

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

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Abstract

What role does social identity play in the transition from employed work to entrepreneurship? It was expected that social identity shapes the cognitive processes that, according to the theory of planned behavior (TPB), underlie the formation of entrepreneurial intentions. Focusing on academic scientists' intentions to commercialize research knowledge, we investigated social identity (scientists' group identification with their workplace peers in academia) as a moderator in the TPB model. Our hypotheses were tested in a sample of 488 German scientists. The data revealed that entrepreneurial intentions were predicted by attitude, social norms, and perceived control and that group identification was negatively associated with perceived control. Multi-group structural equation modeling further showed that group identification moderated the TPB-intention link. Scientists with low group identification based their entrepreneurial intentions not so much on social norms and attitudes but on their self-initiative and control beliefs. Among scientists with high group identification, in turn, entrepreneurial intentions were mainly a function of social norms. These results, in sum, illustrate the long-neglected complex importance of identification with, and social cohesion within, peer groups at the workplace for the transition to entrepreneurship.

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

The majority of entrepreneurs engage in enterprising activity after a period of employment in established organizations (Nanda & Sørensen, 2010). Thus, a better understanding of factors determining the transition from organizations to entrepreneurship is crucial for theory building on the enterprising individual and contributes to the ongoing scholarly and political debate on how to foster entrepreneurial societies (Audretsch, 2007).

This study examines the role of social identity in the transition from employed work to entrepreneurship. Although social identity (which refers to the aspect of a person's self-image that is derived from membership of social groups) is generally deemed a crucial shaper of vocational choices (Gottfredson, 1981), we still know too little on the effect of social identity in the specific field of *entrepreneurial* career choices (Falck, Heblich, & Luedemann, in press). How does, for example, a person's group identification with workplace peers affect his or her intentions to engage in entrepreneurship such as developing an innovative business idea? In answering this question, we focus on the early phase of the transition process to entrepreneurship, namely on the development of an innovative business idea (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 thus an important research topic in entrepreneurship research (Reynolds, 1997).

In this study, we hypothesize that social identity (in our case scientists' group identification with their workplace peers in academia) does not directly affect entrepreneurial intentions (scientists' intention to commercialize research knowledge by developing an innovative business idea) but critically shapes the cognitive processes that, according to the theory of planned behavior (TPB; Ajzen, 1991; Fishbein & Ajzen, 2010), underlie the intention formation. In what follows, we first discuss the relevance of entrepreneurial

intentions and innovative business ideas for entrepreneurship research and then develop the hypotheses to be tested in this study.

Entrepreneurial behavior and intentions

It is one of the most basic principles in innovation research that, in today's knowledge-based economies, competitive advantage mainly derives from new ideas (Audretsch, 2007). One important mechanism through which new ideas diffuse into the market sphere is *entrepreneurship* (Schumpeter, 1934). Shane and Venkataraman (2000) defined the field of entrepreneurship research as the study of "how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited" (p. 218). According to this definition, at the core of entrepreneurship stands the innovative business idea, that is "the complex of products/services, knowledge, competencies, market, and technologies that are necessary to run a business" (Grandi & Grimaldi, 2005, p. 826; see also Ardichvili, Cardozo, & Ray, 2003). Audretsch (2007) further stressed that not only is the success of a business rooted in the quality, newness, and potential of its business idea, but the success of whole "entrepreneurial societies" depends on the development and exploitation of innovative business ideas. Taken together, *the commercialization of new knowledge by developing an innovative business idea* (the transformation of knowledge into marketable products and services) can be seen as prototypical entrepreneurial behavior.

Entrepreneurship research moreover acknowledges the intentionality of entrepreneurial behavior (Bird, 1988; Krueger & Carsrud, 1993). Acting entrepreneurially is something that people choose or plan to do (Shaver & Scott 1991). The most proximal predictor of the decision to engage in entrepreneurial behavior is seen in *entrepreneurial intentions* (Bird, 1988). Simply put, these are cognitive representations of a person's readiness to engage in entrepreneurship. Entrepreneurial intentions signal how intensely one is prepared and how much effort one is planning to commit in order to carry out entrepreneurial behavior. Even if people may have significant potential, they will refrain from making the transition

into entrepreneurship when they lack the intentions (Krueger, Reilly, & Carsrud, 2000; Krueger & Brazeal 1994). Accordingly, entrepreneurial intentions represent a central variable for researching the entrepreneurial process such as the transformation of knowledge into an economic outcome (Krueger et al., 2000; Lee, Wong, Foo, & Leung, 2009; Obschonka, Silbereisen, Schmitt-Rodermund, in press).

Combining these arguments on the importance of business ideas and entrepreneurial intentions for the study of entrepreneurship in general, in this study we investigated scientists' intentions to develop an innovative business idea on the basis of our own research knowledge (Shane, 2004). We focused on such an academic entrepreneurship context as a suitable arena for the study of entrepreneurial intentions due to the overarching presence of entrepreneurial potential here, namely new research knowledge. Such new knowledge is a hotbed for innovative business ideas (Audretsch, 2007), and its entrepreneurial exploitation is a powerful ingredient in the economic innovation process (OECD, 2003).

Hypotheses

As noted earlier, our overall expectation was that social identity (group identification) would not directly affect entrepreneurial intentions but via the theory of planned behavior (TPB). In the following, we thus first draw from the TPB and derive a set of hypotheses on the proximal factors underlying entrepreneurial intentions (attitude, norms, and perceived behavioral control). Then we turn to our main research question, the effect of social identity.

Theory of Planned Behavior

The TPB offers a coherent, parsimonious, and highly-generalizable framework for understanding and predicting behavioral intentions of different kinds, which makes it a good choice when studying antecedents of behavioral intentions in the context of entrepreneurship (Krueger et al., 2000). The core assumption of the theory of planned behavior (TPB, Ajzen, 1991) is that behavioral intentions (which in turn are seen as the most proximal and important predictor of the target behavior) are an additive function of three latent factors: attitudes,

social norms, and perceived behavioral control. Past research showed that the TPB is able to predict substantial amounts of entrepreneurial intentions in general (e.g., intentions to start a business). Given the general and basic nature of the TPB approach, we expected this framework to also apply in the specific context of academic entrepreneurship with its special focus on scientists' active participation in the entrepreneurial exploitation of new research knowledge (Shane, 2004). In order to ensure matching between the TPB variables examined in our study and the specific target behavior of interest (Fishbein & Ajzen, 2010), each of the TPB variables we studied referred to the development of an innovative business idea (e.g., "My personal attitude toward participation in the development of a business idea to commercialize my own research is that this is...").

Attitudes reflect the individual's enduring evaluation – positive or negative – of engaging in a particular behavior. Existing literature suggests that academic scientists allocate their efforts and time toward entrepreneurship if they have a favorable appraisal of entrepreneurial activity and the commercial use of research knowledge (e.g., Gulbrandsen, 2005; Owen-Smith & Powell, 2001), which hints at the relevance of attitudes here.

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

Perceived behavioral control is closely related to Bandura's (1997) concept of self-efficacy and reflects the perceived ease or difficulty of performing a particular behavior successfully. According to Ajzen (1991), people who do not perceive to have control over

entrepreneurial behavior and its outcome are unlikely to form strong entrepreneurial intentions, even if social norms and attitudes toward entrepreneurship are favorable. This is supported by entrepreneurship research which stressed the importance of self-efficacy as a mechanism for overcoming perceptions of the higher financial, technological, and legal uncertainties that are often associated with the commercialization of research knowledge via entrepreneurship (Markman, Baron, & Balkin, 2002; Obschonka, Silbereisen, & Schmitt-Rodermund, 2010).

In sum, following the TPB, we expected scientists' entrepreneurial intentions to be positively predicted by respective attitudes (*Hypothesis 1*), social norms (*Hypothesis 2*), and perceived behavioral control (*Hypothesis 3*).

The Effect of Group Identification

Identity – a person's self-concept and self-image – as an umbrella term incorporates a variety of narrower identity characteristics (Stets & Burke, 2000; Stryker, 1987). One classical broad classification is the differentiation between personal and social identity. Personal identity refers to identifications with roles and attributes, whereas social identity refers to category and group memberships. In this study, we focused on social identity, namely on *scientists' group identification with their academic workplace peers*. The link between social identity and vocational choices has been researched for several decades (Gottfredson, 1981), and also the link between the TPB and social identity has received considerable research attention so far (Abrams, Ando, & Hinkle, 1998; Fielding, Terry, Masser, & Hogg, 2008; Norman, Clark, & Walker, 2005; Terry, Hogg, & White, 1999). In contrast to personal identity, which focuses more on individualistic personal characteristics (e.g., self-identity), the concept of social identity puts the focus on the social context in which vocational development and choice take place (Terry & Hogg, 1996). As argued by Vondracek, Lerner, and Schulenberg (1986), one cannot fully understand vocational development and choices without considering the social contexts that shape these processes

and decisions (see also Silbereisen, 2002). Likewise, past research on entrepreneurship in general (Lee, Wong, Foo, & Leung, 2009; Reynolds, 1997), and also on academic entrepreneurship (Özcan & Reichstein, 2009), strongly suggests that entrepreneurial career choices should be studied by taking into account not only the individual but also the social context and especially the interplay between both levels.

In this study we investigated workplace peers as relevant social context. Falck, Hebllich, and Luedemann (in press) showed that exposure to entrepreneurial peers in the proximal social environment of adolescents (school peers with entrepreneurial parents) had an effect on their intentions to work as an entrepreneur by the age of 30. Nanda & Sørensen (2010) studied employed adults and found the decision to become an entrepreneur to be shaped by workplace peers, namely by exposure to co-workers who have been entrepreneurs before. However, the role of group identification with peers and social cohesion within groups has been largely neglected in past entrepreneurship research. According to social identity theory (Tajfel & Turner, 1979; Hogg & Abrams 1988) and self-categorization theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), individuals have a tendency to identify with groups in their social environment (e.g., with workplace peers). If they do so, a particular social identity is salient which influences personal decision-making processes (Hogg & Hains, 1998), such as vocational choices (Abrams et al., 1998). It is argued that, given a particular salient social identity such as identification with a peer group, individual choices are made in accord with values and beliefs prototypical for this group, and with the motivation to reinforce this group membership. In other words, as individuals in general “are motivated to engage in identity-related behaviors”, those individuals with a salient social identity 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 to our case (scientists’ group identification with their academic workplace peers), we expected that such a social identity should be of relevance for the formation of

entrepreneurial intentions in that it may function as a *moderator* in the TPB context (*Hypothesis 4*). It is well documented that individuals who identify themselves as a member of a particular group are more inclined to behave according to the perceived norms of that group (Hogg & Abrams, 1988). Thus, whereas the discussed perceived social norms capture the direct effects of peers' normative pressure on intentions, an individual's group identification marks boundary conditions for these peer group effects as it determines the individual's likelihood of following the group's norms (Terry & Hogg, 1996; Terry et al., 1999). At the same time, it was shown that among individuals with a salient social identity, personal characteristics such as attitudes and control beliefs become relatively unimportant as determinants of behavioral intentions (Norman, Clark, & Walker, 2005). Taken together, we expected that if scientists strongly identify with their workplace peers, their intention to engage in entrepreneurship should be mainly driven by perceived social norms of their workplace peers. Attitude and perceived control should be of less importance here. When scientists exhibit lower levels of group identification (the entrepreneurial type), then their entrepreneurial intentions should be mainly driven by their personal attitudes and beliefs (social norms should be less important here).

Method

Sample and Procedure

Data presented in this paper stemmed from the Thuringian Founder Study ("Thüringer Gründer Studie"), which is an interdisciplinary research project that examines the entrepreneurial process and its antecedents from the perspective of economics and psychology. A cross-sectional survey of faculty and academic research staff was conducted to provide the data for the current study. The research was carried out on a regional basis with a focus on the German state of Thuringia. Located in the center of Germany, Thuringia has a legacy of science-based entrepreneurship (e.g., the foundation of the optical lens manufacturer Carl Zeiss) and a broad spectrum of research organizations like universities or non-university

research institutions (e.g. Max Planck Institutes). Data were collected using an Internet-based survey (Gosling, Vazire, Srivastava, & John, 2004). Before we conducted the survey, we pilot-tested the questionnaire and the procedure in an independent sample of 133 scientists in the Federal State of Saxony, Germany.

To establish a sampling frame for our study, websites of the research organizations were accessed and prospective participants of the survey were identified. A total of 4638 contact names and e-mail addresses were collected, comprising scientists from all scientific disciplines. From this initial list of names, a random sub-sample consisting of 2319 individuals was drawn. These scientists were then sent an e-mail containing a cover letter and a link to the online questionnaire. Two weeks later a reminder was sent to the non-respondents, which was set up the same way as the initial e-mail. After another two weeks data collection was completed.

A total of 554 scientists answered the questionnaire, resulting in a response rate of 23.9%, which is an acceptable rate compared to other studies applying a web-based design (Cook, Heath, & Thompson, 2000). Compared with official statistics (Statistisches Bundesamt, 2008), the survey sample appeared to be representative in terms of age, gender, and academic rank. Before conducting our statistical analyses, 15 surveys had to be excluded due to incomplete data or non-serious responses. As this study aimed to trace determinants of scientists' intentions to commercialize their own research results, we also omitted responses from faculty and staff members who stated in the questionnaire that they do not conduct any scientific research. This resulted in a final sample size of 488 scientists.

On average, these participants were 38.6 years old ($SD = 11.16$, range: 23–68) and male (69.7%). About two-thirds worked in a university (66.3%), 26.0% worked in a non-university research institution, and 9.8% worked in a university of applied science ("Fachhochschule"). More than two-thirds were research associates (72.0%), 17.6% were professors or university lecturers, and 10.4% reported another field of activity, for example as

project-related specialists. Regarding the type of engagement in research, 54.1% described their work as applied science, and 45.9% 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 measurements utilized in this study refer to established operationalizations that have been successfully employed in prior research. As noted earlier, in their wording all study variables refer to the target behavior in question (the development of a business idea to commercialize one's own research).

Group identification. Three items assessed respondents' identification with their academic workplace peers (Terry & Hogg, 1996) (Item 1: "Generally speaking, how much do you identify with your group of colleagues at the university / research institute?"; Item 2: "Personally, how strong is your sense of belonging to the group of your colleagues at the university / research institute?"; Item 3: "Do you share social bonds with your colleagues at the university / research institute?"; five-point Likert scale; 1 = "not at all" to 5 = "totally"; $\alpha = .75$).

To also consider research hinting at the relevance of exposure to entrepreneurial peers when deciding to engage in entrepreneurship (Falck, Heblich, and Luedemann, in press; Nanda & Sørensen, 2010), we also collected data on previous entrepreneurial behavior of respondents' workplace peers. Respondents were asked to rate the statement "Your colleagues whose opinions matter to you have already participated in the development of a business idea to commercialize their research" (five-point Likert scale; 1 = "nobody" to 5 = "everybody"). We used this additional variable to check whether our group identification measure could indeed reflect exposure to (and identification with) entrepreneurial peers (Terry, Hogg, & White, 1999). We found, however, that entrepreneurship was rather unlikely among workplace peers in general ($M = 1.62$, $SD = .70$), and group identification (mean of the two

group identification variables) was not associated with entrepreneurial behavior among workplace peers ($r = -.01$, ns). This provides evidence for the notion that we indeed studied the effect of group identification in our study, and not the effect of exposure to entrepreneurial peers.

Entrepreneurial intentions. Three items assessed respondents' intention to develop an innovative business idea (Krueger et al., 2000) (Item 1: "In the foreseeable future, do you intend to participate in the development of a business idea to commercialize your research?"; five-point Likert scale; 1 = no, 5 = yes; Item 2: "In your opinion, how high is the probability that, in the foreseeable future, you will participate in the development of a business idea to commercialize your research?"; 1 = 0%; 6 = 100%; Item 3: "I have recently sought information about the ways and means of developing a business idea with the object of commercializing my research"; five-point Likert scale; 1 = no; 5 = yes; $\alpha = .85$). In a follow-up survey (18 months after the baseline survey) we tested whether our entrepreneurial intentions measure indeed forecasts entrepreneurial behavior. We were able to collect follow-up information on entrepreneurial behavior from 200 of our participants. Respondents were asked whether they had pursued entrepreneurship since T1, using the item "Since the last survey in June 2008, did you participate in the development of a business idea to commercialize your research?" (no: $n = 154$; yes: $n = 46$). We found that entrepreneurial intentions (mean of the three z-standardized intention variables) indeed predicted entrepreneurial activity ($r_s = .45$, $p < .001$).

Attitude. Respondents' attitudes toward academic entrepreneurship were measured with four five-point bipolar adjective scales ("My personal attitude toward participation in the development of a business idea to commercialize my own research is that this is...; Item 1: 1 = "uninteresting" vs. 5 = interesting"; Item 2: 1 = "unattractive" vs. 5 = "attractive"; Item 3: 1 = "boring" vs. 5 = "exciting"; Item 4: 1 = "waste of time" vs. 5 = "worth investing as much time as possible"; $\alpha = .87$) (Ajzen, 2001; 2002).

Social norms. Perceived norms were assessed 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 participate in the development of a business idea to commercialize my research”; Item 2: “... would encourage my participation in the development of a business idea to commercialize my research”; five-point Likert scale; 1 = “not at all correct” to 5 = “totally correct”).

Perceived behavioral control. Following Ajzen and Madden (1986), perceived behavioral control was assessed by three items (Item 1: “I believe I can meet the demands posed by participation in the development of a business idea to commercialize my research”; Item 2: “I am convinced that I would find it generally easy to participate in the development of a business idea to commercialize my research”; Item 3: “If I wanted to participate in the development of a business idea to commercialize my research, I am confident that I would succeed” (five-point Likert scale; 1 = “not at all correct” to 5 = “totally correct”; $\alpha = .82$).

Control variables. Consistent with previous research (Shane, 2004; Murray & Graham, 2007), there are several other influences that may determine scientists’ likelihood of entering an entrepreneurial career. Taking this literature into consideration, this study included variables controlling for *gender* (0 = male, 1 = female), *age*, and *occupational status* (1 = professor, 0 = other).

Results

Descriptive statistics (M , SD) of all item variables and zero-order correlations are provided in Table 1. In line with our expectations (Hypotheses 1, 2, and 3), entrepreneurial intentions were correlated with attitude, norms, and perceived control. Furthermore, group identification showed correlations with norms and control.

We then tested our hypotheses employing structural equation modeling via AMOS (Arbuckle, 2006). This procedure makes it possible to test path models including latent variables that are not affected by measurement error (in our case attitudes, norms, perceived

control, and intentions). With respect to fit indices, we considered χ^2 , GFI, and RMSEA. Note that relying solely on χ^2 as a fit statistic is problematic. For example, χ^2 is affected by the sample size and the size of the correlations in the model. Experts thus suggest considering other more robust fit statistics such as GFI and RMSEA when evaluating model fit. A rule of thumb is that a CFI value greater than .90 indicates a reasonably good fit. With respect to the RMSEA, values $\leq .05$ indicate a close approximate fit, and values between .05 and .08 suggest a reasonable error of approximation (Kline, 2005). Due to missing data (less than 3%), the full information maximum likelihood (FIML) estimation was used, which is the recommended strategy when dealing with such missing information (Arbuckle, 2006).

Theory of Planned Behavior (TPB)

In order to investigate Hypotheses 1, 2, and 3, which were derived from the theory of planned behavior, we tested a structural equation model with attitude, social norms, and perceived behavioral control as predictors of entrepreneurial intentions (all constructs were measured as latent variables in the model). Age, gender, and occupational status (professor: no/yes) were included as control variables. The model fit was acceptable ($\chi^2 [72] = 131.83, p < .001, CFI = .982, RMSEA = .041$), indicating that the measurement of the latent variables is sound. The model explained 63% variance in the dependent variable entrepreneurial intentions. Each of the three TPB variables (attitude, norms, and control) showed up as significant intention predictors. Attitude had an effect of $\beta = .19 (p < .001)$, norms of $\beta = .33 (p < .001)$, and control of $\beta = .41, p < .001$. In sum, Hypotheses 1, 2, and 3 thus received support.

Group identification as moderator

For the purpose of testing the moderating effect of scientists' group identification on the TPB-intention link (Hypothesis 4), multi-group structural equation modeling was employed. We used median splits of the moderator variable (group identification) to produce two groups (low vs. high identifiers). We then conducted a series of mean difference tests, using the means of the manifest variables of each scale to create the variables (e.g., mean of the four

attitude variables to create the scale value for attitude). The two groups differed in perceived control ($t[482] = 2.19, p < .05$), but not in attitude ($t[486] = .60, ns$) and social norms ($t[477] = -1.96, ns$). The low identifiers showed higher levels of control ($M = 2.88, SD = .97$) than the strong identifiers ($M = 2.69, SD = .87$). Moreover, the two groups also did not differ in their entrepreneurial intentions ($t[485] = 1.28, ns$) and entrepreneurial behavior (business idea development at T2: no/yes; $\chi^2[1] = 3.00, ns$). Note that for the creation of the this entrepreneurial intentions scale we used z-standardized values of the respective items as their scaling was different. Finally, with respect to the control variables, 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 gender ($\chi^2[1] = 2.26, ns$) across the groups. The low identifiers were somewhat older ($M = 39.9, SD = 11.58$) than the strong identifiers ($M = 37.3, SD = 20.57$).

The results for the multi-group model are depicted in Figure 1. Panel A shows the results for the low identifiers ($n = 247$) and Panel B for the strong identifiers ($n = 241$). In both groups a comparable amount of variance in intentions could be explained by the model (64% and 68%). Consistent with our expectations, when group identification is low (Panel A), the most important intention predictor was a personal factor, namely perceived control ($\beta = .57, p < .001$). When group identification is high (Panel B), the social context, namely social norms, played the predominant role ($\beta = .53, p < .001$). It must also be noted, however, that social norms played a role in both groups (but the effect in the low-identifier group [$\beta = .30, p < .001$] was much smaller). Finally, against our expectations, attitude only mattered in the high identifiers group ($\beta = .25, p < .05$) and showed no effect on intentions among the low identifiers ($\beta = .08, ns$).

We then asked whether the group differences of the TPB-intentions paths are statistically significant. We thus conducted moderation analyses employing χ^2 difference tests. In a first step, we tested for measurement invariance across the groups. This means that we compared an unconstrained multi-group model with a constrained multi-group model where

the respective factor loadings and measurement intercepts were set equal across both groups. A χ^2 difference test revealed that neither model differed in their fit ($\Delta\chi^2 [20] = 25.70, p = .167$), indicating measurement invariance across both groups. We then tested the unconstrained model against three models where always one of the three paths from the TPB variables to intentions was set equal across both groups (see Table 2). We found evidence for a moderation effect in the case of the control-intentions path (as indicated by the significant $\Delta\chi^2$). In sum, Hypothesis 4 received partial support as there was statistical evidence for a moderation effect of group identification, but only in the case of the control-intentions path.

Discussion

In this study we investigated a psychological construct that has been largely neglected in past entrepreneurship research, namely *social identity*. Entrepreneurship scholars have already pointed to the relevance of personal identity (e.g., entrepreneurial self-identity, Krueger, 2007) but we know very little about the social identity-entrepreneurship nexus so far. We studied social identity and entrepreneurial intentions in the context of academic entrepreneurship as a prototypical example of innovation behavior (Audretsch, 2007; Shane, 2004). As the overall framework we applied the *theory of planned behavior* (TPB), which is a universal model of behavioral intentions (Ajzen, 1991; Fishbein & Ajzen, 2010). In the following, we first briefly discuss our findings on the TPB-intention link, and then turn to our main results, namely the effect of social identity via the TPB.

The TPB would predict that planned behavior such as entrepreneurship is mainly a function of the respective behavioral intentions, which in turn can be best explained by attitude, norms, and perceived behavioral control. Our results were very much in line with this proposition. First, by means of prospective data we could show that our entrepreneurial intentions are indeed a powerful predictor of future entrepreneurial behavior. Second, attitude, norms, and perceived control functioned as good predictors of intentions, thereby explaining a large amount of variance in this variable (around 65%). This compares favorably to both the

35–42% of explained variance in previous entrepreneurship studies applying intentions-based models (e.g., Krueger, Reilly, & Carsrud, 2000; Souitaris, Zerbinati, & Al-Laham, 2007) and the 39% of the variance typically explained across a wide range of other planned behaviors (e.g., dieting, quitting smoking, seatbelt usage) (for a review see Armitage & Conner, 2001).

The actual main result of our study refers to our findings on the complex role of *social identity*, i.e., employed individuals' group identification with workplace peers. First, we found that group identification was negatively associated with perceived control (the high identifiers were less confident in their entrepreneurial skills and ability). This finding concurs with cross-cultural country-level research indicating that individualistic cultures, in contrast to collectivistic cultures, promote an internal locus of control orientation, which, in turn, has been shown to increase an entrepreneurial career decision and entrepreneurial success (Rauch & Frese, 2007), and which is comparable to the perceived behavior control construct in the TPB (Fishbein & Ajzen, 2010). Our results thus hint at the possibility that group identification may function as a background factor in the TPB context (background factors are distal intention predictors that impact intentions via the TPB variables).

Second, in line with our assumptions that drew from social identity theory (Tajfel & Turner, 1979; Hogg & Abrams 1988), self-categorization theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), and prior studies on group identification and behavioral intentions (Terry & Hogg, 1996; Terry, Hogg, & White, 1999), we could further show that group identification functions as a moderator of the TPB-entrepreneurial- intentions link. Whereas the mean level of entrepreneurial intentions (and the respective behavior) did not differ across the identity groups (low vs. high group identification), the routes toward the formation of such intentions were different across the groups, as demonstrated in our multi-group analysis (Figure 1). Our results here suggest that the low identifiers mainly engage in entrepreneurial behavior when they possess the relevant means one needs to control such demanding efforts (indicated by the large effect of control). The social norm is also important

here but obviously with a weaker effect. The high identifiers, in turn, seem to engage in entrepreneurship mainly as a consequence of social norms in their environment (indicated by the large effect of norms). Attitude, and thus a positive appraisal of the target behavior, also turned out to be a relevant but less powerful predictor here.

Whereas these results on effect differences are, first and foremost, descriptive in nature, our moderation test then revealed that, from a statistical point of view, the effects of perceived control differed significantly across the identity groups (low identifiers: $\beta = .57, p < .001$; high identifiers: $\beta = .11, ns$). Control is a key construct in theories on vocational choice in general (Lent, Brown, & Hackett, 1994), and also figures prominently in entrepreneurship research (e.g., self-efficacy and locus of control, Rauch & Frese, 2007) and research on entrepreneurial intentions (Krueger et al., 2000; Lee, Wong, Foo, & Leung, 2009; Obschonka, Silbereisen, & Schmitt-Rodermund, 2010; Zhao, Hills, & Seibert, 2005). One basic result in past entrepreneurship studies is that differences in control beliefs (e.g., higher levels of self-efficacy or internal locus of control) are among the most influential personal influences on entrepreneurial career decisions (Rauch & Frese, 2007). Our results add to this research by suggesting that this relationship may be conditional on social identity, at least when referring to the TPB framework and the effect of workplace peers among employed individuals. This is a new perspective that somewhat challenges the notion of the universal relevance of control, and control-related constructs, in entrepreneurial career decisions. It seems that, in the formation of entrepreneurial intentions, control is more important (as a direct predictor), and also more pronounced (mean level), when group identification with workplace peers is low.

Taking this study's results on the role of group identification together, an overall pattern emerges that may be best understood when drawing from one of the "fathers" of entrepreneurship research, Joseph A. Schumpeter. It seems that entrepreneurship that arises from strong group identification with workplace peers, and social cohesion within these groups respectively, is contrary to the classical Schumpeterian understanding of innovative

entrepreneurship. According to Schumpeter (1934), the entrepreneur is a quite special actor willing to break through traditional structures and to challenge the accepted way of doing things. The Schumpeterian entrepreneur is individualistic, self-directed, has an inner drive to innovate, and, as stated by Leskinen (2011), seeks autonomy and “independence from other people” in order to be “in control of one’s own destiny” (p. 5). Schumpeter further argued that the fascination of entrepreneurship is especially strong for people “who have no other chance of achieving social distinction” (Schumpeter, 1934, p. 93). Likewise, in their seminal study on entrepreneurial intentions and the TPB, Krueger, Reilly, and Carsrud (2000) argued that the prototypical entrepreneur is an “iconoclastic individualist” with a strong “tendency toward inner-directedness” (p. 424). More recently, Krueger (2007) further highlighted the salience of entrepreneurial self-identity (as opposed to a salient social identity, see Tajfel & Turner, 1979) for the entrepreneurial type. When a social identity is salient, in turn, self-categorization theory predicts that those individuals become less self-aware and deindividualized (Turner et al., 1987; see also Hogg & Hains, 1998), and thus more non-entrepreneurial in the Schumpeterian sense. In other words, potential entrepreneurs who finally engage in innovative entrepreneurship in order to conform to social norms and who, at the same time, exhibit lower levels of control beliefs, are clearly less Schumpeterian and should thus be, according to Schumpeter, less “suited” for innovative entrepreneurship. In contrast, classical entrepreneurs rather take their destiny into their own hands and base their entrepreneurial decision-making on their own control beliefs and the distinct inner drive to act, to innovate, and to create something truly new under the sun.

Note that we do not argue that innovative entrepreneurship is completely independent from social interactions in general. Indeed, entrepreneurship research acknowledges the importance of social interactions for successful enterprising behavior, e.g., the use of social capital when developing an innovative business idea (Ardichvili, Cardozo, & Ray, 2003; Leskinen, 2011) or when founding a new business (Lechler, 2001). We rather argue that

strong group identification, and thus a certain outer-directedness toward the group of colleagues such as workplace peers in academia (see also Abrams, Ando, & Hinkle, 1998), is somewhat contrary to the Schumpeterian view on the “essence” of being a successful entrepreneur.

What are the implications of this study? With respect to implications for future research, our results strongly suggest that studying the intertwining between social identity and entrepreneurial intentions and behavior is a promising avenue. One important question that directly arises from our study is whether group identification with workplace peers also relates to future entrepreneurial performance among those who finally engage in entrepreneurship. Although one has to be careful when speculating here (our data does not refer to this question and related entrepreneurship research is scarce), according to the Schumpeterian view, low identifiers in organizations, compared to the high identifiers, might show a superior entrepreneurial performance during the transition toward the market sphere (as they better match the Schumpeterian entrepreneur). Social cohesion and the outer-directedness of one’s decisions and behavior toward the group may diminish successful problem-solving of complex entrepreneurial tasks during the transition to entrepreneurship (e.g., successfully introducing an innovative business idea into an uncertain and changing market by engaging in venture creation activities). Consistent with our speculation, research showed that group identification is positively related to groupthink (a concurrence-seeking tendency in thinking and decision-making) (Hogg & Hains, 1998). Groupthink, in turn, was shown to lead to poorer decision quality (Janis, 1982), which also applies to creative behaviors such as brainstorming (Nijstad, Stroebe, & Lodewijckx, 2006). Successful innovative entrepreneurship, however, not only requires productive creativity but also flexibility and rapid adaptation to changing and uncertain situations (i.e., effectual strategies; Sarasvathy, 2001). Individuals who tend to identify with groups in their organization, and who thus base their decisions and visions on group norms and group similarity, and on the

motive to reinforce group membership as an important part of their self-image (Turner et al., 1987), may thus be less prone to applying effectual strategies that are effective in innovative entrepreneurship. However, as we can only speculate here, it is up to future research to shed more light on the group identification-entrepreneurial performance link.

Furthermore, future entrepreneurship research could also take into account social identity differences to contribute to the ongoing discussion as to why smaller firms produce more entrepreneurs than larger firms do (Nanda & Sørensen, 2010). Existing explanatory models for the “small firm effect” emphasize, for example, differences in individual human capital and personality traits between workers in smaller and larger firms (Elfenbein, Hamilton, & Zenger, 2010; Parker, 2009). Another important and so far overlooked mechanism, however, could be differences in group identification with respect to groups of workplace peers. In smaller firms, strong group identification with workplace peers might be less likely as there is less choice for finding others one would identify with. Future research should thus test the assumption that group identification helps to explain the small firm effect.

With respect to practical implications, our results suggest the following. Scholars emphasize the growing importance of entrepreneurship as an individual’s career choice and the entrepreneurial exploitation of new knowledge as a particular driver of economic growth in today’s knowledge-based societies (Audretsch, 2007; OECD, 2003). Consequently, policy schemes targeting innovative entrepreneurship might be particularly important. Our study suggests that interventions targeting a person’s attitudes, norms, and control beliefs might be fruitful. Interventions informed by intentions-based models, such as the theory of planned behavior (Ajzen, 1991), have already proven to be efficacious in changing intentions and behavior of very different kinds (Fishbein & Ajzen, 2005) and also in the context of entrepreneurship (Fayolle, 2005; Krueger, 2007; Souitaris, Zerbinati, & Al-Laham, 2007). Public support schemes may further benefit from understanding that social identity shapes the intention formation process. On the one hand, with respect to potential entrepreneurs who

strongly identify with their current employment context (e.g., at universities and public research institutions), policy interventions should be designed to foster an organizational climate that favors a career in entrepreneurship in order to assist in developing stronger entrepreneurial intentions. On the other hand, for potential entrepreneurs who show a low identification with their group of workplace peers, our findings hint at the importance of promoting entrepreneurial mindsets and competences in order to stimulate entrepreneurial activity in the Schumpeterian sense.

Our study does not come without limitations. First, one has to keep in mind that the data used to test the TPB model and the effects of social identity is correlational in nature. Second, all information is collected from the same source, namely from the individual scientist. In contrast to multi-informant/multi-method procedures, this method of data collection may result in common-method bias or may suffer from systematic answering tendencies. Nevertheless, our hypotheses are grounded in well-established theories and provide results that match with existing theoretical and empirical evidence. A third caveat is that this study is limited to the population of German scientists and the phenomenon of academic entrepreneurship. This might come at the expense of a more general application of our results in other national contexts and with respect to other kinds of entrepreneurial behaviors.

To conclude, this study introduces the concept of group identification to the study of entrepreneurial career transitions, thereby emphasizing the long-neglected relevance of social identity for this field of investigation. Our results underscore the complexity of social influence by workplace peers on entrepreneurial career choices, particularly with respect to control beliefs.

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Table 1

Correlations between the Variables used in the Structural Equation Models

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Control variables:																			
1 Age	–																		
2 Gender (<i>male/female</i>)	-.25***	–																	
3 Occupational status (<i>Professor - no/yes</i>)	.47***	-.18***	–																
Central variables:																			
4 Attitude: Item 1	-.08	-.00	-.02	–															
5 Attitude: Item 2	-.04	.01	.02	.79***	–														
6 Attitude: Item 3	-.08	.05	.01	.65***	.65***	–													
7 Attitude: Item 4	.02	.05	.06	.58***	.58***	.57***	–												
8 Norms: Item 1	.00	-.05	.01	.42***	.42***	.34***	.35***	–											
9 Norms: Item 2	-.18***	.00	-.19***	.23***	.21***	.19***	.19***	.43***	–										
10 Control: Item 1	.11*	-.20***	.18***	.42***	.37***	.37***	.36***	.33***	.07	–									
11 Control: Item 2	.11*	-.13**	.19***	.47***	.43***	.42***	.36***	.42***	.15***	.70***	–								
12 Control: Item 3	.05	-.10*	.14**	.32***	.27***	.29***	.27***	.26***	.11*	.51***	.59***	–							
13 Group identification: Item 1	-.00	.00	-.01	-.05	.04	-.04	-.02	.07	.09*	-.09	-.09	-.09	–						
14 Group identification: Item 2	-.05	.05	-.09*	-.02	-.01	-.08	-.08	.01	.14**	-.12**	-.15***	-.14**	.62***	–					
15 Group identification: Item 3	-.24***	.15***	-.16***	.00	.01	.01	.00	.06	.13**	-.05	-.02	-.08	.43***	.49***	–				
16 Intentions: Item 1	.02	-.10*	.05	.50***	.49***	.44***	.44***	.54***	.28***	.47***	.55***	.37***	.00	-.07	-.00	–			
17 Intentions: Item 2	.03	-.14**	.14**	.48***	.46***	.42***	.42***	.52***	.25***	.50***	.62***	.44***	-.01	-.12**	-.00	.84***	–		
18 Intentions: Item 3	.11*	-.16***	.08	.34***	.32***	.31***	.28***	.34***	.18***	.36***	.37***	.27***	-.06	-.13**	-.03	.55***	.55***	–	
<i>M</i>	38.63	.30	.18	3.58	3.43	3.71	3.23	2.49	3.57	2.81	2.43	3.10	3.37	3.83	3.16	2.15	2.13	1.47	
<i>SD</i>	11.16	.46	.38	1.12	1.13	1.04	.96	1.14	.68	1.14	1.07	1.02	.86	.86	1.02	1.21	1.25	.99	

* $p < .05$. ** $p < .01$. *** $p < .001$

Table 2

Fit Indices and χ^2 Difference Test for Moderation Effect of Group Identification

Models	χ^2	df	CFI	RMSEA	$\Delta\chi^2$	Δ df
Unconstrained model	231.03***	144	.974	.035		
Attitude→Intention set equal across groups	232.47***	97	.974	.035	1.44	1
Norms→Intention set equal across groups	232.87***	97	.974	.035	1.84	1
Control→Intention set equal across groups	239.14***	145	.972	.037	8.10**	1

** $p < .01$. *** $p < .001$

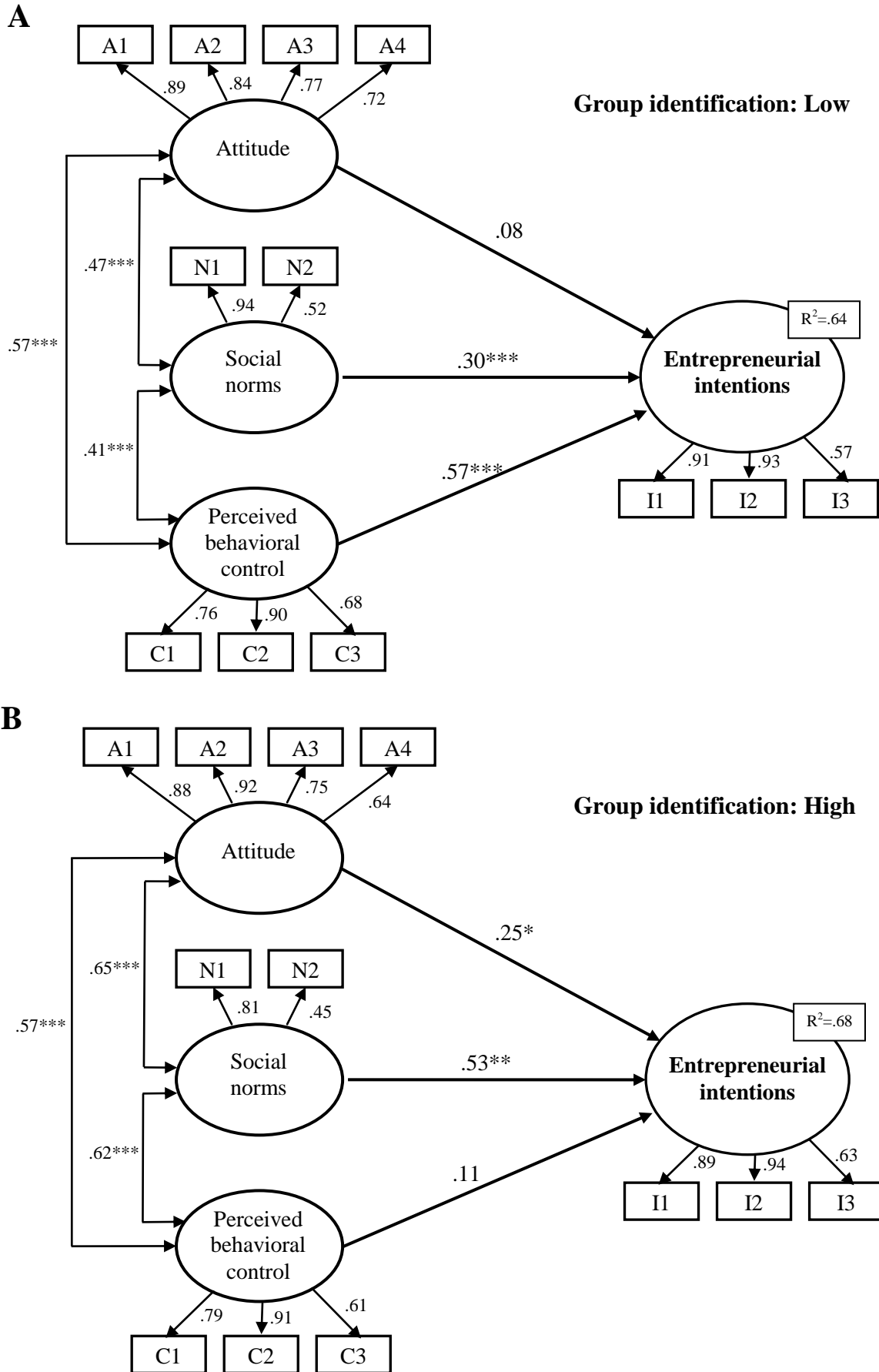


Figure 1: Multi-group analysis (Moderator: Group identification). *Note.* Standardized coefficients are given. All effects are controlled for age, professor (no/yes), and gender. * $p < .05$. ** $p < .01$. *** $p < .001$.