Social Identity and the Transition to Entrepreneurship

Author’s Details:
Saba Fazal Firdousi 1* Prof. Dr. Cai Li 2* Hasnain Javed 3* Majid Murad 4*
(1)(2)(3)(4) Jiangsu University, School of Management, Zhenjiang, P.R. China, 212013.

Abstract
In the transition from employment to entrepreneurship, what part does social identity play? Social identity is supposed to shape the cognitive processes that underlie the development of entrepreneurial intentions, according to the theory of planned actions (TPB). In the TPB model, based on the attitudes of academic scientists to market research awareness, we examined social identity (the group association of scientists with their academic peers at work) as a moderator. In a group of 488 German researchers, our theories are tested. The data revealed that mood, social norms, and perceived control predicted entrepreneurial intentions and that perceived control was negatively correlated with group identity. Multi-group structural equation modeling also showed that the TPB-intention relation was moderated by group recognition. Low-group identification scientists based their entrepreneurial aspirations not so much on social norms and behaviors, but on their own initiative and confidence in power. In addition, entrepreneurial intentions were primarily a function of social norms among scientists with high group identification. In summary, these findings highlight the long-neglected dynamic significance for the transition to the entrepreneurship of identifying with and social cohesion within peer groups at the workplace.

Keywords: Entrepreneurial intentions, Academic entrepreneurship, Theory of planned behavior, Social identity, Opportunity recognition

Social identity and the transition to entrepreneurship: The role of group identification with workplace peers

After a time of employment in existing organizations, many entrepreneurs participate in business activity (Nanda & Sørensen, 2010). A better understanding of factors that determine the transition from organizations to entrepreneurship is therefore essential for developing a theory on the entrepreneur and contributes to the ongoing scholarly and political debate on how to promote entrepreneurial societies (Audretsch, 2007).

This study explores the role of social identity in the transition from work to business. While social identity (which refers to the dimension of a person's self-image derived from membership in social groups) is generally considered to be a key shaper of vocational choices (Gottfredson, 1981), we still know too little about the influence of social identity in the specific field of business career choices (Falck, Heblich, & Luedemann, in the press).

For example, how does group identification of an individual with workplace peers affect his or her intentions of engaging in entrepreneurship, such as creating an innovative business idea? In answering this

1 Authors Note: Saba Fazal Firdousi is currently enrolled as PhD Candidate for Management and Engineering Sciences in School of Management at Jiangsu University, Zhenjiang, China. Email ID:sabafazalfirdousi@gmail.com
2 Authors Note: Dr Cai Li is currently serving as an Associate Professor in School of Management, Jiangsu University, Zhenjiang, China. She is also the corresponding author for this paper. Email ID: gsxxml@yahoo.cn
3 Authors Note: Hasnain Javed is currently enrolled as PhD Candidate for Management and Engineering Sciences in School of Management at Jiangsu University, Zhenjiang, China. He is also the corresponding author for this paper. Email ID:hassnain.javed@hotmail.com
4 Authors Note: Majid Murad is currently enrolled as PhD Candidate for Management and Engineering Sciences in School of Management at Jiangsu University, Zhenjiang, China.

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question, we concentrate on the early stage of the process of transition to entrepreneurship, namely the creation of an innovative business concept (Shane & Venkataraman, 2000). This early phase, characterized by initial conditions and decisions, has long-lasting effects on subsequent entrepreneurial performance (Boeker, 1989; Stinchcombe, 1965) and is, therefore, an important topic for research into entrepreneurship (Reynolds, 1997).

In this analysis, we hypothesize that social identity (in our case, the group of scientists identifying with their academic workplace peers) does not directly affect entrepreneurial intentions (the aim of scientists to commercialize research information through creating an innovative business idea) but critically forms the cognitive processes which, according to the expected behavior theory (TPB; Ajzen.), In what follows, we first examine the importance of business intentions and innovative business concepts for research into entrepreneurship and then develop the hypotheses to be tested in this analysis.

Entrepreneurial behavior and intentions

It is one of the most fundamental principles of innovation research that mainly derive competitive advantage from new ideas in today's knowledge-based economies (Audretsch, 2007). Entrepreneurship (Schumpeter, 1934) is an important method by which new ideas spread into the business sphere. Shane and Venkataraman (2000) described the field of research on entrepreneurship as the study of "how, by whom and with what consequences opportunities are found, evaluated and exploited to create future goods and services" (p. 218). According to this concept, the center of entrepreneurship is the innovative business idea, which is "the complex of products / services, expertise, skills, market and technology needed to run a company" (Grandi & Grimaldi, 2005, p. 826; see also Ardichvili, Cardozo, & Ray, 2003). Audretsch (2007) further emphasized that not only is the success of a company embedded in its business idea's value, newness and potential but the success of whole "entrepreneurial communities" depends on the creation and utilization of innovative business ideas. Taken together, the commercialization of new knowledge can be seen as a prototypical entrepreneurial activity by creating an innovative business concept (transformation of knowledge into marketable products and services).

However, entrepreneurship study acknowledges the intentionality of business behavior (Bird, 1988; Krueger & Carsrud, 1993). It's something people choose or plan to do to act entrepreneurially (Shaver & Scott 1991). Entrepreneurial intentions are seen as the closest predictor of the decision to engage in entrepreneurial behavior (Bird, 1988).

To put it simply, these are mental representations of the ability of an individual to participate in entrepreneurship. Entrepreneurial motives reflect how deeply one is being trained and how much effort one is planning to make to undertake entrepreneurial behaviour.

Even though people may have significant potential, if they lack the goals, they may refrain from making the transition to entrepreneurship (Krueger, Reilly & Carsrud, 2000; Krueger & Brazeal, 1994). Accordingly, entrepreneurial expectations constitute a core factor for research into the entrepreneurial system, such as the conversion of information into an economic outcome (Krueger et al., 2000; Lee, Wong, Foo, & Leung, 2009; Obschonka, Silbereisen, Schmitt-Rodermann, in press).

Combining these claims on the value of business ideas and entrepreneurial intentions for the overall analysis of entrepreneurship, we examined the intentions of scientists to create an innovative business idea based on our own research experience in this study (Shane, 2004). Due to the overarching presence of entrepreneurial potential here, namely new research awareness, we concentrated on such an educational entrepreneurship background as a fitting arena for studying entrepreneurial intentions. Such new knowledge is a hotbed for innovative business ideas (Audretsch, 2007) and is a powerful ingredient in the process of economic innovation (OECD, 2003).

Hypotheses

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Our ultimate hope, as noted earlier, was that social identity (group identification) would not impact entrepreneurial intentions directly, but through expected behavior theory (TPB). Thus, we first draw from the TPB and derive a set of hypotheses on the proximal factors underlying business intentions (attitude, standards, and perceived behavioral control). Then we turn to our main research question, the social identity effect.

**Theory of Planned Behavior**

The TPB provides a consistent, parsimonious, and highly generalizable structure for recognizing and predicting different kinds of behavioral intentions, making it a good option to study histories of behavioral intentions in entrepreneurship (Krueger et al., 2000). The core assumption of the planned behavior theory (TPB, Ajzen, 1991) is that behavioral intentions (which in turn are regarded as the nearest and most significant predictor of target behavior) are an additive function of three latent factors: perceptions, social norms, and perceived behavioral control.

Past research has shown that the TPB can typically predict substantial amounts of entrepreneurial intentions (e.g., business start-up intentions). Given the general and fundamental nature of the TPB methodology, this concept was also expected to apply in the specific context of educational entrepreneurship, with a particular focus on the active participation of scientists in the entrepreneurial use of new research knowledge (Shane, 2004). To ensure that the TPB variables tested in our analysis correlated with the specific target behavior of interest (Fishbein & Ajzen, 2010), each of the TPB variables we analyzed related to the creation of an innovative business concept. (e.g., "My personal attitude towards participation in designing a business idea to market my own work is...").

Attitudes reflect the persistent–positive or negative–assessment of the individual's involvement in a particular behavior. Existing literature suggests that academic scientists devote their energies and resources to entrepreneurship if they have a favorable view of entrepreneurial activity and the commercial use of scientific expertise (e.g., Gulbrandsen, 2005; Owen-Smith & Powell, 2001), which implies that attitudes are important here.

The second predictor of intentions, social norms, refers to perceived normative pressure to engage or not engage in a particular behavior from a specific reference group (Ajzen, 1991). In line with academic entrepreneurship literature (e.g., Bercovitz & Feldman, 2008; Stuart & Ding, 2006), our study considered the workplace peers of individual scientists as a prominent reference group that determined their entrepreneurial behaviour. Previous research has suggested that scientists feel pressured to engage in the marketing of their research knowledge and are therefore more likely to do so if they feel that their academic peers look favorably on such activity (Rahm, 1994).

Perceived behavioral control is closely related to the concept of self-efficacy of Bandura (1997) and reflects the perceived ease or difficulty of successfully performing a specific behavior. According to Ajzen (1991), it is unlikely that people who do not experience power over entrepreneurial activity and its outcome will form strong entrepreneurial intentions, even though social norms and attitudes to entrepreneurship are favorable. This is reinforced by entrepreneurship research, which stressed the value of self-efficacy as a tool to address perceptions of the higher financial, technological, and legal uncertainties that are often correlated with the commercialization of studies knowledge through entrepreneurship (Markman, Baron, & Balkin, 2002; Obshonka, Silhereisen, & Schmitt-Rodermund, 2010).

In summary, following the TPB, we expected the entrepreneurial intentions of scientists to be predicted positively by respective attitudes (Hypothesis 1), social norms (Hypothesis 2), and perceived regulation of actions (Hypothesis 3).

**The Effect of Group Identification**
Identity — the self-concept and self-image of a person — includes a variety of narrower identity characteristics as an umbrella term (Stets & Burke, 2000; Stryker, 1987). The distinction between personal and social identity is one classical specific category. Personal identity refers to positions and qualities classification, while social identity refers to memberships in classes and groups. We focused on social identity in this research, namely on the association of the group of scientists with their colleagues in the academic workplace. For several decades, the link between social identity and occupational choices has been explored (Gottfredson, 1981), and the relation between TPB and social identity has gained significant research attention so far (Abrams, Ando, & Hinkle, 1998; Fielding, Terry, Masser, & Hogg, 2008; Norman, Clark, & Walker, 2005; Terry, Hogg, & White, 1999). Unlike personal identity, which focuses more on individualistic personal characteristics (e.g., self-identity), the concept of social identity focuses on the social context of vocational development and choice (Terry & Hogg, 1996). As argued by Vondracek, Lerner, and Schulenberg (1986), without understanding the social structures that form these processes and decisions, one can not fully understand vocational growth and choices (see also Silbereisen, 2002). Likewise, past research on entrepreneurship in general (Lee, Wong, Foo, & Leung, 2009; Reynolds, 1997) and also on educational entrepreneurship (Özcan & Reichstein, 2009) strongly suggests that the option of entrepreneurship profession should be studied taking into account not only the student but also the social context and, in particular, the interplay between the two levels.

We studied colleagues in the workplace as a relevant social context in this research. Falck, Heblich, and Luedemann (in press) found that exposure to entrepreneurial peers in adolescents’ close social environment (school peers with entrepreneurial parents) had an effect on their intent to work as an entrepreneur by the age of 30. Nanda & Sørensen (2010) researched working adults and chose to become an entrepreneur to be influenced by peers in the workplace, namely by access to co-workers who were previously entrepreneurs.

However, in past entrepreneurship research, the role of group identification with peers and social cohesion within groups was largely neglected. According to the theory of social identification (Tajfel & Turner, 1979; Hogg & Abrams, 1988) and the theory of self-categorization (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), individuals tend to identify in their social environment with groups (e.g., peers in the workplace). If they do so, there is a particular social identity that affects the processes of personal decision-making (Hogg & Hains, 1998), such as occupational choices (Abrams et al., 1998). It is argued that individual choices are made in accordance with prototypical values and beliefs for this group, despite a specific popular social identity such as affiliation with a peer group, and with the desire to affirm this group membership. In other words, when individuals, in particular, are "motivated to participate in identity-related activities," they orient their behavioral choices in terms of group thinking and norms, and less in terms of their own idiosyncratic attitudes and beliefs (Terry, Hogg, & White, 1999; p. 229).

Translated into our case (scientists' group association with their academic workplace peers), we expected such a social identity to be important to the creation of entrepreneurial intentions as it could act as a TPB moderator (Hypothesis 4). It is well known that individuals who identify as members of a particular group are more inclined to act in compliance with that group's perceived expectations (Hogg & Abrams, 1988). Therefore, while the perceived social norms discussed to capture the direct effects of the normative influence of peers on behavior, the group identity of an individual marks boundary conditions for these peer group effects as it determines the probability of the individual adopting the norms of the group (Terry & Hogg, 1996; Terry et al., 1999). At the same time, it has been shown that personal characteristics such as attitudes and beliefs of control become relatively unimportant as determinants of behavioral intentions among individuals with a prominent social identity (Norman, Clark, & Walker, 2005).

Taken together, we predicted that if scientists identify strongly with their peers in the workplace, their intention to participate in entrepreneurship should be driven primarily by their workplace peers' perceived social norms. There should be less concern here for attitude and perceived command. If scientists demonstrate lower levels of group identity (the type of entrepreneur), then their entrepreneurial intentions should be driven primarily by their personal attitudes and beliefs (here, social norms should be less important).
Method

Sample and Procedure

The data presented in this paper was drawn from the Thuringian Founding Study ("Thüringer Gründer Study"), an interdisciplinary research project that explores the entrepreneurial cycle and its context from an economic and psychological perspective. To provide the data for the current study, a cross-sectional survey was conducted of faculty and academic research staff. The research was conducted on a regional basis with a focus on Thuringia's German state. Thuringia is situated in the center of Germany and has a tradition of innovation based on science (e.g., optical lens manufacturer Carl Zeiss foundation) and a wide range of research organizations such as universities or non-university research institutions (e.g., Max Planck Institutes). An Internet-based survey was used to collect data (Gosling, Vazire, Srivastava, & John, 2004). Until we performed the study, in a representative group of 133 scientists in the Federal State of Saxony, Germany, we piloted the questionnaire and the method.

To set up a sampling system for our analysis, research organizations’ websites were accessed and prospective survey participants were identified. A total of 4638 individual names and email addresses, including scientists from all scientific disciplines, have been registered. A random sub-sample of 2319 individuals was drawn from this initial list of names. Then an e-mail with a cover letter and a reference to the online questionnaire was sent to these scientists. A notification was sent to the non-respondents two weeks later, which was set up in the same manner as the original e-mail. The data collection was finished after another two weeks.

A maximum of 554 scientists responded to the survey, resulting in a response rate of 23.9%, which is an acceptable rate relative to other web-based design studies (Cook, Heath, & Thompson, 2000). The survey sample appeared to be representative in terms of age, race, and educational rank according to official statistics (Statistisches Bundesamt, 2008). Due to incomplete information or non-serious answers, 15 surveys had to be omitted before performing our statistical analyzes. Since this study was aimed at tracing determinants of the intentions of scientists to market their own research results, we also omitted answers from faculty and staff members who stated in the questionnaire that they were not conducting any scientific research. This resulted in 488 scientists having a final sample size.

Such participants were, on average, 38.6 years of age (SD = 11.16, range: 23–68) and male (69.7%). Approximately two-thirds worked at a university (66.3%), 26.0% worked at a non-university research institution, and 9.8% worked at an applied science university ("Fachhochschule"). Research associates were more than two-thirds (72.0 percent), professors or university lecturers were 17.6 percent, and another area of operation was identified by 10.4 percent, such as project-related specialists. With regard to the type of research activity, 54.1 percent described their work as applied science and 45.9 percent described their work as basic science. The majority worked in the field of natural science (52.6%); 29.7% worked in engineering, and 17.7% in economics, law, or social science.

Measures

All the measurements used in this study relate to existing operationalizations that were used successfully in previous research. As mentioned above, all study variables in their terminology relate to the target action in question (developing a business idea to market one's own research).

Group identification. Three items measured the affiliation of respondents with their academic workplace peers (Terry & Hogg, 1996) (Item 1: "Generally speaking, how much do you identify with your community of colleagues at the University / Research Institute?;" Item 2: "Actually, how deep is your sense of belonging to the group of colleagues at the University / Research Institute?"")
In addition, in order to consider research suggesting the importance of access to entrepreneurial peers when deciding to participate in entrepreneurship (Falck, Heblich, and Luedemann, in press; Nanda & Sørensen, 2010), we also collected data on the previous entrepreneurial behavior of the workplace peers of respondents. Respondents were asked to rate the claim "Your colleagues whose opinions matter to you have already been involved in developing a business idea to market their work" (Likert scale of five points; 1= "no one" to 5= "everyone"). We used this additional factor to test whether our group identity measure can actually reflect access to (and affiliation with) company peers (Terry, Hogg, & White, 1999). Nevertheless, we found that entrepreneurship among workplace peers, in particular, was rather unlikely (M= 1.62, SD=.70), and group identity (mean of the two group recognition variables) was not correlated with workplace peer entrepreneurship (r=.01, ns). It provides evidence of the notion that in our research we have primarily observed the impact of group recognition, not the effect of access to entrepreneurial peers.

Business intentions. Three items evaluated the intention of respondents to develop an innovative business idea (Krueger et al., 2000) (Item 1: "Do you intend to participate in the development of a business idea to market your research in the foreseeable future?"; five-point Likert scale; 1= no, 5= yes; Item 2: "In your opinion, how high is the likelihood that you will participate in the foreseeable future?"; five-point Likert scale; 1 = no; 5 = yes; α = .85). We checked in a follow-up survey (18 months after the baseline survey) whether our entrepreneurial plans actually measure market behavior forecasts. We were able to gather follow-up information from 200 of our participants on entrepreneurial behavior. Respondents were asked if they had been practicing entrepreneurship since T1, using the item "Since the last survey in June 2008, have you been involved in developing a business idea to market your research?"(No: n is 154; yes: n is 46). We found that entrepreneurial intentions (mean of the three z-standardized variables of intention) actually predicted business activity (rs = .45, p < .001).

Social standards. Perceived standards were evaluated with two items, each referring to academic workplace peers (Ajzen, 2002) ("Most of my colleagues whose opinions matter to me...;" Item 1: "... think I should be involved in developing a business idea to market my research"); Item 2: "... would encourage my participation in the development of a business idea to market my research".

Perceived regulation of behaviour. Following Ajzen and Madden (1986), perceived behavioral influence was measured by three things (Item 1: "I accept that I can meet the demands of participating in the development of a business idea to commercialize my research"); Item 2: "I am persuaded that I would usually find it easy to participate in the creation of a business idea to market my research;" Item 3: "If I wanted to participate in the development of a business idea".

Variables of power. There are several other influences in line with previous research (Shane, 2004; Murray & Graham, 2007), which can determine the likelihood of scientists entering an entrepreneurial career. Given this literature, this research included gender-controlled variables (0=male, 1=female), age, and occupational status (1=professor, 0=other).

Results

All element variables and zero-order comparisons are given with descriptive statistics (M, SD) in Table 1. In line with our perceptions (Hypotheses 1, 2, and 3), behavior, norms, and perceived power associated with entrepreneurial intentions. In addition, group classification demonstrated norm and control associations.

We then tested our hypotheses using AMOS (Arbuckle, 2006) to model the structural equation. This technique allows testing of path models including latent variables not influenced by measurement error (attitudes, expectations, perceived power, and intentions in our case). As far as fit indices are concerned, we found r2, GFI, and RMSEA. Remember that it is problematic to rely solely on $2 as fit statistics. For example, the sample size and the size of the model's correlations affect $2. Experts, therefore, recommend that when assessing model performance, other more reliable test statistics like GFI and RMSEA should be considered. A thumb rule is that a greater than.90 CFI price implies a reasonably good match. About the
RMSEA, values like .05 indicate a near approximate match and values between .05 and .08 indicate a fair approximation error (Kline, 2005). The full information maximum likelihood estimate (FIML) was used due to missing data (less than 3 percent), which is the standard strategy for dealing with such missing information (Arbuckle, 2006).

**Theory of Planned Behavior (TPB)**

To examine Hypotheses 1, 2, and 3, derived from the expected behavior theory, we tested a structural equation model with attitude, social norms, and perceived behavioral regulation as predictors of entrepreneurial intentions (all constructs are calculated in the model as latent variables). Included as control variables were age, race, and occupational status (professor: no / yes). The model fit was acceptable ($\chi^2 [72] = 131.83$, $p < .001$, CFI = .982, RMSEA = .041), indicating that the latent variables measurement is sound. The model explained the variance of 63 percent in the dependent variable business intentions.

Each of the three variables of TPB (attitude, perceptions, and command) emerged as significant predictors of intention. Attitude had $\beta = .19$ ($p < .001$), $\beta = .33$ ($p < .001$), and $\beta = .41$, $p < .001$ control. In summary, this gave support to Hypotheses 1, 2, and 3.

**Group identification as a moderator**

Multi-group structural equation modeling was used to test the moderating effect of the group identification of scientists on the TPBintention link (Hypothesis 4). To build two classes (low vs. high identifiers), we used median splits of the moderator factor (group identification). We then conducted a series of mean differential tests using the means of each scale’s manifest variables to construct the variables (e.g., mean of the four attitude variables to create the attitude scale value). The two groups differed in perceived power ($t[482]= 2.19$, $p < .05$), but not in behaviors ($t[486]=.60$, ns) or social norms ($t[477]= -1.96$, ns). Low identifiers showed lower control rates (M=2.88, SD=.97) relative to powerful identifiers (M=2.69, SD=.87).

Remember that we used z-standardized values of the respective products to establish the scale of these entrepreneurial intentions as their scaling was different. Eventually, as far as the control variables were concerned, we found group differences in age ($t[478]= 2.62$, $p < .01$), but not in occupational status (professor: no / yes; $\chi^2 [1]= 1.73$, ns) and sex ($\chi^2 [1]= 2.26$, ns) between classes. The small identifiers are slightly older than the high identifiers (M= 39.9, SD= 11.58) (M= 37.3, SD= 20.57).

Figure 1 shows the results of the multi-group model. The results for the low identifiers (n= 247) and the strong identifiers (n= 241) are shown in Panel A. The model can explain a comparable amount of variation in intentions in both groups (64% and 68%). In line with our assumptions, when group identity is weak (Panel A), a personal variable, namely perceived power ($\beta=.57$, $p <.001$), was the most important purpose predictor.

The social context, namely social norms, played the predominant position while group recognition is high (Panel B) ($\beta=.53$, $p <.001$). Nevertheless, it should also be remembered that social standards played a role in both groups (but the effect was much smaller in the low-identifier category[ $\beta=.30$, $p <.001$]). Finally, against our assumptions, attitude only counted in the group of high identifiers ($\beta=.25$, $p <.05$) and showed little impact on low identification intentions ($\beta=.08$, ns).

We then asked if the TPB-intentions paths group differences are statistically significant. Therefore, we carried out moderation analyzes using differential tests of $\chi^2$. We checked for invariance calculation across the groups in the first step. This implies we compared an unconstrained multi-group model with a restricted multi-group system where the respective variable loads and measurement intercepts are set on an equal basis across both categories.
A χ² differential test showed that none of the two models varied in fit (∆χ² [20]=25.70, p=.167), suggesting invariance of measurement across the two classes. The unconstrained model was then tested against three models, where one of the three paths from the TPB variables to intentions was always set equal across both groups (see Table 2). In the case of the direction of control-intentions, we found evidence of a relaxation effect (as shown by the positive ∆χ²). In summary, Hypothesis 4 received partial support as there was statistical evidence for a group identification moderation effect, but only for the path of control-intentions.

Discussion

We explored a psychological concept in this study that has been largely neglected in past research into entrepreneurship, namely social identity. Entrepreneurship researchers have already pointed out the importance of personal identity (e.g., entrepreneurial self-identity, Krueger, 2007), but so far, we know very little about the intersection of social identity-entrepreneurship. As a model example of innovation behavior, we analyzed social identity and entrepreneurial ambitions in the sense of educational entrepreneurship (Audretsch, 2007; Shane, 2004). We applied the expected behavior theory (TPB), a standard model of behavioral expectations, as the overall structure (Ajzen, 1991; Fishbein & Ajzen, 2010). We first address our findings briefly on the TPB-intention relation in the following and then turn to our key findings, namely the impact of social identity through the TPB.

The TPB would conclude that expected behavior like entrepreneurship is primarily a function of the respective behavioral expectations, which can be best explained by mood, norms, and perceived behavioral power. Our findings have been very much in line with this plan. Next, we should show through prospective information that our business goals are indeed a strong predictor of future entrepreneurial behaviour. Second, behavior, expectations, and perceived power served as effective predictors of intentions, explaining a large amount of variation in this parameter (around 65%). It compares favorably with both the 35–42 percent understood variance in previous entrepreneurship studies applying intention-based models (e.g., Krueger, Reilly, & Carsrud, 2000; Souitaris, Zerbinati, & Al-Laham, 2007) and the 39 percent variance usually explained across a wide range of other expected activities.

Our study's actual main result refers to our findings on the complex role of social identity, i.e., group identification of employed individuals with peers in the workplace. First, we found that group identity was negatively linked to perceived power (high identifiers were less positive about their entrepreneurial skills and ability). This result is consistent with cross-cultural country-level research showing that individualistic cultures, unlike collectivistic cultures, foster an internal locus of control orientation, which in turn has been shown to increase entrepreneurial career decision-making and entrepreneurial performance (Rauch & Frese, 2007). And equivalent to the assumed concept of behavior regulation in the TPB (Fishbein & Ajzen, 2010). Our findings, therefore, indicate that group identity can serve as a background factor in the sense of TPB (background factors are distal intention predictors that impact intentions through the TPB variables).

Furthermore, in accordance with our findings based on the theory of social identity (Tajfel & Turner, 1979; Hogg & Abrams, 1988), the theory of self-categorization (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), and previous studies on group recognition and behavioral intentions (Terry & Hogg, 1996; Terry, Hogg, & White, 1999), we were able to further show that group identification acts as a TPB moderator. While the mean level of entrepreneurial intentions (and the respective behavior) did not differ across identity groups (low vs. high group identification), as shown in our multi-group analysis (Figure 1), the routes toward the formation of such intentions were different across groups. Our results here suggest that the low identifiers mainly participate in entrepreneurial actions when they have the appropriate means that such challenging activities need to be managed (indicated by the broad control effect). Always essential here is the social norm, but obviously with a weaker influence. In addition, the high identifiers tend to be engaging in entrepreneurship primarily as a result of social norms in their community (indicated by the large effect of norms). Attitude, and therefore a positive evaluation of the target actions, was also a significant but less strong predictor here.
While these results on impact differences were largely descriptive in nature, our mediation experiment then showed that the effects of perceived influence differed significantly across identity groups from a statistical point of view (low identifiers: $\beta=.57$, $p<.001$; high identifiers: $\beta=.11$, ns). Command is a key component of vocational choice theories in general (Lent, Brown, & Hackett, 1994), as well as prominent figures in entrepreneurship research (e.g., self-efficacy and locus of control, Rauch & Frese, 2007) and entrepreneurship research (Krueger et al., 2000; Lee, Wong, Foo, & Leung, 2009; Obschonka, Silbereisen, & Schmitt-Rodermund, 2010; Zhao, Hills, & Seibert, 2005). One fundamental finding of past entrepreneurship research is that variations in control beliefs (e.g., higher self-efficacy levels or inner locus of control) are among the most important personal factors on business career decisions (Rauch & Frese, 2007). Their findings add to this research by indicating that this relationship can rely on social identity, at least when referring to the TPB model and the influence of workplace peers between employed people. This is a new perspective that, in entrepreneurial career decisions, questions somewhat the notion of the absolute importance of control and control-related structures. Control tends to be more critical in shaping entrepreneurial intentions (as a direct predictor) and also more pronounced (mean level) when group affiliation with peers in the workplace is weak.

Putting together the results of this study on the role of group identity, and an overall pattern emerges that can better be learned from Joseph A. Schumpeter, one of the "fathers" of entrepreneurship science. It seems that entrepreneurship arising from strong group affiliation with organizational peers and social cohesion within these communities is contradictory to the conventional Schumpeterian concept of creative entrepreneurship. The entrepreneur is a quite different person, according to Schumpeter (1934), able to break through conventional systems and question the established way of doing things. The Schumpeterian businessman is individualistic, self-directed, have an inner drive to invent, and, as Leskinen (2011) says, seeks autonomy and "freedom from other men" to "command one's own destiny" (p. 5). Schumpeter further argued that entrepreneurship's fascination is particularly strong for people "who have no other chance of social distinction" (Schumpeter, 1934, p. 93). Similarly, Krueger, Reilly, and Carsrud (2000) argued in their seminal analysis of entrepreneurial intentions and the TPB that the prototypical entrepreneur is an "iconoclastic individualist" with a pronounced "tendency toward inner-direction" (p. 424). More recently, Krueger (2007) further illustrated the salience of entrepreneurial self-identity for the entrepreneurial type (as opposed to a popular social identity, see Tajfel & Turner, 1979). In addition, when a social identity becomes prevalent, self-categorization theory suggests that these individuals become less self-conscious and deindividualized (Turner et al., 1987; see also Hogg & Hains, 1998), thus becoming more non-entrepreneurial in the Schumpeterian context. In other words, aspiring entrepreneurs who are actually engaged in creative entrepreneurship to comply with social standards and who, at the same time, have lower levels of control, are obviously less Schumpeterian and should be, More "fit" for creative entrepreneurship, according to Schumpeter. Classical businessmen, on the other hand, often take their fate into their own hands and base their entrepreneurial decision-making on their own confidence in power and the distinct internal desire to act, invent, and create something really new under the sun.

Remember that they argue that creative innovation is typically wholly independent of social interactions. Nevertheless, entrepreneurship research recognizes the importance of social interactions for effective entrepreneurial behaviour, such as the use of social capital in creating an innovative business concept (Ardichvili, Cardozo, & Ray, 2003; Leskinen, 2011) or in setting up a new company (Lechler, 2001). We suggest rather than strong group identity, and thus some outward-lookingness towards the community of colleagues such as academic workplace peers (see also Abrams, Ando, & Hinkle, 1998), is somewhat contradictory to Schumpeter's perception of the "essence" of being a successful businessman.

What are the study's implications? Our findings strongly suggest that researching the interweaving between social identity and entrepreneurial intentions and actions is a fruitful avenue with regard to implications for future research. One critical question that arises directly from our research is whether group association with workplace peers also affects potential entrepreneurial success among those who are eventually engaged in entrepreneurship. While one has to be cautious when speculating here (our data does not apply to this issue and related entrepreneurship work is scarce), according to Schumpeter's view, low organizational identifiers,
compared to high identifiers, that display superior entrepreneurial performance during the transition to the market sphere (as they suit the Schumpeterian entrepreneur better). Social cohesion and the external direction of one's decisions and actions towards the community that diminishes the effective problem-solving of complex entrepreneurial tasks during the transition to entrepreneurship (e.g. successfully implementing an innovative business concept into an unpredictable and evolving market by engaging in venture development activities). Research has shown that group identity is positively linked to group thinking (a competitive pattern in learning and decision-making) in line with our theory (Hogg & Hains, 1998). In turn, group thinking has been shown to lead to poorer quality of decision making (Janis, 1982), which also applies to creative behaviors such as brainstorming (Nijstad, Stroebe, & Lodewijker, 2006). However, successful innovation requires not only productive creativity but also flexibility and rapid adaptation to changing and uncertain situations (i.e., effective strategies; Sarasvathy, 2001). Individuals that prefer to associate with their organization's groups and thus base their decisions and goals on group standards and group similarity, and on the desire to affirm group membership as an important part of their self-image (Turner et al., 1987), may therefore be less likely to apply effective strategies that are effective in creative entrepreneurship. Since we can only speculate here, however, it is up to future research to shed more light on the relationship between group recognition and entrepreneurial success. In addition, future entrepreneurship work may also find variations in social identity to contribute to the ongoing discussion as to why smaller firms generate more entrepreneurs than larger firms do (Nanda & Sørensen, 2010). Existing "small firm effect" explanatory models illustrate, for example, disparities in individual human resources and personality traits between employees in smaller and larger firms (Ellenbein, Hamilton & Zenger, 2010; Parker, 2009). Nevertheless, another significant and hitherto ignored factor might be variations in group recognition with respect to workplace peer classes. Strong group affiliation with workplace colleagues in smaller firms may be less likely because there is less option to associate with others. Future research should, therefore, check the hypothesis that group identity helps clarify the impact of the small firm.

Our findings suggest the following with respect to the practical implications. Scholars stress the growing importance of entrepreneurship as a career choice for an adult and the entrepreneurial leveraging of new knowledge as an engine of economic growth in today's information-based societies (Audretsch, 2007; OECD, 2003). Policy schemes aimed at creative innovation could, therefore, be particularly important. Our study suggests that interventions directed at the behaviors, norms, and values of command of an individual could be fruitful.

Interventions influenced by expectations-based models, such as organized behavior theory (Ajzen, 1991), have already proved effective in modifying intentions and actions of very different types (Fishbein & Ajzen, 2005) as well as in the sense of entrepreneurship (Fayolle, 2005; Krueger, 2007; Souitaris, Zerbinati, & Al-Laham, 2007). Public support programs can also benefit from recognizing that the mechanism of goal forming is formed by social identity. On the one hand, with regard to potential entrepreneurs who identify strongly with their current employment background (e.g., at universities and public research institutions), policy initiatives should be designed to foster an organizational environment that supports a career in entrepreneurship to help develop stronger entrepreneurial intentions. On the other hand, our results point to the value of fostering entrepreneurial mindsets and skills to promote entrepreneurial behavior in the Schumpeterian context for potential entrepreneurs who display a low affiliation with their class of workplace peers. Despite restrictions, our analysis does not come. First, it should be borne in mind that the information used to evaluate the TPB model and the social identity results are of a correlational nature. Second, from the same source, namely from the individual scientist, all information is collected. This method of data collection, unlike multi-informant / multi-method procedures, which result in bias in the common method or may suffer from tendencies of systematic response. Nonetheless, our hypotheses are based on well-established theories and are compatible with current theoretical and empirical evidence. A third caveat is that this research is restricted to the German scientists' population and the scientific entrepreneurship trend. This could come at the expense of extending our research more broadly to other national contexts and other forms of entrepreneurial behaviour.
In conclusion, this thesis introduces the concept of group identification into the study of entrepreneurial career transitions, highlighting the long-neglected importance of social identity to this research field. Our findings illustrate the complexity of workplace peers' social influence on the choice of entrepreneurial career, particularly with regard to beliefs in power.

References


### Table 1
Correlations between the Variables used in the Structural Equation Models

<p>|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Control variables: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 Age |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 Gender (male/female) | -0.25*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 Occupational status (Professor - no/yes) | 0.47*** | -0.18*** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Central variables: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 Attitude: Item 1 | -0.08 | -0.00 | -0.02 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 Attitude: Item 2 | -0.04 | 0.01 | 0.02 | 0.79*** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 Attitude: Item 3 | -0.08 | 0.05 | 0.01 | 0.65*** | 0.65*** |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 Attitude: Item 4 | 0.02 | 0.05 | 0.06 | 0.58*** | 0.58*** | 0.57*** |  |  |  |  |  |  |  |  |  |  |  |
| 8 Norms: Item 1 | 0.00 | -0.05 | 0.01 | 0.42*** | 0.42*** | 0.34*** | 0.35*** |  |  |  |  |  |  |  |  |  |  |
| 9 Norms: Item 2 | -0.18*** | 0.00 | -0.19*** | 0.23*** | 0.21*** | 0.19*** | 0.19*** | 0.43*** |  |  |  |  |  |  |  |  |  |
| 10 Control: Item 1 | 0.11* | -0.20*** | 0.18*** | 0.42*** | 0.37*** | 0.37*** | 0.36*** | 0.33*** | 0.07 |  |  |  |  |  |  |  |  |</p>
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$p < .05$. **$p < .01$. ***$p < .001$
### Table 2

**Fit Indices and χ² Difference Test for Moderation Effect of Group Identification**

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