrants causal conclusions with respect to the predictive validity of school subject-specific motivational beliefs for

motivational beliefs recorded at the second—but not the first—measurement point.

Due to similarities in structure and experience-based developmental processes, self-concepts of ability and intrinsic task value were treated as similar constructs throughout this study. However, in line with Gorges (2016), the pattern of results showed some inconsistencies across the analyses for self-concept and intrinsic task value. As an explanation, Gorges (2016) suggested that the concept of similarity underlying students' generalization may be different. More specifically, self-concepts generalize when students perceive a school subject as a foundation of a field of study, whereas intrinsic task value may generalize when students perceive the topics and the structure related to a school subject and a field of study to be similar. Against this background, students' may have realized that their mathematical competence is less important for being successful in law and human resources; hence, the predictive power of mathematical self-concept decreases. By contrast, they may have noticed that language (i.e., expressions and wordings) are important for success in a law courses, hence the predictive validity of their German self-concept for law increased. Regarding intrinsic task value, business arithmetic and accounting might include tasks similar to mathematics at school (e.g., mathematical exercises taken from everyday life). However, neither mathematics nor German tasks match the requirement of the learning contents of law and human resources, which might explain the extremely low stability of students' self-concepts of ability: They have to draw a picture of their own about their subfield-specific competence because their anticipated self-concepts drawing on mathematics turned out to be inadequate.

The present study focused on one specific field of study, namely business studies. This field of study was chosen based on its diverse contents and its absence in the regular school curricula in Germany, where this study was set. Replicating the study with respect to a field of study that students already know more about, for example, because it is a subject at school, may lead to different results. Such a study would nevertheless be desirable for broadening our understanding of motivational beliefs in higher education. Similarly, using a field of study with a smaller range of subfields may also lead to different results because it is more likely that students' field-of-study-specific motivational beliefs are in line with their subfield-specific beliefs. Finally, the present study focused on mathematics- and German-specific antecedents of subfield-specific motivational beliefs. Future research addressing

generalization and revision processes during the transition into higher education is needed to scrutinize the assumptions underlying the present study and to provide more details on how students' motivational beliefs develop in higher education.

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