EMPIRICAL IMPLICATIONS FOR PROMOTING STUDENTS’ ENTREPRENEURIAL INTENTIONS

SILKE TEGTMEIER
Leuphana University of Lueneburg
Department of Entrepreneurship & Start-up Management
Scharnhorststrasse 1, 21335 Lueneburg, Germany
tegtmeier@uni.leuphana.de

Ajzen’s Theory of Planned Behaviour (TPB) suggests empirical implications to promote students’ entrepreneurial intentions. In the course of an empirical study with 208 German students, regression analyses confirm that attitude, social norm, and perceived behavioural control contribute substantially to the prediction of start-up intentions. The use of index based measurements shows that entrepreneurial intention is significantly influenced by all three constructs ($R^2 = 0.446$). As beliefs based on information and experiences are decisive in order to emerge an intention, a promoting approach should start here. Following the TPB, changes at singular points are not sufficient. A discussion of concrete beliefs provides implications for future research as well as for practical interventions.

Keywords: Entrepreneurship; entrepreneur; theory of planned behaviour; entrepreneurial intention; universities; intervention.

INTRODUCTION

In response to the positive social and economic effects of entrepreneurship, many universities try to advance entrepreneurial thinking and behaviour (Fayolle, 2007). Moreover, in this context, it appears to be crucial to enhance students’ awareness about what entrepreneurship is and create entrepreneurial mindsets.

In Germany, a considerable number of professorships in entrepreneurship, as well as governmentally funded support programmes, have been installed in recent years. However, students’ entrepreneurial intentions are still underdeveloped. With 58 entrepreneurship professorships and an additional 13, which either have recently been established or in the planning...
process. Almost one third of all universities (scientific and applied sciences) in Germany are structurally involved in the field of entrepreneurship education. With only 20 professorships available in 1998, there is still an ongoing dynamic in installing new opportunities (Klandt et al., 2008).

Among a many funding programmes in Germany, the “Federal Ministry of Education and Research” launched the nation-wide programme, “EXIST,” in 1998 to foster particularly academic entrepreneurship. This programme is aimed at sensitizing students and academic staff at universities and other research organizations toward an entrepreneurial career and focuses on boosting entrepreneurship education, improving the entrepreneurial climate, and sustainably anchoring a culture of entrepreneurship at universities (currently hosted at “Federal Ministry of Economics and Technology,” www.exist.de, Kulicke et al., 2006).

However, the “International Survey of Collegiate Entrepreneurship” revealed that, in German students, entrepreneurial intentions are still ranked lowest among 14 other countries. While focusing on European countries, such as Norway, Finland, Belgium, France, and Switzerland, the study addressed non-European countries such as New Zealand and Australia as well (Fueglistaller et al., 2006). The “Global Entrepreneurship Monitor” demonstrated that, with respect to non-scholar entrepreneurship education (including education at universities), Germany ranks number 8 among 11 innovation-driven countries with USA ranking number one (Brixy et al., 2009).

In this paper, I focus on uncovering individual factors that influence student’s entrepreneurial intentions. Such an approach permits an in-depth assessment of entrepreneurial intentions of those who might once become so-called “high-potential” entrepreneurs, a term reflecting the privilege of academic education.

For an intention approach, Ajzens’ Theory of Planned Behaviour (TPB) represents a systematic theoretical framework (Ajzen, 1985, 1991). The TPB model, which uses few variables and shows how various factors influence human behaviour, has already been used to explain different behaviours and has been tested empirically (for an overview, see Ajzen, 2009). Just as starting a business venture is clearly a planned, intended behaviour (Shapero and Sokol, 1982; Katz and Gartner, 1988; Krueger and Carsrud, 1993) of entrepreneurship has been linked to TPB (Engle et al., 2010; Fayolle, 2000; Van Gelderen et al., 2008; Kolvereid, 1996; Krueger et al., 2000; Liñán, 2008; Liñán and Chen, 2009; Zellweger et al., 2011; Zumholz, 2002). The current application of the TPB model provides an indication of individual behavioural beliefs influencing the decision of
starting a business or not and reasons how to promote students’ entrepreneurial intentions from a cognitive perspective.

To develop this conceptual framework for the current study, I outline TPB in the following section, with a presentation and discussion of the empirical investigation to follow. I also define the purpose of the research design, sample, and results of a pilot study. Furthermore, a questionnaire and hypothesis are depicted followed by the results and discussion of the outcomes of the current investigation. Finally, based on the empirical test, deeper analyses suggest implications for behavioural interventions. The article will conclude with implications for entrepreneurship research, education and policy.

THE “THEORY OF PLANNED BEHAVIOUR” AS INTENTION APPROACH

The TPB is the prevailing model for the explanation of behavioural intentions (Krueger and Brazeal, 1994), because TPB can be used in many different behavioural domains and can be characterized by conceptual clarity.

According to the TPB, behaviour can be explained as a result of an intention, which is influenced by three global constructs: attitude (perceived attractiveness of the target behaviour), perceived social norms (social pressure in favor for or against the target behaviour), and perceived behavioural control (the actor’s perceived ability to perform the behaviour).

People intend to perform a specific behaviour if (1) their personal assessments of the questioned behaviour are positive, (2) they think their important referents agree with the behaviour, and (3) they assume that the required resources and opportunities are available. If perceived behavioural control and actual control over the behaviour are identical, intention should be the immediate antecedent of the behaviour. However, intention can be changed by new information that prevents performance of the behaviour (Ajzen, 1985, 2005).

On the one hand, the influencing constructs of attitude, social norms, and perceived behavioural control can be measured directly via semantic differential scales (Osgood et al., 1957) that use bipolar adjective pairs at opposite ends of a dimension (e.g., good-bad). In this context, direct measurement means that participants answer whether their attitude toward a behaviour is generally positive or negative. On the other hand, attitude, social norms, and perceived behavioural control can be indirectly explained through beliefs based on information and experience (belief index). For example, attitude towards a certain behaviour is assumingly defined by
beliefs concerning behaviour. Indirect measurement means that people specify singular beliefs rather than a composite evaluation, and a positive or negative attitude results from the combination of these beliefs. In the sense of an expectancy value model, belief is defined as the subjective probability that behaviour is related to a certain consequence (Fishbein and Ajzen, 1975). Belief-based indices explain why people hold certain attitudes, social norms and perceptions of control. These are the antecedents that finally determine intentions. For instance, “the attitude towards the behaviour is determined by the person’s evaluation of the outcomes associated with the behaviour and by the strength of these associations.” (Ajzen, 2005, 123). By summing up the products of strength of beliefs and outcome evaluations, a person’s attitude can be estimated on the basis of accessible beliefs about the behavior in question. (For more information see Ajzen, 1991, 2005.)

Figure 1 shows the TPB with a belief-based (and, therefore, indirect) measurement of the influencing constructs of behavioural beliefs,
normative beliefs, and control beliefs (Ajzen, 2005; Krueger and Carsrud, 1993).

A belief-based measurement results in three indices for global constructs including attitude, social norms, and perceived behavioural control. The current study utilizes an indirect (index-based) measurement.

Only those central beliefs that are readily accessible to memory are assumed to play a decisive role with the intent to perform a behaviour. Behavioural beliefs as determinants of attitude, normative beliefs as determinants of social norms, and control beliefs that explain perceived behavioural control can thus be distinguished. Behavioural beliefs consist of the expected consequences of a behaviour (probability of occurrence) and the evaluation of those consequences (desirability). For instance, someone assumes job-related independence to be a probable consequence of entrepreneurial activity and he or she evaluates job-related independence positively.

Normative beliefs indicate whether a person expects his or her important referents to approve of the behaviour, as well as the person’s motive for complying with the referents. For instance, a person assumes his or her partner to disapprove of the target behaviour and the motivation to comply with the referent’s desires is high.

Finally, control beliefs characterize expectations regarding the availability of factors that either promote or prevent the performance of a behaviour (probability of occurrence) and the perceived power of these factors over the ability to perform the target behaviour (Ajzen, 1985, 1991, 2005). Control factors can be resources such as time, funds, or skills. For instance, funds are assumed to be very beneficial for the performance of the target behaviour; however, the individual does not regard them as sufficiently available. His or her perception of this control factor will weigh on the decision to perform the target behaviour. Because beliefs represent the information the person has concerning his or her environment (whether or not they are correct), this information ultimately determines behaviour (Ajzen, 2005).

The TPB also has implications for behavioural interventions, specifically that it provides general guidelines for intervention programmes that can be directed toward behavioural, normative, or control beliefs as antecedents of intention. Such behaviour-change programmes work through persuasion, information, increasing skills, goal-setting, and rehearsal of skills (Hardeman et al., 2002). If the relevant sets of beliefs change, the corresponding overall attitude, social norm or perceived behavioural control should change as well (Ajzen, 2005).
EMPIRICAL INVESTIGATION

Research design and sample. In the current application of the TPB, the behaviour under study is entrepreneurship. In this context, the term entrepreneurship is usually translated into German by using the word “Existenzgruendung”. This term refers to the economic importance to the entrepreneur and requires him or her to act independently in order to build up or save for an independent economic existence. For this, the venture is the main source of income. Entrepreneurship is not limited to the creation of new companies, but may involve entire or partial buyouts and operating participation. Entrepreneurship also refers to starting a self-employed activity for economic reasons.

The sample of the current investigation was comprised of 208 students in different courses of study at a German university, responding to a standardized online questionnaire. The reasons for their entrepreneurial intentions were identified as prospects or forecasts because they were associated with conditions at the time the intention was formed (Krueger and Carsrud, 1993) and because they can be transfigured by a retrospective survey. Persons who were not interested in becoming entrepreneurs were also included in the investigation. It is reasonable to concretize the target behaviour, as well as all antecedent variables regarding the time aspect, because beliefs can vary based on the particular time at which the target behaviour takes place. The shorter the period until the performance of the target behaviour, the more important the beliefs regarding the behaviour’s negative aspects (approach-avoidance behaviour; Ajzen, 1985, 2001). Beliefs are of central importance because, based on beliefs, measures are presumed to promote entrepreneurial activity in a reasonable way. Furthermore, answers will be more realistic if the time period until the behaviour is shorter and the target behaviour is more concrete. Based on these considerations, the target behaviour of this study is “becoming an entrepreneur within five years after completing studies.” This data was evaluated using a regression analysis, which provides hints regarding central cause and effect coherences of the TPB. Additionally, approaches for promoting students’ entrepreneurial intentions were derived from belief-intention correlations, as well as, mean values of central beliefs.

Pilot study. Prior to the development of a standardized questionnaire (concerning TPB), an elicitation study was conducted among a comparable sample of 39 students. At the time of the enquiry, the participants were enrolled in a diverse range of study courses. They participated in qualitative
interviews which were based on an open-ended questionnaire. On grounds of frequency of naming, the most important factors were identified and assembled into the following list (modal accessible beliefs, Ajzen, 2002; Francis et al., 2004):

Six important consequences: job-related independence, personal responsibility, risk of failure, personal evolvement, influence on flexibility, and high workload.

Six referent groups: parents, partner, other family members, friends/fellow students, colleagues at work, and important professors.

Six control factors: seed capital, start-up knowledge, business idea, economic climate, support of others, and practical experience.

Questionnaire. The questionnaire contained items concerning demographic factors such as sex, number of semesters attended, faculty, parents’ self-employment and entrepreneurial intentions.

As recommended in the literature (Francis et al., 2004) the TPB constructs have been measured on 7-point-response formats (rating scales), such as “I intend to become an entrepreneur within five years after having finished my studies” (very improbable-very probable) for intention (Ajzen, 2006).

Behavioural beliefs. For measuring behavioural beliefs, the consequences from the pilot study were consulted. Using 7-point scales for the following constructs, subjective probability of occurrence was measured (very improbable-very probable). Furthermore, these consequences were evaluated (extremely negative-extremely positive).

Normative beliefs. To measure normative beliefs, I used the referents from the pilot study. Specifically, we obtained a measure of the subjective probability of the referent group approving-disapproving regarding the participant becoming an entrepreneur within five years after studying. Furthermore, the responder’s desire to comply with the referent’s desires was also measured (not at all-very much).

Control beliefs. Control beliefs were measured using the control factors from the pilot study. The subjective probability whether the control factor is existent had to be estimated (very improbable-very probable). In addition, the impact on becoming an entrepreneur within five years after studying was evaluated (would make it much more difficult — would make it much easier).

Hypothesis. Based on the TPB, the following hypothesis was tested using belief-based indices as an indirect measurement of the influencing constructs:
The more positive attitude, social norms, and higher perceived behavioural control, the stronger the intention of a person to become an entrepreneur within five years after studying.

**Methodology of analysis.** Belief-based indices of attitude, social norms, and perceived behavioural control were acquired by means of behavioural beliefs, normative beliefs, and control beliefs. For behavioural beliefs, the subjective probabilities of occurrence were coded from 1 to 7 (improbable-probable) and evaluations of consequences from $-3$ to $+3$ (bad-good) (Francis *et al.*, 2004). Thus, the valence of the composite index indicated the direction and strength of influence. The index was also divided by the number of consequences. Hence, the indices for attitude, social norms, and perceived behavioural control could be compared more easily within a study, while studies that use a different number of behavioural consequences can be related in a better way (Francis *et al.*, 2004).

For normative beliefs, the belief that referents approve or disapprove of the behaviour was coded from $-3$ to $+3$ (rejection-agreement) and the motive to comply with these referents was coded from 1 to 7 (low–high). Here, participants often chose “referent not existent,” indicating that there is no social pressure of either a positive or negative nature coming from this group of referents. Thus, the composite index refers only to referents where they exist and was divided by the number of these referents.

The belief in whether the participant has the necessary control factors was coded from 1 to 7 (not existent–existent) and their perceived importance for the target behaviour was coded from $-3$ to $+3$ (difficult–easy). The result was divided by the number of control factors for an average, as was done with the behavioural and normative beliefs.

**Descriptive data.** Table 1 contains the characterization of the sample ($n = 208$).

Table 1 shows that the ratio between men and women participants (1:1.1) was relatively balanced. Students of the faculties “Business Administration and Social Sciences” as well as “Cultural Sciences” were the primary participants in the study. Data concerning the intended completion of a course of study shows that the sample mainly consisted of students who attended main courses and who were relatively close to their exams. Approximately 33% of the participants had self-employed parents. Table 2 provides the mean values, (mean), standard deviations ($\sigma$), minimum and maximum values (min; max), values range, and the number of valid values ($n$).

The mean value for the attitude-index was 4.805, located relatively close to the centre of the range of values, which was level 0 (range of values for
all three indices each: \([-21; +21]\)). The mean value for perceived behavioural control was with 7.321, explicitly more positive. Because becoming an entrepreneur requires special knowledge, lower mean values are generally assumed; clearly, students are confident of their ability to gain the necessary knowledge for becoming entrepreneurs. However, the mean value for social norms was found to be slightly negative.

**Regression analysis.** Table 3 depicts the results of the regression analysis with index-based measurement of the influencing constructs \((n = 194)\). These results confirm the predictive validity of the TPB for entrepreneurial intentions. Indices for attitude, social norms, and perceived behavioural control have been taken as regressors of the analysis. Using this model, 44.6% of the variance in entrepreneurial intentions is explained and all components of the TPB contribute significantly to the estimation of

<table>
<thead>
<tr>
<th>Table 1. Characterization of the Sample.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex:</strong> male: 47.6% female: 52.4%</td>
</tr>
<tr>
<td><strong>Faculties:</strong> business and social sciences: 59.6% cultural sciences: 14.1% life sciences: 6.6% others: 19.7% (each with &lt;10%)</td>
</tr>
<tr>
<td><strong>Planned Graduation Year:</strong> 2005: 22.8% 2006: 35.1% 2007: 17.8% others: 24.3% (each with &lt;10%)</td>
</tr>
<tr>
<td><strong>Study Period:</strong> advanced studies: 81.4% basic studies: 18.6%</td>
</tr>
<tr>
<td><strong>Semester:</strong> 6.: 14.4% 8.: 18.8% 10.: 17.8% others: 49.0% (each with &lt;10%)</td>
</tr>
<tr>
<td><strong>Parents’ Self-employment:</strong> yes: 32.5% no: 67.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2. Descriptive Data.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intention</strong></td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td><strong>Intention</strong></td>
</tr>
<tr>
<td><strong>Attitude-Index</strong></td>
</tr>
<tr>
<td><strong>Social Norm-Index</strong></td>
</tr>
<tr>
<td><strong>Perceived Behavioural Control-Index</strong></td>
</tr>
</tbody>
</table>
intention. The standardized regression coefficients for attitude and social norms have similar values, whereas the coefficient for perceived behavioural control is lower. However, this result cannot be explained by the fact that no control factors were required because the target behaviour was not in the sphere of total volitional control of the person. Furthermore, this was not supported by further analyses. However, it can be concluded from the results that entrepreneurial capabilities, knowledge, and opportunities must be indicated in the sense of hygienic factors. These factors are not sufficient for the emergence of an entrepreneurial intention; however, it is essential to have a positive attitude toward the target behaviour. The standardized partial regression coefficients for attitude and social norms indicate that the relative importance of attitude is higher than the relative importance of social norms.

**Behavioural interventions.** To identify an appropriate approach to promote start-up decisions, detailed results concerning the beliefs are decisive. Table 4 depicts detailed results regarding behavioural beliefs. The expected consequences were ranked according to their correlation with entrepreneurial intention (each outcome evaluation multiplied with the estimated probability of occurrence: \( e^i b_i \), see above). For a detailed analysis, the following presents mean values and standard deviations of each outcome evaluation and each estimated probability of occurrence. Depending on the mean values, the average evaluations of the sample were interpreted as negative or positive and the average estimated probabilities were interpreted as probable or improbable with further nuances.

As a result, there is a need for action if

(1) The outcome is important regarding the formation of entrepreneurial intentions (correlation >0.30) and

---

### Table 3. Multiple Regressions of Index-Based Measurement.

<table>
<thead>
<tr>
<th>Dependent Variable: Intention</th>
<th>( r )</th>
<th>( b )</th>
<th>( b^* )</th>
<th>( R )</th>
<th>( R^2 )</th>
<th>( R^2* )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude-Index</td>
<td>.536**</td>
<td>.137***</td>
<td>.372***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Norm-Index</td>
<td>.496**</td>
<td>.121***</td>
<td>.358***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Behavioural Control-Index</td>
<td>.343**</td>
<td>.087***</td>
<td>.195***</td>
<td>.668***</td>
<td>.446***</td>
<td>.437***</td>
</tr>
</tbody>
</table>

Annotations: ***\( p < 0.001 \), **\( p < 0.01 \), \( b \): unstandardized regression coefficient, \( b^* \): standardized regression coefficient, \( R^2 \): coefficient of determination, \( R^2* \): adjusted coefficient of determination, \( R \): multiple correlation, \( r \): bivariate correlation, \( n = 187 \) cases with valid values of all regressors.
Table 4. Behavioural Beliefs.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Outcomes</th>
<th>Correlation $b_i^*e_i$ with Intention</th>
<th>Evaluation</th>
<th>Belief (probability)</th>
<th>Need for Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>σ</td>
<td>Interpret. Mean</td>
</tr>
<tr>
<td>1</td>
<td>job-related independence</td>
<td>.514</td>
<td>1.62</td>
<td>1.15</td>
<td>positive</td>
</tr>
<tr>
<td>2</td>
<td>risk of failure</td>
<td>.468</td>
<td>−1.12</td>
<td>1.54</td>
<td>rather negative</td>
</tr>
<tr>
<td>3</td>
<td>influence on flexibility</td>
<td>.361</td>
<td>−0.59</td>
<td>1.50</td>
<td>rather negative</td>
</tr>
<tr>
<td>4</td>
<td>personal evolvement</td>
<td>.268</td>
<td>2.41</td>
<td>0.76</td>
<td>positive</td>
</tr>
<tr>
<td>5</td>
<td>high work load</td>
<td>.224</td>
<td>0.19</td>
<td>1.63</td>
<td>indifferent</td>
</tr>
<tr>
<td>6</td>
<td>personal responsibility</td>
<td>.173</td>
<td>2.21</td>
<td>0.82</td>
<td>positive</td>
</tr>
</tbody>
</table>

Annotations: Interpretation of mean “evaluation”: $<−1.5$: negative; $<−0.5$: rather negative; $<0.5$: indifferent; $<1.5$: rather positive; $<=3$: positive.

Interpretation of mean “belief”: $<2.5$: improbable; $<3.5$: rather improbable; $<4.5$: indifferent; $<5.5$: rather probable; $<=7$: probable.

Important regarding the intention: if correlation $>0.30$. 

The sample estimates the outcome as negative and probable which means it is relevant, but prevents an entrepreneurial intention or

The sample estimates the outcome as positive, but improbable, which means that it would promote an entrepreneurial intention, but is irrelevant.

Particularly, the consequences “risk of failure” and “influence on flexibility” are important starting points regarding the behavioural beliefs of this student sample. To promote entrepreneurial intentions, it should be communicated, which supporting institutions can make a failure less probable. The evaluation of risk could become less negative if debts in case of a failure could be abated or if it could be convincingly communicated that a business failure is not a personal stigma, but strengthens a person for future jobs, in particular a subsequent start-up. The influence on flexibility was estimated as probable, but had been evaluated negatively that is, German students think that a start-up makes them inflexible.

As the correlation of the flexibility evaluation with high workload was low, there must be other reasons for the negative evaluation of flexibility in terms of becoming an entrepreneur. At this point, underlying concrete aspects and experiences should be followed up in a subsequent study. Such aspects could be the role of the entrepreneur as man or woman in charge with respect to the company, the amount of business appointments, or compatibility with family life. In fact, German women think being an entrepreneur makes it more difficult to take care of their children while, in the U.S., women think they would be more flexible regarding childcare (Lauxen-Ulbrich and Leicht, 2004).

Table 5 depicts detailed results regarding normative beliefs. The expected referent groups were ranked according to their correlation with entrepreneurial intention (each expected referents’ evaluation multiplied with the motive to comply with the referent group: \( r_j m_j \), see above).

As with respect to behavioural beliefs, mean values and standard deviations of each perceived referent group’s evaluation and each motive to comply with the referent are presented. Depending on the mean values, the average referents’ evaluations were interpreted as negative or positive and average motives to comply with them were interpreted as high or low with further nuances.

As a result, there is a need for action if

(1) The referent group is important regarding the formation of entrepreneurial intentions (correlation >0.30) and
Table 5. Normative Beliefs.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Referents</th>
<th>Correlation $r_{mj}$ with Intention</th>
<th>Perceived Referents’ Evaluation</th>
<th>Motive to Comply with Referent</th>
<th>Need for Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>σ</td>
<td>Interpret. Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>1</td>
<td>friends/fellow students</td>
<td>0.635</td>
<td>-0.55</td>
<td>1.71 rather negative</td>
<td>3.85</td>
</tr>
<tr>
<td>2</td>
<td>other family members</td>
<td>0.517</td>
<td>-1.26</td>
<td>1.76 rather negative</td>
<td>3.15</td>
</tr>
<tr>
<td>3</td>
<td>parents</td>
<td>0.492</td>
<td>-1.26</td>
<td>1.86 rather negative</td>
<td>3.62</td>
</tr>
<tr>
<td>4</td>
<td>partner</td>
<td>0.480</td>
<td>-0.90</td>
<td>1.96 rather negative</td>
<td>5.03</td>
</tr>
<tr>
<td>5</td>
<td>colleagues at work</td>
<td>0.477</td>
<td>-1.48</td>
<td>1.92 rather negative</td>
<td>3.62</td>
</tr>
<tr>
<td>6</td>
<td>important professors</td>
<td>0.285</td>
<td>-0.71</td>
<td>1.39 rather negative</td>
<td>3.03</td>
</tr>
</tbody>
</table>

Annotations: Interpretation of mean “perceived referents’ evaluation”: $< -1.5$: negative; $< -0.5$: rather negative; $< 0.5$: indifferent; $< 1.5$: rather positive; $\leq 3$: positive.
Interpretation of mean “motive to comply with referent”: $< 2.5$: low; $< 3.5$: rather low; $< 4.5$: middle; $< 5.5$: rather high; $\leq 7$: high.
Important regarding the intention: if correlation $>0.30$. 
(2(a)) The referent group is assumed to evaluate an entrepreneurial behaviour of the test person negatively and the motive to comply with the referent group is high, which means it is relevant, but prevents an entrepreneurial intention (negative social pressure) or

(2(b)) The referent group is assumed to evaluate an entrepreneurial behaviour of the test person positively and the motive to comply with the referent group is low which means it would promote an entrepreneurial intention (positive social pressure), but it is irrelevant.

Particularly, “partner,” as a referent is an important starting point regarding normative beliefs of this student sample. For the promotion of entrepreneurial intentions, influences in partnerships are decisive. The fact that all named referent groups were assumed to rather dislike a test person’s entrepreneurial intention confirms that the acceptance in society is low and indicates that important influences of referents have to be expected. Changes at this point can only be achieved via long-term approaches of cultural change.

Table 6 depicts detailed results regarding control beliefs. The expected control factors were ranked according to their correlation with entrepreneurial intention (each control factor’s probability of occurrence multiplied with the power of the control factor: $c_k p_k$, see above).

As with respect to the other belief components, mean values and standard deviations of each control factor’s probability of occurrence and each control factor’s power, in order to become an entrepreneur are depicted. Depending on the mean values, the average power of each control factor was interpreted as negative or positive and its average probability of occurrence was interpreted as probable or improbable with further nuances.

As a result, there is a need for action if

1. The control factor is important regarding the formation of entrepreneurial intentions (correlation $>0.30$) and

2(a)) The control factor is assumed to be existent and to prevent an entrepreneurial behaviour, in other words, it is relevant, but prevents an entrepreneurial intention or

2(b)) The control factor is assumed not to be existent and to facilitate an entrepreneurial behaviour, which means it would promote an entrepreneurial intention, but it is irrelevant.

Since the correlation of each control factor with intention was low, there is no direct need for action in order to promote entrepreneurial intentions. All control factors named in the pilot study were taken for facilitating
Table 6. Control Beliefs.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Control Factors</th>
<th>Correlation $c_{kP_k}$ with Intention</th>
<th>Belief (probability) Mean $\sigma$ Interpret. Mean</th>
<th>Power Mean $\sigma$ Interpret. Mean</th>
<th>Need for Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>practical experience</td>
<td>.240</td>
<td>4.63 1.63 rather probable</td>
<td>2.38 1.06 positive</td>
<td>need for action only in combination with behavioural beliefs (see in the text)</td>
</tr>
<tr>
<td>2</td>
<td>support of others</td>
<td>.219</td>
<td>4.13 1.73 indifferent</td>
<td>1.47 1.36 rather positive</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>seed capital</td>
<td>.206</td>
<td>3.54 1.80 indifferent</td>
<td>2.06 0.98 positive</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>economic climate</td>
<td>.192</td>
<td>3.41 1.56 rather improbable</td>
<td>2.04 1.13 positive</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>start-up knowledge</td>
<td>.167</td>
<td>4.63 1.72 rather probable</td>
<td>1.77 1.33 positive</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>business idea</td>
<td>.152</td>
<td>3.84 2.08 indifferent</td>
<td>1.03 2.17 rather positive</td>
<td></td>
</tr>
</tbody>
</table>

Annotations: Interpretation of mean “belief”: $< -1.5$: negative; $< -0.5$: rather negative; $< 0.5$: indifferent; $< 1.5$: rather positive; $< 2.5$: positive.
Interpretation of mean “power”: $< 2.5$: low; $< 3.5$: rather low; $< 4.5$: middle; $< 5.5$: rather high; $<= 7$: high.
Important regarding the intention: if correlation $>0.30$. 

factors; specifically, 59.6% of the students in this sample study at the faculty “Business and Social Sciences” (14.1% “Cultural Sciences”, 6.6% “Life Sciences”, 19.7% others, each with less than 10%). This might be the reason why this sample assumes important control factors such as practical experience or start-up knowledge as probable, at least within five years after having finished their studies. As estimated, the correlation between the risk of failure, as a consequence of a start-up and start-up knowledge as control factor, was negative ($r = -0.234***$), which means the higher the perceived start-up knowledge, the lower the perceived risk of failure. On the one hand, this indicates that the influencing constructs within the TPB influence each other, though an additive model is commonly used. On the other hand, this finding reveals that it is not sufficient to influence singular points to promote entrepreneurial intentions.

**IMPLICATIONS FOR ENTREPRENEURSHIP EDUCATION, POLICY AND RESEARCH**

Based on these results, several implications for education, policy, and research can be derived. In particular, we are in need of a discussion concerning approaches to the promotion of entrepreneurial intentions. Here, curricular and non-curricular programmes have to be looked at just as political campaigns.

First, the aim of such a promoting approach or programme has to be identified. In this case, the aim should be to increase the amount of students’ spin-offs. Thereby, programmes should focus on the promotion of start-ups. As beliefs based on information and experiences are decisive in order to induce an intention, the approach should also start at this point. Following the TPB, changes at singular points are not sufficient (Ajzen, 2005). Entrepreneurial intentions, for example, cannot just be promoted by facilitating the access of seed capital if the target person does not assume to have any start-up knowledge et cetera. All central beliefs leading to the development of attitude, social norms and perceived behavioural control have to be considered and there should be a focus on these beliefs contributing to a low entrepreneurial intention.

It seems reasonable to communicate a set of arguments supported by some empirical evidence. A long-term change of intentions can only be achieved if the delivered information is well-founded. The arguments refer directly to the performance of the target behaviour. Based on the current empirical study concerning the behavioural consequences, it should begin
with risk of failure, flexibility, and workload. Regarding referent groups, it must be noted that all referents or referent groups, which are perceived as relevant in this study, are assumed to dislike a start-up through the target person. As students do not only comply with their possible partners, but also with their parents and friends, these groups are decisive as well. With respect to control factors, the questioned students often significantly overrate themselves. From their point of view, they are likely to gather sufficient start-up knowledge and work experience in order to start a business within five years after having completed their studies.

This study provides insight into concrete aspects of students’ beliefs with respect to entrepreneurial behaviour. Following basic ideas of the TPB, detailed starting points to enhance entrepreneurial intentions have been illustrated. Future research is needed to evaluate appropriate measures or interventions aimed at fostering entrepreneurship. Further, other groups than students have to be researched. In addition, cross-country comparisons promise valuable insights.

References


