



Paper to be presented at the DRUID 2012

on

June 19 to June 21

at

CBS, Copenhagen, Denmark,

Not-Invented-Here: How Cohesive Socialization Practices Affect The Formation Of Negative Attitudes Toward External Knowledge

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Abstract

The management literature has highlighted several potential benefits of cohesive socialization practices within companies. In contrast, this paper posits that such practices, by fostering a higher degree of company identity and cohesion, contribute to a biased perception of the virtues of internally generated knowledge and therefore to a greater reluctance to adopt external knowledge, the so-called Not-Invented-Here (NIH) syndrome. Drawing on multi-informant survey data of small and medium-sized Danish enterprises, the authors find that cohesive socialization practices are an important driver of the NIH syndrome. The effect is attenuated in technologically highly specialized companies, but particularly aggravated in technologically sophisticated ones.

Introduction

It is now commonly accepted that successful companies must be capable of leveraging opportunities outside their boundaries. This adage has been applied to many aspects of a firm's life, and recently to the management of innovation, technology, and knowledge. The growing threats and opportunities stemming from rising technology markets, where a great deal of disembodied knowledge can be acquired and sold (Arora et al., 2001, Fosfuri and Giarratana, 2010) has meant that companies increasingly need to acquire external knowledge in order to sustain their innovative activities.

Despite increasing awareness about the subject, the degree to which firms are willing to insource external knowledge seems to vary significantly. While some tend to overly value knowledge coming from other organizations (Menon and Pfeffer, 2003, Menon et al., 2006), others tend to display a persistent negative attitude to ideas and technologies not developed in-house. The latter tendency has been documented in a variety of settings (Lichtenthaler and Ernst, 2006) and is usually referred to as the "Not-Invented-Here (NIH) syndrome" (Katz and Allen, 1982). Whereas heterogeneity in the level of attitudes to external knowledge has been documented in the literature, its underlying causes are not yet completely understood. In other words, *why do some companies have a higher level of negative attitudes to external knowledge than others (i.e. NIH syndrome)?* This is precisely the question this paper addresses.

Recent examples in the business practice reveal the implications of such negative attitudes, leaving no doubt about the relevance of this question for further investigation. The well-known experience of Procter and Gamble in their 'connect and develop' program, for instance, illustrates the resistance faced by the company's executives when implementing the new strategy: "[our goal was] to exert steady pressure on the culture, to continue to shift mind-sets away from resistance to 'not invented here'. Early on, employees were anxious that connect and develop might eliminate jobs or that Procter and Gamble would lose capabilities" (Huston and Sakkab, 2006: 66). Kodak's response to digital technology is another example of the pronounced impact of attitudes on firm performance. Although the company invested heavily in, and at an early stage of, the transition from film to digital imaging, it failed to take advantage of the new technology mainly due to the protective

attitudes of middle managers, who felt that the new technology could jeopardize their jobs and thus blocked any further development (Lucas and Goh, 2009), ultimately leading the company to file for bankruptcy protection in January 2012 (New York Times 19-01-2012).

As these examples reveal, firms often put a high (perhaps too high) premium on internal knowledge and then face difficulties in seeking and using external knowledge (Bresman, 2010, Bierly III et al., 2009). Several economic and knowledge-related explanations have been put forward to rationalize this tendency: High transaction costs, inappropriate incentives, asymmetric information, and lack of relevant capability are examples (Nelson, 1959, Arrow, 1963, Cohen and Levinthal, 1990). The literature has investigated socio-psychological roots of this tendency, too: Individuals participate in groups and strive to maintain a positive social identity to the detriment of outsiders (Mullen, Brown, & Smith, 1992). In fact, the very same scientists and engineers who are responsible for creating new knowledge within a company are the recipients of knowledge flows from outside. This ambivalence in roles generates tensions that might hinder the ability of a company to put external knowledge to good use.

Drawing on innovation management literature and social identity theory, our research contributes to this line of inquiry by deepening our understanding of the mechanisms through which cohesive socialization practices affect the formation of the NIH syndrome. Cohesive socialization practices, which foster the formation of group identity (Tajfel, 1982), have been emphasized in the management literature as a source of several benefits, spanning from incentives alignment to greater coordination, and from coherent corporate image to greater internal knowledge exchange (Ackerman, 2010, Jansen et al., 2005). In contrast, we point out that excessive emphasis on socialization might have downsides as well.

Specifically, cohesive socialization practices, by fostering a higher degree of company identity, inevitably increase the distance between what is inside the organization and what is outside. As social identity theory (Mullen et al., 1992) predicts, identity formation depends on identification with specific groups: In-groups are the groups we identify with, whereas out-groups are the ones we do not identify with. Greater identification with the company means that R&D scientists develop a stronger bias in favor of internal knowledge and greater

reluctance to embrace external knowledge — that is, they develop higher levels of the NIH syndrome. We explore the boundary conditions of our framework by investigating the contingencies under which we expect a weaker or stronger relationship between socialization practices and NIH syndrome.

We test our contention using multi-informant survey data collected from a sample of small and medium-sized (SME) manufacturing firms in the medium-high-tech and high-tech sectors in Denmark (n=169). Our findings suggest that cohesive socialization practices, along with a lack of prior experience with external knowledge sources, do contribute to the formation of negative attitudes to external knowledge. In addition, we find that this effect is attenuated in technologically highly specialized companies, but particularly aggravated in technologically sophisticated ones.

Our study offers a number of contributions for management research and practice. We contribute to theory by identifying a potential drawback of cohesive socialization practices and improving the understanding of how negative attitudes to external knowledge develop. We question the excessively positive (and perhaps naïve) comprehension of the consequences of cohesive socialization practices and strong corporate identity for innovation activities, offering a more nuanced perspective to the constructs.

In parallel, we contribute to the growing literature on the NIH syndrome. This notion has been applied in multiple ways: as a moderating variable to explain the reasons that make the search, transfer, and assimilation of external knowledge a challenging process (e.g. Agrawal et al., 2010, Szulanski, 1996), as an essential trait of individual and group behavior (e.g. Sherman et al., 2000, Wilkesmann et al., 2009) and as a pathology that affects companies that become too inward-looking (e.g. Cohen and Levinthal, 1990, Escribano et al., 2009). Very few studies have focused specifically on the nature and antecedents of the NIH syndrome both theoretically and empirically. Katz and Allen (1982), Lichtenthaler and Ernst (2006), and, more recently, Reitzig and Sorenson (2010) have highlighted the importance of looking deeper into the social environment and have brought up in-group favoritism and identity creation as major drivers of the NIH syndrome. Our work contributes to this literature by exploring the contingencies under which the link between a firm's social practices and the emergence of negative attitudes to external knowledge is more or less likely to materialize.

Empirically, we contribute by carrying out the first large-scale study on the antecedents of the NIH syndrome. They have, so far, been discussed only at a conceptual level. As noted by Lichtenthaler et al. (2010), from an empirical point of view, little is known about why this tendency emerges and gains prominence inside organizations. Our multi-informant survey data allow us to begin answering some of these unresolved questions. Our study also points to some relevant implications for practice, because prevention of detrimental attitudes to external knowledge valuation, such as the NIH syndrome, requires identification of its triggers, so that managerial intervention can be most effective.

In the next section, we present the theoretical developments of the paper in the form of a set of hypotheses about the impact of cohesive socialization practices on the formation of NIH tendencies. Next, we introduce our dataset and the measurements used for our empirical study. Subsequently, we present the statistical analyses and results. The final section concludes with a discussion of the findings, implications for research and practice, and directions for future research.

Socialization and NIH syndrome: theory and hypotheses

Generally speaking, socialization refers to the gradual acquisition of language, manners, customs, norms, and other socially approved values through reinforcement, observation, and interaction with other people. It starts in early infancy within the family and continues throughout life in a person's social circles. Socialization has been extensively researched by social scientists because it has a lasting impact on how people relate to each other in society and how they develop the values and beliefs that lead to their attitudes. In particular, it creates cohesiveness in groups. Through socialization, people come to share a clear sense of identity, to develop good interpersonal relations, to place high value on the group they belong to, and thereby to develop a positive evaluation of their own group relative to others (Brewer, 1979). As Katz and Allen (1982: 18) put it, "the pressures and interactions within a given group can significantly influence the behaviors, motivations and attitudes of its members".

In organizational life, socialization refers to the process of learning about the unique characteristics and culture of an occupational field or an organization (Beyer and Hannah, 2002). Through their social interaction experiences, new employees learn which behaviors, attitudes, work styles, and norms an organization considers acceptable. This process, which we refer to as “cohesive socialization practices,” begins with the initial contact between an individual and an organization, often a recruiting interview, and continues for some time after the person actually enters the organization. Thereafter, cohesive socialization practices constitute the process by which companies integrate new employees, both implicitly and explicitly, “adjusting” them to the organizational reality and encouraging them to accept pre-set roles, conform to organizational norms, and reproduce the organizational status quo (Epstein, 1983). Examples of such practices are mentorship programs with senior colleagues and team-building activities. The ultimate goal is to generate among employees a “sense of belonging” or “strong group affiliation” to the firm, which results in certain behaviors, expectations, world views, plans, and other similar emotional ties that form specific organizational identities and favor the creation of collective interpretations of reality (Gioia et al. 2000).

Although a strong group identity and collective interpretations of reality may be instrumental for various activities of the firm, such as strategy implementation, employee motivation, cooperation, loyalty, and internal exchange of knowledge (Gioia et al. 2000; Beyer and Hannah, 2002; Jansen et al. 2005), they may be detrimental to others. They can lead to in-group bias in favor of (some) organizational members. Socialization serves in this way the dual function of preserving in-group solidarity and creating attitudinal and perceptual biases in favor of one’s own group that justify the exploitation of out-groups. Membership and exclusion go hand in hand (Rowley and Moldoveanu, 2003). Cohesive socialization practices have indeed been associated with hostility and suspicion to outsiders, resistance to new entrants, and a pronounced propensity to conformity and groupthink (Gioia et al., 2000, Jansen et al., 2005).

In-group bias influences, among other things, the adoption of ideas from outside, in the sense of creating an overemphasis on internal knowledge and the emergence of negative attitudes to external knowledge: the NIH syndrome (Summer, 1906, Jones, 1986). It often leads, as a consequence, to the rejection of external knowledge,

because the group considers it more legitimated and prestigious to create new knowledge in-house, instead of reusing knowledge invented elsewhere (Michailova and Husted, 2003). The effects of in-group bias imply that knowledge evaluations often occur as a non-rational process, independent of the actual content of the knowledge that is conveyed, and strongly shaped by socio-psychological forces (Menon and Blount, 2003). Put differently, knowledge is evaluated not exclusively on the basis of objective criteria such as quality and content, but also on the basis of equally important subjective criteria stemming from affects, cognitions, and social relationships — that is, attitudes. Cohesive socialization practices bias the way a firm's scientists judge internally developed knowledge, making more likely a predisposition to promote their own and other members' innovation capabilities and, consequently, self-enhancement. In addition, Tajfel and Turner (1986) have said that sharper demarcations between in-group members and out-groups enhance identification. External knowledge is, thus, considered less legitimate and its adoption a cause of potential loss of identity and group cohesion.

In summary, cohesive socialization practices are aimed at building a strong corporate identity. To the extent that employees see themselves as members of one organization, however, they will be biased against ideas proposed by outsiders. In fact, outside knowledge, for the very simple reason that it belongs to the out-group, cannot be a source of identification for in-group members. Putting these arguments together, we expect that the valuation of external knowledge will be influenced by the social environment of the firm as follows:

H1: Cohesive socialization practices positively affect the formation of negative attitudes to external knowledge (i.e., the NIH syndrome).

In what context? The introduction of moderators

Having noted the direct effect of cohesive socialization practices on the emergence of the NIH syndrome, we think it is important to qualify our argument, identifying the context in which this effect materializes and in which contexts it may be stronger or weaker. This is especially important because cohesive socialization practices are expected to bring benefits to other firm activities (Beyer and Hannah, 2002) so managers may need

a more nuanced understanding of their impact on specific types of companies. In turn, a better understanding of such contingencies helps establish the boundaries of the applicability of our theoretical framework. In particular, we examine the context in terms of the knowledge base of firms (Grant, 1996, Kogut and Zander, 1992), as distinguished by their level of *absorptive capacity*, *technological specialization*, and *technological sophistication*. The focus on the knowledge base of the firm is a natural choice, as extramural knowledge needs to be integrated with internal knowledge to be fully exploited. This integration process is moderated by a firm's knowledge base, and thus the formation of negative attitudes to external knowledge due to cohesive socialization practices depends on the characteristics of the company's knowledge base. Our model is illustrated in Figure 1.

Insert Figure 1 about here

The valuation of external knowledge is intrinsically linked to a firm's ability to identify, assimilate, and exploit knowledge from the environment; that is, to the firm's *absorptive capacity* (Cohen and Levinthal 1990). Firms with "a high absorptive capacity will tend to have attitudes to external knowledge acquisition that are at least not strongly negative" (Lichtenthaler and Ernst 2006: 376). Indeed, absorptive capacity helps reduce uncertainty associated with external knowledge (Volberda et al., 2010). Insofar as the firm is able to understand better the content and quality of external knowledge flows, it can also better assess the degree of overlap and substitution with its internally generated knowledge. Absorptive capacity contributes to expectation formation in the sense that it influences the manner in which ideas from the outside are accessed (Lichtenthaler and Lichtenthaler, 2009).

A high level of absorptive capacity is therefore likely to contribute to a more rational basis for knowledge evaluation, which can balance out subjective evaluations based on ethnocentric views of the world. We expect that firms with more developed absorptive capacity in certain fields will be in a better position to judge the potentialities, flaws, and risks associated with a particular piece of knowledge, making the abundant information associated with it less confusing and ambiguous. This rational understanding is in turn expected to make the inherent value of knowledge more salient, diminishing eventual prejudices associated with its origin. When

people evaluate knowledge on a rational basis, they strictly consider its content quality and feasibility. Content quality relates to whether knowledge is creative, insightful, relevant, accurate, and reliable. Feasibility relates to the degree to which knowledge is timely, appropriate, and applicable—from a technical point of view, but also from the point of view of the resources to be deployed for its use (Menon and Blount, 2003).

Our core argument is that it is absorptive capacity that provides the basis for such rational judgments. Put differently, the lack of absorptive capacity generates biased perceptions of the external world and thus strengthens the effect of cohesive socialization practices on knowledge provincialism. Following this reasoning, we expect that the overemphasis on domestic knowledge as a result of a strong social identity will be at least partially mitigated by absorptive capacity:

H2: Absorptive capacity attenuates the impact of cohesive socialization practices on the organization's negative attitudes to external knowledge (i.e., the NIH syndrome).

Similarly, cohesive socialization practices are expected to have less impact in *technologically very specialized companies*. This is because the degree of technological specialization of a company is likely to change its functional relation to the outside world by increasing its level of interdependence. Because of their relatively narrow and focused knowledge bases, specialized companies are less inclined to see outsiders as direct rivals and to perceive external knowledge as a threat (the extent of overlap with other organizations is naturally limited).

Threat is an important element to be considered in the context of relations between groups, because it has been found to be a critical factor triggering strong emotions against the out-group, such as antagonism, derogation, and hostility, which may lead to biased attitudes (Hewstone et al., 2002). The absence of threat, in contrast, is associated with a reduced degree of in-group/out-group polarization of hostility (Tajfel 1982).

As experimental research on inter-group discrimination has shown (Brewer 1979), reductions in bias are achieved when the nature of the functional relationship between groups is modified. Among other means, such as the use of common superordinate goals and the increase in inter-group contact, a modification in this functional relationship can be achieved via a decline in competitive pressures and a simultaneous intensification of the need for cooperative interaction (Brewer, 1979). The greater degree of specialized firms' dependence on the external world is thus expected to modify their relation to outsiders as a result of a basic survival instinct, to weaken group-serving biases, and to reduce the difference in attitudes to members of the in-group and the out-group.

In contrast, diversified firms operating in various markets and technological fields can benefit to a large extent from cross-fertilization and reutilization of in-house knowledge, and they are thus more likely to survive on the basis of their own internal knowledge base. In addition, the breadth of their technical base exposes them to a greater chance of intersection/similarities with other organizations. For this reason, they are expected to develop stronger sentiments of rivalry and competition with outsiders, exacerbating their predisposition for in-group positivity and enhancement, alongside "we know better" kinds of attitudes. As Brewer (1979, p. 307) said, "the greater the intensity of competitive interdependence between groups, the more attraction within the in-group and correspondent hostility towards the other group." Put simply, the cooperative interdependence typical of firms that operate in very specialized technological fields leads to less inter-group discrimination and prejudice. Because focused knowledge bases promote open attitudes toward external knowledge (Yayavaram and Ahuja, 2008), they may compensate for the effects of a strong social identity acquired from socialization practices. This leads to the following hypothesis:

H3: Technological specialization attenuates the impact of cohesive socialization practices on the organization's negative attitudes to external knowledge (i.e., the NIH syndrome).

Fourth, we expect cohesive socialization practices to be particularly detrimental for *technologically very sophisticated firms*. The tendency to in-group favoritism triggered by a strong corporate identity is expected to be reinforced in firms operating at the technological frontier, because they are more likely to downplay potential contributions from outside in the belief that little can be learned from other (laggard) firms. In fact, research on group cohesiveness has come to the conclusion that “in-group bias rests on the perception that one’s own group is better, although the out-group is not necessarily depreciated” (Brewer, 1979, p.322). This sense of dominance may create a deformed view of reality, aggravating hostility to ideas from outside. This response may be seen in the case of Apple Computer in the early 1990s. Because of its well-known technical superiority vis-à-vis its rival Microsoft and the Windows operating system, Apple managers “recoiled from good external ideas and live[d] in what was widely known as their own reality distortion field” (Menon and Pfeffer, 2003, p. 497).

This makes sense from the perspective of social identity theory (Tajfel and Turner, 1986), because “factors which direct people’s attention toward their own group are likely to enhance in-group members’ awareness of in-group attributes” (Mullen et al., 1992, p. 105). Increased awareness, in turn, is likely to exaggerate perceptual and judgmental biases (Tajfel, 1982). According to this theory, the triggering factors must possess one of three attributes: salience, status, or relevance (Mullen et al. 1992).

Salience makes group membership more obvious, thus increasing the perception of differentiation between the in-group’s and out-group’s attitudes. Status confers general prestige on groups, making them “feel good about themselves” (Mullen et al. 1992) — a feeling that has important implications for the positive social identity of the members, as well as for the satisfaction of their need for positive self-esteem. In fact, empirical evidence suggests that members of high-status groups tend to show more bias than members of low-status groups, especially on relevant dimensions that favor their own group (Hewstone et al. 2002). Relevance is central to the categorization criterion and to the group’s concerns, and for this reason it evokes biases and evaluative reactions more readily than a more peripheral factor (Mullen et al. 1992). We posit that technological sophistication may realize the function of such a

triggering factor and exacerbate identification with the group and, consequently, attitudinal biases. We posit:

H4: Technological sophistication enhances the impact of cohesive socialization practices on the organization's negative attitudes to external knowledge (i.e., the NIH syndrome).

Methods

Sampling and data

The empirical evidence is based on a sample of 169 SMEs from medium-high-tech to high-tech manufacturing sectors in Denmark. First, following the classification of sectors applied by Eurostat (2008), we focused on pharmaceutical products, consumer electronics, medical equipment, computers, machinery and chemicals, as these sectors are known for using advanced technology and for complementing internal investments in R&D with external knowledge acquisition (Cassiman and Veugelers 2006). Second, relevant enterprises were identified on the basis of NACE trade codes in a nationwide electronic database (NED). We chose the NED database because it is regarded as the most complete, detailed, and up-to-date catalog of companies in Denmark. Third, size and age criteria were also applied in the search. Only companies that fell into the category of small and medium-sized enterprises (i.e., with 10 to 249 employees) and that were more than three years old (i.e., established before 2006) were selected. SMEs are a good test bed for our theory because they are more reliant on technological knowledge from outside their boundaries than are larger organizations. These companies are more likely to suffer the greatest consequences from NIH tendencies. Very young companies are not suitable because the implementation of socialization practices is gradual and requires time. After we applied these selection criteria, the final population consisted of 1,206 companies.

In order to limit common method bias, we collected data from two informants in each company for our independent and dependent variables. We therefore administered two completely distinct questionnaires in order to increase the validity of our study. Through preliminary interviews conducted in the pilot phase, we were able

to choose suitable informant profiles: General managers or CEOs were identified as the first group of informants for the independent variable (socialization practices), as they proved to have a very good overview of their respective companies. We identified chief technology officers (CTOs) as the second group of informants for the dependent variable (the NIH syndrome) and moderators (knowledge-base contingencies). We chose CTOs because they are responsible for R&D activities and are therefore most knowledgeable about the technological aspects of their companies.

We conducted a pilot study with four companies in July 2009 to test the effectiveness of the questionnaire. No major comprehension problems or complaints were reported, and only minor modifications were suggested. Data collection was carried out between September and November 2009. During this phase, we first contacted the companies by telephone to present the study, identify the right informants, obtain their consent, and encourage their participation. Those who consented immediately received an e-mail with an invitation letter and a link to the Web-based survey, which was accompanied by an executive summary of the research project. The questionnaires were administered online with the software Inquisite version 9.0 in English, because measurement scales adopted from the literature were developed exclusively in that language. Although most respondents were not native speakers, nearly all of them use English as a working language. In addition, the pilot tests revealed no indications that the language of the survey might cause problems. In order to boost response rates further, two reminder e-mails were sent out. Of the 1,206 companies contacted, 645 (53%) agreed to participate and therefore received the link to the survey. In all, 527 questionnaires were returned, yielding a response rate of 40.9%. Of those responses, 282 pertained to the first survey and 245 to the second survey. As a result, we had *169 matched pairs* with data from both respondents, for a final response rate of 26.2%. The respondents had a mean company tenure of three to five years and a mean industry tenure of six to ten years, suggesting sufficient competence to reply to the questionnaires.

In order to test for non-response bias, we examined differences between respondents and non-respondents based on the objective variables of firm size, firm age, and industry affiliation. A t-test showed no significant differences ($p < .05$) with respect to age and to distribution across industries; the test for firm size revealed a

slight tendency for respondents to be larger than non-respondents (significant difference at 1% level). Nevertheless, there seems to be broad overall correspondence between the underlying population and our sample on these objective measures.

Measures and operationalization

Except for the NIH syndrome, the other scales employed in this study are perceptual measures borrowed from previous research. The scales constitute multi-item measures based on Likert-type scales, as presented in Tables A1 and A2 in the appendix. The constructs used in the analysis were computed by calculating the arithmetic averages of their respective items so that they could be treated as observed indicators. In addition, the constructs were standardized for the hierarchical regression analysis in order to reduce potential multicollinearity problems.

Dependent variable. The two-item scale of *NIH syndrome* ($\alpha = 0.41$) is the only one for which a survey-based measure was not available in the existing literature; therefore it had to be developed exclusively for this study (previous investigations in the field are based on qualitative fieldwork).

The following steps were taken to develop this new measure. First, items based on relevant literature were proposed for internal discussion. Following state-of-the-art research in socio-psychology, we developed items as instruments for *direct attitude measurement*, in which the assessment of a person's attitude is carried out with a single question about her general evaluation of the attitude object (Bohner and Wänke, 2002, Bohner and Dickel, 2011). These items were designed to capture the valuation of attitudes toward external knowledge that is both closely and distantly related to the knowledge base of firms, on the basis of "an implicit notion of boundaries between different technological domains" (Rosenkopf and Nerkar, 2001, p. 288). Because the feelings and beliefs related to an attitude are internal to the person and cannot be observed directly (Ajzen, 2001, Eagly and Chaiken, 2005), we relied on behavior to draw inferences about attitudes. This is consistent with previous studies in the socio-psychological and organizational field (Albarracín et al., 2005, Ajzen, 2001, Lichtenhaler et al., 2010). Two items were proposed for this scale: i) we favor the application of technologies from outside which overlap to a great extent to what we already know, ii) we often work with new technologies which lie outside our

domain of expertise (both reverse-coded). The first item reflects behavior regarding closely related knowledge, whereas the second concerns behavior in relation to the adoption of distant knowledge. The argument for our categorization is that companies have open attitudes toward outside knowledge when they are willing to use knowledge that is located on both ends of the spectrum of the technological distance scale, and thus that can be either complementary to their own knowledge bases or substituted for them. In other words, these are two sides of the same attitude object.

Even though multi-item scales are often considered superior in reliability, single-item measures are in fact most common in survey research on attitudes because, besides being highly economical, they are better at capturing accessible attitudes, the ones that can be most easily retrieved from memory and hence are less subject to motivated response distortions (Bohner and Wänke, 2002). We therefore employed single-item measures in our study (i.e., one item for each facet of external knowledge). After the scale was designed, it was then validated during pilot studies, when we could confirm that the questions were intelligible to respondents and posed no difficulties.

The CTO was used as informant for this scale. Even though we rely on one informant to assess the overall level of attitude among employees, this is not considered to be a severe limitation in the study, which intends to capture differences at the inter-organizational, and not at the intra-organizational level. Furthermore, the CTO is considered a reliable informant, especially in the context of SME's, where he is likely to interact directly with all employees involved in innovation processes. Although the application of the questionnaire among all employees of the organization would be recommendable, it is not a feasible approach for the collection of data among a large sample of companies.

In addition, we do not regard the relatively low Cronbach's alpha statistic as a source of great concern for the internal reliability of the scale, because it consists of only two items. When scales are restricted to three or four items, a Cronbach's alpha of 0.50 is considered satisfactory by most researchers (Kristal, 2008). Therefore we can consider a value of 0.41 for a two-item scale as acceptable. In addition, it is worth mentioning that the

bivariate correlation between the two items is 0.258 and is significant at the 0.01 level (two-tailed test). Confirmatory factor analysis further corroborated the validity of the construct.

Independent variable. The measurement of the independent variable came from the first informant and was tailored to fit the type of companies (SMEs) and the targeted informants (CEOs). *Cohesive socialization practices* were assessed according to the construct developed by Jones (1986) for the so-called institutionalized socialization practices (practices that are structured, that are formalized, and that encourage acceptance of behaviors and values). On the contrary, the other type of socialization practices includes the ones known as “individualized” practices, for they favor diversity and therefore tend not to produce the same standardized behaviors, but rather innovative responses (Jones, 1986). The items of this scale capture socialization processes at a general level, that is, irrespective of the nature of the culture or the types of norms people are being socialized to. Thus, what we wanted to assess is the extent to which socialization practices are intended to drive homogeneity in behaviour, and not to evaluate specific characteristics of the culture of each organization surveyed. We have also corrected the scale to take into account that the respondents are the general managers (and not typical employees). These adjustments tried to preserve the original phrasing as much as possible. The basic change was to replace “employees” with “I” ($\alpha = 0.67$).

Moderators. To account for the characteristics of the technological base of the firms surveyed, three measures were employed, namely *absorptive capacity*, *technological specialization*, and *technological sophistication*, as provided by the second informant, the CTO. The 25-item scale developed by Lichtenthaler (2009), which follows the same format as that of Jansen et al. (2005), was employed as a proxy for *absorptive capacity* ($\alpha = 0.94$). Because it was designed to measure directly the ability to absorb external knowledge (despite the inherent difficulties of measuring such an abstract construct), this measurement was more appropriate for our study than other proxies traditionally employed in the literature, such as R&D intensity and the number of corporate researchers. Besides, by using a scale already available in the literature, we tried to minimize potential overlapping with the NIH syndrome measurement. Even though these are conceptually distinct constructs referring to the *ability* (absorptive capacity) and *willingness* (NIH syndrome) to use external

knowledge, they share the characteristic of being difficult to compute and not directly observable, hence inferred from behavior. To ensure the validity of these measurements, the absorptive capacity scale refers to the execution of a set of activities, and the NIH-syndrome scale refers to the way respondents evaluate such activities (therefore the word “favour” on the questionnaire). Moreover, because absorptive capacity has been regarded as a multi-dimensional construct encompassing the recognition and application of external knowledge — also known as potential and realized absorptive capacity (Zahra and George, 2002) — we have also worked with these two sub-dimensions in separate items (items 1–9 for potential absorptive capacity and items 10–25 for realized absorptive capacity).

We used an adapted version of Anderson and Weitz’s (1992) scale for specialized investments to measure the degree of *technological specialization* ($\alpha = 0.80$), the extent to which a firm has invested in resources that lose value if not applied to a specific technology. The scale fundamentally relies on an assessment of the breadth of use of existing technical base of the organization. The measure of *technological sophistication* ($\alpha = 0.86$) came from Danneels (2008) and is designed to capture the extent to which firms have built new technological competencies over the past 10 years. This time span was identified during the pilot study, when respondents were asked to define the average length (in number of years) of the technology cycles in their industry. Confirmatory factor analyses were performed on the moderator variables, and they corroborated the validity of these constructs.

Control variables. Two groups of control variables were included: the controls related to organizational attributes and practices — *lack of prior experience*, *formalization*, and *relational skills* — and the more traditional set of controls related to firm characteristics.

Lack of prior experience with external knowledge ($\alpha = 0.83$) was measured as the number of external actors not used by the companies as information sources in their innovation activities. Along the lines proposed by the Eurostat Community Innovation Survey, companies were asked to reply on a four-point scale (which ranged from “not used” to “high degree”) to what extent they had used 13 external sources of information for their innovative activities in the period 2006–2008 (see Table A1). The 13 sources were then coded as binary

variables, 0 if the company had used the source to some degree in the past three years and 1 if it had not used it at all. The 13 sources were then summed to form the variable. We have in fact used the opposite version of the measure proposed by Laursen and Salter (2006) for “search breadth.” We assume that the higher the number of sources not used, the less experienced the company is in using external knowledge. The use of a binary variable is thus justified by the fact that we are not interested in the nuances related to the extent of use, but solely on the distinction used/not used. Lack of prior experience is added as a control because direct experience has been identified as an important driver of attitude formation (Ajzen 2001). The general manager or CEO was used as respondent for this measure.

Formalization was evaluated according to a scale derived from the work of Burton et al. (2002), who have used this scale in a very similar setting, namely the context of Danish SMEs using CEO as respondent. Originally encompassing 8 items, it was reduced to a five-item scale in order to ensure that the questionnaire remained lean ($\alpha = 0.69$). Formalization is expected to diminish biased attitudes against outsiders because written rules and codes of conduct are likely to limit non-rational behavior based on individual feelings and beliefs.

To measure the ability of organizations to establish and maintain relationships with external partners, the scale of *relational skills* of Walter et al. (2006) was employed ($\alpha = 0.84$). *Relational skills* are included as a means of taking into account the ability of firms to establish relations with outside partners, for it is expected to affect the attitudes toward them. Confirmatory factor analyses were performed on all moderator variables related to organizational characteristics, and they corroborated the validity of these constructs.

In addition, five sets of control variables describing firm characteristics were included: *firm size*, *firm age*, *R&D intensity*, *participation in holding groups*, and *industry effects*. Except for R&D intensity, all the variables were available in the NED database. Because larger firms can typically be expected to have more resources and a larger knowledge base, we included the natural logarithm of the number of full-time employees to account for firm size. We also controlled for firm age, measured as the natural logarithm of the number of years since its foundation. Older firms may lack the flexibility to deal with new external knowledge and thus develop stronger

negative attitudes. We included R&D intensity (i.e., R&D expenditure as a percentage of turnover) as a measure of internal knowledge availability, because internal knowledge availability has been found to influence the formation of the NIH syndrome (Menon and Pfeffer, 2003). R&D intensity was a self-reported measure provided by the second informant. A dummy variable for participation in holding groups was also added (0= “no participation in holding group” and 1= “participation in holding group”), because it is related to a firm’s boundaries and possibly affected its inclination to deal with extra-organizational knowledge. Given our cross-industry approach, we also controlled for industry effects. Accordingly, a dummy variable, medium-high-tech/high-tech sector, was included (0= “medium-high-tech” and 1= “high-tech”).

Results

Table 1 shows the descriptive statistics and correlations for the study variables. The level of NIH tendencies was moderately high (overall average: 4.02 on a 7-point scale). Our data in this way support existing indications of the widespread incidence of the NIH phenomenon (Lichtenthaler and Ernst, 2006).

Insert Table 1 about here

Beyond these stylized facts, we rely on hierarchical regression to test our hypotheses. Table 2 presents the results of hierarchical regression analysis for the effect of socialization practices and moderators on the formation of the NIH syndrome. The results show standardized coefficients as well as their significance. All variables were standardized in order to avoid potential problems of multicollinearity. We checked, nonetheless, the variance inflation factors (VIFs) in each of the regression equations. The highest value was 1.91 (model 3), which is well below the rule-of-thumb cut-off level of 10 (Wooldridge, 2009). This finding indicates that multicollinearity is not a serious issue in our analysis.

Insert Table 2 about here

Model 1 in Table 2 refers to the base model, which encompasses only the control variables. Of the traditional controls, only R&D intensity was found to be significant and negative ($\hat{\beta}=-0.22$, $p<0.05$) in Model 1, indicating that the availability of internal knowledge reduces the formation of biased attitudes to external knowledge (Menon and Pfeffer, 2003). This effect disappears, though, when the main explanatory variables are introduced. The fact that internal knowledge constitutes a rational and realistic basis for the assessment of external knowledge may explain this outcome. Of the organizational controls, all three were significant and with the anticipated signs. It is worth noting the relatively high coefficient of the variable *lack of prior experience* ($\hat{\beta}=0.31$, $p<0.001$), which nonetheless weakens in subsequent models where main variables are introduced. An intuitive interpretation of this finding suggests that the more firms are used to drawing on external sources, the less suspicious they are of outsiders. This is known as the “familiarity principle” in the socio-psychological literature, according to which the more often an object is encountered, the more pleasing and likable it becomes (Crano and Prislin, 2006).

Relational skills ($\hat{\beta}=-0.14$, $p<0.10$) and *formalization* ($\hat{\beta}=-0.16$, $p<0.05$) both have negative effects on the formation of NIH tendencies. These are two interesting findings in the sense that they are variables subject to managerial intentionality and therefore can be used as a means of reducing unwanted attitudes.

Models 2 to 5 include the effects of the variables cited in our hypotheses. Comparisons with the corresponding base model reveal that adding the theoretical variables significantly improved the models’ fit, as R^2 changes were significant for all models but model 4 ($p<0.001$ for Models 2 and 3, $p<0.05$ for Models 5 and 6). That is, the models with full specification showed the highest explanatory power compared to the base model. This means that the level of negative attitude to external knowledge among Danish SMEs is better explained by accounting for the effects of cohesive socialization practices in its direct and indirect ways. Besides, it is worth noting that our controls lose significance when the main variables are introduced, except for the variable *lack of prior experience*, which remains significant in all models.

The results for the main effects portrayed in model 2 provide support for hypothesis 1, which specified a positive relation between NIH syndrome and cohesive socialization practices. The coefficient of the key antecedent in our model is positive ($\hat{\beta}=0.16$) and significant at the 5% level, thus corroborating the notion that socialization practices that lead to a strong sense of social identity, and consequently to sentiments of in-group favoritism, drive the formation of NIH tendencies. Moreover, it is worth noting that the direct effects of all moderators are significant (the highest coefficient is the one of absorptive capacity, $\hat{\beta}=0.50$). In order to investigate its effect further, we estimated the individual impact of the two sub-dimensions of absorptive capacity in model 3. Although potential absorptive capacity was shown to be insignificant ($\hat{\beta}=-0.12$, $p>0.10$), realized absorptive capacity had a significant and sizable effect ($\hat{\beta}=-0.42$, $p<0.001$). This finding suggests that it is mostly the ability to transform and exploit external knowledge that is related to the NIH syndrome. In turn, these are also the activities that demand higher commitment of a firm's resources. Instead, scanning the environment, searching for recent developments in the industry and the other activities related to potential absorptive capacity, are less conflictive for the in-group /out-group dynamics, because they do not involve the actual application of solutions from the out-group.

Hypotheses 2 to 4 proposed that a number of characteristics of a firm's knowledge base moderated the effect of socialization practices on the NIH syndrome. Model 4 introduces the first of these interaction effects, the joint effect between cohesive socialization practices and *absorptive capacity*. The coefficient was not significant ($\hat{\beta}=0.10$, $p>0.10$), however, and therefore, contrary to our expectations, hypothesis 2, which posited a negative moderation effect of absorptive capacity, could not be confirmed. Our theoretical conjecture was based on the notion that greater absorptive capacity contributes to a more rational basis for knowledge evaluation, thereby making the inherent value of knowledge more salient and diminishing eventual prejudices associated with its origin. But as we showed above, it is not potential absorptive capacity, but rather realized

absorptive capacity, that matters for the formation of NIH tendencies. This outcome might thus offer a potential explanation for the insignificant coefficient of the interaction term.

Model 5 shows the moderating effect of *technological specialization*. We found a negative and significant coefficient ($\hat{\beta}=-0.14$, $p<0.05$) and as a result could verify hypothesis 3. For highly specialized firms, the effects of socialization practices on the NIH syndrome are less negative than for their technologically diversified counterparts.

Model 6 presents the results pertaining to the last hypothesis of our study. It reveals a positive and significant effect of the moderator *technological sophistication* ($\hat{\beta}=0.03$, $p<0.05$), leading to the confirmation of hypothesis 4. It implies that the impact of socialization practices on the NIH syndrome is strengthened in technologically very sophisticated companies.

As a robustness check, we have also checked the results using an ordered logit model. Given the nature of our dependent variable, we found it appropriate to recalculate our model, treating it as a count ordered variable. As table 3 shows, results are robust across the two model specifications. Hypothesis 1 regarding the main effect of cohesive socialization practices was once more verified, as were hypotheses 3 and 4 about the moderation effects of technological specialization and sophistication. Hypothesis 2, which posited a positive moderation effect of absorptive capacity, was rejected again.

Insert Table 3 about here

Discussion and conclusion

Our objective was to assess empirically the effect of cohesive socialization practices related to employee integration on the formation of negative attitudes to external knowledge. Because previous research has been either conceptual or qualitative, an additional objective was to develop a reliable scale for the measurement of the NIH syndrome.

Cohesive socialization practices were found to contribute significantly to the formation of negative attitudes to external knowledge. This is because the practices of employee integration are designed to lead to shared social experiences and to congruence of values, needs, and beliefs. Individual employees are in this way encouraged to build collective interpretations of reality and to align their perspectives with respect to a number of matters — that is, to form a strong corporate identity (Epstein 1983; Jones 1986). This need for internal commitment and compliance, in turn, leads to a biased perception of the external world (a kind of mental prison), in such a way that employees tend to undervalue the usefulness of knowledge from outside and at the same time tend to favor and exalt internal knowledge production.

Our main premise about the effect of cohesive socialization practices on the NIH syndrome was verified. We found that this effect is attenuated in technologically highly specialized companies and particularly aggravated in technologically sophisticated ones. Our results related to the moderators' variables contribute in this way to a more nuanced perspective of the process of knowledge valuation. Along the lines put forward by Menon and Blount (2003), our study shows that not only the origin of knowledge per se, but also contingencies arising from the organizational context (in terms of the firm's knowledge base) affect the formation of NIH tendencies. This is especially valuable information for managers who need to assess the trade-offs related to the establishment of cohesive socialization practices.

Implications to theory and practice

Our findings have implications for a number of theoretical streams. First, we contribute to the innovation management literature by improving the understanding of the formation of negative attitudes to external knowledge. In the first large-scale study on the topic, we show the effects of cohesive socialization practices on the formation of the NIH syndrome, thus gathering empirical evidence that supports previous conceptual work on the subject. What is more, we propose a first perceptual scale to measure the NIH attitude, which despite its limitations may be instrumental in encouraging further research on the influences of attitudinal responses upon innovative activities. Second, we contribute to strategic management research by specifying one attitudinal

foundation of a firm's ability to exploit external knowledge. As Felin and Foss (2005) have noted, there is a need to integrate micro-foundations arguments in capability-based theory in order to deepen our understanding in decision making and strategy implementation. Third, from the perspective of the identity literature within the organizational behavior tradition, we offer a more nuanced perspective to the construct of corporate identity, exposing one of its drawbacks. By identifying an important trade-off, we counter-balance the excessively positive and perhaps naïve comprehension of the consequences of cohesive socialization practices and strong corporate identity that dominate this literature (Ackerman, 2010, Gioia et al., 2000).

From a practical point of view, our study draws the attention of managers to a reflective inquiry about the way they integrate newcomers into their organizations. We point out the importance of thinking critically about the extent to which management encourages the development of a strong corporate identity and homogeneity of behaviors in their organizations, in which there may not be room for divergences and constructive dialogue. Particularly for SMEs, where pressures to conform with existing roles and frames of mind are naturally stronger than in larger organizations, the socialization of new recruits can have a lasting impact on the way employees relate to the outside world (specifically in assessing external knowledge). For practitioners, the bottom line is that a clear trade-off is involved in the development of strong corporate identity and value system, and they must be aware of it. What is more, this trade-off is particularly exacerbated in companies working at the technological frontiers (the front-runners), but attenuated in firms that are technologically very specialized.

Limitations

This study has some noteworthy limitations that merit discussion. First, our empirical focus has been on Danish companies. Although nothing leads us to suspect that our results are country-specific, supplementary research in other geographical contexts is required in order to confirm our claims. Second, we relied on a cross-sectional dataset. It constrained our inference of causality among variables, as we were not able to demonstrate time precedence. Our causal relationships are built exclusively on an extensive theoretical rationale, and for this reason they need to be validated in a longitudinal research design. Third, although most of our hypotheses were

confirmed, this study is to some degree exploratory, because a scale for the dependent variable was newly developed for it. Unavoidably, the NIH syndrome was measured rather crudely, based solely on behavioral elements that mirrored some of the questions developed by Lichtenthaler et al. (2010) for the Not-Sold-Here (NSH) syndrome, but that disregarded the cognitive and affective dimensions of attitude.

Future research

Our discoveries offer a number of interesting pathways for further research in the field. Regarding the link between employee attitudes and innovative performance, scholars may consider analyzing other determinants of the NIH syndrome, such as incentive systems. It would be similarly valuable to conduct studies in other settings, so that our sample could be compared to other industries and other kinds of organizations, such as large companies or universities. Future research may also aim at investigating Lichtenthaler and Ernst's (2006) five attitudes to knowledge other than the NIH syndrome. Examining how these attitudes relate to each other and to what extent they affect the various knowledge-based tasks of an organization seems promising. As we indicated, the scale of the NIH syndrome we propose here is far from perfect and clearly needs to be improved. It may be very fruitful to examine whether there is an optimal balance between the three attitudinal pairs, as well as how organizations can avoid potential biases on both the positive and negative sides of the assessment spectrum. Too positive an evaluation of external knowledge is not desirable either, as it may lead to downgrading internal knowledge, and consequently to degrading the internal capabilities of a company. We suggest, furthermore, that management and organizational research would greatly benefit from an open dialogue and cross-fertilization efforts with the socio-psychological field, which has studied the nature, operation, consequences, and measures of attitudes for a long time.

References

- ACKERMAN, L. 2010. The Identity Effect. *OD Practitioner*, 42, 36-42.
- AGRAWAL, A., COCKBURN, I. & ROSELL, C. 2010. Not Invented Here? Innovation in company towns. . *Journal of Urban Economics*, 67, 78-89.
- AJZEN, I. 2001. Nature and operation of attitudes. *Annual Review of Psychology*, 52, 27-58.
- ALBARRACÍN, D., JOHNSON, B. T., ZANNA, M. P. & KUMUKALE, G. T. 2005. Attitudes: Introduction and Scope. In: ALBARRACÍN, D., JOHNSON, B. T. & ZANNA, M. P. (eds.) *The Handbook of Attitudes*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- ANDERSON, E. & WEITZ, B. 1992. The Use of Pledges to Build and Sustain Commitment in Distribution Channels. *Journal of Marketing Research*, 29, 18-34.
- ARORA, A., FOSFURI, A. & GAMBARDELLA, A. 2001. *Markets for Technology: The Economics of Innovation and Corporate Strategy*, MIT Press.
- ARROW, K. J. 1963. Uncertainty and the Welfare Economics of Medical Care. *Amer. Econom. Rev.*, 53, 941-974.
- BEYER, J. M. & HANNAH, D. R. 2002. Building on the Past: Enacting Established Personal Identities in a New Work Setting. *Organization Science*, 13, 636-652.
- BIERLY III, P. E., DAMANPOUR, F. & SANTORO, M. D. 2009. The Application of External Knowledge: Organizational Conditions for Exploration and Exploitation. *Journal of Management Studies*, 46, 481-509.
- BOHNER & DICKEL, N. 2011. Attitudes and Attitude Change. *Annual Review of Psychology*, 62, 391-417.
- BOHNER, G. & WÄNKE, M. 2002. *Attitudes and Attitude Change*, New York, Psychology Press.
- BRESMAN, H. 2010. External Learning Activities and Team Performance: A Multimethod Field Study. *Organization Science*, 21, 81-96.
- BREWER, M. B. 1979. In-Group Bias in the Minimal Intergroup Situation: A Cognitive-Motivational Analysis. *Psychological Bulletin*, 86, 307-324.

- BURTON, R. M., LAURIDSEN, J. & OBEL, B. 2002. Return on Assets Loss from Situational and Contingency Misfits. *Management Science*, 48, 1461-1485.
- COHEN, W. M. & LEVINTHAL, D. A. 1990. Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35, 128-152.
- CRANO, W. D. & PRISLIN, R. 2006. Attitudes and Persuasion. *Annual Review of Psychology*, 57, 354-374.
- DANNEELS, E. 2008. Organizational antecedents of second-order competences. *Strategic Management Journal*, 29, 519-519.
- EAGLY, A. H. & CHAIKEN, S. 2005. Attitude Research in the 21st Century: The Current State fo Knowledge. In: ALBARRACÍN, D., JOHNSON, B. T. & ZANNA, M. P. (eds.) *The Handbook of Attitudes*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- EPSTEIN, K. A. 1983. Socialization practices and their consequences: The case of an innovative organization. *Sloan School of Management, Massachusetts Institute of Technology*. Cambridge, MA: WP#1502-83.
- ESCRIBANO, A., FOSFURI, A. & TRIBÓ, J. A. 2009. Managing external knowledge flows: The moderating role of absorptive capacity. *Res. Policy*, 38, 96-105.
- EUROSTAT 2008. *Science, technology and innovation in Europe*, Luxembourg, Eurostat.
- FELIN, T. & FOSS, N. J. 2005. Strategic organization: a field in search for micro-foundations. *Strategic Organization*, 3, 441-455.
- FOSFURI, A. & GIARRATANA, M. S. 2010. Introduction: Trading under the Buttonwood - a foreword to the markets for technology and ideas. *Industrial & Corporate Change*, 19, 767-774.
- GIOIA, D. A., SCHULTZ, M. & CORLEY, K. G. 2000. Organizational identity, image and adaptive instability. *Academy of Management Review*, 25, 63-81.
- GRANT, R. M. 1996. Toward a Knowledge-Based Theory of the Firm. *Strategic Management Journal*, 17, 109-122.
- HEWSTONE, M., RUBIN, M. & WILLIS, H. 2002. Intergroup bias. *Annual Review Psychology*, 53, 575-604.

- HUSTON, L. & SAKKAB, N. 2006. Connect and Develop: Inside Procter & Gamble's New Model for Innovation. *Harvard Business Review*, 84, 58-66.
- JANSEN, J. J. P., VAN DEN BOSCH, F. A. J. & VOLBERDA, H. W. 2005. Managing Potential and Realized Absorptive Capacity: How Do Organizational Antecedents Matter? *Academy of Management Journal*, 48, 999-1015.
- JONES, G. R. 1986. Socialization Tactics, Self-Efficacy, and Newcomers' Adjustments to Organizations. *Academy of Management Journal*, 29, 262-280.
- KATZ, R. & ALLEN, T. J. 1982. Investigating the Not Invented Here (NIH) Syndrome: A Look at the Performance, Tenure, and Communication Patterns of 50 R&D Project Groups. *R & D Management*, 12, 7-20.
- KOGUT, B. & ZANDER, U. 1992. Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology. *Organization Science*, 3, 383-397.
- KRISTAL, A. R. 2008. Evaluation of Nutrition Interventions. In: COULSTON, A. & BOUSHEY, C. J. (eds.) *Nutrition in the prevention and treatment of disease*. London: Elsevier.
- LICHTENTHALER, U. 2009. Absorptive Capacity, Environmental Turbulence, and the Complementarity of Organizational Learning Processes. *Academy of Management Journal*, 52, 822-846.
- LICHTENTHALER, U. & ERNST, H. 2006. Attitudes to externally organizing knowledge management tasks: a review, reconsideration and extension of the NIH syndrome. *R & D Management*, 36, 367-367.
- LICHTENTHALER, U., ERNST, H. & HOEGL, M. 2010. Not-Sold-Here: How Attitudes Influence External Knowledge Exploitation. *Organization Science*, 21, 1054-1071.
- LICHTENTHALER, U. & LICHTENTHALER, E. 2009. A Capability-Based Framework for Open Innovation: Complementing Absorptive Capacity. *Journal of Management Studies*, 46, 1315-1338.
- LUCAS, H. C. & GOH, J. M. 2009. Disruptive technology: How Kodak missed the digital photography revolution. *The Journal of Strategic Information Systems*, 18, 46-55.
- MENON & BLOUNT, S. 2003. The messenger bias: A relational model of knowledge valuation. In: KRAMER, R. M. & STAW, B. (eds.) *Research in Organizational Behavior*. Oxford: Elsevier.

- MENON & PFEFFER, J. 2003. Valuing Internal vs. External Knowledge: Explaining the Preference for Outsiders. *Management Science*, 49, 497-513.
- MENON, THOMPSON, L. & CHOI, H.-S. 2006. Tainted Knowledge vs. Tempting Knowledge: People Avoid Knowledge from Internal Rivals and Seek Knowledge from External Rivals. *Management Science*, 52, 1129 - 1144.
- MICHAILOVA, S. & HUSTED, K. 2003. Knowledge-sharing Hostility in Russian Firms. *California Management Review*, 45, 59-77.
- MULLEN, B., BROWN, R. & SMITH, C. 1992. Ingroup bias as a function of salience, relevance and status: an integration. *European Journal of Social Psychology*, 22, 103-122.
- NELSON, R. R. 1959. The Simple Economics of Basic Scientific Research. *Journal of Political Economy*, 67, 297-306.
- REITZIG, M. & SORENSON, O. 2010. Intra-organizational provincialism. Available at SSRN: <http://ssrn.com/abstract=1552059> (16 April, 2010).
- ROSENKOPF, L. & NERKAR, A. 2001. Beyond Local Search: Boundary-Spanning, Exploration, and Impact in the Optical Disk Industry. *Strategic Management Journal*, 22, 287-306.
- ROWLEY, T. J. & MOLDOVEANU, M. 2003. When Will Stakeholder Groups Act? An Interest- and Identity-Based Model of Stakeholder Group Mobilization. *Academy of Management Review*, 28, 204-219.
- SHERMAN, J. D., SOUDER, W. E. & JENSSEN, S. A. 2000. Differential effects of the primary forms of cross functional integration on product development cycle time. *J. of Product Innovation Management*, 17, 257-267.
- SUMNER, W. G. 1906. *Folkways: A study of the Sociological Importance of Usages, Manners, Customs, Mores and Morals*, Boston, Ginn.
- SZULANSKI, G. 1996. Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17, 27-43.
- TAJFEL, H. 1982. Social-psychology of Inter-group relations. *Annual Review Psychology*, 33.

- TAJFEL, H. & TURNER, J. 1986. The social identity theory of intergroup behavior. *In: WORSHEL, S. & AUSTIN, W. G. (eds.) Psychology of Intergroup Relations*. Chicago: Nelson-Hall.
- VOLBERDA, H. W., FOSS, N. J. & LYLES, M. A. 2010. Absorbing the Concept of Absorptive Capacity: How to Realize Its Potential in the Organization Field. *Organization Science*, 21, 934-954.
- WALTER, A., AUER, M. & RITTER, T. 2006. The impact of network capabilities and entrepreneurial orientation on university spin-off performance. *Journal of Business Venturing*, 21, 546-567.
- WILKESMANN, U., WILKESMANN, M. & VIRGILLITO, A. 2009. The Absence of Cooperation Is Not Necessarily Defection: Structural and Motivational Constraints of Knowledge Transfer in a Social Dilemma Situation. *Organization Studies*, 30, 1141-1164.
- WOOLDRIDGE, J. M. 2009. *Introductory Econometrics: A Modern Approach*, Scarborough, South Western.
- YAYAVARAM, S. & AHUJA, G. 2008. Decomposability in Knowledge Structures and Its Impact on the Usefulness of Inventions and Knowledge-base Malleability. *Administrative Science Quarterly*, 53, 333-362.
- ZAHRA, S. A. & GEORGE, G. 2002. Absorptive Capacity: A Review, Reconceptualization, and Extension. *Academy of Management Review*, 27, 185-203.

FIGURE

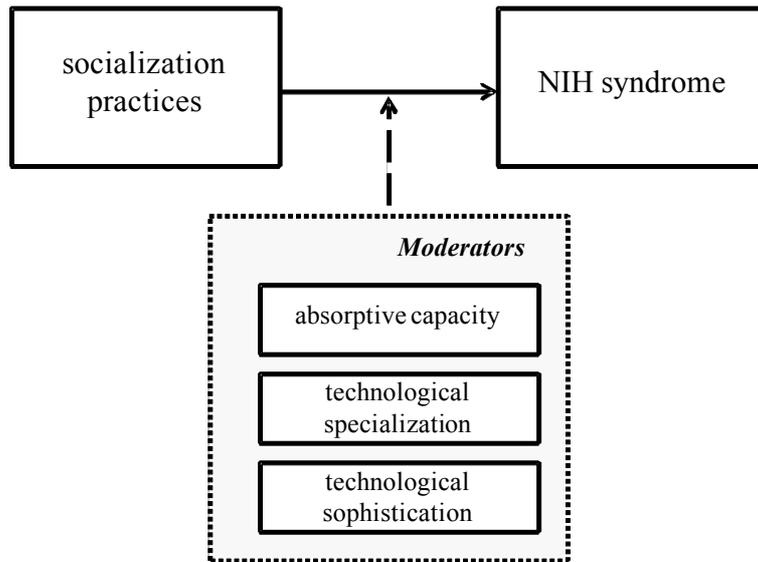


Figure 1: A Model of the Formation of NIH-syndrome

Source: Authors' elaboration

TABLES

TABLE 1
Descriptive Statistics and Correlations of Study Variables

Variables	mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. NIH syndrome	4.05	1.03	1.00												
2. Socialization	5.05	0.89	0.01	1.00											
3. Absorptive capacity	4.82	0.85	-0.55**	0.19*	1.00										
4. Technological specialization	3.30	0.97	-0.14	-0.09	-0.19*	1.00									
5. Technological sophistication	3.42	1.00	-0.34**	0.16*	0.44**	-0.18*	1.00								
6. Lack of prior experience	3.17	2.93	0.35**	0.03	-0.30**	-0.08	-0.22**	1.00							
7. Relational skills	5.88	0.70	-0.17*	0.40**	0.21**	-0.02	0.17*	-0.10	1.00						
8. Formalization	2.92	0.62	-0.09	0.19*	-0.03	0.23**	-0.10	0.04	0.03	1.00					
9. Firm age	3.33	0.77	0.06	-0.16*	-0.02	0.07	-0.17*	0.09	-0.11	-0.04	1.00				
10. R&D intensity	1.93	0.96	-0.20**	-0.04	0.29**	-0.08	0.33**	-0.15*	0.01	-0.28**	-0.29**	1.00			
11. Firm size	3.67	0.88	0.02	-0.13	-0.08	0.02	0.02	-0.08	-0.08	-0.13	0.27**	-0.19*	1.00		
12. Part of holding group	0.80	0.40	-0.07	0.04	0.06	-0.06	0.09	-0.05	0.05	-0.01	0.06	0.01	0.25**	1.00	
13. Medium-high/high-tech sector	0.20	0.40	0.03	0.07	0.00	-0.03	0.12	0.06	0.09	-0.01	-0.26**	0.21**	-0.03	-0.04	1.00

Source: Authors' elaboration

N=169

** . Significant at the 0.01 level (2-tailed).

* . Significant at the 0.05 level (2-tailed).

TABLE 2

Results of Hierarchical Regression Analyses: Effects of Socialization Practices and Moderators on the NIH syndrome

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Controls</i>						
Lack of prior experience	0.31 ***	0.13 †	0.14 *	0.13 *	0.13 †	0.12 †
Relational Skills	-0.14 †	-0.10	-0.09	-0.10	-0.11	-0.07
Formalization	-0.16 *	-0.11	-0.11	-0.11 †	-0.09	-0.10
Firm age	-0.04	0.05	0.04	0.06	0.04	0.06
R&D intensity	-0.22 *	-0.03	-0.03	-0.02	-0.04	-0.04
Firm size	0.00	-0.01	-0.02	-0.01	-0.01	-0.01
Participation in a holding group	-0.04	-0.03	-0.04	-0.04	-0.03	-0.05
Medium-high/high-tech sector	0.05	0.04	0.04	0.05	0.05	0.03
<i>Main effects</i>						
Socialization		0.16 *	0.16 *	0.18 *	0.18 *	0.18 *
Absorptive capacity (AC)		-0.50 ***		-0.48 ***	-0.50 ***	-0.52 ***
Potential absorptive capacity			-0.12			
Realized absorptive capacity			-0.42 ***			
Technological specialization (TE)		-0.21 ***	-0.22 **	-0.21 **	-0.21 **	-0.21 **
Technological sophistication (TS)		-0.14 †	-0.15 *	-0.15 *	-0.14 †	-0.11
<i>Interaction effects</i>						
Socialization x AC				0.10		
Socialization x TE					-0.14 *	
Socialization x TS						0.03 *
<i>Model statistics</i>						
F	4.81 ***	10.04 ***	13.90 ***	9.56 ***	9.92 ***	9.85 ***
Adjusted R ²	0.15	0.39	0.40	0.40	0.41	0.41
R ² change		0.24 ***	0.25 ***	0.01	0.02 *	0.02 *

Source: Authors'elaboration

Notes: Standardized coefficients reported (N= 169)

Significance: † p<0.1; *p<0.05; **p<0.01; ***p<0.001 (two-tailed t-tests)

TABLE 3
Results of Ordered Logit Analyses

	Model 1	Model 2	Model3	Model 4
<i>Controls</i>				
Lack of prior experience	0.11 (0.05) *	0.12 (0.05) *	0.11 (0.05) *	0.10 (0.05) *
Relational skills	-0.33 (0.22)	-0.33 (0.22)	-0.36 (0.22)	-0.26 (0.22)
Formalization	-0.42 (0.25) †	-0.42 (0.25) †	-0.35 (0.25)	-0.41 (0.25) †
Firm age	0.13 (0.21)	0.17 (0.21)	0.15 (0.21)	0.17 (0.21)
R&D intensity	-0.11 (0.17)	-0.09 (0.17)	-0.13 (0.17)	-0.15 (0.18)
Firm size	-0.05 (0.18)	-0.06 (0.18)	-0.07 (0.18)	-0.07 (0.18)
Participation in holding group [=0]	0.07 (0.36)	0.06 (0.36)	0.09 (0.36)	0.17 (0.36)
Medium-high/high-tech sector [=0]	-0.28 (0.36)	-0.30 (0.36)	-0.32 (0.36)	-0.21 (0.37)
<i>Main effects</i>				
Socialization	0.36 (0.18) *	0.41 (0.18) *	0.43 (0.18) *	0.41 (0.18) *
Absorptive Capacity (AC)	-1.41 (0.22) ***	-1.36 (0.22) ***	-1.42 (0.22) ***	-1.49 (0.23) ***
Technological specialization (TE)	-0.59 (0.16) ***	-0.59 (0.16) ***	-0.61 (0.16) ***	-0.60 (0.16) ***
Technological sophistication (TS)	-0.34 (0.16) *	-0.38 (0.16) *	-0.35 (0.17) *	-0.27 (0.17)
<i>Interaction effects</i>				
Socialization x AC		0.21 (0.13)	-0.27 (0.14) *	
Socialization x TE				
Socialization x TS				0.28 (0.15) †
<i>Pseudo R2</i>				
Nagelkerke	0.45	0.46	0.459	0.459
McFadden	0.14	0.14	0.143	0.144

Source: Authors'elaboration

Notes: Unstandardized coefficients reported with standard errors in parenthesis (N= 169) Link function: Logit

Significance: † p<0.1; *p<0.05; **p<0.01; ***p<0.001 (two-tailed t-tests)

APPENDIX
TABLE A1: CONSTRUCTS
FIRST RESPONDENT: GENERAL MANAGER

Construct	Items
Socialization practices <i>from Jones (1986)</i>	1. Experienced organizational members see advising or training newcomers as one of their main job responsibilities in this organization 2. Employees typically gain a clear understanding of their role in this organization from observing senior colleagues. 3. Employees typically receive little guidance from experienced organizational members as to how they should perform their job (R). 4. Employees have little or no access to people who have previously performed their role here (R). 5. Employees are generally left alone to discover what their role should be in this organization (R). <i>(7-point scale, where 1=strongly disagree and 7=strongly agree)</i>
Relational Skills <i>from Walter et al. (2006)</i>	1. We have the ability to build good personal relationships with business partners. 2. We can put ourselves in our partners' position. 3. We can deal flexibly with our partners. 4. We almost always solve problems constructively with our partners. <i>(7-point scale, where 1=strongly disagree and 7=strongly agree)</i>
Formalization <i>from Burton et al. (2002)</i>	1. There are clear-cut rules for how employees must perform their jobs. 2. We carefully control whether our employees follow the rules of the company. 3. Employees are allowed to deviate from rules. 4. Employees' work is to a high degree governed by standards. 5. Employees are allowed to deviate from standards <i>(5-point scale, where 1= strongly disagree and 5= strongly agree)</i>
Lack of Prior Experience <i>from Laursen and Salter (2006)</i>	<p><i>How important to your company's innovation activities during the three-year period 2006–2008 were each of the following information sources?</i></p> <p style="text-align: center;"><i>Market Sources</i></p> a) Suppliers of equipment, materials, components, or software b) Clients or customers c) Competitors d) Consultants e) Commercial laboratories/R&D enterprises <p style="text-align: center;"><i>Institutional Sources</i></p> f) Universities or other higher education institutes g) Government research organizations h) Other public sector, e.g., business links, government offices i) Private research institutes <p style="text-align: center;"><i>Other Sources</i></p> j) Professional conferences, meetings l) Trade associations m) Technical/trade press, computer databases n) Fairs, exhibitions <i>(4-point scale, where 0= not used and 3=used to high extent)</i>

**TABLE A2: CONSTRUCTS
SECOND RESPONDENT: TECHNOLOGY MANAGER**

<p align="center">NIH syndrome</p>	<p><i>Please consider your company's core technological field in answering these questions</i></p> <ol style="list-style-type: none"> 1. We favour the application of technologies from outside which overlap to a great extent to what we already know (R). 2. We often work with new technologies which lie outside our domain of expertise (R). <p align="center"><i>(7-point scale, where 1=strongly disagree and 7=strongly agree)</i></p>
<p align="center">Absorptive Capacity</p> <p align="center"><i>from Lichtenthaler (2009)</i></p>	<ol style="list-style-type: none"> 1. We frequently scan the environment for new technologies. 2. We thoroughly observe technological trends. 3. We observe in detail external sources of new technologies. 4. We thoroughly collect industry information. 5. We have information on the state-of-art of external technologies. 6. We frequently acquire technologies from external sources. 7. We periodically organize special meetings with external partners to acquire new techn. 8. Employees regularly approach external institutions to acquire technological knowledge. 9. We often transfer technological knowledge. 10. We thoroughly maintain relevant knowledge over time. 11. Employees store technological knowledge for future reference. 12. We communicate relevant knowledge across the units of our firm. 13. Knowledge management is functioning well in our company. 14. When recognizing a business opportunity, we can quickly rely on existing knowledge. 15. We are proficient in reactivating existing knowledge for new uses. 16. We quickly analyze and interpret changing market demands for our technologies. 17. New opportunities to serve our customers w. existing technologies are quickly understood. 18. We are proficient in transforming techn. knowledge from external sources into new prod. 19. We regularly match new technologies from outside with ideas for new products. 20. We quickly recognize the usefulness of new technological knowledge from outside for existing knowledge. 21. Our employees are capable of sharing their expertise to develop new products. 22. We regularly apply technologies developed externally in new products. 23. We constantly consider how to better exploit technologies from outside. 24. We easily implement external technologies in new products. 25. It is well known who can best exploit new technologies inside our firm. <p align="center"><i>(7-point scale, where 1=strongly disagree and 7=strongly agree)</i></p>
<p align="center">Technolog. Specialization</p> <p align="center"><i>from Anderson and Weitz (1992)</i></p>	<ol style="list-style-type: none"> 1. Much of our technical expertise is insufficient for the application and implementation of new technologies. 2. We have to significantly reinvent many of our operating procedures and protocols to successfully apply technologies developed externally into our business. 3. To be successful in new outside technologies, we often need to change substantially the manner in which we carry many of our tasks. 4. Our equipment and instruments are often not useful for our new developmental projects. 5. Many of our manufacturing skills cannot be applied to new technologies. 6. We usually have to retrain/lay off current employees or hire new ones in order to successfully develop new technologies <p align="center"><i>(5-point scale, where 1= strongly disagree and 5= strongly agree)</i></p>
<p align="center">Technolog. Sophistication</p> <p align="center"><i>from Danneels (2008)</i></p>	<p><i>These questions ask to what extent your company built or developed new resources, skills, or competences that it did not yet have in the year 2000. Since the year 2000, we built:</i></p> <ol style="list-style-type: none"> 1. New kinds of production operations or facilities 2. Technological expertise in new areas 3. R&D skills and resources in new technical areas 4. Engineering skills and resources in new technical areas <p align="center"><i>(7-point scale, where 1=strongly disagree and 7=strongly agree)</i></p>

(R) means reversed coding