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Technical workers in international organizations

PhD dissertation

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Executive summary

The purpose of this dissertation is to shed light on technically skilled expatriates. This group of occupants is important to investigate as companies have expressed concerns about the low amount of future employees with an education within science and technology disciplines. In shedding light on this group of occupants, this dissertation finds and bridge a gap in two current streams of literature. On the one hand, expatriate scholars have been calling for research that investigates what expatriates actually do (Shaffer, Kraimer, Chen, & Bolino, 2012). This request on the other hand aligns well with calls from occupational sociologist who ask what tasks and job technical workers actually perform. Rahman and Barley (2017) reemphasizes that we still lack an understanding of technical work and the occupation itself. What scholars of occupations are particular interested in understanding how members of such occupations accomplish their work (Barley, 2005). Therefore, this dissertation contributes two both of these fields of research. This contribution is made through five empirical papers that investigate technically skilled workers in international settings at different levels of analysis.

The first two articles are studies on micro level dynamics connected to technically skilled workers and expatriates. The first paper examines the role that highly educated technical specialists hold in international high-tech companies. It concludes that two predominant tasks drive the role development of technical skilled workers. The first task being an advisory task in which specialists monitor and guide other members in the organization based on their technical knowledge and experience. Through these tasks, specialists gets an enhanced understanding of the organizational processes connected to new product development. The second task manifests itself as an emerging task in which specialists test new ideas learned by understanding the processes. If emerging tasks concludes that it is a beneficial idea is it implemented in to the advisory task. The interplay between

the two prominent tasks, advisory and emerging, is important to enhance our understanding of how technical specialists develop through their tasks in organizations. Following this, the second paper then analyzes technical specialist roles being expatriated to another country. This study concludes that despite holding the technical knowledge, the adjustment to a new setting is a collective effort involving both the technically skilled expatriate and their local counterparts.

To further investigate multicultural aspects of technically based communities, the third and fourth paper set out to examine inclusive behavior in technical professional work groups. The third paper thus studies the importance of inclusive behavior in members' involvement in technical work groups. It concludes that when work groups perform well, inclusiveness is less important for group members. The fourth paper similarly investigates effects of inclusive behavior in technical work groups. This study on the other hand tests inclusive behavior as a mediator of the technical knowledge resources – performance relationship. Moreover, this study also examines whether this effect differs between private business and university work groups. The study concludes that members of university-based work groups rely more on inclusive behavior among its members than members of private business.

The fifth and last study in the dissertation, explores embeddedness factors for scientists, technicians, engineers, and mathematicians (STEM) immigrants in Denmark. The study tests if community and job embeddedness factors predict the likelihood of STEM immigrants leaving Denmark. Furthermore, the study also assesses the effect of STEM immigrants having a spouse. The study concludes that both types of embeddedness are important yet in different ways. Community embeddedness appears to be associated with higher probability to leave, whereas job embeddedness increases likelihood of staying. In testing the effect of a spouse, we find an increase in the likelihood to stay, except when the spouse and immigrant share same nationality.

Despite each one of the five studies having separate contributions to different fields and areas such as role development and group inclusiveness behavior, they all together contribute in providing a better and more nuance understanding of a lesser researched phenomena, the technically skilled expatriate.

Dansk resume

Formålet med denne afhandling er at kaste lys på højtuddannede tekniske udlændinge. Grunde til dette er, at virksomheder og brancheorganisationer længe har udtrykt bekymringer om mængden af nuværende arbejdere med en længerevideregående uddannelse inden for videnskabelige og teknologiske discipliner. Forskere inden for medarbejderudstationering har længe kaldt på forskning der reelt afbilleder hvad udstationeret arbejdskraft laver (Shaffer, Kraimer Chen, & Bolino, 2012). I den samme tankegang, har beskæftigelsesforskere kaldt på forskning der faktisk præcisere hvad højtuddannet teknisk arbejde indebære (Rahman and Barley, 2017). Denne afhandling bidrager derved ind i begge forskningsgrene, og dette gøre igennem fem empiriske studier.

De første to artikler in afhandlingen studere dynamikker på det lavere niveau for højtuddannede tekniske arbejder og udlændinge. Det først studie undersøger den rolle som højtuddannede tekniske medarbejdere besidder i højteknologiske virksomheder. Studiet konkludere at to dominerende arbejdsopgaver driver rollen for højtuddannede tekniske arbejdere. Det andet studie i afhandlingen analysere endvidere dynamikker for udstationerede arbejdere i den tekniske rolle. Dette studie finder at, højtuddannede tekniske udstationerede givet deres viden opretholder et stærk position i datterselskabet. Tilpasningen til de nye omgivelser betinget af en kollektiv indsats imellem udlændinge og deres lokal kollegaer.

Tredje og fjerde studies har til videre hensigt, at undersøge det multikulturelle aspekt af tekniske fællesskaber. Dette gøres gennem et fokus på inkluderende adfærd blandt medarbejdere i multikulturelle tekniske arbejdsgrupper. Det tredje studie fokusere mere præcist på hvordan arbejdsgrupper inkluderende adfærd over for forskelligheder er mindre vigtig når arbejdsgruppen er succesfuld. Det fjerde studie undersøger inkluderende adfærd som en formidler af gruppens

tekniske viden og deres præstation. Derudover belyser studiet forskelle for sådan arbejdsgruppers adfærd i private virksomheder og universiteter. Studiet konkludere at grupper inkluderende adfærd er vigtigere på universiteter end det er i private virksomheder.

Det sidste og femte studie i afhandlingen udforsker faktorer der fonankre STEM (Scientists, Technicians, Engineers, & Mathematicians) immigranter i Danmark. Studiet afdækker hvorledes samfunds- og jobforankring kan forklarer om denne gruppe immigranter bliver i, eller forlader Danmark. Studiet viser at de to forankringsfaktorer er vigtige, dog på hver sin måde. Samfundsforankring er associeret med at denne gruppe immigranter forlader Danmark, hvorimod jobforankring ser ud til at øge deres sandsynlighed for at blive. Ydermere finder vi at, immigranter der bor i Danmark med en samlever øger deres sandsynlighed for at blive, dette er dog ikke tilfælde når samleveren kommer fra det samme land som STEM immigranten.

Til trods for at hvert studie i sig selv bidrager til forskellige felter og områder af forskning, bidrager de samlet set til at bygge en bedre forståelse det mindre forsket fænomen; den højtuddannede tekniske arbejder i international organisationer.

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Chapter 1.

Introduction to the dissertation

The globalization process has accelerated the hunt for technical talent and knowledge-based capital. Being primarily a knowledge driven economy according to the World Bank, 2016, Denmark is thus forced to attract technical and specialized talent from abroad (Dansk Industri¹). Therefore, the ‘war’ on global talent is forcing organizations to compete for future specialists on an international level (Chambers, Foulon, Handfield-Jones, Hankin, & Michaels III, 1998; Schuler, Jackson, & Tarique, 2011). With global talent recruitment, Danish firms seek to extend and maintain their competitive positions in their fields of expertise. Recently this was illustrated when different interests organizations addressed and expressed their concern towards the growing gap within the Danish labor market; especially the need for specialized employees (ing.dk, 2011; Magisterbladet, 2015). Thus, the recruitment of technical personnel beyond the national border is central for Danish organizations and multinationals to maintain competitive positions both nationally and internationally. Despite this effort by organizations, the head of the Technical University of Denmark pointed out that in year 2025, Denmark will lack 10,000 highly educated workers within technology, science, and IT disciplines (DTU, 2018).

Research related to expatriation and international assignments is neither new nor rare, and the number of publications has risen steadily over the last four decades (Kraimer, Bolino, & Mead, 2016). Topics related to international assignments and reallocations have often been connected to adjustment to the host country (Black, Mendenhall, & Oddou, 1991a; Firth, Chen,

¹ Dansk Industri is a confederate private organization, funded, owned, and managed entirely by approximately 10,000 companies within the manufacturing, trade and service industries in Denmark.
<https://di.dk/English/Pages/English.aspx>

Kirkman, & Kim, 2014; Seibert, Kraimer, & Crant, 2001). Other topics have been on failure and withdrawal (Harzing, 1995; Shaffer & Harrison, 1998), selection and training (Black & Porter, 1991; Shaffer, Harrison, Gregersen, Black, & Ferzandi, 2006; Tung, 1987), career outcomes (Jokinen, Brewster, & Suutari, 2008), and transfer of knowledge (Chang, Gong, & Peng, 2012; Zhou, Fey, & Prashantham, 2016). All topics that are not to be neglected and that remain interesting for researchers but also organizations hiring internationally and doing expatriation of current staff.

Expatriates in various forms are individuals living in a different country from their own, assuming different roles (Tharenou, 2015). Edström and Galbraith (1977) described expatriate roles as a pallet of specific functional positions, such as controlling, coordinating, or developing. International technically skilled workers and expatriates have therefore often been investigated in doing tasks connected to such functions; that is performing management assignments rather than technical tasks. In particular, the expatriate literature has been focusing on transfer of knowledge and skills from the parent company to subsidiaries in relation to technical workers. As such, it has been argued that one of the main reasons for using technically skilled expatriates is the potential exchange of knowledge across national boundaries (Kraimer et al., 2016; Minbaeva & Michailova, 2004). Despite a growing research on expatriates and international technically skilled workers, we still do not know much about the work and tasks that these employees actually perform (Shaffer, Kraimer, Chen, & Bolino, 2012).

Research has furthermore shown, that organizational expatriates are often chosen for their performance related to technical rather than management tasks at the headquarter location (Selmer, 2002). Therefore, international assignments require global workers to bring skills, knowledge, and knowhow that are either on a par or better than the skill level in the host country (cf. West Jr & Bogumil Jr, 2000). Even though skilled technical workers are in demand and often expatriated, research on this group of workers in particular, as to what they do and how

they do it, is limited, even in a mono-cultural context (Barley, 1996, 2005). As such, Rahman and Barley (2017) recently did one such study; they explored the interaction between designers and technical advisors in a single North American location. They found that creative and technical work is much more than just brilliant idea generation, also entailing much detailed ad-hoc work connected to solving constraints between the original idea and the technical problems. Given the scarce literature on both what technical workers and expatriates do, the aim of this dissertation is to shed light on this less debated group of international workers, namely technically skilled expatriates. In doing so, the framework of the PhD will capture the role that technically skilled workers obtain in multicultural organizations, and show how collaboration between the foreigners and the host country nationals unfolds. More so, the importance of inclusive behavior among members in multicultural technically skilled work groups is investigated. Lastly, macro-economic host-country embeddedness factors for skilled professionals living in another country than their own is explored.

In this task, however, only few scholars have focused on technically skilled expatriates. One example is Manolopoulos, Dimitratos, and Sapouna (2011a) who investigated the transfer of tacit knowledge between R&D expatriates within different multinational companies. Similarly, Fang, Jiang, Makino, and Beamish (2010) found that technically skilled expatriates were often engaged in support related activities in contrast to traditional expatriation assignments. Finally, Morgan, Nie, and Young (2004) found technical expatriation tasks to be more unambiguous than those of a non-technical expatriation. The research on technically skilled workers is spread across various streams of literature complicating coherent and proper synthesis. Scholars within dedicated management disciplines, for example, international business, management, innovation, and new product development focus to some extent on this group of occupants. Yet, these streams of literature rarely draw on each other's findings.

While little empirical research exists on this theme, it may be argued that technically skilled expatriates are likely to express characteristics that are different from the general population of expatriates. High levels of emotional and social intelligence generally tend to be important for expatriates as the assignments often involve leadership positions and complex person related matters (cf. Hoffman & Frost, 2006). This indicates difficulties in the context of interpersonal relations and in the adjustment to diverse social settings (Bass, 2001). Likewise, it is argued that technical individuals tend to avoid jobs and assignments where interpersonal skills or leadership roles are required (e.g. Igbaria, Kassicieh, & Silver, 1999). Despite the growing need for technical individuals, the scholars suggest that expatriates performing technical tasks and assignments may experience difficulties when dealing with local personnel.

This problem not only involves the individuals but also the organizations that hire or expatriate those technically skilled workers. In this regard, expatriation and international reallocation have been argued to be the single largest investment that a multinational corporation can attach to any individual employee (Selmer, 2002). Thus, an organization choosing to invest in international assignments carries many of the expenses for arranging the reallocation, housing, and medical care coverage (Templer, Tay & Chandrasekar, 2006). These expenses are arguably higher for organizations if the international assignments fail, and likewise as laborious for the individual expatriates (Gibson et al, 2014.). Nevertheless, technically skilled workers are in high demand, and thus, organizations have to use this group of expatriates despite the increased risk associated with insufficient adjustment.

The remainder of this chapter is organized in the following way. Firstly, I present the key concepts of the dissertation, hereafter follows the research questions for each of the five papers and the connection between them is highlighted. Next, I will elaborate on the research method and data collection in the dissertation. Then I will present the five research articles

shortly, and finally this chapter ends by a discussion of the findings and limitations of this dissertation.

1.1 Key concepts

The technically skilled expatriate - definition and operationalization

The expatriate has been researched in connection with various disciplines and organizations (Kraimer et al., 2016; Shaffer et al., 2012). In particular, during the last two decades researches have been breaking down the expatriate definition to several subgroups (Tharenou, 2013). Especially themes on organization expatriates (OEs) and self-initiated expatriates (SIEs) have been researched on different matters, e.g. on how they differ in terms of organizational support or not, but also how the adjustment to the host country differentiates for the two types of expatriates (Lauring & Selmer, 2018; Peltokorpi & Froese, 2009; Tharenou & Caulfield, 2010). This theorizing and operationalization of subgroups in the expatriate literature have led scholars to challenge the definition of expatriates further, as it needs to encompass the group that is expatriated by their employer, but also the group that simply chooses to live and work in another country than their own (Andresen, Bergdolt, Margenfeld, & Dickmann, 2014; McNulty & Brewster, 2016; Tharenou, 2015). In doing so, researchers within expatriate management have for the last decade repeatedly tried to come up with a broad and clear definition able to capture the various aspects of expatriates, including the self-initiating part, which has a clear migration part to it. One such articulation was done by Andresen et al. (2014), who considered the expatriates with immigrant status. More so, commonly for all the emerging definitions are the articulation of a ‘job’, which is a key concept in understanding expatriation. This has led some researchers to start using the notion of ‘business expatriates’, which also fits well as a broadened definition for technically skilled expatriates whom this dissertation seeks

to shed light on. Therefore, this dissertation initially follows and draws upon the definition by McNulty and Brewster (2016):

Legally working individuals who reside temporarily in a country of which they are not a citizen in order to accomplish a career-related goal, being relocated abroad either by an organization, by self-initiation or directly employed within the host-country.

Tharenou (2015) added one more subgroup to the definition debate, namely skilled immigrants (SIs). SIs differentiate themselves from self-initiated expatriates (SIEs) in Tharenou's (2015) opinion, as they must hold at least a minor degree from an university in their home country, before migrating to the host country. This notion is particularly interesting when we want to capture expatriates in technical positions compared to the above broad definition by McNulty and Brewster (2016). This dissertation therefore puts emphasis on the definition by Tharenou (2015), as it will assist in understanding the difference between the pure business expatriate and the technically skilled expatriate. The working definition of technically skilled expatriates for the overall framework of the dissertation therefore is:

Managerial, professional and technical persons usually holding at least a bachelor's degree gained in their home country and a skilled occupation, who self-initiate migration for the long-term usually to settle permanently in a new country for reasons of economic motivation, career progress, lifestyle, establishment of better lives and living conditions, and/or family and relationships, either migrating through employer sponsorship of a job in the new country or independently by a skilled migration program seeking to gain employment once there.

Within this dissertation, the term 'technical/technically' is a key concept, and to ensure a common understanding of what the technical aspect entails in an occupation, the definition by *The Oxford English Dictionary* (2019) of a technician is used:

A person qualified in the practical aspects of one of the sciences or mechanical arts; (in later use) esp. a person whose job is to carry out practical work in a laboratory or to give assistance with technical equipment.

As this dissertation aims to shed light on technically skilled expatriates by means of five empirical papers, the level of analysis and operationalization varies in the different papers as shown in Table 1. As the papers contribute to different research disciplines, the operationalization follows the current debate in the respective fields, i.e. the role development literature or international business.

Table 1: Operationalization and level of analysis

Study	Title	Level of analysis (Methodology)	Operationalization
I	The specialist role: A case of new product development in high-tech firms	Micro foundational (Qualitative)	Highly educated technical specialist (HETS)
II	Expatriate adjustment: The case of a technical community	Group and mezzo (Qualitative)	Technical expatriates
III	Achievement as a compensator for low inclusiveness in multilingual work groups?	Group (Quantitative)	Members of technical R&D workgroups
IV	Language inclusiveness in international R&D workgroups: The moderating role of sector affiliation	Group (Quantitative)	Members of technical R&D workgroups
V	What makes foreign specialists stay? Embeddedness and foreign STEM workers' likelihood to stay or leave Denmark	Macro-economic (Quantitative)	STEM immigrants (Scientific, Technology, Engineering, & Mathematics)

1.2 Research questions and contributions

The five papers in the dissertation are to a large extent representing my increasing knowledge about the nature of the technically skilled expatriates. Themes that are important for both researchers and organizations have been outlined in the dissertation, including adjustment, embeddedness, the nature of the technical role, and the effect of inclusive behavior in international technical workgroups. The initially idea for the PhD was to investigate international technical workers in terms of expatriate adjustment and knowledge sharing behavior by use of multiple analytical lenses. In line with my proposal, the overall focus remains the same, the technically skilled expatriates. However, the context changed from merely investigating knowledge to seeking to capture other important aspects of expatriates' lives, both at work and off work. Adjustment research within expatriate literature was initially, and still is, about the ability of expatriates to settle into the new cultural context, including their position, their role, the new business environment, and the host country context and the nationals (Black & Mendenhall, 1991; Kraimer et al., 2016; Mahajan & Toh, 2014a). Another topic that became important when working with this dissertation was the effect of spousal adjustment to the new context, which is increasingly important to understand when examining the success of individuals partaking in international assignments (Andreason, 2008; Chen & Shaffer, 2018). In this dissertation, I try to theorize adjustment differently, considering the technically skilled expatriate as a knowledge agent of value to host country nationals. Yet, this adjustment is two-sided, as the locals need the knowledge and expertise of the technically skilled expatriates and therefore must learn from them; the expatriates on the other hand will often learn about the local context from their interaction with the local workers (Mahajan & Toh, 2014a). To see this unfold, the first two studies in the dissertation have an explorative, qualitative approach. The first paper investigates the role of the technical specialist worker in two international firms and the second paper is displaying how the technically skilled

expatriates' adjustment unfolds in a two-way interaction with the host country workers, assisting to the process of the expatriates and the local workers getting used to each other.

The first study depicts the role that the technically skilled workers assume in two international companies. The study furthermore shows that such international technically skilled workers are indeed strong knowledge agents who obtain a rare position in international firms. To guide me in the research, I asked the following question: *How does the role of highly educated technical specialists develop in new product development processes in the interplay between advisory tasks and emerging tasks?* Sequential to this, the second study investigates how the interaction and learnings between technically skilled expatriates and host country national workers led to a two-way adjustment, and we formulated the following guiding question: *how do specialist expatriates interact with host country employees and what do the specialists learn from the locals in that process?*

The third and fourth studies focus on members in international technical work groups and use psychometric methodologies on a large cross-sectional survey data. The two studies investigate the inclusiveness by 'openness to language diversity' in multilingual environments. Firstly, as language is argued to be important for inclusive behavior, we suggest in paper 3 that this might be less the case if the work groups are performing well. Therefore, the research question is as follows: *Will group inclusiveness have a different influence on the feeling of work group involvement when the members have a strong practice of applying the expertise residing in the group?* As for paper 4, various organizations are to a larger extent relying on international talent and therefore often consist of multilingual work groups. Culturally diverse groups might experience exclusive behavior among group members. Such behavior is said to mitigate by line managers particularly in private business firms. Literature similarly tells us that universities tend to have less profound line managers. Therefore, the fourth paper, asks; *Will group inclusiveness behavior differ in multicultural technical work groups for private*

business R&D and universities? The last and fifth paper of the dissertation investigates two macro-economic embeddedness factors for individual expatriates in Denmark, using register data for a 12-year-period. We formulated the research question in the following way: *To what extent does an individual's job and social embeddedness matter in foreign STEM workers' decision to stay in or leave the host country?*

The five papers are clearly investigating different phenomena throughout the dissertation, yet there is some commonalities between the papers. Paper 1 and 2 are explorative qualitative studies and examine the international technical specialist workers and expatriates from two different theoretical angles. These two studies zoom in on the dynamics and mechanics at the micro and mezzo levels. The level of analysis is the individual technical specialist worker in an international context. Papers 3 and 4 have a different theoretical angle as they investigate the group level mechanisms. These two papers investigate the importance of language inclusiveness in multicultural technical workgroups. The fifth paper captures the embeddedness factor for the entire population of foreign STEM workers in Denmark for a 12-year period. Table 2 outlines the contribution of the five papers.

Table 2: Research question and contribution of papers

Paper	Research question	Contribution	Operationalization
Study I: The specialist role: A case of new product development in high-tech firms	<i>How does the role of highly educated technical specialist develop in new product development processes in the interplay between formal advisory task and emerging tasks?</i>	Self-initiated role development for technical specialists in international organizations doing new product development	Highly educated technical specialists in international companies
Study II: Expatriate adjustment: The case of a technical community	<i>How do specialist expatriates interact with host country employees and what do the specialists learn from the locals in that process?</i>	Situated learning theoretical lenses provides new evidence for how adjustment unfolds when technically skilled expatriates interact and collaborate with local workers	Danish technical expatriates in the UK
Study III: Achievement as a compensator for low inclusiveness in multilingual work groups?	<i>Will group inclusiveness have a different influence on the feeling of work group involvement when the members have a strong practice of applying the expertise residing in the group?</i>	Shows how achievement, in terms of bringing expertise to bear, in multicultural technical workgroups mitigate the importance for inclusiveness	Members of technical R&D work groups in Denmark
Study IV: Language inclusiveness in international R&D workgroups: The moderating role of sector affiliation	<i>Will group inclusiveness behavior differ in multicultural technical work groups for private business R&D and academic organizations?</i>	The study theorizes on leaderships' importance for inclusive behavior in workgroups with a multicultural composition. In workgroups where leadership is less profound, inclusiveness is needed for the workgroup to perform	Members of technical R&D work groups in Denmark
Study V: What makes foreign specialists stay? Embeddedness and foreign STEM workers' likelihood to stay or leave Denmark	<i>To what extent does an individual's job and social embeddedness matter in foreign STEM workers' decision to stay in or leave the host country?</i>	On-the-job and off-the-job embeddedness influences STEM immigrants' likelihood to stay in Denmark. For international STEM workers, community embeddedness is associated with higher probability to leave, whereas job embeddedness increases the likelihood to stay	STEM immigrants (Scientific, Technology, Engineering, & Mathematics)

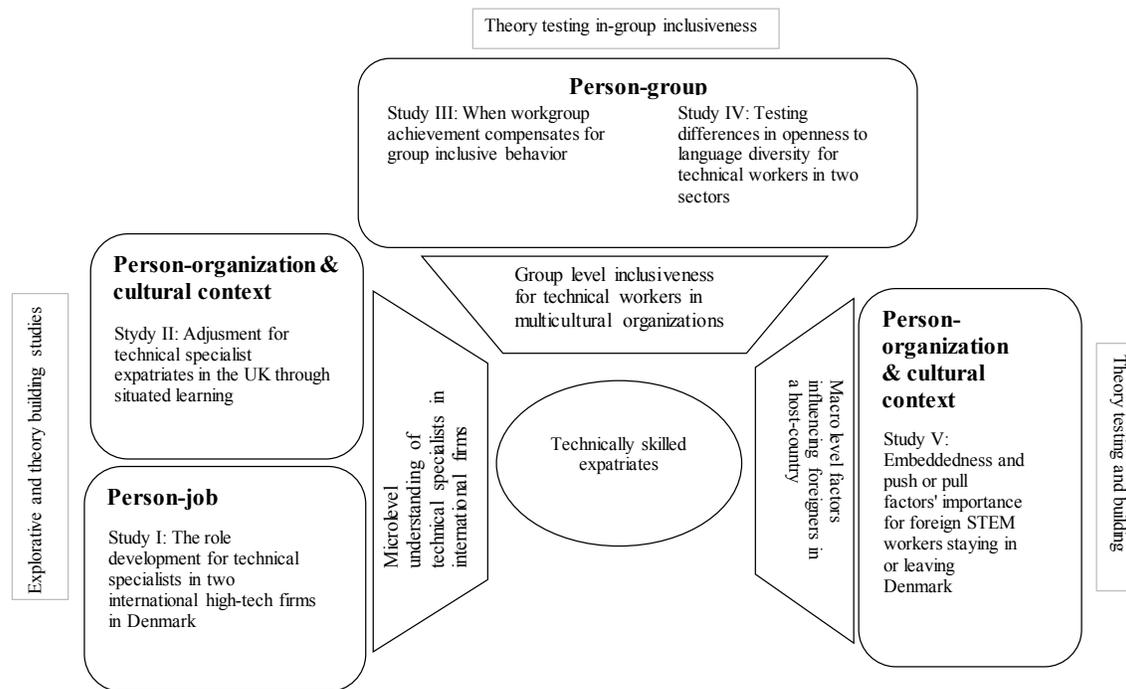
Person-Environment fit framework

The overall framing arch for this dissertation relies on the Person-Environment (P-E) fit framework. One of the stronger suits of this framework is that it provides scholars and practitioners with a theoretical lens to capture different mechanics between individuals, organizations, and society (Blau, 1987; Caplan, 1987; Kristof-Brown, Zimmerman, & Johnson, 2005). The P-E fit framework has been used as a lens in several studies on expatriates in international assignments (Chuang, Hsu, Wang, & Judge, 2015; Luring & Selmer, 2018; Stoermer, Haslberger, Froese, & Kraeh, 2018). The framework provides different perspectives that are suitable to explain the connection between the five studies in this dissertation. More so, the P-E fit framework acts as a lens to understand the relationship between the five papers and the technically skilled expatriate. In doing so, this dissertation relies on four perspectives within the P-E literature. These four were found to be important when building the understanding about the technically skilled expatriate. These four perspectives are: Person-Job, Person-Organization, Person-Group, and cultural context (cf. Makkonen, 2015). First, the P-E fit framework is used to bridge the technically skilled expatriate's fit into MNCs, workgroups, and the host country contexts. Therefore, to capture the role of technical specialists in multicultural firms, and understand the tasks they perform, the dissertation relies on the Person-Job perspective. This perspective is suitable as it captures the fit between a person's characteristics, like technical skills and knowledge, and the compatibility with the job or the task performed in the job (Edwards, 1991; Kristof, 1996). The Person-Organization fit perspective addresses the issue of how a person fits to more broadened constructs of the organization, such as values, the organizational culture, and the climate (Elfenbein & O'Reilly III, 2007; O'Reilly, Chatman, & Caldwell, 1991). Therefore this perspective assists in gaining an understanding of how technically skilled expatriates fit and are compatible with MNCs and larger units in a host country setting. Thirdly, the Person-Group perspective relates to the

interpersonal compatibility between the individual workers and their work groups (Kristof, 1996; Young Seong & Kristof-Brown, 2012), again in terms of value and climate, but also knowledge, skills and abilities (Seong, Kristof-Brown, Park, Hong, & Shin, 2015). This perspective is important in this dissertation, as it will help to grasp that some climate characteristics influence on group member relationships in multicultural organizations. The Person-Cultural context (Peltokorpi & Froese, 2014; Van Vianen, De Pater, Kristof-Brown, & Johnson, 2004) is a perspective between foreigners' compatibility with the local host national culture, values, and norms.

Following Schneider, Smith, and Goldstein (2000) a good P-E fit depicts a good congruence between the attributes of the individuals and those of the environment. The underlying assumption, according to Ostroff (1993) is that when attributes of the individual match is relatively high in congruence with the situation environment, the organization will be more effective. The same notion for the P-E fit could be applied for technically orientated expatriates working in a host-country subsidiary or seeking job opportunities in another country. Figure 1 depicts how the five studies on technically skilled expatriates are captured under the P-E fit framework, and the four different perspectives.

Figure 1: Relationship between the papers



1.3 Research design and methodological approach

The following section presents the different research designs of the dissertation, the data collection, and methodologies of analysis, although each study contains a more precise account for the methodological approach. The aim of this overview is to explain the motivation for varieties in the methodologies applied in the dissertation.

Research setting

Although the data and the observations for the second paper unfold in the UK, the common focus for all five papers in the dissertation is the Nordic context. As such, the second paper investigates Danish food engineers during their expatriation to a UK subsidiary, where they have to facilitate and monitor the establishment of new production lines and the product development for a Danish multinational corporation. The informants for the first paper all held a job where they were connected to the headquarters located in Scandinavia. The study is based on a multiple case study design, investigating how the technical specialist role develops in two

multicultural firms with English as the corporate language. The study theorizes on role development through task adjustment by the use of 26 informants. The multicultural work groups for papers 3 and 4 were located within either Danish academic institutions or private sector firms. The Nordic countries are suitable for research on international workers, as the English proficiency is very high and for many companies, English is the corporate language, despite not being the host country language. For the fifth and last paper in the dissertation, the target population consisted of all the working professional foreigners at the highest level of professional positions in Denmark. The study relies on the unique dataset generated for the purpose of this study. The data includes observation over 12 years and therefore allows for longitudinal research. By the use of a logistical regression model, the study estimates the likelihood of foreigners leaving or staying in Denmark.

Methodological approach

This dissertation adopts multiple approaches of research design and therefore includes both qualitative and quantitative methods. By the use of a qualitative multiple case study research design (Yin, 2009), this dissertation is able to ask questions about the role that the specialists who work in two international firms obtain. Also, using a qualitative method enables the collection of rich and insightful data “with strong potential for revealing complexity” (Miles & Huberman, 1994). In doing so, asking exploratory research questions, researchers are enabled to seek new insight or assess a phenomenon in a new light (Strauss & Corbin, 1990). An ethnographic research design allows for theorizing about the process when technical specialists and host country nationals learn from each other (Spradley, 1980). The two qualitative studies take on a predominantly constructivist perspective in the analysis of the phenomenon, thus follows that the findings are theory elaborating and building (Mir & Watson, 2000).

When assessing group dynamics in international organizations, in particularly inclusiveness, a quantitative research design is using psychometrics techniques. More

precisely, this dissertation relies on multilevel (Rabe-Hesketh & Skrondal, 2004) and moderated mediation designs (Preacher, Rucker, & Hayes, 2007) to investigate the inclusiveness for workgroups in multicultural organizations. Lastly, in theorizing and testing the embeddedness of expatriate knowledge workers living in another country, a quantitative longitudinal quasi-experiment with logistical estimations (Hoetker, 2007) is used.

Qualitative data collection

As mentioned, the first two papers are based on qualitative methods. The first paper has an explorative inductive approach to investigate the role that technical specialists have in international organizations. To answer the research question of this paper, an inductive qualitative case study approach using two high-tech organizations was chosen. The data includes 26 semi-structured interviews on different organizational levels. The data for the second paper was collected through a 3-month period using an ethnography research design including participatory observations, the collection of artefacts, and performing ethnographic interviews with both local and expatriated workers.

Quantitative data collection

Two studies (3&4) in the dissertation investigate multicultural group dynamics and rely on survey data collected electronically from 29 work groups in 29 different organizations. For the fifth and final paper in the dissertation, the data came from Statistics Denmark. The data set was constructed of four different databases to ensure that we had the data foundation that we needed to do the analysis. Overall, the target group consists of nearly 74,000 year-observation through 12 years.

Table 3: Data foundation of dissertation

Paper number and title	Approach	Method	Data sources
Study number I: The specialist role: A case of new product development in high-tech firms	Explorative Inductive Theory elaboration	Qualitative Multiple case study with two firms in Denmark	26 semi-structured interviews
Study number II: Expatriate adjustment: The case of a technical community	Explorative Inductive Theory elaboration	Qualitative Single case study in a subsidiary in the UK Embedded case study	42 ethnographic interviews Artefacts Participant observations in a 3-months period
Study number III: Achievement as a compensator for low inclusiveness in multilingual work groups?	Confirmative Deductive Theory testing	Quantitative Psychometric analysis Multi-level analysis	Survey data with 1124 individuals in 29 technical workgroups Multicultural organizations
Study number IV: Language inclusiveness in international R&D workgroups: The moderating role of sector affiliation	Explorative Deductive Theory testing	Quantitative Psychometric analysis Aggregated moderated mediation model	Survey data with 1118 individuals in 29 technical workgroups Multicultural organizations
Study number V: What makes foreign specialists stay? Embeddedness and foreign STEM workers' likelihood to stay or leave Denmark	Confirmative Deductive Theory testing & building	Quantitative Statistical analysis Logistical regression modelling	Register data including a target group of 73,998 individual-year observations over a 12-year period The finale dataset includes information about spouse and other working population Integrated Database for Labor Market Research (IDA)

To summarize, study I, II and V relies on a specific dataset collected for the purpose of the study. The data for study III and IV comes from the same source. The variation in n arise from missing values in the theoretical constructs.

1.4 Overview of the research articles

Table 4: Paper status

Paper	Title	Status
I	The specialist role: A case of new product development in high-tech firms	Working paper
II	Expatriate adjustment: The case of a technical community	Is being prepared for submission to Academy of Management Learning and Education
III	Achievement as a compensator for low inclusiveness in multilingual work groups?	Under review at International Journal of Human Resource Management
IV	Language inclusiveness in international R&D workgroups: The moderating role of sector affiliation	Working paper
V	What makes foreign specialists stay? Embeddedness and foreign STEM workers' likelihood to stay or leave Denmark	Is being prepared for submission to Research Policy

Research article I: The specialist role: A case of new product development in high-tech firms

Authors: Kenneth Nygaard (single authored)

RQ: *How does the role of highly educated technical specialists develop in new product development processes in the interplay between formal advisory tasks and emerging tasks?*

As job roles are fluid and constantly evolving, the development of a role is often described as a change driven process, connected to the work tasks, which includes elaboration with co-workers, close peers or members within work groups (Reay, Golden-Biddle, & Germann, 2006). Therefore, this first study of the dissertation aims to investigate a role that is less dependent on peers to make changes to tasks. This study explores self-driven role development through task adjustment for highly educated technical specialists working in two multicultural high-tech organizations. Such specialist workers have been shown to perform various advisory tasks connected to new product development (Jassawalla & Sashittal, 1998). Besides the advisory tasks, other studies have shown that individuals in such roles also engage in emerging

tasks, an ad-hoc assignment that connects to the above-mentioned advisory task (Wright, Sturdy, & Wylie, 2012).

The results of a qualitative multiple case study including 26 semi-structured interviews reveals that specialist roles develop through a balancing act between the advisory tasks and the exploration of various emerging task as they unfold. This behavior by specialist roles is catalyzed by an embedded understanding of the process connected to new product development in the firms. The specialists develop such understanding by their interactions and observations in organizations. Gaining an understanding of new product development enables the specialists to identify threats and opportunities in current processes. By exploring these threats and opportunities, highly educated technical specialists do tests to conclude, if this alters current processes. If yes, then an advisory task will change the result of such an emerging task. The findings of this study contributes to the understanding of a continued role development of highly specialized workers. It adds insights on how specialists themselves drive role development, and in the case of new product development, insight is provided by performing explorative emerging tasks, which in some cases leads to an adjustment of the advisory task.

Research article II: Expatriate adjustment: The case of a technical community

Authors: Kenneth Nygaard, Jakob Luring, and Charlotte Jonasson

Guiding RQ: *How do specialist expatriates interact with host country employees and what do specialists learn from locals in that process?*

Adjustment to the new context has been the most central concept examined in expatriate research. The concept entails several topics related to cross-cultural adjustment. Firstly, the concept relates to work-related adjustment in the new country (Black et al., 1991a). Secondly, adjustment similarly relates to the host country and the relationship to host nationals (Caligiuri,

2000; Toh & Denisi, 2007). Recently, however, the theoretical foundation guiding expatriate adjustment studies has received much critique. In this article, we propose that rather than grounding new theoretical thrust on the same underlying theory as used previously, theoretical renewal may be found in applying a new perspective. More specifically, we explore if situated learning theory could provide useful novel insight that has not materialized when basing theoretical notions on social learning theory. We use an ethnographic study through a 3-month period to show how a group of expatriates in technical positions interact and collaborate with local English workers.

The data gave a strong indication of the technical expatriates bringing in knowledge, expertise and practices that differed from those that the local worker was used to. This led the two groups, expatriates and locals to challenge each other in different subjects. The technical expatriates questioned all current practices and restructured nearly all processes. On the other side, the local workers challenged the expatriates' function in guiding and managing people but also questioned their communication practices and skills. Through the observation in the data, we found that over time, the two groups started to adjust to each other. Some expatriates understood this, adjusted their work practices to fit the local context and through this development accelerated the learning of technical skills among the locals. Adjustment of practices of both expatriates and local workers was thus dependent on joint legitimate participation in the common community of practice. Our findings indicate that this theoretical lens can reveal the influence of group dynamics in expatriate adjustment and work place learning that would have been ignored using the original perspective.

Research article III: Achievement as a compensator for low inclusiveness in multilingual work groups?

Authors: Kenneth Nygaard & Jakob Lauring

RQ: Will group inclusiveness have a different influence on the feeling of work group involvement when the members have a strong practice of applying the expertise residing in the group?

The third paper of the dissertation investigates group involvement in international organizations. This we do as individuals' involvement has been found to be vital to the functioning of diverse work groups. Work group involvement, however, is difficult to achieve in the increasingly internationalized environment that exists in knowledge intensive organizations. According to van Knippenberg, De Dreu, and Homan (2004), a greater openness to diversity will facilitate better relations among group members and more interaction. Such positive attitudes towards diversity are argued to promote group involvement in spite of intragroup dissimilarities.

Based on developments in social identity theory, we set out to explore two types of group activities that can lead to involvement, namely relation-oriented activities that can lead to inclusiveness (being open to language diversity) and task-oriented activities that can lead to achievement (bringing expertise to bear). We have designed our study in this way because examining in which ways group inclusiveness and achievement affect individuals' involvement will demonstrate how higher level contextual factors in combination can influence the emotions of the single person. Our main hypothesis is that the two types of activities can supplement each other so that group inclusiveness becomes less important for feeling involved if group achievement is high. Using a multilevel approach and responses from 1,124 individuals in 29

multicultural technical work groups in private business organizations and universities, we confirm our theoretical assumptions.

Research article IV: Language inclusiveness in international R&D workgroups: The moderating role of sector affiliation

Authors: Kenneth Nygaard (Single Authored)

Guiding RQ: *Will group inclusiveness behavior differ in multicultural technical workgroup for private business R&D and academic organizations?*

Cultural diversity in work groups has long been argued to be important for broadening the depth and width of the collective groups knowledge pool (Van Knippenberg, Van Ginkel, & Homan, 2013). This notion is particularly interesting for organizations that have an international outlook, such as private business organizations and universities. Inclusiveness behavior among group members has been found to mediate the intragroup knowledge on its performance (Schippers, Den Hartog, Koopman, & Wienk, 2003). The negative side of having multicultural work groups is that it may lead to potential conflict and exclusive behavior among its members (Phillips, Northcraft, & Neale, 2006). One way to limit such behavior among group members is through the use of line managers (Cook, MacKenzie, & Forde, 2016). This particular effect of line managers mitigating the categorization process in diverse groups has been found to be positive in private business settings (Lauring & Jonasson, 2018; Mitchell et al., 2015). Furthermore line managers are often a visible part of the private business organization, whereas they are argued to be less profound in universities (Mintzberg, 1979). In this in mind, this study firstly hypothesizes that inclusiveness positively affects the work group performance in multicultural organizations. Secondly, following the argument on line managers' role in organizations, the study then hypothesizes on a difference between group

inclusiveness behavior in private business organizations and universities. The result of the analysis confirms the hypothesis and the study contributes to the stream of literature enhancing the role that line managers have when mitigating problems connected with diverse organizations.

Research article V: What makes foreign specialists stay? Embeddedness and foreign STEM workers' likelihood to stay or leave Denmark

Authors: Kenneth Nygaard & Anders Ryom Villadsen

RQ: To what extent does an individual's job and social embeddedness matter in foreign STEM workers' decision to stay in or leave the host country?

With increasing globalization, labor markets have provided specialists with the opportunity to work around the world. In the 'war' for talent, firms and countries struggle to retain specialists and try to avoid them pursuing their next position in another country. With this study, the focus is on the effects of on-the-job and of-the-job embeddedness (Mitchell, Holtom, Lee, Sablinski, & Erez, 2001) on STEM immigrants' likelihood to stay in Denmark. We operationalize these as community and job embeddedness, and we assessed them by ratios of other STEMs, foreigners, and foreign STEMs at each individual observation, in the municipality and at the work place. Therefore, this study proceeds to investigate the retention of international skilled STEM workers in Denmark, done by a longitudinal research design, using a dataset including the entire population of 73,998 individual-year observations in our target group. Results indicate that both types of embeddedness are important for STEM immigrants, yet in different ways. Community embeddedness appears mostly to be associated with higher probability to leave, whereas job embeddedness is more connected to an increase in the likelihood of STEM immigrants staying. We furthermore tested the effect of spouses

connected to STEM immigrants in the data. We did so, by categorizing the spouse as either being from the host-country (Denmark) or having the same nationality as the foreign STEM worker, thereby ‘having a spouse’ was the baseline. The result of having a spouse while living in Denmark saw an overall increased likelihood to stay, except when the spouse shares a person’s foreign nationality. The result has interesting theoretical implications as we test embeddedness on an entire population.

1.5 Discussion and implications

This introduction section has highlighted the need for more and better understandings of technical skilled workers and in particular those working and navigating in an international context. The five papers have attempted to answer this call, by the use of various sophisticated analyses of complex datasets on technically skilled expatriates in various contexts. As the result of the first two papers contributes to the discussion about the roles that expatriates assume (Tharenou, 2015). In parts, paper 1 also highlights how the technically skilled expatriate acts in headquarter locations. Furthermore, the dissertation also answers the call on what tasks that the technically skilled expatriates perform, and in that sense partly replays to Shaffer et al’s. (2012) call. Connected to this, it also contributed to occupational calls on what technical specialists actually do (Rahman & Barley, 2017). These tasks had no management functions in it, yet findings indicate that in their expected tasks, advice by monitoring and guiding, match the statement by Edström and Galbraith (1977) on expatriates controlling and coordinating. Both papers 1 and 2, show that within the ‘box’ of knowledge, technically skilled expatriates are very confident, and they are likely to challenge practices that are deeply rooted in the organization. Furthermore, they, when compared to leaders and managers, are less likely to negotiate the meaning about their knowledge. As such, their opinions are not easily up for debate, when they perform tasks connected to monitoring or providing guidance. In

highlighting the technically skilled expatriate role, the findings strongly indicate that the role includes elements of ambiguity and less clarity in career advancement. This is similar to the findings by Morgan et al. (2004), who found the role of technically skilled expatriates to be ambiguous and unclear compared to leadership and management roles.

The dissertation also suggests that adjustment (e.g. Black et al., 1991a) to a new setting rather than being unidirectional, is a collective mechanism between the expatriates and the host country locals following the thinking by Toh and Denisi (2007). Especially for technically skilled expatriates where situated learning and participation to technical communities of practice provided a good theoretical lens examining the adjustment pattern between the expatriates and the local workers.

When examining technically skilled expatriates connected to work group activities, the importance of inclusive behavior was assessed, both as a mediator but also as a predictor, on group performance. For technically skilled expatriates, inclusive behavior in multi linguistic contexts is important to get work groups to perform. These findings conflict with some of the indications in the literature on technically skilled expatriates possibly having difficulties in the context of interpersonal relations and adjusting to a diverse setting (Bass, 2001). Furthermore, these findings go against the suggestion by Igarria et al. (1999), who argued in favor of technical individuals avoiding jobs that require interpersonal skills or roles.

The last study in the dissertation finds that job embeddedness is important for the technically skilled expatriate, but not just any type of job embeddedness. Foreign professional embeddedness factors are positively associated with the foreign skilled expatriates staying in the country. This finding is important for the aim of the dissertation, as it provides a better understanding of retaining foreign technical talent, which is argued to be one of the biggest

challenges for international human resource management in international firms (Schuler et al., 2011).

Limitations and suggestions for future research

The limitations are discussed throughout the papers of the dissertation. However, as these are specific for the studies themselves, it is important to highlight some overall general limitations to this dissertation. Firstly, the empirical focus has mainly been in a Danish context. Therefore, in further building an understanding on technically skilled expatriates, other organizations and countries should be included, as the findings in the dissertation may be applied differently in other contexts and settings. Nevertheless, the Danish context is a useful setting when asking multicultural research questions. As many organizations have corporate languages and are operating as internationalized firms doing cross-board business activities. Furthermore, the English proficiency in the Danish population are among the highest in world, this provides good opportunity for foreigner to navigate every day life without any deep local language proficiency.

Secondly, the dissertation utilizes a very broad definition on expatriates, as it meant to capture all types of technically skilled expatriates, whether organizational expatriated (i.e. sponsorship through organizations), self-initiated or skilled immigrants. This boundary condition for the expatriate research is in many aspects also one of the bigger limitations of the dissertation. As the broad definition fits the aim, shedding light on an under-researched group of expatriates, it at the same time limits the practical implications of the dissertation. Also in the task of bridging two streams of research literature are the theories and frameworks that are the normally connected to these fields are less central for this dissertation. One reason for this is, a topic often connected to skilled workers, is the knowledge worker and the connected debate to that operationalization (Davenport & Prusak, 1998; Drucker, 2004) and in

particularly the lack of clear definitions connect on the term knowledge workers (Pyöriä, 2005). Including the knowledge worker debate in this dissertation would have broadened the scope of the dissertation even more.

Thirdly, the five papers all capture individuals in technical communities, work groups or municipalities. By this, the technically skilled expatriate has been depicted from different perspectives, yet many aspects of international technical skilled worker still needs to be uncovered in future research. For example, are they in the same way reliant on the community of practice? In that sense, do they influence and partake in local technical communities? Furthermore, are skilled professional expatriates less likely to have interactions with local workers, if so how does this influence the expatriate to local relationship. Lastly, how can, or do firms, incorporate technical skilled workers into their “frequent flyer” schemes - and is this solution more beneficial for technical skilled workers in international companies, or do subsidiaries need their hands on expertise and experience on site?

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Chapter 2

The specialist role: A case of new product development in high-tech firm

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ABSTRACT

Role development is often a process driven through the likes of coworker and peers. This study investigates self-driven role development through task adjustment for highly educated technical specialists. The results of a qualitative case study including 26 semi-structured interviews reveal that specialist roles develop through a balancing act between performing formal tasks and an explorative emerging task. This is catalyzed by understanding the process of new product development which specialists build by interactions and observation within an organization. This study contributes to the understanding of continued occupational role development of highly specialized workers in high-tech industries. It adds insights on how specialists by themselves drive role development by doing emerging tasks, which, if successful, leads to an adjustment of their formal task.

Keywords: Specialists, experts, role development, tasks, task adjustment,

Introduction

Knowledgeable workers in highly educated technical specialist (HETS) roles, i.e. mechanical engineers, EngD (engineering Doctorates), or PEs (professional engineers), have been described as key-persons connected to innovative processes (Colombo, Dell'Era, & Frattini, 2015; Kach, Azadegan, & Wagner, 2015). HETSs working in technology-based organizations are said to be important for development of new technologies (Truelove & Kellogg, 2016). They hold an influential role in organizations' innovative processes as they provide guidance and suggest changes to ongoing innovation (Birkinshaw, Hamel, & Mol, 2008: 836). In that line of thinking, the tasks performed by HETS are influencing new product development (NPD) (Jassawalla & Sashittal, 1998; Kerr & Ivey, 2003). High technology product development is often argued to be driven by employees whose tasks resemble basic scientific research, this includes hours at work to develop personal skill (Partha & David, 1994). Therefore, the development of HETS roles in firms doing new product development is important to investigate, as they seem to be less dependent on collective and group level development of roles (Leonard-Barton, 1992; Pratt, Rockmann, & Kaufmann, 2006; Reay et al., 2006).

HETSs often assume the role of a consultant, and their most predominant task seems to be advising on processes in organizations (Bessant & Rush, 1995; Laursen & Salter, 2004; Perkmann & Walsh, 2008). Researchers have argued that HETSs are part of an internal consultancy driving and managing innovative initiatives (cf. Birkinshaw et al., 2008). For example, Henderson and Cockburn (1994) argue that an understanding of embedded processes contributes to new product development for firm scientific teams. From such an understanding, the HETS role does a 'formal' advisory task in which they actively debate and guide innovators towards the success criteria of NPD (Birkinshaw et al., 2008; Rahman & Barley, 2017; Sturdy & Wright, 2011). Connected to this, Wright et al. (2012) found that specialists in internal consultant roles were central for organizations as they apply a rigorous and methodological

framework to the innovative initiatives. One way to do this is by adjusting current tasks to fit new technologies from both industry and scientific research to current NPD processes (Perkmann & Walsh, 2008; Wright et al., 2012).

Studies on HETS roles have shown that the tasks they conduct are often defined by a vague job description, leaving time for performing emerging tasks (e.g. Barley, 1996). More so, understanding internal processes is essential for HETSs if they want to do emerging tasks connected to new product development. An emerging task is specialists identifying a problem or opportunity in current NPD processes where they try to develop a service that can overcome this within their area of specialty. If successful, this emerging task will find its way into the current advisory tasks.

Role development is closely related to role identity (cf. Barley, 1989), and therefore it refers to how professionals define themselves in terms of the work they do (Pratt et al., 2006; Reay, Goodrick, Waldorff, & Casebeer, 2017). Following this, professionals, i.e. HETS, develop strong connections to their work and define themselves by interactive patterns associated with what they do (Abbott, 1988; Reay et al., 2017). Scholars furthermore argue that role development is often driven by bottom-up strategies in which new emerging tasks enable adjustment to the current role task (Kraatz, Ventresca, & Deng, 2010; Nigam & Dokko, 2018). Researchers have suggested that performing emerging tasks has substantial impact when new roles emerge or when current roles need to be adjusted at the collective level (Howard-Grenville, Nelson, Earle, Haack, & Young, 2017; Reay et al., 2006). This is exactly why the interplay between the emergent task and the advisory task is a key dynamic in individual role development for HETSs. In addition, HETSs also need to adjust tasks to include new technologies from industry and research to ensure best practices when providing guidance and advice.

How the HETS role develops is interesting to investigate as HETSs are strongly connected to NPD. Yet, only little research investigates how and why this role develops at the individual level in innovative organizations. For example, roles like those of HETSs have been argued often to possess a position in organizations as an ‘expert performer’ – a “one of a kind” employee with no close peers, i.e. not part of a collective role development. Furthermore, such roles are found to have little assignment overlaps with other employees (Ericsson, 2017; Ericsson & Charness, 1994; Simonton, 2014). Despite extant literature on roles and new product development processes, none, to my knowledge, has investigated the personal role development through the importance of task adjustment for highly educated technical specialists. Therefore, in its importance for organizations and for researchers, I set forth to explore how the HETSs’ role and tasks connect to the NPD process in an international environment. I do this in two global technology-based firms as they rely on high skilled individuals specialized within a narrow professional area. Therefore, I ask: *How does the role of highly educated technical specialists develop in new product development processes in the interplay between advisory tasks and emerging tasks?*

To guide me in answering the research question and address the existing gaps in knowledge, this study takes off using a qualitative approach to clarify how and when highly educated technical specialists act in their formal tasks, and how this makes them engage in emerging tasks. The paper continues as follows: Next comes the conceptualization and presentation of the important themes and the connected theory. This is followed by the methodological and analytic approach to the empirical foundation. Afterwards, the findings from the study is presented. Lastly, discussion, implications and limitations conclude the paper.

Conceptualization and theory

To examine how the HETS role develops through continued tasks adjustment to innovation in new product development processes, this next section presents the main constructs and theory used in the paper.

New product development processes

The process of managing innovation is essential for organizations to control and ensure that work connected to NPD will be profitable. It entails a rational perspective and includes those individuals, in this case HETSs, that drive the product innovation in organizations (c.f. Chandler, 1962). The innovation process framework by Birkinshaw et al. (2008) builds on four activities that are essential for individuals, i.e. HETSs acting as R&D staff and advisors in the innovation of new products (Kach et al., 2015). These activities are agenda setting, idea linking, idea testing, and theory linking. This study relies on these four activities also to understand what Rahman and Barley (2017) called situated redesign connected to NPD. In this regard, agenda setting relates to HETSs understanding novel problems, opportunities, and threats in the current process (Burgelman, 1983). For HETSs, idea linking relates to initiation of the emerging task by ‘coming up’ with solutions in the form of new practices or hypothetical adjustments to the observed problems, opportunities, and threats (Ettlie & Elsenbach, 2007; Hargadon, 2003). Idea testing is when HETSs do emerging tasks, testing the possible solutions to new practices that could improve current processes of NPD (Zbaracki, 1998). Theory linking as an activity is when HETSs can articulate that the new practices have altered their current tasks (Ettlie & Elsenbach, 2007; Greenwood, Suddaby, & Hinings, 2002). Importantly, all these processes are connected to the NPD process (Reid & De Brentani, 2004; Veryzer Jr, 1998) and the well-argued part of the NPD, i.e. the stage-gate procedure in which different iterations of the product development is evaluated (Ettlie & Elsenbach, 2007). For HETSs it is

import to understand these four phases, as they provide a clear idea about how to adjust the advisory and guidance tasks in order for them to match findings in the emerging tasks.

Formal advisory tasks and debate through guidance and monitoring

The HETS role is important for the innovative processes in relation to NPD within organizations for two main reasons: Firstly, they monitor the process. That is, they guide and suggest changes to the original design (Kach et al., 2015). Secondly, by self-reflective behavior HETSs evaluate current and future processes against own experience in NPD (Birkinshaw et al., 2008: 836; Jassawalla & Sashittal, 1998). Importantly, the HETS roles are fluid and constantly evolving through the development of tasks connected to the NPD process. One key observation in the literature is that they drive and create change in organization that are of interests within top management (DiMaggio, 1988). In other words, if value is added in some articulation, this may provide the initiation for adjustment in the specialist tasks, and they are often supported by high-ranking members in top management, i.e. the chief engineer.

Roles similar to those of HETSs have been studied from different theoretical angles, but not many actually theorize about the actual tasks they perform or how tasks affect role adjustment. One of the first attempts to investigate such roles and their work tasks was done by Barley (1996) who described how professionals' work unfold and at the same time also depicted how organizations often fail to appreciate technical professional workers. More recently, Rahman and Barley (2017) described, through ethnographic research, the day-to-day mundane work and tasks of creative professionals (technical designers and engineers) in a large architectural company in North America. They found that the debate between technical advisors and innovators had an important impact on the final product. By continued interaction with organizational NPD processes, internal specialists partake in opportunity-and-problem-driven search, idea contextualization through trial and error, and idea linking by debating with,

e.g., innovators (Jassawalla & Sashittal, 1998; Rahman & Barley, 2017), which lead to an enhanced understanding of the tasks connected to NPD (Birkinshaw et al., 2008; Chen, 2005; Kach et al., 2015).

Contextual factors from industry and research

Extra-organizational factors are found to influence the innovative processes in organizations. In particular, the NPD process is argued to be influenced by developments in industry and through university-to-industry collaboration (Giannopoulou, Barlatier, & Pénin, 2019; Perkmann & Walsh, 2008; Sturdy & Wright, 2011). External factors influencing innovative practices and processes are said to primarily originate from universities, professional organizations, and competitors in the industry (Tether & Tajar, 2008). Contextual factors force HETs to be adaptive towards new technology outside of the firm. Next, just as with internal opportunities, these new technologies from industry or research must be evaluated by trial and error behavior to test whether or not some of them should be adopted as part of NPD process. Therefore, such external opportunities and threats are, in a similar way, subject to the same procedure: HETs consider it as a new agenda setting idea, then idea linking to current processes. Next idea testing of hypothetical new processes, and theory linking – thus adopt adjustment in processes and tasks accordingly if the tests are successful.

The emerging tasks

Reflective behavior on own experience and organizational processes is important for HETs as it enables them to engage in explorative emerging tasks in which solutions for new practice or alteration of current tasks emerge (Wright et al., 2012). Role adjustment through the task they perform has been shown to be cultivated through individuals' prior experiences and deep understanding of the processes that they navigate everyday (Reay et al., 2006). Moreover,

Wright et al. (2012) found that internal specialist roles are adaptive and responsive towards changes which is helpful in identifying opportunities and doing emerging tasks connected to the NPD processes. The emerging tasks refer back to particular two of the phases mentioned above: Idea linking and idea testing. These two phases relate to the actual emerging task, trying to solve a problem or opportunity observed in the current process, by formalizing and testing different solutions. If the trial and error tests are successful, the emergent task leads to a new way of understanding the process, and adjustment of the advisory task is needed (Birkinshaw et al., 2008; Kach et al., 2015; Wright et al., 2012).

Social learning theory

Social learning theory explains that by interaction with the work surroundings, employees are learning about processes from the opinions of others, but at the same time also from the actions they observe others perform (Bandura, 1977). Hence, in its broadest sense, all social learning is a result of observing others and the consequences of their behavior. Within management research, this unfolds when employees observe a pattern in the local setting, remember what they observed, reproduce the behavior, and expect the surroundings to reward the behavior accordingly. Therefore, social learning theory is useful to capture and understand how and why tasks and emerging tasks are interconnected when investigating self-developing roles (Manz & Sims Jr, 1980), i.e. when HETSs adjust the NPD processes.

It is in the interaction and through the observation with NPD surroundings that HETSs obtain the deep understanding of processes which is pivotal to cultivate potential changes (Reay et al., 2006). In the debate between the HETSs and NPD team members, the deep process knowledge is built. Importantly, it includes that the HETS understand the needs, problems, and opportunities within the current NPD processes accumulated through prior experience, which is another key element in cultivating change (Reay et al., 2006). As Bandura (1977) argues, the

capacity to learn through observation and interactions makes individuals like HETSs able to understand patterns and processes in organizations. Furthermore, social learning theory provides a fruitful explanation to how workers through thoughts and actions, and from interactions and observations with their surroundings, drive own incremental task adjustment (Bandura, 1986). This is when HETSs, through their social learning in the organization, identify opportunities or problems, which they through a deep process understanding try to either solve or incorporate by the use of prior experience to formulate the emerging task.

Similarly, HETSs are influenced through new trends and themes, arising in both industry and scientific research communities; these will trigger identical mechanisms. If the ideas pass the trial and error testing process in the emerging tasks, then the specialist will integrate the new idea into the advisory task connected to guiding the innovation process. By adjusting from initial interaction with surroundings, the technical specialist role is always developing through a task adjustment mechanism driven by the learnings and observation from the social interaction with the organizational members.

Methodology

Research design & Participants

While role development through task adjustments connected to NPD is still in a nascent stage, I considered an inductive case study research design as the most useful to address this topic. I choose this design as it “involves investigating one or a small number of social entities or situations about which the data are collected using multiple sources of data and developing a holistic description through an iterative research process” (Easton, 2010). Such approaches to research are well documented as a guide for qualitative management research (Locke, 2001), and, more importantly, it allows for a detailed and exploratory account of individuals’ perceived attitudes and coping strategies towards the challenges that they face in their

occupation. Albeit these positive outcomes and other important strengths of qualitative research, literature and research in organizational and occupational management studies, investigating vocational jobs like highly educated technical professionals, rarely see contributions from qualitative research disciplines.

Qualitative research is argued to be suited to address “why” and “how” questions (Eisenhardt, 1989; Yin, 2009) similar to the one this paper seeks to investigate. In doing so, this paper will be using the “Doing Lens” suggested by Anteby, Chan, and DiBenigno (2016) as the analytical lens. By this “Doing Lens”, all three filters (doing task, doing emergence, and doing justification) suggested by the authors, are utilized to show how the role of HETSs is dynamically developed through task emergence and alterations. The study therefore adds to our understanding of both job roles development and the interconnection between the two main tasks they perform.

The 26 interviewees selected for this study came from a wide variety of technical occupations (engineers, designers, physicists, and chemists) and organizational support functions (line-managers and Vice Presidents). I settled with informants from the two companies which I considered most suitable for the study. As the access point was established with both organizations, I relied on snowballing sampling technique to gain more informants from the two organizations. Interviews were conducted at company office spaces or by conference calls to employees outside Scandinavia.

I established the criteria for the selection of informants. Participants should either hold a technical university degree (minimum a master degree or similar), be a part of the management, or be project managers using and collaborating with the specialists. Secondly, I asked for a variety of nationalities to ensure that elaboration on role development was not captured due to local social habitus but more on an international level and hence becoming a generalizable phenomenon. Lastly, I aimed for a good and equal blend of males and females

for the same reason as above. Following each interview, the core themes were pinpointed and new emerging topics were appended to the interview guide (as “hot new topics”) for future interviewees. As the emerging topics were recurring, I naturally included these as core themes in our subsequent interviews (Charmaz, 2006).

Table 1: Respondents in the study

Respondent's profile						
Respondent	Title	Management level	Firm tenure	Native language	Foreign language skills	Interview language
DrugCO 1	Director	Top	12	Danish	English	Danish
DrugCO 2	Specialist	Low	14	Danish	English	Danish
DrugCO 3	Specialist	Middle	16	Portugese	English	English
DrugCO 4	Specialist	Middle	12	Danish	English	Danish
DrugCO 5	Specialist	Non-managerial	3	German	English	English
DrugCO 6	Specialist	Middle	18	Swedish	Danish/English/German	English
DrugCO 7	Specialist	Non-managerial	20	Danish	English	Danish
DrugCO 8	Specialist	Non-managerial	4	Italian	Danish/English/German/Spanish	English
DrugCO 9	Specialist	Non-managerial	6	English	German/Danish	English
DrugCO 10	Team leader	Middle	4	Danish	English	Danish
DrugCO 11	Team leader	Middle	10	Danish	English	Danish
DrugCO 12	KPI/specialist	Middle	11	Danish	English	Danish
DrugCO 13	KPI/specialist	Middle	15	Danish	English	Danish
DrugCO 14	PM	Middle	5	Indian	German/English	English
SensorCO 1	VP	Top	15	Danish	English	Danish
SensorCO 2	PM	Middle	8	Danish	German/English	Danish
SensorCO 3	PM	Middle	10	Danish	English	Danish
SensorCO 4	PM	Upper	12	English	Spanish/German	English
SensorCO 5	Specialist	Non-managerial	2	Danish	English	Danish
SensorCO 6	Cheif engineer	Upper	18	Danish	English	Danish
SensorCO 7	Director	Middle	16	Danish	English	Danish
SensorCO 8	System engineer/Specialist	Non-managerial	17	Danish	English	Danish
SensorCO 9	Team leader	Middle	7	Danish	English	Danish
SensorCO 10	PM/director	Top	12	English	-	English
SensorCO 11	Cheif engineer	Top	10	English	-	English
SensorCO 12	Specialist	Non-managerial	12	English	-	English

The first firm is a leading pharmaceutical player and excel at innovating on patient devices (DrugCO). This company relies heavily on technical brilliance, as the company aims to be on the cutting edge to compete, maintain, and gain a competitive advantage in the market. Therefore, DrugCO hires many and different styles of technical expertise. In their device innovative support team, they predominantly hire PhDs in engineering, chemistry, physics, or mathematics. Therefore, this unit in DrugCO was targeted for two reasons: Firstly to gain access to their pool of employees consisting of highly skilled technical experts, and secondly,

to gain access to the devices development division which is one of divisions known for keeping the company in front of the competitors with innovative and bold designs for decades.

SensorCo is a company that continuously tries to balance new technologies with state of the art thinking. The firm itself even goes further and calls the knowledge stock “proven technology”. SensorCO is a major Scandinavian sensor and radar device producer. In their portfolio they have maritime and aerospace industries, but also defense departments, as their potential customers. The company might be utilizing proven technology, but at the same time they are also playing with the combination of; for example, proven sonar technology and virtual reality. However, SensorCo offers tailor-made solutions on very big contracts with countrywide departments and units. Commonly, these clients require solid and proven technology, yet not old fashioned and still ahead of other countries. A delicate blend that can be difficult for such a company to balance. SensorCO are hiring engineers at all entry levels: Bachelor, Masters, PhDs, and masters in mathematics, IT, and big data sciences.

Materials

The data collection was based on a semi-structured interview protocol. Interviews lasted from 60 to 100 minutes and averaged about 70 minutes. The protocol included priori questions as well as questions connected to themes emerging as the interviews were unfolding to ensure more detailed accounts. All interviews were audio-recorded and transcribed immediately after, enabling the researcher to recognize new emerging themes to be included in the following interviews. Three out of the 26 interviews were conducted via corporate video conference at the companies. Furthermore, two of the interviews were conducted by phone. The rest of the interviews were conducted face-to-face. All 26 interviewees were used in the analysis. Transcripts for recorded interviews totaled 220 single-spaced pages.

Analytical Procedure

Given the scant amount of research on task adjustment in specialist roles, the data collected were inspired by grounded theory techniques. The benefit of grounded theory is twofold, as it “can be used to uncover and understand what lies behind any phenomenon about which little is known. Moreover, it also has a usage in gaining novel and fresh angle on things which quite a bit is already known (Strauss & Corbin, 1990). Full transcripts of the interviews underwent a multi-phased analysis guided by the NVivo software for qualitative analysis. NVivo is a tool assisting researchers during the coding process by adding efficiency to the identification and organization of statements and by improving accuracy in grouping similar statements. I used initial coding techniques to create labels. I then grouped statements that seemed similar into concepts. (Charmaz, 2008).

Coding

During the open coding, I first studied the interview transcripts in detail. Throughout the transcripts, there was, among respondents from all positions in organizations, a strong agreement that HETSs are needed within the firms, and that the tasks they perform are very clear, yet ambiguous at times. Similarly, there was a strong agreement among line managers, project managers, and team leaders on the usefulness and influence that the advisory task provided the NPD process by the knowledge that HETSs bring to the organizations. Yet, knowledge specialization implied a path into deeper and very narrow scoped tasks, which is not likely to be the case. Instead, specialization is connected to understanding the complete picture and processes in NPD, and, more importantly, which effects advice inflicts on the NPD project. The data also clearly depicted that technical specialists are acting or organized as internal or in-house consultants, providing them with some intra-organization legitimacy for doing not planned tasks to test for innovation optimization, which provides an opportunity for role change behavior.

Next, I attached in-vivo codes to the open codes in the data. For instance, the sentence “My role as a specialist is to say, yes – this or that is a good idea, and/or this not so much” (DrugCO 13) was captured under the code “technical advisory tasks”. As the recurrence of tasks, both advisory and emerging tasks, was predominant throughout the interviews, I went back to the literature and by the iterative interplay between my data and the current literature, the concept of role development through tasks gradually emerged. Next, I looked for individual behavior connected with technical specialists conducting emerging tasks on their own. Lastly, through axial coding, I sought to identify relationships among the various categories and connect them with the underlining process. The following section will sum up the categories and their connection to each other for HETSS performing tasks in connection with NPD.

Findings

I will now outline the findings by presenting the nature of technical internal consultants and then continue with presenting two types of tasks related to technical specialists: First the technical advisory task, which purposively guides specialists to gain an understanding of the innovation processes. Secondly, I will present the concept of emerging tasks, which manifest themselves due to process understanding stemming from the advisory task. This in turn also provides HETSS to articulate and test new way of doing NPD through, e.g., individual competence development, from pursuing these emerging tasks. Finally, I will show how these tasks in combination constitute the continued role development the technical specialist.

The in-house technical advisory task

Informants at all positions, i.e. specialists, team leaders, and line managers, considered themselves to be a part of an internal consultancy. The topics often related to usage of hours

assisting NPD teams, but also the services, current or upcoming, that enhanced or improved the NPD. A team leader expressed:

You could call us an in-house consultancy. We are a competence-based organization that are providing competent solutions to the firm and especially the projects. We are always trying to develop “service” to the organization. (SensorCO 4)

This articulation of an advisory taskforce, acting like consultants, and in particular the notion of utilization of work hours was profound in the data. A team leader expressed the following: “*We need to think like consultants and use terms like utilization hours*” (DrugCO 10). Overall, HETSs understood the importance of their role when suggesting changes to the design. It is important to keep in mind that the HETSs are not a part of the NPD teams. The HETS role is uniquely and exclusively connected to a competence center. Hence, this was also a reason for line managers and team leaders to talk about utility hours – a simple way to keep track of the NPD teams using HETS.

The predominant assignment for HETSs in these competence centers was to provide support to project teams doing NPD, and this they did by their specialized knowledge. The line managers continued to articulate the importance of the advisory role of their specialists and to highlight the uniqueness of these workers in terms of mobilizing knowledge when needed to the NPD team. Yet, despite this constant articulation about the consulting role from team leaders and line managers, the function and tasks of technical specialists was vaguely and broadly defined. A specialist elaborated on this:

To be honest, I think that it is easier to become team leader, than it is to become a specialist. Simply because the road to becoming a team leader is very well defined and in no way messy compared to the specialist road, which is much more ambidextrous, unclear, and have much more uncertainty. (DrugCO 12)

As the role definition is vaguely formulated, so are the tasks, and this led to a formulation among the specialist team members themselves, relying on experienced and technical specialists to form a collective understanding of the job, tasks and routines. A top-level specialist expressed it like this:

I have a responsibility to ensure that we got the right internal knowledge on materials, and secure the way that we work with materials is optimal. This implies that I am also expected to take some collective responsibility [...] in terms of defining the work tasks of both knowledge activities and when we need to do advisory. (DrugCO 13)

The advisory task itself, despite it being an expected task, is not per se a given task for HETSs as depicted by the statements above. This finding was a common topic and reference point throughout the interviews. Yet, overall the data suggested that the existence of a technical advisory task is an essential part of the HETS role.

Technical advisory task

The articulation of the advisory function was vague according to the findings above. However, different opinions on the advisory role manifested differently from HETSs' experience in debating and understanding NPD. As such, upcoming technical specialists and team leaders had this embedded opinion of a 'sales' strategy to their role while experienced specialists seemed more relaxed on this notion. This articulation did, throughout the data, reveal that some specialists identified more with the consulting role. The statement beneath shows how a specialist refers to his everyday advisory tasks:

I see my job as a supporter and as an internal consultant. I do go actively out to the projects and try to identify some problems they might have. [...] that is helping them before it is needed in their mind. (DrugCo 8)

That statement also captured the fact that by performing the advisory task, the specialists are present in the NPD teams, which assisted in building an understanding on the processes connected to NPD. Therefore, NPD process understanding emerges through task debate with the NPD teams, as it assists HETSS in building this NPD process understanding. Another specialist elaborated on this advisory task in the following way:

I am giving advice and consulting on material and actions in project teams, I do it by my experience and knowledge of chemistry. This I combine with my knowledge of materials, which I accumulated from supporting our production and prior NPD projects. I know what made prior projects fail and where possible bottlenecks might arise, simply because I know the stage gates so well. (DrugCO 9)

There is overall no doubt that technical advisory task is a pivotal part of HETS tasks. Yet, the approach and articulation of the advisory task is very different from the two citations shown here. The first approach is more exploratory as the task described resembles a trial and error approach. This implied figuring out some potential problems that might not be obvious yet, and more importantly acquiring an enhanced NPD understanding through debate with the NPD teams. The second approach to advisory tasks was connected to guiding and monitoring the choices in processes for NPD.

The findings on the advisory task are twofold: One connects to the advisory role trying to bring the knowledge to bear in the organization. This is done by being present in the NPD teams where their knowledge adds value. Second, specialists must actively go and meet the workers in the NPD project organization. This is simply to network and get experience about the work processes connected to NPD. These findings suggest that HETSS, through interactions with the NPD workers, built a process understanding, and thereby they know when to mobilize their 'domain' knowledge into the project teams. HETSS stay informed through tasks, they

debate with people in their network and through this they get a solid grasp on in which phase the different NPD projects are. A specialist elaborated on this:

I do this to create some good relations with my colleagues in that division. I want to be a familiar face in the innovation teams, and often they joke about me when I go there; - *oh there he is again, so we didn't get rid of him anyways*, [...] I ask them to reflect a bit more about these variance problems. Furthermore, I discuss with the NPD teams how it should be solved (variance problem) before the project continues towards the next milestone. (DrugCO 13)

This finding is important as it is connected to the task I will showcase next. It relates to HETSs' ability to think and act holistically about the NPD process. The milestone is an evaluation of the progress in which senior and top management together with the Chief Engineers and KPI owners flag a project. They either flag the project process red, yellow or green, which, for the innovation team, means to either terminate, postpone, or solve the problem, or enter next development stage, respectively. It is a stage-gate process.

Task debate and innovative NPD process understanding

The findings continue with the task HETSs are expected to do. More precisely, these 'getting' out in the organizations and debating and advising entail a latent mechanism which is helpful for the development of the required understanding of the NPD process. It also provides an overview of the current knowledge in the NPD teams. What for the NPD teams seems as a mundane task, for example selecting plastic material for different parts of the design, could initiate a debate with a HETS. In fact, here the value added of the HETS was clear throughout the data, as it shows the process in which HETSs will start debating such choices with the NPD team members. A case would be on the choice of component and material connected to, e.g., plastic. Data revealed that HETSs partake in debates like this and enjoy it. As a project manager

noted: “When they are articulating themselves within the box knowledge – it is hard to argue with them, simply because they are spot on”. In the case of plastic choice, HETSs would ask questions about the chosen plastic as it might not be very suitable as a container of chemical agencies or might not have a barrier towards toxic substances in DrugCO. For SensorCO the specialized knowledge helped in assessing the chosen component as it could block sensors which would most likely decrease sensitivity performance in the finished device.

Another key aspect is the deeper knowledge, also referred to as ‘domain knowledge’ by both HETSs and team leaders. This referred to, e.g., the profound knowledge about the plastic industry, enabling HETSs to suggest alternative suppliers that were either cheaper and/or could offer the same functions, just through multiple contractors. Industry knowledge also enabled specialists to outline problems connected to sourcing strategy, thus minimizing the risk of pointing to a selected component coming from one or few manufacturers. The HETS’ role is very central for the future manufacturing of the NPD project as the HETS, already in an early stage, is making sure that it will be likely to monetize. As one specialist outlined this very clearly:

I will tell them about their choices, I’ll help to reduce risk. [...] They value the input a lot, they have never really challenged my input, they appreciate that I know, also they don’t need to go into the depth. So, I provide them with options: *“If you go this way, you don’t have to investigate. If you do this, then we need to do explorative testing. These testings reduce uncertainties, but take time.”* It is all about resolving risk – at all times. (DrugCO 9)

More precisely, it enabled HETSs to pinpoint how their suggestions influenced the entire ecosystem when advising the NPD teams. For advancement in specialist levels, this process understanding was necessary: *“the advancement within the specialist ranks depends on the level of overarching understanding and implication of your advice in the finished*

product” (DrugCO 10). In that sense, the more specialized the ‘domain knowledge’, the more ‘holistic’ the specialist needs to be. This will make HETSs able to predict the precise implications of the guidance they provide to the NPD teams. As one respondent put it:

Especially with the technical specialization and NPD, we have a need for rigorous methods and processes. [...] but the specialists must understand the needs of teams more holistically, than they need to do in-depth specialization by themselves. (SensorCO 1)

Process understanding and debate are connected to each other, as process understanding is built through the experience by guiding and debating with the NPD teams:

There is a lot of knowledge in our team and we see that especially when we hire new employees. They very seldom see holistically on, for example, the material choices. Especially those new hires from the university have a unique material knowledge, and they possess the newest scientific knowledge, but they do not have the holistic approach that the firm requires them to. This comes with time. (DrugCO 12)

This way of using technical specialists as talkative advisors is not per se straight forward. One manager outlined that like this: *“Engineers want to tinker, not talk to people”* (SensorCO 10). When this is the case, it is a problem for HETSs, as it reduced the understanding in NPD processes and therefore made it difficult to justify the benefit of the specialist role. Similarly, another project manager elaborated on this problem connected to the explorative nature of the advisory task: *“My general experience is that employees in technical positions or with more technical background are reluctant to step outside their comfort zone or even just trying to go near the edge of it”* (DrugCO 14). The problem in doing the advisory task is connected to what the line managers refers to as ‘the box’ of knowledge. Because knowledge about the NPD processes is rather small in the beginning of HETSs’ careers, their advisory task in some cases are tough, as they try to ‘sell’ a problem or opportunity they might

not be able to predict or identify yet. Therefore, debates about choices with the NPD teams were often the first step in the building an understanding about the NPD process for workers in the HETS role. Lastly, NPD process understanding enabled HETSs to address weaknesses in the knowledge between themselves, their team, and the line organization supporting the NPD projects. HETSs started to think about adjusting their current task, as they wanted to assist the development of NPD projects in an earlier stage. This thinking triggered the emerging task. Overall, the data indicates that the advisory task for the technical specialist is to assist the NPD process with specialized knowledge that will make the design more robust through debate, as less risk involved, and is more likely to monetize when the NPD is finalized.

Explorative emerging tasks

So far, the predominant tasks of HETSs have been uncovered which clearly outlined an advisory task related to NPD. Next, the analysis above showed that through debate with the NPD teams, a process understanding was developed. This understanding provided evidence for a second, but more informal activity: The emerging tasks.

Described as a task that is not directly related to the advisory task at first, yet, this emerging task arose out of information and knowledge gathered about the problems and bottlenecks in NPD. As stated above, some HETS roles are more explorative in their advisory task. This does not minimize the effect their advice has on the project. A specialist elaborated on the reasons for doing emerging tasks connected to the advisory task, in this case, molding simulation. This procedure assists the designers in identifying weak parts of the design quite early in the development:

We also have one of the biggest influences and impacts on changes in the part design.

The later I suggest changes, the more expensive it becomes to implement these changes

to the design [...] but before and after I give suggestions, I use time figuring out how we capture the right parameters in the simulations. (DrugCO 5)

This statement on emerging tasks relates to an advisory task of a more explorative nature; hence, the emerging task is well-connected to this. Still, these informal tasks performed by HETSs relate to improving the advisory task (of search and identify), and they are justified by the fundamental question: ‘How can my work assist the projects in saving time and money by implementing suggestions earlier on’. This was a common trend in the data: All emerging tasks connected to improving the advisory tasks were explorative by nature. Moreover, the development of areas and service through emerging tasks manifests throughout the data and is a central part of the HETS role. Interestingly, line management does not control these emerging tasks per se. Instead, they were found to be anchored on the shoulder of the more experienced specialists:

A specialist is so skilled that they go beyond the regular assignments and tasks in the organization by creating a certain direction for service area within their professional area. As such, they drive activities and initiate developing and managing ideas for that certain business area. (DrugCO 10)

In addition, advisory tasks of a more formal and less explorative nature partake in tasks anchored as emerging:

My chief specialist position also has to do with compliance and methods. This includes looking at how we work here in the department, but also in the rest of the firm. The scope is the competence center, but it will have a spillover effect to the rest of the company. It entails to look at methods of how we do work. (SensorCO 6)

For HETSs doing advisory tasks in well-defined domains, such as those advising on KPIs, robustness, and sourcing, emergent tasks are also an important part of the role. The legitimization for performing emerging tasks was somewhat different from those doing

explorative advisory tasks. Albeit the emergent tasks still add value to the organization, it may not relate directly to current NPD projects. HETSs in these domains do emerging tasks connected to feedback to the NPD team simply because the written material and feedback is highly technical and contains many details, particularly if variance problems are identified within the device evaluated. A specialist elaborated on why doing the emerging task is important for him, the NPD team, and the organization:

You need to be capable of having the most evil “imaginary illusion” about the device, depict it and get it processed. Then I am developing a method to dig out the more critical aspects of a design... and formulate this without a high degree of technical details. They (NPD teams) just need my conclusions on the problem, subject, element, or matter. (DrugCO 13)

Another straightforward advisory task is advising on how printed circuit boards (PCBs) are functioning in the designs. Here, HETSs used time to do emerging tasks to enhance the current protocol. As PCBs have ventured into micro and nanotechnology, more PCBs are going into more and smaller devices and tools. Therefore, there is now an increased risk of electronic failures in the final device. A HETS elaborated on the connection between doing advisory tasks and complementing them with emerging explorative tasks:

I need to understand the connections between PCBs and the enclosure. We can never just make a PCB in a vacuum, it needs to be aligned with whatever final device it is going to be a part of. There will also be a lot of specification in connection to development of the final device that we have to fulfill, but these are kind of standards. Therefore, I spend time on methods to ensure that we have optimal pressure tests and moist resistance procedures to reduce sensor scattering/interference - especially for what we call “megatronic devices. (SensorCO 7)

Contextual factors on emerging tasks

A common theme particularly connected to doing the emerging task was the continued development of skills and knowledge competences coming from factors outside the companies. HETs are often among the few who can actually do what they do. HR functions in the companies did not have any competencies on ‘upskilling’ HETs, and therefore the responsibility was placed with the technical specialist themselves. Upon describing how continued development and upskilling were perceived informants described it solely their own responsibility. One informant expressed it: *“It seems more as we are supposed to go out and reinvent ourselves”*. (DrugCO 8).

From HETs, three manifested strategies on their personal and continued development were: 1) External business collaborating and displaying (conferences). 2) Participation in professional guilds outside the firm (professional communities and council & committee jobs). 3) Research-related activities (collaboration with universities and reading scientific outlets). As mentioned: *“We are already collaborating with universities. However, it could be so much more facilitated than it is at the current level”*. (DrugCO 2). Another one informant continued on this: *“The firm encourages the workers that they find professional communities outside of these stonewalls.”* (SensorCO 3).

Overall, these findings indicate that HETs are unique, placed in the companies as they have legitimacy in the knowledge (skills), experience (prior failure and successes), and an understanding of innovative processes of NPD, making them very strong, influential and independent employees.

HETS role development through task adjustment

The advisory style job, the domain expertise, and the responsibility to manage and decide on own continued development make HETSs obtain a special and different role in organizations. Throughout the findings, two tasks are clearly unfolding: the advisory task and the emerging task. The findings bridge the interplay between these two tasks as they are pivotal for a self-driven role development for HETSs. As shown above, understanding the NPD process triggered the initiation of the emergent task. In addition, emergent tasks tend to be explorative in nature, at least initially. Nevertheless, throughout the data, a clear pattern revealed that many of these emergent tasks find their way into the advisory task. Thereby, a role adjustment happens, based on the interplay between the two tasks. A specialist reasoned about his emerging tasks and what drove him in the process of adjusting the advisory task, hence the role and what he did:

I was an associate professor and had a function of being connected to a lot of different projects and I really enjoyed the experimental part of the research, setting up protocols and guides to exploratory and experimental designs, which I still do here, [...] what came of these experiments are now a solid part of our service pack. (DrugCo 7)

A director furthermore saw this as an important part of their role, as they become some of the key people running adjustments in the organization through their services, and hence, they control the NPD innovative processes:

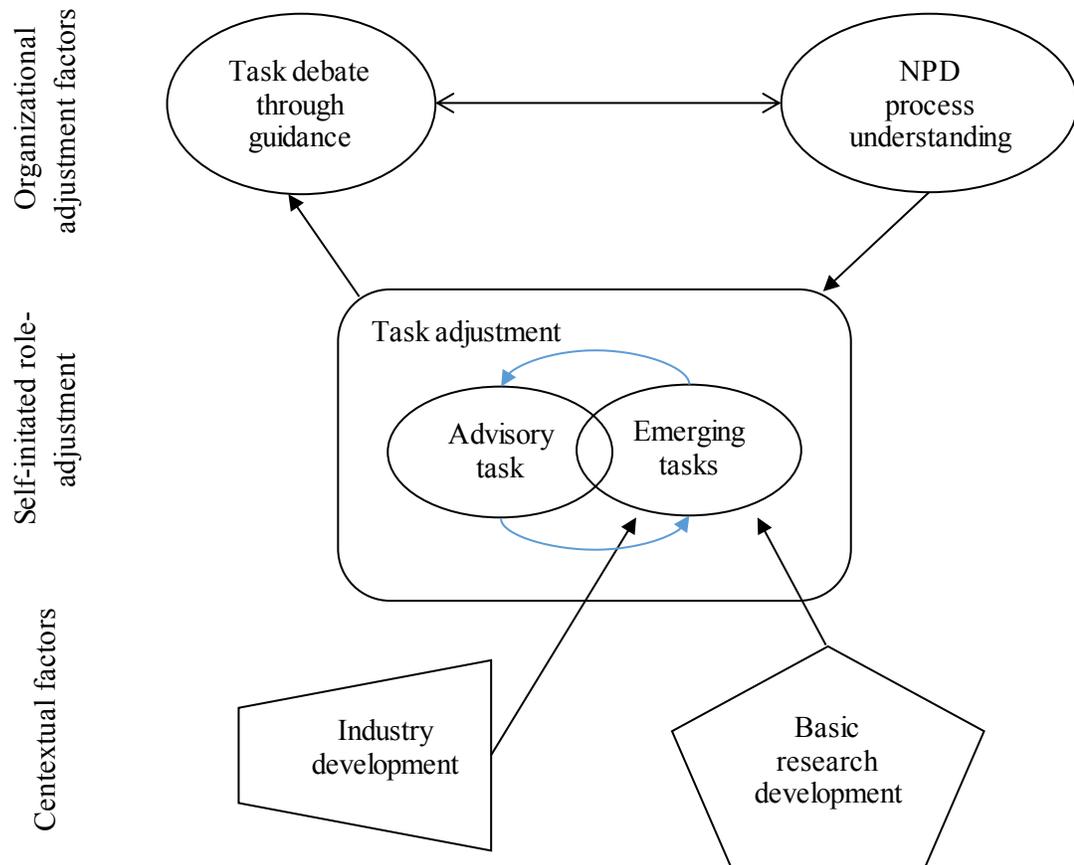
We are a competence-based organization which is providing competent solutions to the firm and especially the projects. So, we are always trying to develop new and better services to the organization. (SensorCO 7)

The team leader furthermore acknowledges that specialists do emerging tasks to ensure coherence with the technology development, and they need to be agile in the advisory task adjustment.

We are doing the simulations and calculations, so we need to be proactive; that is being able to provide services that are competitive. Meaning that we should be ready to support or even complement new technologies like 3D printing options. Therefore, our service is never a one set piece. It is a dynamic size, and we need to be able to adjust the tasks. (DrugCO 11)

Within the HETS role hides a thinker, tinker, and maybe a sales person. That being said, the role in its nature is self-developing due to the two tasks we presented above. The legitimization is an ingrained part of the specialist role, as skills and knowledge within these workers are hard to compete with for a 'simpleton' in the NPD team. Statements confirming this were not uncommon, and a 'math-guy' said during our lunch "*I think I might be among top 5 within the simulation models I do*", followed by a comment from his colleague "*more likely top 2*". Moreover, as HETSs themselves facilitate their own development, this places them in a powerful position when performing emerging tasks as they are the knowledge change agents. One good example of an advisory task that came out of an emerging task, was by the advancement of simulations, which had two major impacts on the two units servicing that phase of the NPD. The simulation task entered as an alternative and very explorative procedure, but in time substituted the prior explorative molding process done by highly educated technical plastic specialists. Now, simulations are pinpointing flaws in the design at an early stage, and the molding team adjusted to doing more systematic and methodical tests on the mold. This would be troubleshooting the concerns and worries that the simulation HETS had pointed out as weak spots. Therefore, molding specialist had to adjust their role through task adjustment to match the alteration in NPD process.

Figure 1: Core categories of HETS role development



Discussion and conclusion

The primary purpose of this qualitative study was to add to our understanding how HETSs roles develop in private organizations and to discuss role adjustment through tasks. This study follows the thinking about how new roles come to be by Reay et al. (2006) and thus adds to our understanding of how small wins for specialist employees are more the process of explorative tasks that will adjust or renew their role without eliminating the current. Figure 1 shows how the concepts in the findings connect when HETSs role develop in high-tech firms. The results indicate a situated continued development of HETSs advising on NPD. Compared to findings on peer driven role adjustment, HETSs do not rely on the “right time” and the “right place” for taking action. Alternatively, understanding the NPD process enables specialists to take action through emerging and explorative tasks. These opportunities arose from a profound

embedded understanding of underlying institutional mechanisms like the way NPD units work and the NPD phases in the organization. More importantly, for HETSs to drive their own role development, they need to know where their work influences the NPD process the most. Albeit the study fixated on specialists roles developing by their tasks in science-driven technology firms in Scandinavia, I strongly believe that the findings on specialist thinkers and tinkerers proactively developing own roles through task adjustment are generalizable. Thus, the findings are applicable to other populations in areas where task adjustment occurs, irrespective of whether it is a technical, pharmaceutical, information technological, or physician self-driven role development. One boundary condition would be that the initial task adjustment is likely to occur in an innovative environment, which allows for and embrace, specialists to be adaptive and adjustable to accommodate threats and opportunities.

Theoretical contributions

This study provided several important contributions to role development literature and theory. First, adjacent to existing research which has extensively investigated role adjustment in situations where either entire new roles were needed and justified by the organization, or peer-driven legitimizing opportunity seeking behavior, this study investigates the self-initiated role development. By the analysis of HETS, I integrate the interplay between the two predominant specialist tasks, advisory tasks and emerging tasks, and I explore new ways of doing the advisory tasks in a theoretical perspective. Social learning theory provided a theoretical lens to antecedents of the local situated embeddedness related to decoding and understanding the process of NPD which is in line with the suggested framework by Reay et al. (2006). Indeed, the findings on and understanding of the NPD processes throughout this study provided empirical evidence that constitutes one of the most important catalysts for an initial role adjustment behavior. In fact, the interconnectedness between the advisory task, the emerging

task and process understanding is pivotal for the adjustment in the HETS's role. In particular, performing the advisory tasks effectively contributed to the process understanding as this mobilized ideas and problem solving, catalyzing the emerging task initiatives. Ultimately, this leads back to an adjustment of the initial advisory task and thus a role development. These emerging tasks have been shown to exist in other contexts, yet peer driven, as Reay et al. (2006) found that nurses in a similar way had embedded unit knowledge and experience within their field was able to seize such a task as a collectively, initiating them to formulate new roles based on these emerging tasks. Albeit it is worth noting that building understanding by itself does not explain self-driven role change, rather the suggested factors in combination initiate adjustment in roles.

Second, the analysis showed how HETSs mingle in the NPD processes, and it is important that scholars continue to theorize on this interaction between innovators and technical advisors. One recent attempt to depict a similar interaction was done by Rahman and Barley (2017) who coined this interaction as situated redesign in connection with architectural project development. This study, on the other hand, finds that knowledge sharing, which is an unneglectable task of knowledgeable workers, is more a 'sales' task when it concerns 'out-of-unit' sharing. Nevertheless, this task of bringing your knowledge to bear by selling it to the organization is an interesting finding, and the empirical evidence suggests that specialized, knowledgeable workers are less likely to negotiate meaning with the NPD designers and team members; rather, they merely think in terms of organizational benefit. The HETS role, as the assessment indicates, often acts as a monetizing agent or a technical lawyer, ensuring that the NPD team is making coherent choices for methods, materials, and quality of the design. The reasons for this was that the final version of the product is to be profitable. Therefore, this study adds to our understanding and reasoning by specialists, when they bring their knowledge to the forefront of the organization.

Limitations and future avenues for research

The study has several limitations; however, they pave the way for continued investigation of knowledgeable workers in future. As the research design of this study is a multiple case study, one central limitation is the generalizability of case studies (Eisenhardt, 1989), and furthermore, this design does not permit for statistical generalizability (Yin, 2006). Further research will therefore be required in organizations in different industries. The findings in this multiple case study reveal that NPD process understanding is a key catalyst for initial role adjustment, yet I only did this in very technical environments, and the same pattern might unfold in other settings where expertise thrives, such as IT-professionals, legal advisors, surgeons, and maybe military special units.

This study is cross-sectional, and consequently, the data only allowed for cross-sectional analysis. Future research could help to improve our understanding of self-driven change processes by the use of a statistical research design, testing the connections between the advisory task, the process understanding in NPD, the emerging doings, and occupational change behavior. Research following this should follow a longitudinal research design to better understand how these connections unfold over time.

Concluding remark

This in-depth inductive, qualitative study further diffuses the dynamics of how roles come to be for highly educated technical specialists in private organizations. It was shown that through formal tasks and process understanding, an emergent task was arising. This emergent task is contribute to a beneficial alteration of the formal tasks and thereby adding value to organizations, overall.

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Chapter 3

Expatriate adjustment: The case of a technical community

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Abstract

Adjustment to the new context has been the most central concept examined in expatriate research. Recently, however, the theoretical foundation guiding expatriate adjustment studies has received much critique. In this article we propose that rather than grounding new theoretical thrust on the same underlying theory as used previously, theoretical renewal may be found in applying a new perspective. More specifically, we explore if situated learning theory could provide useful novel insight that have not materialized when basing theoretical notions on social learning theory. We use an ethnographic study of how a group of expatriates in technical positions interact and collaborate with local workers. Our findings indicate that this theoretical lens can reveal the influence of group dynamics in expatriate adjustment and work place learning that would have been ignored using the original perspective.

Keywords: Situated learning, expatriate, adjustment, experts, community of practice, ethnography

INTRODUCTION

Adjustment to a different geographical and social environment was early on identified as a primary reason for expatriate failure and inability to reach full performance (Torbiörn, 1982; Tung, 1981). Since then different perspectives of intercultural adjustment has been proposed to account for the abilities of expatriates to function in foreign work environments. For example, a number of studies headed by Ward has distinguished between psychological and sociocultural adjustment (e.g. Ward & Kennedy, 1994). In this work psychological adjustment is related to subjective well-being, whereas sociocultural adjustment addresses behavioral competence (Ward, 1996). The main thrust in the field, however, has been propelled by the work of Black, Mendenhall, and Oddou (1991a). They presented the idea of a three dimensional concept of expatriate adjustment subdividing it into job adjustment, interaction adjustment, and general adjustment. Following the initial publications by Black and colleagues (Black & Stephens, 1989; Black, 1988; Black, Mendenhall, & Oddou, 1991b), expatriate adjustment research gradually converged on an understanding of expatriate adjustment as an affective construct expressing the degree of perceived psychological comfort with a variety of factors in the surroundings (Black, 1990; Black & Gregersen, 1991).

Although the adjustment research has produced enough publications to warrant two meta-studies (e.g. Bhaskar-Shrinivas, Harrison, Shaffer, & Luk, 2005; Hechanova, Beehr, & Christiansen, 2003) there is still ongoing critique of the theoretical foundation (Hippler, Caligiuri, & Johnson, 2014a; Hippler, Caligiuri, Johnson, & Baytalskaya, 2014b; Shaffer et al., 2016). For example, Takeuchi (2010) have argued that existing literature on expatriate adjustment has resulted in a number of unhelpful implicit assumptions about the nature of

adjustment. Such notions seems to have restricted the theoretical advancement of the field to the single path outlined by the main stream thinking.

To comply with these resent critiques of the existing notions on expatriate adjustment we set out to explore a different theoretical perspective. We argue that using alternative theoretical lenses to understand expatriate adjustment may provide useful novel insight that have been neglected in the existing work. So far, the general idea of intercultural adjustment has been built on social learning theory (Bandura, 1977). This view is represented by scholars such as Black et al. (1991a), Aycan (1997), Caligiuri (2000), as well as Osman-Gani and Rockstuhl (2008) and Selmer and Luring (2014, 2016) to just name a few. The argument put forward has been that individuals learn and develop by observing their social surroundings. Applied to expatriate adjustment, social learning theory predicts that the learning that occurs through interactions with people from different cultures will provide a person with a mental model for imitating and adapting to the new social context. In other words, social experiences shape learning so that the observation of practices will result in cognitive remodeling of the individual's behavior to be better adjusted to the local environment (Littrell, Salas, Hess, Paley, & Riedel, 2006). In this sense Bandura's (1977) theoretical framework mainly portrays learning as an individual cognitive process based on observing other's behavior and process the information gained from this guiding their following behavior. What is important is that learning can be based on another person's experiences in a context, a so called vicarious experience.

For understanding expatriate adjustment we have learned much from the research based on the underlying idea of social learning theory. However, to seek theoretical renewal one

could also apply a more recent development in learning theory, namely the notion of situated learning (Brown & Duguid, 1991; Wenger, 1999). Situated learning is a theory on how individuals acquire skills and practical knowledge by participating in social communities (Lave & Wenger, 1991). Rather than asking what kinds of cognitive processes and conceptual structures are involved in learning based on vicarious experiences of observing other's model behavior, this alternative theory focuses on the actual social engagements and participation in a community providing the proper context for learning to take place (Lave, 1993). One advantage of applying situated learning theory is that it stipulates an understanding of how learning is preconditioned by what is termed legitimate peripheral participation in a community. Legitimate peripheral participation here conceptualizes how learning is a process, where the novice (learner) is situated in a peripheral or marginal position needing to gradually, through participation in the practices, become a full member of the community for the learning to take place. In this sense situated learning theory focuses on learning that can only take place when participating in a community and not by merely observing others. This view is in line with Toh and Denisi (2007) arguing that knowledge gained from host country nationals can rarely be substituted by formal training. The situated aspect of learning is particularly important as it emphasizes that a number of elements in learning a practice require being a legitimate members of the community that performs the practices. This also indicates a conflictual perspective on learning, for example between novices and experts in a community. These individuals will often negotiate the value of certain abilities and practices. As such, conflicts can arise in terms of continuance versus disruption of important community practices that individuals need to learn. Using the situated learning perspective may thus add a group dynamics as an element to understanding expatriate adjustment as a learning process. This is a perspective that has generally been neglected when perceiving the adjustment process mainly as an individual trajectory towards a given end goal (e.g. Hippler et al., 2014a; Shaffer et al.,

2016; Torbiörn, 1982). A number of authors have made calls for more research on expatriate adjustment including the local community or more specifically the role host country nationals (Takeuchi, 2010; Toh & DeNisi, 2003, 2007; Varma, Pichler, Budhwar, & Kupferer, 2012). It is argued that expatriate literature needs to focus also on external resources in the expatriate's network. Mahajan and Toh (2014b), for example, found that expatriates who sought advice from locals reported higher adjustment levels. However, they also noted that expatriates may not always be interested following the advice offered. In a different study Toh and Srinivas (2012) found that task cohesiveness affected host country nationals' willingness to share information and that this effect increased with perceived organizational support. They argue that the unique information held by locals can aid the expatriates in their understanding of their new role. Even though these studies stress the importance of including external factors when theorizing expatriate adjustment they focus very much on the individual level ignoring how dynamics in interaction and group relations can play out in foreign subsidiaries.

While our research makes a contribution to expatriate management research our paper also adds the development of situated learning theory by including an international dimension to an area that has mainly viewed learning as a domestic phenomenon with a clear perception of who are newcomers to a community of practices and who are the experts. When foreign experts are entering a new organization they are in some ways experienced practitioners but in other ways novices. This introduces uncovered interpersonal dynamics to situated learning theory.

In line with the above discussion we set out to explore the idea of conceptualizing adjustment based on ideas originating from situated learning theory. In particular, we use the

notion of legitimate peripheral participation in a community of practice to provide a novel conceptualization of the expatriate adjustment situation. In order to develop this idea we take departure in experiences from the interaction that took place in a technical section of an international organization where local employees and a group of expatriates needed to collaborate.

Although the use of expatriates to meet the demand for technical skills has been described as one of the core roles that foreign staff may take in international subsidiaries (Edström & Galbraith, 1977; Harzing, 2001) little research has explored this group in detail. This is an omission because expatriates in technical positions not only have jobs that diverge substantially from the white collar management staff, they are also relatively well represented in multinational corporations (Manolopoulos, Dimitratos, & Sapouna, 2011b; Morgan et al., 2004; Wang, Tong, Chen, & Kim, 2009). Personnel with specific technical skills are, for example, regularly expatriated to R&D departments to ensure knowledge transfer activities from headquarter to subsidiaries, or they are providing advanced technical assistance in establishing and running a production in a foreign country (Fang et al., 2010; Manolopoulos et al., 2011b). The latter, could include designing or facilitating automated systems and assembly lines, setting up and testing procedures, machines, and IT systems (cf. Chatterjee, Lubatkin, Schweiger, & Weber, 1992). These tasks require a high level of technical competencies normally obtained through years of education and organizational experience.

This article begins with a discussion of the nature of technical expatriates. It then elaborates on a theoretical model for adjustment as legitimate peripheral participation in communities of practice. After the method section data on the interaction between Danish

expatriates and local English workers are presented. In the discussion section we relate the empirical findings to a proposed theoretical idea about applying situated learning theory to develop a novel understanding of the expatriate adjustment processes. Finally, we elaborate on the implications of this new perspective.

LITERATURE REVIEW AND THEORETICAL DEVELOPMENT

Expatriates in Technical Positions

So far, only few studies provide empirical insight into the group of expatriates in technical positions. For example, Manolopoulos, Dimitratos, and Sapouna (2011) studied expatriates working in R&D laboratories in Greece. They found that the type of laboratory had a great impact upon relocation patterns for this type of expatriates. In a qualitative study on the same theme, von Zedtwitz (2004) found that technology and product experts were dispatched as temporary expatriates to transfer processes and routines, but also to help with recruitment. A problem shown in this study was, however, a too ethnocentric orientation among the expatriates, which inhibited collaboration with the local staff. In a different study Morgan et al. (2004) found a positive association between the technical orientation among individual expatriates and their job satisfaction. The article discussed if this could have resulted from the confidence in one's ability to undertake immediate technical tasks. Technical orientation has also been examined in relation to performance. Wang et al. (2009), for example, explored the link between using expatriates with technical skills and organizational performance. Although no direct effect was found, there was an indirect effect via knowledge transfer into the subsidiary. Hence, their study suggests that the ability to communicate with the host country national workers is central to the usefulness of technical expatriates. In conclusion, it may be

argued that technical skills among expatriates can lead to positive organizational and individual level outcomes.

In addition to favorable characteristics of this group of expatriates it has been argued that individuals with a high technical orientation often neglect the social aspects of their job. For example, technically orientated individuals have been reported to find it difficult to use praise and flattery when trying to build relations or motivate employees (Dubrina, 2004; Nelson, 1997). Also, Smith (1989) found technical oriented system analysts to be highly conservative as opposed to being open minded and adaptable to new ideas and environment. Similarly, Hunt et al. (1975) showed that technical orientation affected management policy decisions in the direction of maintenance rather than organizational development. Finally, both Igarria et al. (1999) and Allen and Katz (1986) found that technically oriented professionals tended to avoid job descriptions where interpersonal skills were critical for success. In sum, there are some indications in the literature, that technical oriented personnel experience difficulties in collaborating with the local staff. While the personal nature of the individual may be one explanation for those issues, problems may also be associated with the structure and characteristics of the social groups in which they work. In this regard, individuals in technical positions, such as engineers, have been described as participating in strong communities of practices (Brown & Duguid, 1991, 1998). Expatriates in technical position may therefore be a well suited group to focus on in order to understand adjustment from a situated learning perspective.

Adjustment and Legitimate Peripheral Participation

The term community of practice was coined by Lave and Wenger (1991) who defined it as an activity system about which participants share understandings concerning what they are doing and what that means in their lives and for their community. It is a central assumption that less experienced members' work place learning is based on interactions with more experienced 'full' members as experts. Through this interaction, the learner's participation is gradually changed towards herself becoming a full member. Here, legitimation is concerning novices' legitimate access to participate in the community of practice as well as being legitimated as peripheral novices in this community.

Initially novices normally engage in more peripheral or simple activities. Over time, however, they take on more central tasks and roles to eventually become full members. By participating in a community, a novice participates in the community's practice and thus comes to become more skilled or experienced with various tools, role-definitions, language, and equipment as well as implicit relations, subjective viewpoints, tacit conventions, underlying assumptions, and values bound to the community.

It has been argued that legitimate peripheral participation can lead to mutual recognition it but does not necessarily entail equality or respect (Wenger, 1999). Moreover, powerful core members of a community may deny full participation or even access to newcomers. Constraints on novices are strongest if they threaten to transform the practices of the extant community, as that is what the full members have invested in (Handley, Sturdy, Fincham, & Clark, 2006). This involves a complex, changing participation in altering practices for both novices and experts (cf. Lave & Wenger 1991). For example, it may not only be the novice having to change

their participation. A novice to a community of practice may, through their prior experiences and participation challenge the current practices in ways, where the so called expert members' expertise is challenged and where they need to change their participation in changing practices thus involving their work place learning too.

Communities of practices can thus be argued to result from participants' continuous work of reproducing and modifying the applied practices through ongoing negotiations between e.g. experts and novices. More specifically, Lave and Wenger (1991) argue that no practices are ever entirely agreed upon but will continuously be contested and reproduced through everyday participation by both more and less experienced members. These changes in practices and thereby also changes in individuals' participation make the fundamentals of situated learning.

METHOD

To examine the relation between expatriate adjustment and work place learning in a foreign subsidiary one of the authors selected an organization where the research group, based on previous studies, knew that expatriates were used for highly specialized technical functions. After two initial interviews at HQ, an ethnographic fieldwork was carried out over three months in a English subsidiary of a Danish MNC. An ethnographic approach was chosen in order to attain a near insider's view on organizational processes that would provide information on the micro dynamics of intercultural interaction between technical expatriates and local workers.

When doing ethnography, the researcher is using him- or herself as a research ‘instrument’. Therefore, the data collection becomes subjective in nature. This is not considered to be a disadvantage in ethnography as long the researcher is aware that results are based on subjective conclusions (Schenshul, Schenshul, & LeCompte, 1999). An advantage is that the ethnographer can get a deep understanding of underlying ‘logics’ guiding activities in the field (Hammersley & Atkinson, 1997). However, a number of measures can be taken to ensure that the researcher is not basing conclusions on twisted or biased information. Most commonly, methods triangulation (comparing results from different data collection tools; participant observation, interviews, and documents) and data source triangulation (comparing results from different sources; different informants and different documents) are applied (Miles & Huberman, 1994). This makes ethnography an open but also highly systematic scientific method. Organizational ethnographic field work generally includes data collection as a combination of participant observation, semi-structured interviews, and corporate documents (Moore, 2011).

Participant Observation

The general purpose of participant observation was to obtain information that could not easily be acquired from interviews. Such information can be sensitive in nature, and may represent examples of practices that are not entirely rational given the aim of the organization. The information collected by participant observation can then be used to develop interview questions that the researcher had not thought of based on available literature. In this study, participant observation made the researcher more aware of central themes in the field, and therefore allowed him to engage in deeper and more locally grounded organizational debates when interviewing the expatriates and locals. Moreover, the long-term presence and familiarity

of the researcher doing the fieldwork increased informants' trust in that person which made them provide more honest information. Finally, the time that the researcher spent in the subsidiary enabled informants to return to the researcher with new examples that they had just experienced which in turn allowed the researcher to return to informants with new questions.

In the subsidiary the researcher was quite free to move around and make conversation or interview appointments. This made the researcher a well-known face in the organization at all levels, and in all functions, thus going beyond 'casual ethnographies of the executive suite' (Westney & Van Maanen, 2011). The researcher was not paid by the organization and not directly connected to any department, and he presented himself as an independent researcher. Therefore, there was never any danger of becoming too much of a full member of any group. However, at certain times the researcher would spend a certain period with a particular production department. The researcher also participated in social activities such as company outings, sports, and birthday parties.

Interview

All the 13 expatriates in technical positions were interviewed as well as 29 local production workers and managers. 27 of the interviewed informants had managerial responsibilities. All interviews were conducted in the informants' native language, in order to register as many details as possible. Managers were interviewed in their offices while workers were interviewed in vacant team leader offices or meeting rooms. The interviews were all audio-recorded and transcribed.

Interviews took the form of an open dialogue between the researcher and the informants, as close to a normal conversation as possible (cf. Bernard, 1995). Each interview covered a standard set of questions, although the researcher encouraged interviewees to raise and discuss a variety of additional, related topics as well. An interview protocol included four main sections: a. background, b. technical orientation and function, c. social engagement and role, and d. interaction with other nationalities. However, more specific questions were added in relation to observed incidences and adjusted to the particular informant.

Document Review

56 documents were reviewed. These included the MNC's management philosophy, HR handbook, corporate strategy, yearly reports, mission statements, and newsletters as well as press clips concerning the MNC and the subsidiary. These data were coded and used together with field notes and interview transcripts. In total, the three data sources yielded a database of several hundred pages that was re-coded to fit the purpose of this article.

The process of data collection was concluded with a written report sent to key informants in the English subsidiary. This was done to ensure that relevant topics had been addressed during the interviews and that the results coincided with the perceptions of the informants. A few comments from these individuals were then integrated into the final data material.

Analysis

During and after data collection, the researcher took notes on emergent themes and questions thus starting the coding and analysis process early in the study. While only one of the authors

conducted the fieldwork, all authors took part in the analysis process. The combined data material was originally coded and categorized into recurrent themes, searching for patterns and varieties of technical expatriates' behavior. This was done by use of the qualitative data analysis program Nvivo. Theme analysis followed the steps described by Spradley (1980) and involved detailed close reading and coding of field notes, interview transcripts, and documents, which led to the development of detailed descriptions of the site. The authors of this article collaborated about coding the available text and discussed the few discrepancies in how to categorize text bits. 8 main field codes were sub divided in between 2 and 14 sub codes that were further subdivided (cf. Miles & Huberman, 1994; Spradley, 1980). For example the code 'Technical orientation' was subdivided into the codes 1) Local perceptions, 2) Expatriate attitudes, 3) Industrial traditions, 4) Consequences. The sub code Consequences was then further subdivided into the sub-sub codes: a) Expatriate adjustment, b) Management skills, and c) Knowledge transfer. In the analysis the researcher relied on triangulation of data wherever it was possible to check the validity of statements obtained from interviews, observations and secondary sources. The reporting includes only data substantiated over multiple information sources.

Context

The studied organization is a Danish owned MNC employing 19,000 employees with a turnover of more than 10 Billion Euros. The company operates in the food processing industry and has production facilities in 13 countries and sells products in more than 100 countries from 30 strategically located country sales offices.

Due to relatively restricted growth opportunities in Denmark, the MNC became interested in expanding the sales opportunities by entering foreign markets. To support its internationalization strategy, the company in its formal policies expressed the need for developing a sustainable international business culture. Expatriation was to be leveraged as a central measure for achieving this. It was described in the HR handbook and in the corporate strategy that on a long-term basis, expatriates should develop international skills and values through contact with other nationalities.

In total the company employs almost 70 expatriates on long term contracts. These contracts are of three years' duration but can be expanded to a maximum of five years. If they stay in the host country longer than this, the expatriate will be transferred to a local employment contract. In relation to expatriation it is stated that "*The objective is to support the international growth strategy... [and] to develop future international leader and employee competencies [...] where there is a lack of skills in the market*" (Global mobility policy).

FINDINGS

The Technical Community of Practice

The Danish parent company has for years been highly specialized in the technical processes involved in the specific production that is also applied in the English subsidiary. Therefore local subsidiary employees as well as expatriates agreed that the technical knowledge and skills of the expatriates were well needed to improve the performance of the subsidiary. It was, for example, mentioned that the high level of training the expatriates had received led to great

advantages in improving the quality of the product. For example, a local team leader mentioned that “*expatriates have a big input to make and they come out with some great ideas*”. Another described the abilities of the expatriates: “*They are really expert when it come to the machinery. They have been used to some much higher standards*”. Hence, when it came to technical skills it was clear that the expatriates were experts and the locals were the novices that needed to catch up with the more sophisticated ways of working. For example, local work routines concerning hygiene around the machinery needed to be changed. When expatriates finally convinced the subsidiary production workers not to wear dirty work clothes and rubber booths inside the processing equipment the shelf life of the product improved dramatically.

Quality control was another area where great advances were made. The consistency of meeting a high quality level each time allowed the subsidiary to sell the product for more sophisticated use. As one of the expatriate managers mentioned:

If you want the machinery run the right way so that you don't get mistakes out to the customers, then it is our experience that it is best to use expatriates. The locals have a tendency to try things out and then test the result afterwards. With the expatriates it is different. They know exactly what to do so they don't even have to test it after the process has run. This is new here (Expatriate manager).

Another area where expatriates made a strong impact on the technical development of the production was in relation to waste. This had been reduced from an average of 40,000 pounds a month to 10,000 pounds a month. Such results led to a number of expatriates arguing that the company should remove all local personnel from management position in the production and

replace them with parent company staff. As an expatriate manager argued: “*Then we would really start making money I tell you. Ten expatriates in this section and they would pay their own salary in no time*”. As the above quotes indicate the expatriates had quickly established themselves as the core members of the technical community of practices in the subsidiary. The perception clearly was that the locals were legitimate community participant but in peripheral positions. As one expatriate described it:

I have fairly high technical knowledge of the machinery. So when I come over here to such a bunch of sheep it is quite difficult. They simply have no clue of what happens in the machinery. They can push a button but they haven't got the faintest idea why.
(Expatriate manager).

Hence, with the new ideas and work routines introduced by the expatriates the locals had to take on the role as novices. Those that could not accept this were soon made redundant. In this process almost one-third of the workforce was let go. The remaining local employees entered a steep learning curve catching up to the new superior technical standards.

Challenging Expatriate Expert Practices

While there was full acceptance of the superiority of the expatriates the local workers also had some critical comments concerning the way the foreigners managed the production in the subsidiary. It was mentioned that the expatriates were condescending and had an arrogant attitude that was based on their higher technical capabilities. For example, the local employees described that the expatriates came “*completely armed with - we've got stuff to tell you*” (Local

employee). Another local employee conveyed a similar view: *“The expatriates tend to think they only know best of the industry. They are probably right, but sometimes they express it like – ‘we know, you know nothing’”*. Or as one said: *“When you work with the expatriates you feel you are being told not asked”*. The demeaning view on the locals could be observed in daily conversations such as the one described below:

Local employee to expatriate manager: *You think I am in the Dark ages don't you?*

Expatriate manager: *I think you are on your way out.*

Local employee: *How can I be on the way out, when I am a good reliable worker and I know all about my job?*

Apart from the arrogance and self-righteousness the expatriates were also described being too oriented towards technical aspects of their job. As one local said it: *“They are so focused on getting the production to run the way it does back home that they forget that it is actually people that run the machinery not the other way around”*. A local manager described the difficulties experienced with the technical expatriates when discussing issues not directly related to equipment.

If our expatriates in the production have to describe anything about the running of the plants they will very soon go into technical details with nuts and bolts one, two, and three. The expatriates will generally be uncomfortable about talking on the personal level. It is an entirely different set of values for how to solve problems. Fact-based logics it is called

here. That is something that the expatriates love but they are not as good when it comes to the other three or four modules that comprise a person (Local manager).

In this way, the strong orientation towards the technical aspects of the job was mentioned by the local employees to have a negative impact on what was perceived to be good management communication. As a local manager described it: *“The expatriates generally are not good with people. They are too direct”*. Another local manager also mentioned the communication style as problem.

The English tend to...they are not as abrupt. You know if they have got something to say they will probably spend ten minutes before eventually get to the point. Whereas the expatriates would just say - you are not doing this right and I want you to do it like this and I think sometimes the English tries to be a bit more diplomatic (Local manager).

This, some of the expatriate top managers had noticed as well. As a Danish director described it:

Generally their communication skills are very poor. The expatriates come with the attitude that they are the best in the world and no one is better than them – and they won't listen. They have to understand that it is important that the people that do their jobs are also happy and satisfied. It is important that one understands that. That you don't just think they are all idiots (Expatriate top manager).

Hence, although the expatriates were clearly the expert in the technical area they had some inadequacies related to people management. Those insufficiencies lead to some pressure for changes to the practices that the expatriates exercised in the technical community of practice.

Situated Learning and Adjusted Practice

The one-sided technical focus generally made it difficult for the expatriates to transfer their knowledge and skills to the locals. For the locals to learn the technical skills and move from being novices to assuming more of an expert role a close interaction needed to take place with the expatriates. However, the training of the locals was reduced by the dismissive expert attitudes and by lacking communication.

While most technical expatriates were described as having poor people skills a few were known to be more social. As one of the local managers put it: “*Some of the expatriates are actually good with people. We have [Jens]*”. When asked what made this individual different from other expatriates a local worker replied: “*He knows how to talk to people and he also listen...sometimes. He’s a great guy*”. An expatriate top manager was also aware of a few of the Danish expatriates having better social skills than the others. He told the researcher:

A few of the young guys have made a great career here and have moved to good positions as area managers. This is not because they are better technically. There are definitely some of the others that have more experience with the machinery. But these guys they know how to talk to the workers and actually they often manage to create better results. I think this is because they get the people to work with them (Expatriate top manager).

As such, some of the expatriates had developed their communication skills to a level where they were able to have a deeper dialogue with the locals. When this happened some of the arrogance was also reduced as they got to know the local workers better. In this way a positive feed-back mechanism developed where expatriates gradually changed and improved their people oriented communication skills and reduced the dismissive and derogatory language. These individuals was observed to also be joking with the locals and not being only interested in equipment. While they were rarely full members of the technical community, they were described, by both top managers and local employees, as providing very good work results.

At the same time as some of the expatriates changed their working practices to involve a more engaged dialogue and a more people oriented management style the local workers also developed. By being more involved some local employees moved closer to the center in the technically defined community. This mainly happened in the smaller departments and especially those that were run by younger expatriate managers. Here the expatriates often developed a management routine as a so-called ‘hands on’ approach, where the expatriate managers would work in the production along with the staff. In such situations they were often able to develop the skills of the local work group to a much higher level than in the larger department where they were more dependent on a more formal setting for training. As it was described by an expatriate manager: *“In the process area we have got some English people with really good technical skills. They have learned a lot because they walk around with people like [Morten] all day”*. In this way some expatriates adjusted their work practices to fit the local context and through this development accelerated the learning of technical skills among the

locals. Adjustment of practices of both expatriates and local workers was thus dependent on joint legitimate participation in the common community of practice.

DISCUSSION

The aim of this study has been to explore adjustment and work place learning in a technical community of practice situated in an MNC subsidiary. Especially we were interested in the role of technical expatriate managers their interaction with local workers. We draw on situated learning theory (Lave & Wenger, 1991; Wenger, 1999) to argue that expatriate adjustment should not only be conceived as an individual learning trajectory but should also be connected to the collective behavior of the expatriates and their local counterparts as well as a dynamic interaction between the two groups. Our ethnographic field study illustrate our theoretical assumptions. This research is important for the developing of a more nuanced and dynamic expatriate adjustment theory and to better understand and manage the processes of expatriate adjustment and the social organization that takes place in foreign subsidiaries.

Theoretical contributions

Applying situated learning theory (Lave & Wenger, 1991; Wenger, 1999), this study offers a model for understanding the role of communities of practices in expatriate adjustment and work place learning. The existences of strong communities of practice can have a positive effect of internal learning processes. This was exemplified by how the conflicts that challenged existing practices could result in novices' (locals) and experts' (expatriates) mutual adjustment and learning as changed participation in changed practices. Here both parties had to adjust to each

other. We extend the existing literature by providing a new model based on a different theoretical foundation for expatriate adjustment and illustrating the insights this can provide in foreign subsidiary. We also extend the focus of situated learning theory by adding an international element which provide novel details to the understanding of novices as newcomers to a community of practices.

Contribution to the literature on expatriate adjustment

So far, expatriate adjustment has been conceptualized mainly from a social learning theory perspective (e.g. Caligiuri, 2000; Selmer & Luring, 2014). This has provided a model to understand how an individual adjust to a local setting by observing other's practices and gradually adapting his or her own behavior to fit these practices. This perspective has been tremendously useful for developing theories that conceptualizes the internal and external changes that the expatriate goes through in order to minimize the person-environment fit gap (Makkonen, 2015). One area, however, that has been paid less attention to in the adjustment debate is how group dynamics affect adjustment and learning processes. Situated learning can introduce such insights to the overall theoretical framework for expatriate adjustment. From this perspective adjustment can be understood as participation related movements within communities of practice. This theoretical lens focuses less on reducing the national cultural differences and more on the learning that needs to take place between people in order to do one's job most effectively. In an expatriation situation this most often includes transferring job related knowledge, routines, and values to the local workers. A closed and exclusive community of practices could inhibit local employees from learning new practices due to restricted interaction or dismissive attitudes. Participation in the community, however, grants the opportunity to learn the practices as exercised by core members. Existing research on the

relation between host country nationals have focused on the effect of cultural differences when predicting the willingness to learning from each other (Toh & Denisi, 2007; Toh & Srinivas, 2012; Varma et al., 2012). Although cultural traits may have some effect on adjustment our research suggests that acceptance of professional skills may be equally important.

Situated learning theory offers an understanding of how participation of novices has the potential for gradually changing the practices performed in the group. As the novices learn and move closer to the core of the community they also gain access to make adjustments to the applied practice negotiating details in relation to elements of applied routines. In this way, adjustment can take place as the inclusion of a group of novices that once they get to know the ropes are influential in changing the way a group performs its work from within. In case the novices, in this case the locals, are not granted access and legitimacy to change the current practices by the experts, there will less mutual adjustment and less work place learning taking place. This perspectives thus adds a more group dynamic, collective layer to the existing thinking about expatriate adjustment. A theorizing that has rarely taken into consideration how a more complex mutual situated adjustment may take place. A number of studies have explored factors influencing the willingness of host country national to share information with expatriates (Toh & Denisi, 2007; Toh & Srinivas, 2012; Varma, Pichler, Budhwar, & Biswas, 2009; Varma et al., 2012). In our study we illustrate the dynamics that may shape willingness or unwillingness to engage in mutual adjustment and work place learning.

Contribution to the literature on situated learning

Apart from providing novel ways of conceptualizing adjustment in expatriate communities our research also adds to the situated learning perspective. This theory is mainly developed in

domestic, mono-cultural context assuming that expert and newcomers originate from the same country. In an expatriation context the experts in a community of practice being defined by its technical ways of working can be novices in the sense that they are not familiar with specific cultural behaviors and norms relevant to carry out such technical ways of working in another country. This make the situation of defining precisely who are novices and who are experts more ambiguous. We propose that more studies on situated learning in expatriate communities are needed to confirm our contribution.

Practical implications for international corporations expatriating technical workers to do managerial assignment and tasks may be somewhat premature due to the exploratory character of the study. Nonetheless, increasing the awareness at headquarters of possible adverse effect of facilitating strong communities of practices in foreign subsidiaries could be a first step forward. Facilitating situated learning requires possibilities for mobility within and between communities of practices. This could be an area for increased attention from personnel responsible for international HRM. Including the role of communities of practice could increase the likelihood of success. The importance of insiders as socializing agents for assisting novices making sense of their new environment has been firmly recognized (Toh & Denisi, 2007). This is because communities of practice, shaped of locals or expatriates, are reservoirs of valuable organizational information.

Limitations

This study has some clear limitations. First it should be mentioned that this is only one study performed in one country (England) with expatriates from one other country (Denmark). The situation described in our article, hence, may be influenced by the specific cultural contexts

and may have played out differently had other nationalities been involved. In other words, it is unclear to what extent our results can be generalized to other MNCs or other subsidiaries. Second, in this study we have focused on a technical community of practice because such communities have been described as being particularly strong (Brown & Duguid, 1991, 1998). We did this because we wanted to study a situation where the community of practice had strong implications for expatriate adjustment and for workplace learning. However, in other communities of practice defined by expertise in areas such as finance, sales, or marketing the interaction with locals and adjustment could be different from our example. More research would need to access different types of communities of practices and compare implication of participation in them. Third, we studied a context where a relatively large group of expatriates worked in a foreign subsidiary forming a strong technical community of practice. In many cases there will be fewer expatriates of each profession belonging to a number of different communities of practice. In such situations communities could virtually span different business units including other subsidiaries and the parent organization. Virtual element to communities of practice in MNCs, however, needs to be further explored in coming research. Despite the many limitations of this research endeavor our study has illustrated some of the fundamental processes taking place within and among group of employees in a foreign subsidiary. This provides a small first step towards the development of a theory on the relation between expatriate and local mutual adjustment and situated workplace learning.

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Chapter 4

Achievement as a compensator for low inclusiveness in multilingual work groups?

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ABSTRACT

Individuals' involvement has been found to be vital to the functioning of diverse work groups. Work group involvement, however, is difficult to achieve in the increasingly internationalized environment that exists in knowledge intensive organizations. Based on developments in social identity theory we set out to explore two types of group activities that can lead to involvement, namely relation-oriented activities that can lead to inclusiveness (being open to language diversity) and task-oriented activities that can lead to achievement (bringing expertise to bear). Our main hypothesis is that the two types of activities can supplement each other so that group inclusiveness becomes less important for feeling involved if group achievement is high. Using a multilevel approach and responses from 1124 individuals in 29 multicultural technical work groups in private business organizations and universities, we confirm our theoretical assumptions.

Keywords: diversity, international HRM, involvement, turnover, achievement, openness

Introduction

The involvement that individuals feel in a group is important to long term cooperation and ultimately effectiveness in any diverse organization (Cohen & Bailey, 1997; Korsgaard, Schweiger, & Sapienza, 1995). This is not least because work group involvement ensures commitment, information sharing, and willingness to live with differences (Z. Chen, Zhu, & Zhou, 2015; Mikulincer, Shaver, & Rom, 2011). Involvement can be described as an act of participation in a setting that facilitates an internalization of values and behaviors endorsed in that context (Deci & Ryan, 2008; Lodahl & Kejner, 1965). In relation to work groups, Mor-Barak and Cherin (1998) define involvement in the group as the perception of inclusion and exclusion concerning interpersonal interaction in a social unit. Hobman, Bordia, and Gallois (2004) add that work group involvement can relate to how much the individual feels listened to and respected with regard to task processes such as information exchange and collaborative decision making. As such, work group involvement includes relational as well as task-related elements.

While group involvement is positive for work outcomes, feeling involved can be difficult to achieve in multilingual organizations (Bordia & Bordia, 2015). This is because language use can be linked to identification and categorization processes in organizations (Lauring, 2008; Reiche, Harzing, & Pudelko, 2015). According to social identity theory (Tajfel, 1982), an individual's self-concept is based not only on his or her individual identity but on that person's awareness of valuable memberships in specific social groups. This group identity can be derived from a variety of salient group categories into which individuals classify themselves and others (Turner, Sachdev, & Hogg, 1983). Moreover, once group categories and membership are established, there is a tendency for discriminatory and biased behavior that

reduces intergroup interaction (Hogg & Terry, 2000). As such, dissimilar group members are often less likely to feel involved in the group due to being excluded from important networks of information and opportunity (Mor-Barak & Cherin, 1998). For example, having a non-standard language usage has been found to have negative consequences for employment, perception of competence, job opportunities, collaboration intent, and social status (Cargile, Maeda, Rodriguez, & Rich, 2010; Fuertes, Gottdiener, Martin, Gilbert, & Giles, 2012; Hebllich, Lameli, & Riener, 2015; Hosoda, Stone-Romero, Nguyen, & Stone-Romero, 2012).

In line with the above, social identification and categorization processes can explain much of the interaction barrier that exists across linguistic divides (Chakraborty, 2017; Giles & St Clair, 1979; Lippi-Green, 2012). Furthermore, it has been argued that language use can be an even stronger source of social identity than, e.g., culture because it is immediately detectable in interaction (Giles & Johnson, 1981; Luring & Jonasson, 2018). Reiche, Harzing, and Pudelko (2015) argue that language difficulties in multilingual organizations as a direct effect can make it difficult to interact with others and thereby develop strong relational ties whereas culture only has an indirect effect. As such, linguistic variation has been argued to be structured around social identity and vice versa (Chakraborty, 2017; Lippi-Green, 2012; Yzerbyt, Provost, & Corneille, 2005). In consequence, there is generally a negative effect on interpersonal involvement of linguistically diversity in organizations.

Not all work groups, however, handle diversity similarly. One driver that has been argued to facilitate group involvement in spite of intragroup dissimilarities is the expression of positive attitudes towards diversity (Gonzalez & Denisi, 2009; Hentschel, Shemla, Wegge, & Kearney, 2013; Herdman & McMillan-Capehart, 2010; D. Van Knippenberg, Van Ginkel, &

Homan, 2013). According to van Knippenberg, De Dreu, and Homan (2004), a greater openness to diversity will facilitate better relations among group members and more interaction. Relation-oriented activities are interactions that affect the development and maintenance of relationships. Relationships are successfully formed and maintained by showing openness, inclusion, and support through interaction that has social and emotional content (Gorse & Emmitt, 2007; Keyton, 1994).

Work group involvement, however, can also be created if the unique task-relevant knowledge of dissimilar individuals is perceived as needed for creating positive work outcomes. This will make the individual feel as a valued participating member of the group (R. Mitchell et al., 2015; Rebecca Mitchell, Nicholas, & Boyle, 2009). Task-oriented elements of group activities is interaction with the aim of completing tasks. This implies communication and knowledge sharing in order to achieve goals and to discuss functional issues. According to Barker et al. (2000), groups achieve success in task activities by debating job-related ideas through the exchange of information and opinions that lead to problem solving. Both relation-oriented and task-oriented activity in groups will lead to stronger feelings of involvement among diverse group members (cf. Homans, 2013).

While relation-oriented (Neyer & Harzing, 2008) and task-oriented (Kearney & Gebert, 2009) group activity has been shown to have positive consequences in international organizations separately, in this study we focus instead on how the two types of activities could influence each other. More specifically, we want to explore if the effect of relation-oriented activity (directed towards group linguistic inclusiveness) changes under conditions of high or low task-oriented activity (directed towards achievement in using the group's expertise). We

thus pose the following research question: *Will group inclusiveness have a different influence on the feeling of work group involvement when the members have a strong practice of applying the expertise residing in the group?*

We base our investigation on two elements of social identity theory as proposed by Ashforth and Mael (1989). They maintain that involvement in diverse groups can originate 1) from feelings of belonging due to social inclusion among members resulting from relation-oriented activity, and 2) from successful accomplishments of the group resulting from task-oriented activity. We assesses this in multicultural technical organizations by use of a multilevel model measuring inclusiveness (being open to language diversity) and achievement (bringing expertise to bear) at the group level and work group involvement at the individual level. We have designed our study in this way because examining in which ways group inclusiveness and achievement affect individuals' involvement will demonstrate how higher level contextual factors in combination can influence the emotions of the single person (cf. McKay, Avery, & Morris, 2009). This is relevant because not all individuals respond similarly to the same group environment, and because the specific social organization of the group can have an important influence on individual feelings (Shin, Kim, Lee, & Bian, 2012).

Recent calls have been made for more multilevel research in the area of interaction in multilingual groups (e.g. Tenzer, Terjesen, & Harzing, 2017). However, so far only few multilevel empirical studies have been conducted in this area. None of those, as far as we know, have dealt with the influence of different types of group level activities on individual feelings of involvement in the work group.

This article begins with a theoretical section, where we first outline an explanation for the connections between relation-oriented activity directed towards inclusion (being open to language diversity), task-oriented activity directed towards achievement (bringing group expertise to bear), and individual level feelings of group involvement. We then predict first that there will be a positive direct effect of group level inclusiveness on the individual's involvement. Secondly, as the two types of group activities supplement each other, we expect that group level achievement will compensate for low levels of group inclusiveness. We test our hypotheses empirically using survey data collected from a sample of work groups in knowledge intensive private and public multilingual organizations, and conclude with a discussion of the results.

Theoretical background and hypotheses

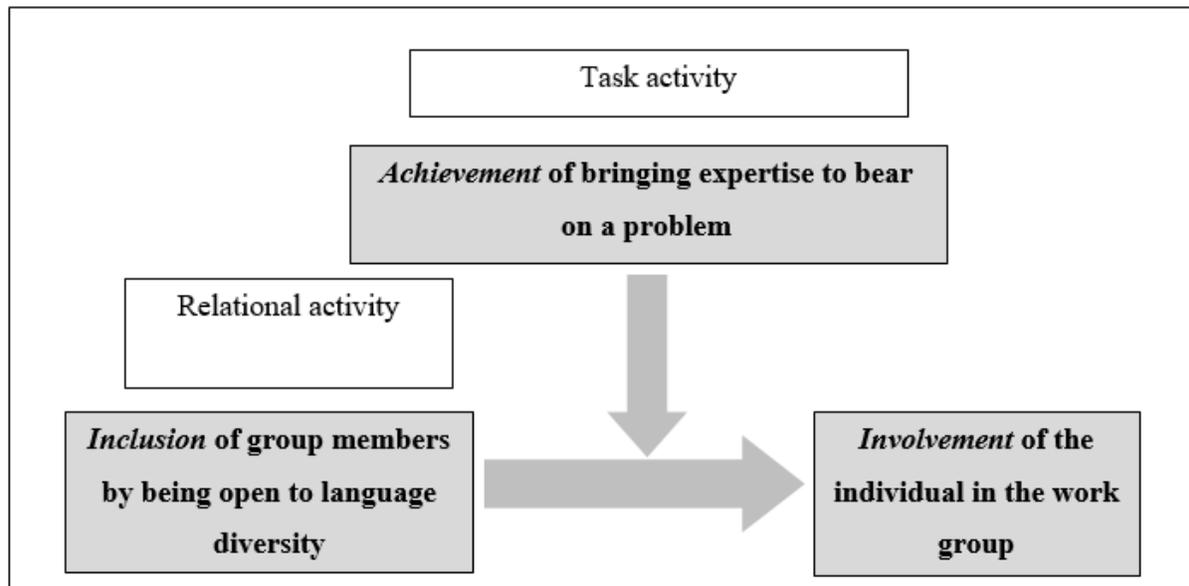
Social identity theory maintains that individuals may involve themselves in group activities due to a need for a feeling of belonging socially and due to a need for positive self-definition (Mael & Ashforth, 1992). In other words, apart from the involvement sentiment caused by interacting with other individuals that accept one as a group member, a person can also identify with a group when adopting the positive defining characteristics of the group as defining characteristics for him- or herself (Turner et al., 1983). In this way, by partaking in the successes and status of the group, individuals come to embody the attributes they ascribe to their group into their own self-concepts (Dutton, Dukerich, & Harquail, 1994; Oakes & Turner, 1980).

These dual aspects of social identity theory have often been applied in sports psychology. Here individual involvement has been conceptualized as socio-psychological

(relation-oriented) or team-based (task achievement oriented). Hence, involvement has been related, on the one hand, to peer group acceptance and social interaction and, on the other hand, to what is termed vicarious achievement (Fink, Trail, & Anderson, 2002; Funk & James, 2006). The first fulfills a need for belonging and affiliation. The other provides a feeling of accomplishment from belonging to a successful group. Both can be powerful facilitators of identifying with and feeling involved in a group (Wann, 2006). As an example of the vicarious achievement, a sports team member that is rarely included as an active participant could still feel a strong personal involvement in the team based on its success in the playing field. This is because the association with the successful group will lead to self-esteem and an enhanced self-perception. If excluded from direct participation in an unsuccessful team, it is likely that the individual will lose the feeling of personal involvement and consequently withdraw.

Based on this notion we propose that inclusiveness and task achievement can supplement each other so that if the group provides a low level of one element, the individual could still feel involvement if there is a high level of the other. More specifically, we predict that if the group does not show sufficient inclusiveness by being open to the individual differences in skills and accents regarding internal language use, this will be less important if the group is good at accomplishing its main task, namely to use its expertise to accomplish task goals. This conceptual model is depicted in Figure 1 and provides the basis for the following hypotheses to be tested empirically.

Figure 1: Conceptual model



Relation-oriented activity towards inclusiveness

Group diversity has generally been found to reduce individuals' involvement in the group (Pelled & Xin, 2000; Tsui, Egan, & O'Reilly, 1992). Lichtenstein, Alexander, Jinnett, and Ullman (1997), for example, found that members of age diverse teams participated less in decision making. Similarly, Kirchmeyer (1995) studied individuals who viewed themselves to be dissimilar from peer work group members and found a perceived poorer fit with the group. However, in line with social identity theory, existing research has found some evidence for a positive influence of inclusive behavior that could enhance group involvement in diverse groups (Shore et al., 2011). For example, as indirect documentation Mor-Barak, Levin, Nissly, and Lane's (2006) study suggested that perceived inclusiveness among child welfare workers was related to job satisfaction and low turnover intentions. Sliter, Boyd, Sinclair, Cheung, and McFadden (2014) found perceived inclusiveness in the form of diversity climate to reduce conflict and increase engagement among nurses. Similar results were found by Buttner, Lowe, and Billings-Harris (2012).

In multicultural organizations with many different languages, spoken in many different ways, and with different proficiency levels, language use plays an important role for relationship building and for developing a feeling of belonging (Lauring & Klitmøller, 2015; Tenzer & Pudelko, 2015). This can be related to language being described as one of the strongest indicators of who is included and who is excluded from a group (Giles & Johnson, 1981; Giles & St Clair, 1979). Accordingly, language-related inclusiveness may be conceptualized as a form of interaction that allows others to take part in the dialogue regardless of inherent language differences (e.g. variations in accents and linguistic skills) (Lauring & Jonasson, 2018). So far, studies have shown perceived openness to language diversity to lead to knowledge sharing behaviour (Lauring & Selmer, 2013), creativity (Lauring & Klitmøller, 2017), and performance (Lauring & Selmer, 2012). As being open to language diversity could be particularly important for making social relations in multilingual organizations, we present the following hypothesis:

Hypothesis 1: There is a positive association between a work group's inclusiveness in the form of being open to language diversity and an individual group member's feeling of involvement in the group.

Task-oriented activity towards achievement

According to Fink et al. (2002), vicarious achievement, or the sense of self-esteem that one derives by being connected to a successful group, is highly related to the feeling of involvement in the group. That is, one would more likely identify with a particular group when one can obtain a sense of achievement from the connection. Fink et al. (2002) provide evidence that

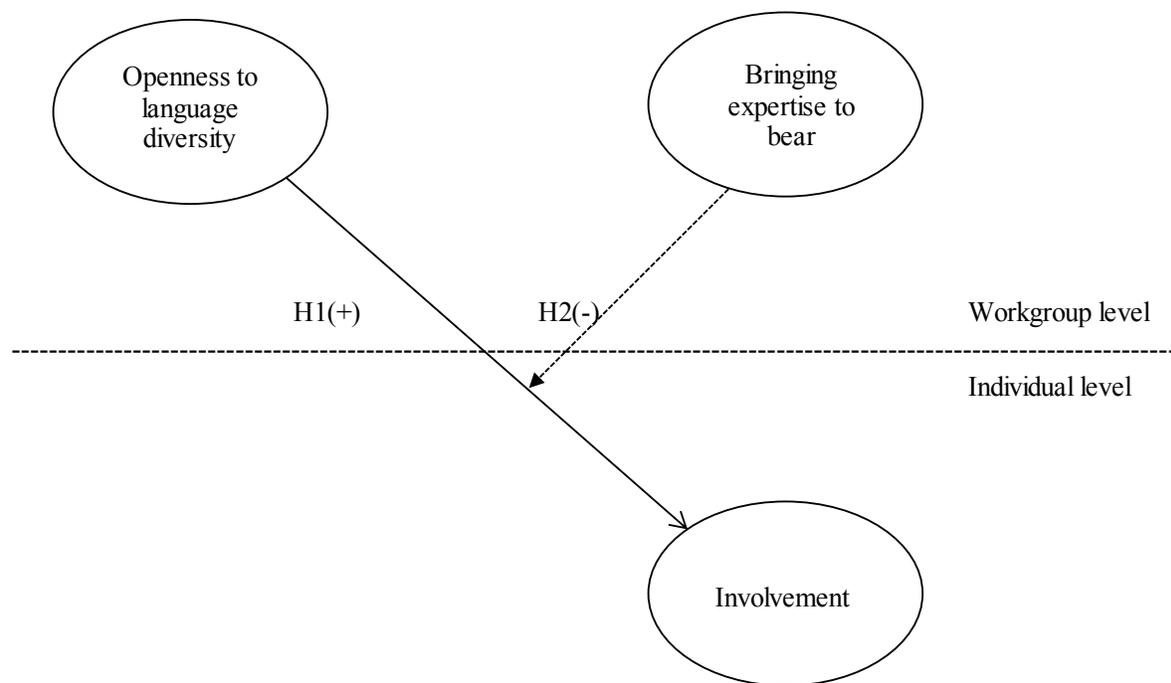
vicarious achievement is one of the strongest predictors of feeling connected to a group with social relations to group members being the second strongest. Sloan (1989) also demonstrates that social prestige and esteem gained from group affiliation are strong predictors of perceived involvement. He explains the effect of vicarious achievement with the notion that an association with positive others will make oneself appear in a more favorable light too.

In knowledge intensive technical work groups such as academic work groups in the technical and natural sciences as well as business R&D in the area of engineering, biotech, and IT, using the available expertise in the group on a particular task is a vital accomplishment. The task-related interaction involved in producing such a result has been described as bringing expertise to bear. Faraj and Sproull (2000) argue that knowledge intensive organizations need to develop forms of interaction by which expertise is applied to solve a problem in a timely manner. To accomplish that, group members integrate individual outputs through an emergent process of task interactions. According to Faraj and Sproull (2000), groups that develop the ability to work together smoothly bringing the expertise to bear also face less need for social interaction. This could indicate an automated process where social relations and attitudes of inclusiveness come second in line compared to the task-related achievement of the group. In other words, if the group is able to bring expertise to bear through problem solving interaction, this may compensate for low levels of interpersonal inclusiveness and less focus on social relations and interaction. This provides the foundation for our second hypothesis which is also outlined in Figure 2.

Hypothesis 2: The relationship between a work group's inclusiveness (in the form of being open to language diversity) and an individual's feeling of involvement to the

group is moderated by the group's level of achievement (in the form of bringing expertise to bear), such that lack of inclusiveness has a weaker negative effect on individuals' feeling of involvement when the group's achievement is high.

Figure 2: Hypothesized model



Research methods

Research setting, participants, and procedures

For the purpose of this study, we collected our research data from employees who were either working in a technical expert position in a private business (R&D departments) or as researchers at science and technology departments in universities. We targeted these departments because prior research indicate that private companies and universities often attract employees from abroad (Lauring & Selmer, 2012; Selmer & Lauring, 2010; Wang,

2015) making them multilingual organizational units. They are therefore suitable targets for investigating the effect of group level expertise application and inclusiveness towards language diversity. The data was collected electronically, and a commercial web survey software package was used to administer the questionnaire.

We first targeted private businesses by the use of a self-constructed database of e-mail addresses of white-collar employees in departments of Danish private knowledge intensive organizations holding R&D units. More specifically, we targeted Danish-owned companies with more than 1,000 employees in Denmark. From this pool, we made a list of the ten most internationalized companies in terms of foreign nationals working in Denmark. After contacting the ten corporations, five companies from the list agreed to participate in the survey. In total, 981 employees from 13 departments in the area of biotech, information technology, and engineering were invited to participate in the survey. Eventually, 676 responses were received amounting to a response rate of 69 percent. The average age of respondents was 41.4 years, and the average tenure was 11.2 years. The average number of languages spoken on a daily basis in departments was 2.4. We used the same strategy and parameters for identifying Danish science and technology university departments. We included a total of 16 departments with themes ranging from chemistry and computer science to nanotechnology. In total 1,022 academics were invited to participate in the survey and eventually, 489 responses were received amounting to a response rate of 48 percent. The average number of languages spoken on a daily basis in the university departments was 2.7.

The combined sample consists of 1,124 employees in 29 different multinational departments. Of the 1,124 respondents, 579 (51.6%) were female. The average age in the

sample is 39.6 years. This was a bit higher for the female sample. They had an average age of 40.1 years whereas for men it was 38.9 years. The average tenure for the sample was 15.4 years. This was lower for females with an average of 13.9 years of tenure versus 16.8 years for male respondents. 26 % of the sample was speakers of the local language, Danish. 14% had English as a native language. Other major language groups were German, Polish and Dutch (48% of the sample). The most represented Nordic languages were Swedish, Finnish, and Icelandic (5% of the sample).

Measures

The instruments applied in the current study all originate from tested multi-item scales. All scales used response categories ranging from (1) “strongly disagree” over (3) “neutral” to (7) “strongly agree”. We show the descriptive statistics in table 1.

Inclusiveness: The group’s openness to language diversity

Being open to language diversity was measured by a four-item scale by Luring and Selmer (2012) measuring how inclusive or exclusive group members are in their interaction with others when crossing linguistic divides. Sample items are: ‘Department members enjoy doing jobs with people despite of language barriers’ and ‘Department members make an extra effort to listen to people speaking different languages’ (alpha = .79).

Achievement: The group’s bringing expertise to bear

Bringing expertise to bear was measured by a four-item scale by Faraj and Sproull (2000). The scale measures a work group’s ability to solve problems through interactions aimed at sharing

of expertise. A sample item is: ‘More knowledgeable department members freely provide other members with hard-to-find knowledge or specialized skills’, and ‘If someone in our department has some special knowledge about how to perform the department task, he or she is not likely to tell the other members about it’ (R) (alpha = .75).

The individual’s feeling of involvement in the group

Work group involvement at the individual level was measured by a five item scale adapted from Mor-Barak et al. (1998). Sample items include statements such as ‘I feel part of informal discussions in the department’, and ‘I feel isolated from the work group’ (R) (alpha = .87).

Control variables

Based on existing studies connected to involvement (Hobman et al., 2004; Mor-Barak & Cherin, 1998) we identified several potentially relevant control variables. We included gender: “What gender are you?” (1=female), age (in years), tenure (measured as the number of years in the organizations). Age and gender are used because these characteristics can have influence on involvement patterns (Davis, Shaver, & Vernon, 2003). Similarly, as tenure represents individuals’ experience in a work group that has accumulated over the years, it may also affect personal feelings of involvement. We include organization as a control; by this, we control for whether the respondent belongs to a private business or a university organization. This is because the private and business sectors are organized differently, i.e. ownerships, organizational culture, and leadership styles (Tsui et al., 1992). Nationality was included and measured by the direct question: “What is your nationality?”. ‘National status’, however, indicates if individuals were host country nationals or of foreign nationality to the organization.

This control is relevant as locals could have a stronger feeling of being involved in the work group than foreigners.

Table 1: Descriptive statistics and correlations

Descriptive statistics and correlation for study variables									
Model	M	SD	1	2	3	4	5	6	
Individual-level model (N=1124)									
1 Nationality	21.70	17.88							
2 National status (local and non-local)	0.27	0.44	.013						
3 Gender	1.48	0.50	.077**	.236**					
4 Age	39.57	10.96	-.175**	-.034	-.056				
5 Tenure	15.36	12.90	.096**	.264**	.111**	.286**			
6 Organization type	0.58	0.49	-.455**	-.597**	-.390**	.194**	-.424**		
7 Involvement	5.51	0.96	-.148**	-.087**	-.099**	.100**	-.096**	.237**	
Group-level model (N=29)									
1 Openness to language diversity	5.12	0.99							
2 Bringing expertise to bear	5.18	1.07	.354**						

Note $p < .05$ * $p < .01$ **

Analytical strategy

Table 1 shows the descriptive statistics and correlations of all key variables. Due to the nested data, we aggregated group level construct and calculated the ICC[1] and ICC[2] respectively. Moreover, as being open to language diversity and bringing expertise to bear were both measured at the group-level, we centered these variables around group means; by this notion we use the group mean centered portions of the group level variables to model the individual level relationship (D’Innocenzo, Luciano, Mathieu, Maynard, & Chen, 2016). To capture the effect of group level variables, we use a multi-level framework to estimate a lower-level individual outcome. Therefore, the hypothesis testing was done performing a multilevel analysis using a maximum likelihood estimation software package. To assess the effect of common method variance (CMV), we followed Richardson, Simmering, and Sturman’s (2009) recommendation and used a marker technique. More specifically, we adapt a CFA marker

approach as suggested by Lindell and Whitney (2001) and Williams, Edwards, and Vandenberg (2003). Practically, this involves adding a marker variable to the CFA analysis. We followed Malhotra, Kim, and Patil's (2006) approach in post hoc estimation of CMV and chose 0.02 as the threshold. No significant differences were detected between the correlation estimates of original and marker adjusted ones; this indicates that CMV should not be a concern in our data (see Appendix 1). Also, one benefit of using the multilevel framework is that aggregation to the higher level substantially minimizes CMV threats in the data. Finally, it has been argued that moderation effects cannot be caused by CMV (Chang, van Witteloostuijn, & Eden, 2010; Siemsen, Roth, & Oliveira, 2010). In conclusion, it is unlikely that CMV has affected the results of this study.

Results

Confirmatory factor analysis

For construct validation, we conducted a series of confirmatory factor analyses using LISREL (Jöreskog, 1969, 1993). Following the notion by Chen, Kirkman, Kanfer, Allen, and Rosen (2007) the tests were conducted at the individual level because the group-level sample size was much lower. To maintain good indicator-to-sample-size ratios, we used scores of each of the three constructs. First, we tested the hypothesized model in a three-factor model. It fits the data well with $\chi^2(60, N=1124) = 210.82$, comparative fit index (CFI) = .962, root-mean-squared error of approximation (RMSEA) = 0.055. Relative to the hypothesized model, two two-factor models were tested. In the first of the two factor models, the indicators bringing expertise to bear and being open to language diversity were set to load on one factor. This made the data to model fit worse, $\Delta\chi^2(3, N=1124) = 571.04$, $p < .01$, CFI = .82, RMSEA = .12. A similar result emerged from a second alternative model. Here indicators of involvement and bringing

expertise to bear were set to load on a single factor, $\Delta\chi^2(3, N=1124) = 558.15, p < .01, CFI = .082, RMSEA = 0.12$. Lastly, an alternative one-factor model was tested against the hypothesized model and showed significantly worse data-to-fit characteristics, $\Delta\chi^2(4, N=1124) = 1307.07, CFI .635$ and $RMSEA = .17$. These results strongly support the discriminant validity of involvement, bringing expertise to bear, and being open to language diversity measures.

Aggregation at the group level

We examined whether aggregation of being open to language diversity and bringing expertise to bear was appropriate. Following previous and recent research by Chen et al (2007) and Walumbwa, Muchiri, Misati, Wu, and Meiliani (2017), we assessed the intra-class correlations of being open to language diversity, bringing expertise to bear, and involvement. For being open to language diversity it was calculated that $ICC[1] = .127$ and $ICC[2] = .771$. For bringing expertise to bear these were $ICC[1] = .135$ and $ICC[2] = .420$. Lastly, involvement scores were $ICC[1] = .106$ and $ICC[2] = .55$. The intra-class correlations all indicated that the data was suitable for doing multilevel statistics.

Hypothesis testing

Table 2 presents the results of the multilevel analyses, which is done in a hierarchical structure with step-wise model fit statistics improvement. We obtain $ICC(1)$ of .106 for involvement in an unconditional model, providing clear indications of sufficient group-level variation in involvement. In step 1, we entered all of the individual- and group-level control variables. In step 2, we added the openness to language diversity variable to the model; this independent variable was significant in predicting positively individual involvement in the group. In step 3,

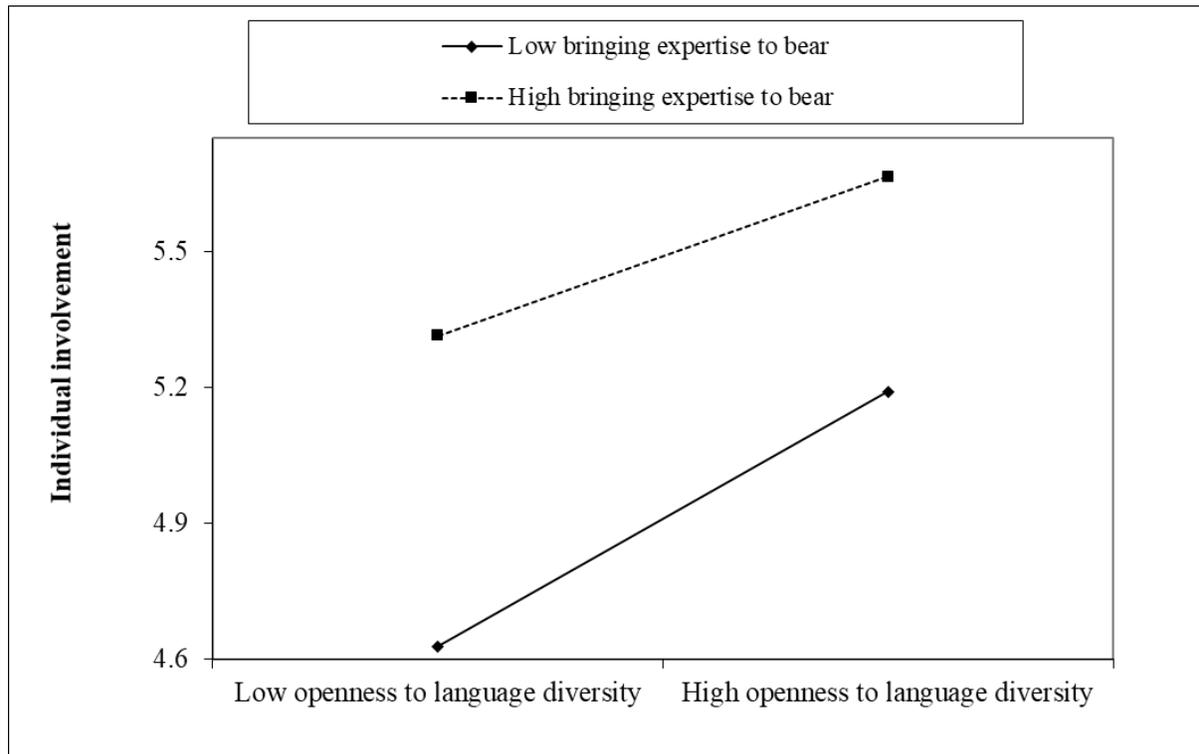
we entered the moderator bringing expertise to bear; this, similar to being open to language diversity, had a significant positive relationship with the feeling of personal work group involvement. Lastly, in step 4 we added the interaction between the independent variable, being open to language diversity, and bringing expertise to bear. This interaction had a significant negative impact on individual level group involvement. The plot for the interaction effect is shown in figure 3. To gain a more nuanced understanding of the interaction effect, we conducted simple slope analysis for the link between bringing expertise to bear with being open to language diversity in relation to involvement. The above shows support for both of our hypotheses.

Table 2: Results of multilevel analysis predicting individual involvement

Steps and variables	Model 1		Model 2		Model 3		Model 4	
	Beta	SE	Beta	SE	Beta	SE	Beta	SE
Step 1: Control variables								
Nationality	-.003	.002	-.002	.002	-.003	.002	-.003	.002
National status (local and non-local)	.175	.082	.092	.077	.090	.073	.087	.073
Gender	-.055	.060	-.068	.060	-.057	.053	-.057	.053
Age	.007**	.003	.004	.003	.003	.002	.003	.002
Tenure	-.004	.003	-.002	.002	-.000	.002	-.001	.002
Organization	.445**	.137	.434**	.132	.473**	.130	.464**	.128
Step 2: Independent group-level variable								
Openness to language diversity			.367**	.027	.262**	.027	.256**	.027
Step 3: Group-level variables								
Bringing expertise to bear					.294**	.025	.290**	.025
Step 4: Cross-level two-way								
Openness to language diversity x Bringing expertise to bear							-.051*	.023
Increase in model fit								
χ^2			$\chi^2(5) = 37.24$	$\chi^2(7) = 222.18$	$\chi^2(10) = 390.05$		$\chi^2(11) = 396.75$	
$\Delta\chi^2$				184.94	167.87		6.7	
R ²		.062	.184		.27		.28	
ΔR^2			.122		.086		.1	

Note $p < .05$ * $p < .01$ **

Figure 3: Bringing expertise to bear moderating the link between being open to language diversity and involvement



Discussion

The purpose of this study was to examine the effect of group level inclusiveness on the individual's feeling of involvement in the work group and to determine if the group's general ability to bring its expertise to bear affected this relationship. We draw on two elements of social identity theory as portrayed by Ashforth and Mael (1989) to argue that the group's ability to bring expertise to bear can compensate for lacking inclusiveness by providing the individual with a successful self-defining attribute from the group. The empirical study confirmed our theoretical assumptions.

Theoretical contributions

Using Ashforth and Mael's (1989) notions on social identity theory, this study offers a model for understanding how different types of interaction with different purposes may supplement

each other in fostering individual involvement in multilingual organizations. We show that there is a buffering moderation of achievement-oriented group activities on the relation between inclusiveness-oriented interaction and feeling involved in the work group. Hence, we extend the existing literature by providing a new model for the connection between different types of group activities in multilingual organizations.

Contribution to the literature on group inclusiveness

A number of studies have explored the effects of perceived and actual inclusiveness in relation to group and individual level outcomes (e.g. Hobman et al., 2004; Homan et al., 2008). As this body of literature has mainly dealt with domestic group inclusiveness, language has only received scant attention. Our study suggests that group level openness towards language diversity is important for individuals' involvement in the multilingual group. This emphasizes the need for group members to be able to embrace the challenges of having to communicate in different languages. In a self-report sample of academics, Luring and Selmer (2011) found a positive association between individual level being open to language diversity and performance. Being open to language diversity has also been found to have a favorable effect on creativity (Luring & Klitmøller, 2017) and knowledge sharing (Luring & Selmer, 2013) in private and academic organizations respectively.

In our study, we use a multilevel approach to assess the relation between group being open to language diversity and individual involvement to the multilingual group. Accordingly, we offer relatively solid evidence for the effects of group level openness to language diversity on the individual's feeling of involvement in the group. We thus support existing findings on positive outcomes of being open to language diversity. Our study, however, did not assess the

effect of group openness to language diversity on group level involvement, e.g. in the form of group cohesiveness or collective commitment. As other studies have found positive diversity attitudes to have a general impact also on group level outcomes (Homan et al., 2008; McKay et al., 2009), it could be speculated that this would also be the case here. This, however, needs to be explored further in future studies.

Contribution to the management of multilingual organizations

The current study also responds to calls for more research on the management of multilingual organizations (Tenzer et al., 2017). To add new knowledge to the multilingual organization management field, we combine insight from social identity research with findings on group language management. In relation to language management, Tenzer and Pudelko (2015) suggest that a leader of a multilingual group can distract the group from language-related problems by setting a clearly formulated goal. In our study, we find a comparable distracting effect of group achievement such that when the group is successful in utilizing its expertise, the international inclusiveness plays a less important role for the individual to feel involvement. Our findings thus support prior research. We have shown that group level inclusive language positively predicts the individual's involvement to the group. This can be related to the notion in qualitative research by Welch, Welch, and Piekkari (2005) arguing that language-based social exclusion affects individual belongingness to the group negatively. Along this line, our findings also support Homans (2013) indication that task-orientated interactions among individuals are associated with stronger feelings of involvement to the group.

This study's findings regarding the importance of inclusion vs. achievement in multilingual organizations also add novel insight to social identity theory (Ashforth & Mael,

1989). In a number of studies of social identity in work groups (Mael & Ashforth, 1992; Turner et al., 1983) and sports teams (Fink et al., 2002; Funk & James, 2006; Wann, 2006) it is demonstrated that relation-oriented as well as task-oriented activity have positive implications for individual involvement. Our study provides evidence that not only can both dimensions affect feelings of involvement, the two dimensions can also supplement each other. Taking departure in our findings, more research could explore the role of group task achievement for the development of positive emotions and cohesiveness in multilingual organizations. Moreover, while we have focused on multilingual groups, future research endeavors could also assess if the same dynamics exist in domestic organizations although the effect of inclusiveness is likely to be stronger in an international setting.

With regard to practical implications, our study shows that interaction related to inclusiveness and interaction related to achievement can supplement each other. This knowledge could be a useful addition to diversity management approaches that have, so far, mainly focused on facilitating inclusiveness (e.g. Özbilgin & Tatli, 2005). The buffering effect of achievement-oriented interaction offers a two-way interpretation for managers of multilingual workgroups. When multilingual groups feel successful, inclusive interaction can be mitigated, as individuals are proud of being a part of the ‘winning team’. This, on the other hand, implies that managers, when groups are less successful, must pay more attention to the inclusive behavior of the group in order to ensure individual involvement.

Limitations

This study is not without its limitations. First, the sample size is relatively small on the upper level. However, this is often the case in multilevel research, and our statistical results are quite

unambiguous. Moreover, in connection to the sample size on the upper level, we follow the recommendations put forth by Rabe-Hesketh and Skrondal (2012) about a minimum of 10-20 clusters for a random effect estimation. Furthermore, we rely on the argumentation done by Bell et al. (2014) that few upper level observations are not a hindrance for accuracy, but rather for achieving the desired power which is not a problem in our model. Secondly, we used self-rating of individuals' involvement. While this may lead to subjective evaluations, it would be impractical for others to rate an emotional variable such as personal feelings of involvement in a group. Another limitation could be the combination of groups within the university sector and private company work groups. However, the groups are relatively similar as they are all technical-oriented, knowledge intensive organizations engaged with R&D. Furthermore, it has been argued that university departments in recent years to a large extent have come to resemble private companies (Krejsler, 2006). Hence, the functioning of multilingual university work groups may not be particularly different from those in engineering, biotech, IT consulting, or R&D. In such organizations, many employees also have high education levels (often MBA or PhD) and international experience that resemble those of academics (cf. Kim & Park, 2010; Yenyurt, Townsend, Cavusgil, & Ghauri, 2009). To ensure that our results are not affected by the type of organization, we control for this (cf. Tsui et al., 1992).

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Appendix 1

		Theoretical model CFA - std. coeff.	Marker CFA - std. coeff.	Change in std. coeff.
Bringing expertise to bear	BEB1	.75	.74	0.01
	BEB2	.47	.47	0
	BEB3	.70	.70	0
	BEB4	.70	.70	0
Openness to language diversity	OLD1	.71	.71	0
	OLD2	.68	.68	0
	OLD3	.85	.85	0
	OLD4	.54	.54	0
Involvement	INV1	.61	.60	0.01
	INV2	.64	.64	0
	INV3	.84	.84	0
	INV4	.84	.84	0
	INV5	.83	.83	0

Chapter 5

Language inclusiveness in international R&D workgroups: The moderating role of sector affiliation

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Abstract

A number of studies have shown that inclusive behavior in diverse work groups can affect the group's performance positively. Less, however, is known about how the organizational context influences this. Using data from 1118 respondents in 29 multicultural technical and culturally diverse work groups in both private business organizations and universities we explore inclusiveness, in the form of openness to language diversity, as mediating the relationship between the knowledge held by the diverse group and the group's performance. We also assess the moderating effect of organization type distinguishing between private business organizations and universities. Our findings confirm our predictions about openness to language diversity mediating the effects of the groups' held knowledge on its performance. Moreover, our findings show that this effect is more pronounced for university based diverse work groups compared to those in private business organizations.

Keywords: openness to language diversity, multicultural, work groups, language

INTRODUCTION

Cultural diversity is argued to broaden group knowledge which positively affects performance in international organizations (Pieterse, van Knippenberg, & van Dierendonck, 2013). This is in particular important for technical private business organizations and universities, as they often rely on multicultural work groups. The downside to such international heterogeneous work groups is the potential for conflict and exclusive behavior arising due to differences in languages and cultural backgrounds, often described as the ‘double edge sword’ (Milliken & Martins, 1996; Phillips, Northcraft, & Neale, 2006). Scholars have grounded such difficulties in diverse organizations in social categorization theory, as group members tend to categorize distinct different others as “them” versus “us” (Ashforth & Mael, 1989; Tajfel & Turner, 1986). This has led researchers to investigate the importance of inclusive behavior in multicultural organizations as a remedy towards negative effects of dissimilarity (McKay et al., 2007; Mitchell et al., 2015; Mitchell, Nicholas, & Boyle, 2009; Nishii, 2013).

One way to mitigate categorization is by introducing inclusive behavior through line managers, who are argued to provide directions for the work group members. This can be on matters like culture and communication, but also by fostering motivation to collaborate (Cook, MacKenzie, & Forde, 2016). First off, line managers navigate different organizational logics, and therefore apply to different communication practices (Bartunek & Rynes, 2014). In private organizations, line managers have been argued to reduce problems connected to group diversity (Mitchell et al., 2015). For university organizations, the role of the line manager is, on the other hand, described as less profound. This is because university organizations, according to (Mintzberg, 1979) are ‘professional bureaucracies’ in where academic activities are loosely coupled (Weick, 1976). To follow Musselin’s (2013) argumentation, academic institutions rely

less on direction from line managers. In that sense, academic work groups are collectively negotiating a direction for their work through frequent communication between the members themselves, rather than this being pointed out by a line manager. Hence, it can be argued that there are some clear distinctions between the role of line managers in private business organizations and universities (Anderson, 2008; Barry, Chandler, & Clark, 2001). This may well also relate to language use in communicating the members' knowledge.

Differences between the university and the private business sector have been examined in several studies (e.g. Betz, 1996; Bower, 1993; Perkmann et al., 2013). This has been the case especially since the triple-helix framework gained more attention (See. Etzkowitz & Leydesdorff, 2000; Leydesdorff & Etzkowitz, 1996). Much focus on the university-industry connection has naturally been directed toward the transfer of information and the collaboration between the two entities (Bekkers & Freitas, 2008; Kingsley, Bozeman, & Coker, 1996; Monjon & Waelbroeck, 2003). Here, it has been argued that industries, particularly within biosciences, IT, nanotechnology, engineering, and pharmaceuticals, benefit from knowledge spillover arising from a university collaboration (Cohen, Nelson, & Walsh, 2002; Meyer-Krahmer & Schmoch, 1998; Zucker, Darby, & Armstrong, 2002). In this regard, it has also been indicated that academics increasingly either get jobs or do consulting in private business organizations (Tether & Tajar, 2008). Yet, researchers have found that even though research units in both the private and the public sector might look similar on the outside, university research units are based upon a different business model and organize their work differently than those in private business organizations (cf. Giannopoulou, Barlatier, & Pénin, 2019; Readman, Bessant, Neely, & Twigg, 2018).

Research and Development (R&D) units in private business organizations and universities have been found to often have an international outlook. This helps them to maintain global best

practice and attract new talent internationally (Tarique & Schuler, 2018). Given the international environment, group compositions are often multi-lingual and the use of a common ‘corporate’ language is central for work group functioning. In this regard, scholars argue for a positive effect of promoting an international inclusive environment in relation to language (Lauring & Jonasson, 2018; Tenzer, Terjesen, & Harzing, 2017). This is because shared language as a common ground is argued to be a strong predictor for cohesiveness in groups (Giles & Johnson, 1981). As international language use is important to collaboration both in private businesses and universities, it is important to investigate how work place inclusiveness differs for two such similar, yet different types of multicultural organizations. This is because the effect of inclusiveness varies in different organizational environments and hence the organizational context may be more important than often assumed in diversity research.

Therefore, this study investigates technical skilled knowledge workers in private business and university R&D work groups in terms of differences in the role of inclusive language use and its influence on group performance. The aim of the study, therefore, is to provide a better understanding about how linguistic inclusiveness actualizes the group’s knowledge resources differently in different sectors.

The article begins with a theoretical section, where we first outline a theoretical background for inclusive group behavior. We then predict that inclusiveness in relation to language use will positively mediate the relationship between technical knowledge held by the work group and its performance. Secondly, we explore if the relationship between linguistic inclusiveness and group performance is moderated by the sectors, to which the work groups belong. Here we anticipate that inclusiveness is more needed in academic work groups. We test our hypotheses empirically

using survey data collected from a sample of technical work groups in multicultural private business and university organizations, and conclude with a discussion of the results.

THEORETICAL BACKGROUND

Diversity has been argued to often increase negative group dynamics and reduce performance consequent to social categorization processes (Ashforth & Mael, 1989; Mohammed & Angell, 2004; Tajfel & Turner, 1986). A social categorization perspective on diversity holds that the perception of similarity and dissimilarities between group members provide a clear basis for stereotyping. This is the process of dividing different individuals into distinct subgroups by a set of group attributes which characterize one group and differentiate it from others (Hornsey, 2008). A way to deal constructively with the negative effects of group diversity has been to introduce inclusive practices in organizations. The number of publications on inclusive behavior within groups and organizations have been growing in the last decade (Mitchell et al., 2015; Nishii, 2013; Nishii & Mayer, 2009). Inclusiveness has been argued to be of key importance when organizations seek to mitigate potential conflicts arising from different opinions viewpoints (Gelfand, Nishii, Raver, & Schneider, 2005; Stewart, Volpone, Avery, & McKay, 2011).

Research on organizational inclusive climate dates back to the 1930s (Lewin, Lippitt, & White, 1939). Group inclusiveness encompasses a group attitude in where acceptance and tolerance exist despite differences in language and cultural background (Ibarra, 1993; Shore et al., 2011). As such, inclusiveness is found to reduce conflict in heterogeneous groups and enhance commitment (Sliter, Boyd, Sinclair, Cheung, & McFadden, 2014). In this regard, language is suggested as one of the strongest predictor of inclusion and exclusion in groups (Giles & Johnson, 1981; Giles & St Clair,

1979). Language inclusiveness could be conceptualized as a form of interaction that allows group members to take part in the dialogue regardless of inherent language differences (e.g. variations in accents and linguistic skills) (Lauring & Jonasson, 2018). In this line of thinking, scholars found that inclusiveness directed towards language in work groups is associated with feelings of belongingness (Lauring & Klitmøller, 2015; Tenzer & Pudelko, 2015). We generally argue that a group's inclusive linguistic behavior, i.e. openness to language diversity could explain some positive group outcomes in multicultural organizations by minimizing social categorization, increase the communication frequency. This will promote collaboration and the utilization the group's resources. For example the needed knowledge held by the group.

MODEL DEVELOPMENT AND HYPOTHESES

Technical knowledge and linguistic inclusiveness

Technical knowledge in work groups mainly creates value to an organization by workers using it to solve a problem. However, as organizations operate in dynamic and changing environment, new problems continue to emerge requiring novel knowledge. An important source for new knowledge is colleagues in the organization (Nonaka & Takeuchi, 1995). Here it is important that knowledge is shared by the members of the organization, and for this language and communication is central (Lauring & Selmer, 2011). This is because for work groups that hold technical knowledge, inclusive language use in various activities allows group members to present, locate, share, create, and apply knowledge among each other (Jackson, Chuang, Harden, & Jiang, 2006).

To effectively achieve positive outcomes of knowledge in diverse organizations, scholars suggest that organizations, should reduce the employees attention toward subgroup distinctions,

such as cultural and linguistic differences (Brewer & Gaertner, 2001). Practically, this implies that organizations should redefine group boundaries and support inclusive behavior, so that possible negative effects of dissimilarity is reduced (Allport, 1954; Brewer & Gaertner, 2001; Dovidio & Gaertner, 2000; Gaertner et al., 1999). In this regard, inclusive behavior has been shown to mediate diversity on various group related outcomes (Jehn, Neale, & Northcraft, 1999; O'Reilly, Caldwell, & Barnett, 1989; Pelled, 1996; Schippers, Den Hartog, Koopman, & Wienk, 2003). In relation to language, studies have shown that perceived openness to language diversity leads to increasing knowledge sharing behaviour (Lauring & Selmer, 2013), enhanced creativity (Lauring & Klitmøller, 2017), and improved performance (Lauring & Selmer, 2012). This could be explained as heterogeneous work groups with a high frequency of communication was shown to also perform well (Roberge & van Dick, 2010). Especially relevant to our study, Schippers, Den Hartog, Koopman, and Wienk (2003) found that communication between group members positively mediated the relationship between the groups' knowledge and its performance. We therefore expect openness to language diversity to be particularly important for a diverse group's performance as it allows the group to utilize its inherent knowledge resources. Accordingly, we propose the following hypothesis:

Hypothesis 1: Inclusive language use will mediate the positive relationship between the extent of needed knowledge held by a diverse group and its work performance.

Different Sectors

Line managers in private business organizations has been found to reduce various categorization processes among employees in diverse settings (Chrobot-Mason, Ruderman, & Nishii, 2013;

Kossek & Zonia, 1993). In connection to this, studies found leadership in private businesses to be of utmost importance for directing inclusive behavior (Eisenbeiss, van Knippenberg, & Boerner, 2008; Luring & Jonasson, 2018; Mitchell et al., 2015). In this line of thinking, Randel et al. (2018) suggest that inclusive leadership will positively affect members' perception of inclusion and this, in turn, will relate positively to behavioral outcomes, such as favorable group identification and feeling of belongingness. Following this, line managers in private business organization will guide subordinates' collaboration practices but also mediate problems arising due to for example cultural differences. Ben-Menahem, von Krogh, Erden, and Schneider (2016), in their ethnography, showed how work groups in private business organizations at all times aligned communication across diverse specializations on emerging problems. In doing so, they demonstrate the important role of the line managers in such communication activities (Ben-Menahem et al., 2016: 1321). Here, the leaders were found to act as facilitators of inclusive behavior between employees holding diverse viewpoints. Hence, in private business organizations inclusion is often located at the nearest leader, who also becomes the promoter of inclusive behavior within the groups (Pless & Maak, 2004).

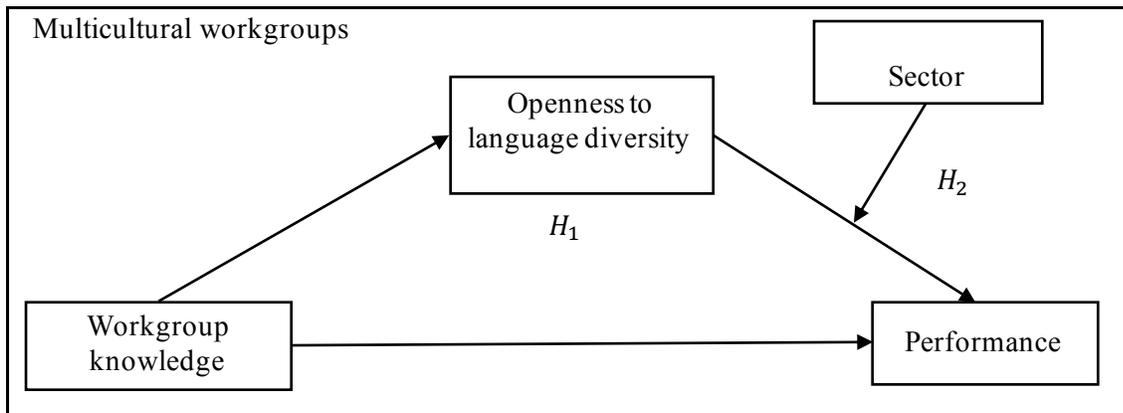
Academic researchers' knowledge creation has been described as trying to answer important questions by learning the nature of a phenomenon in spite of blurry and ambiguous organizational structures, most often with no direct guidance from a line manager (Van de Ven & Johnson, 2006). Aghion, Dewatripont, and Stein (2005) portrayed university employees as navigating universities as egalitarian organizations, with little to no hierarchical structures. In that sense, university employees are less dependent on line managers for using their common knowledge (Biglan, 1973). Instead utilization of internal resources is conditioned by the group's own collaborative effort. Hence, inclusive behavior could be argued to be more needed in

university work groups to effectively enable collective problem solving and participation in the common use of each other's knowledge resources (Pless & Maak, 2004). In other words, in multicultural university groups leadership has less influence on collaborative outcomes.

To summarize, for groups affiliated with the academic sector, positive attitude and inclusiveness is more needed to gain the benefits of diverse groups' knowledge resources (Mor-Barak, Cherin, & Berkman, 1998; Nishii, 2013). This is compared to work groups within the private business sector, where line managers are likely to provide direction and mediate potential problems connected to linguistic cultural diversity. Accordingly, we hypothesize the following:

Hypothesis 2: Sector affiliation will moderate the relation between group inclusiveness towards language use and group performance. This moderating effect will be such that, for private business work groups inclusiveness will have a lesser effect on performance as compared to work groups in universities.

Figure 1: Conceptual model of diverse knowledge on performance



METHOD

Sample and data collection

To validate the presented conceptual framework data was collected from employees using questionnaire collections. More precisely the targeted workers was hired into a technical position in private business organizations or was working as a researcher within technical and science disciplines at universities. The targeted firm and university departments was all located in Denmark. Data collection was done by the use of a self-constructed database of e-mail addresses. Firstly, in private business organizations we targeted white-collar employees in department with technical knowledge. During the selection, only Danish owned knowledge-intensive organizations with more than a 1000 employees located in Denmark was targeted. From the list, we target and contacted the ten most internationalized companies. We did this by foreign nationals working in Denmark at the department. Five of these ten companies return with a positive attitude towards the data collection. Within these five firms, those with most diverse departments in terms of foreign staff and technical expertise in each company was selected. A total of 981 employees were invited to participate in the survey and eventually 676 responses were received amounting to a response rate of 69 percent. The average age of respondents was 41.4 years and the average tenure was 11.2 years. The average number of languages spoken on a daily basis in departments was 2.4. From round one we end up with a total of 13 departments from private sector organizations. Secondly, we sent to the employees within the academic sector. The academic segment consists of Ph.D. students, Associate Professors and Professors. Academic respondents were all affiliated with a work group within natural sciences, at the sciences and technological research departments. In similar way to how we targeted private business departments, we did the same for universities in doing the data collection, albeit not firms, we extracted the data from a larger investigation of all

science departments from three larger universities in Denmark. Development of a database with the e-mail addresses from these departments was conducted. In total we got 16 departments, including traditional disciplines such as, Chemistry and Physics but also newer and more specialized research areas such as Nanotechnology. Science was target due to the similarity to the workers participating in the private knowledge intensive company survey. The data was collected electronically, and a commercial web survey software package was used to administer the questionnaire. The potential respondents were assured of anonymity and confidentiality. In total 1,022 academics were invited to participate in the survey and eventually, 489 responses were received amounting to a response rate of 47.8 per cent. To mitigate potential common method variance problems (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) we collected the data from multiple sources and at different time periods.

The database was for major purpose collected and created for this study. Thus, after data alignment and data cleaning we end with a final sample 1118 technical workers in 29 different multinational departments. Of the 1118 technical workers in the sample 571 (51%) of these were women and 547 were males. Average age in the sample is 39.6 years, this was a bit higher for the female sample, they had an average age of 40.1 years and for the men it was 38.9 years. The average tenure for the sample 15.3 years, this was lower for the females in the sample with an average of 13.9 years of tenure versus 16.8 years for the males in the sample.

Measures

All items used for the study was measured on a 7-point Likert scale. The level of analysis for our hypothesis testing was at work-groups. We follow recent research (Schaubroeck, Lam, & Cha, 2007) and used two intraclass correlation coefficients (ICCs) to assess whether aggregation from individual to group level could be justified (Raudenbush, Bryk, Cheong, Congdon, & Du Toit,

2004). The ICC(1) indicate the extent of agreement in rating of members belonging to same team. ICC(2) provides an indication whether the group differentiate on the basic of variable under consideration.

Independent variable: ‘Workgroup knowledge’ is the explanatory variable and it refers to groups perceived value of knowledge embedded within their work-group affiliation. This follows the thinking of McGrath and Argote (2001) with knowledge repositories. Work-group knowledge was assessed by a four item, seven-point scale. A Sample item could be: “Work-group members have a good ‘map’ of each other’s’ talents and skills”. Cronbach’s Alpha is measured to .860. ICC(1) was .09, $F(28,1118)=5.1$, $p=.000$ and the ICC(2) was .60 and r_{wg} for group knowledge was .78

Mediating variable, inclusiveness: The group’s openness to language diversity

Openness to language diversity was measured by a four-item, seven-point scale by Luring and Selmer (2012) measuring how inclusive or exclusive group members are in their interaction with other despite of language barriers. One sample items is: ‘Department members make an extra effort to listen to people speaking different languages’. Alpha .87, ICC(1) =.14, $F(28,1118)=7.10$, $p=.000$. ICC(2)= .53 and $r_{wg}=.79$

Dependent variable: Group work ‘performance’ is the dependent or the outcome variable for the test of the quantitative hypothesis. This scale is connect to organizational performance escribed in literature review and this variable is normal outcome variable to test for the effect of having knowledge and the ability to share knowledge as proposed in hypothesis 1a. The scale is measured by a six item, seven-point scale, where two of them are reversed. The items are constructed by inspiration of (Martins, Milliken, Wiesenfeld, & Salgado, 2003). Sample item: “This department has a positive view of itself”. The internal validity is measured by the Cronbach’s alpha for the

department success to .858. ICC(1) was .21, $F(28,1118)= 12.18$, $p=.000$ – and ICC(2) and r_{wg} was calculated to .40 and .84 respectively.

Sector is a variable that relates to where the participants stems, they are either employed within the a university or the private business environment. The variable is dichotomous with the 0=academic and 1=business, this provides a strong predictor when sector belonging is used to investigate the differences between the two types of organizations.

Table 1: Means, Standard Deviations, and Intercorrelations of Variables

	Mean	SD	1	2	3
1. Group Performance	5.411	.632			
2. Openness to Language Diversity	5.264	.402	0.7278**		
3. Workgroup knowledge	4.930	.431	0.8025**	0.5334**	
4. Sector	.448	.506	0.5578**	0.4183**	0.4038**

n=1118 * $p<.05$ ** $p<.01$

RESULTS

In following section, we follow the work of previous research done with similar research design (Eisenbeiss et al., 2008), accordingly we firstly report measurement model evaluation analyses of the scales to ensure discriminative validity, follow by an aggregation analyses. For hypothesis testing we rely on the procedures developed and well-tested by (Preacher, Rucker, & Hayes, 2007) in order to assess the effects on the moderation of the mediation.

Measurement model evaluation

To ensure discriminative validity of work group knowledge, openness to language diversity, and group performance, we performed confirmatory factor analyses for different models. We firstly report the hypothesized three-factor model containing work group knowledge, openness to

language diversity, and group performance. Afterwards, assessing of two alternative two-factor models was done. Lastly, we did the discriminative validity analyses by testing an alternative one-factor model. As expected, we found the three-factor model, χ^2 (293, N=1118), CFI = .97, RMSEA = .05, SRMR = .03, indicate a good fit, whereas both the two factor models χ^2 (1491, N=1118), CFI = .8, RMSEA = .13, SRMR = .11, indicate poor fit. Lastly, the one-factor model, χ^2 (2465, N=1124), CFI = .67, RMSEA = 0.17, SRMR = .11, indicate very poor fit. This confirm our use of the hypothesized three-factor measurement model and we can now evaluate aggregation to group level.

Aggregation evaluation

First off, the analysis of within-group variance. In order to justify aggregation of individual group member responses to the group level, interrater agreement were calculated following the formula proposed by James, Demaree, and Wolf (1984) for all three theoretical constructs, work group knowledge, openness to language diversity, and group performance, respectively. As showed above all of them are higher than the critical cutoff value of .70 (James et al., 1984). In addition, the ICCs were also calculated which also indicated a satisfied results. Thus overall, do these results suggest that requirements for aggregation are met – allowing us for aggregation.

Hypothesis Testing

Table 1 shows the descriptive statistics of all variables in the study and correlation matrix for all these variables at the group level. In order to test hypotheses, thus our overall theoretical model (see Figure 1), we utilize the procedure presented by Preacher et al. (2007) to analyze conditional indirect effects. The first, the mediator variable is regressed on the independent variable, and this relationship should be significant. The second step is a multiple regression that predict the

dependent variable from independent variable, mediator, the moderator, and the interaction between the moderator and the mediator. The interaction should be statistically significant. The last step is the indirect conditional effect of moderated mediation. Following Preacher et al. (2007) the conditional indirect effect on model 3, is defined as $f(\hat{\theta}|W) = \hat{a}_1(\hat{b}_1 + \hat{b}_3W)$. Here W is different levels of moderator, \hat{b}_3 are the estimates of the interaction term, \hat{b}_1 is the estimation of relationship between group inclusive attitude and group performance, and \hat{a}_1 is the estimation of the relationship between diverse knowledge and openness to language diversity. The moderator W in the interaction term is a dichotomous variable with a binary outcome (business=1; academia=0), thus, only two levels of conditional indirect effect is worth investigating (Hayes, 2013).

Table 2 present the results of steps described above, firstly, in step one we see, that group knowledge significantly predicts openness to language diversity. The second step, yielded a significant positive mediation (partial) by openness to language diversity on the relationship between work group knowledge and group performance, this provide support for hypothesis 1. Secondly, the interaction between the moderator and the mediator on performance was statistically negative significant on group performance. This interaction we plotted by following (Aiken & West, 1991). Figure 3 shows that private business work groups gain less from openness to language diversity compared to university based work groups on performance. This provides support for Hypothesis 2 as well.

Table 2: Test of Overall Model

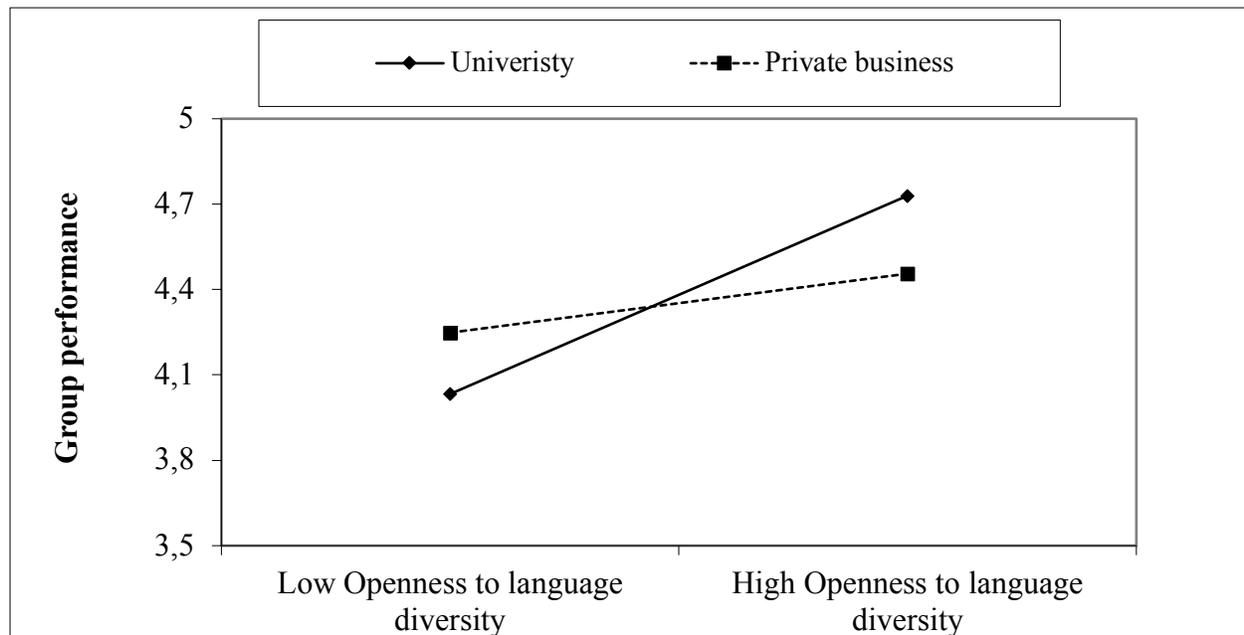
variable	b	SE b	t	R ²
Mediator variable model (Step 1): Openess to language diversity				
Workgroup knowledge	.35	.15	2.27**	.285
Dependent variable model (Step 2)				
Openess to language diversity	.77	.15	5.15**	.827
Workgroup knowledge	.85	.11	7.64**	
Sector	3.2	.95	.3.34**	
Openess to language diversity x Sector	-.61	.19	-3.16**	

Level of deeper knowledge

Conditional indirect effect with bootstrap method	Indirect effect	Differen ces
1st level $35x(.77+ (-.61)x0)$ (baseline=academia)	.27	.21
2nd level $.35x(.77+ (-.61)x1)$ (private business)	.056	

n=1118 *p< .05 **p< .01

Figure 2: Interaction effect between openness to language diversity and sectors on group performance.



DISCUSSION

Based on social categorization theory, this study started out by investigating if inclusive language use mediates the relationship between knowledge and performance in multicultural work groups. The findings indicate that inclusive language use is important for utilizing technical work groups' own knowledge to increase performance. This finding connects well with previous studies who found that communication positively mediates the relation between group knowledge and performance (Schippers et al., 2003). This is also in line with Roberge and van Dick (2010) who found that higher frequencies in communication positively influence work groups performance. Our results also support findings in research focusing on inclusive behavior among group members (Mitchell et al., 2009; Nishii, 2013). This is by showing the importance of linguistic inclusiveness for multicultural technical work groups. Moreover, our finding for openness to language diversity in multicultural work groups supports a study by Learing and Selmer (2011), who found that embracing a common language affected knowledge sharing behavior positively.

Research has called for contextual moderators on work characteristics and institutional environment related to diversity (Nishii, Khattab, Shemla, & Paluch, 2018). While inclusiveness remains important for multicultural work groups, this study shows that for organizations, the effect of language inclusiveness varies in the two examined organizational contexts. We find, that more inclusive behavior is needed for university than for private business work groups. Thereby not saying that linguistic inclusive behavior is unimportant for private business R&D work groups, which the overall model clearly indicates it is. Rather we found that for lower score of openness to language diversity, private business work groups are performing better than university groups. By interpreting the interaction, there is a clear indication that university-based work groups benefit

substantially from inclusive behavior. Similarly, the conditional indirect effect provided a clear indication about inclusive behavior having greater effect on performance for university work groups. As such, this study try to make a comparison, albeit a bold one, between private business and university work groups. This comparison is important in continuing the investigation of linguistic diversity in international organizations. Hence, the finding that the importance of the need for inclusiveness can vary for groups depending on the organizational context contributes to the stream of literature examining moderating contextual effects in inclusive research. (e.g. Gonzalez & Denisi, 2009; Jonasson, Luring, & Guttormsen, 2018; Joshi & Roh, 2009; Kearney, Gebert, & Voelpel, 2009). The Importance of the context implies that inclusiveness strategies, training schemes and polices should be implemented according to the organizational context the multicultural group appears in.

Managerial implications

Our findings have important implications for practice. First, for multicultural knowledge-intensive organizations inclusiveness should be prioritized as we find such attitudes to be important for group performance. In particular, our finding indicates that enhancement of inclusive language use is important. Practically, inclusiveness towards language use can be improved at the individual and organizational level. For individuals, training of diversity awareness has been reported to have a positive impact on group behavior (Kulik & Roberson, 2008). This may also be the case for language diversity.

At the organizational level, policies to promote inclusive behavior among workers speaking different native languages can be applied. Emphasizing, from the management level, that

openness to language diversity is important could to ensure that organizational members behave and collaborate despite working in multi-lingual groups. At the lower managerial level, having a visible line manager whose function includes promoting group inclusive behavior has been found to be positive for creating inclusive attitudes in organizations (Mitchell et al., 2015).

We focused on private business organizations and universities and found that inclusiveness is most important in the academic sector. In universities, the top level management should make strategies and policies to foster positive inclusive attitudes towards diverse language use. Such an aim from the top management is important as universities strategically strives to develop an international environment (Jonasson et al., 2018). This, for university-based work groups, could imply that management communication should preferably be done in English, as such initiatives has been found to increase openness to language diversity among academics (Lauring & Selmer, 2012).

Limitations

This study is not without its limitations. First, although the number of individuals is substantial for this study, the sample size is relatively small on the upper level. However, finding significant relationships and especially moderation effects in relative small samples indicates large effect sizes (Cohen, 1992). Moreover, the sample size is suitable when following the recommendation by Rabe-Hesketh and Skrondal (2012), as they argue for a minimum of 10-20 cluster for a random effect estimation. By our aggregation to the upper level we rely on the argumentation done by Bell, Morgan, Schoeneberger, Kromrey, and Ferron (2014) that small upper level observation are not a problem for accuracy. Secondly, given the nature of a cross-sectional design, we cannot draw any

causal conclusions nor be sure that the mediated relation occurs in the hypothesized direction. A longitudinal research design would be suitable for such claims. Finally, we theoretically argue that the organizational context is particular connected to the role of the line manager when arguing for a difference between private business organizations and universities. It would therefore have been beneficial to include line managers in the sample. Hence, for future research aiming to investigate this organizational difference in inclusive language use further, we encourage that the line manager's role is included in the study design.

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Chapter 6

What makes foreign specialists stay? Embeddedness and foreign STEM workers' likelihood to stay or leave Denmark

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ABSTRACT

Globalization of labor markets have provided specialists opportunities to work around the world. In the war for talent, firms and countries struggle to retain specialists and avoid their next position is in another country. This study proceeds to investigate retention of international skilled STEM workers in Denmark, by the use of a longitudinal research design, using a dataset including 73,998 individual-year observations. The paper focus on the effect job and community embeddedness on STEM immigrants' likelihood to stay in Denmark. Results indicate both types of embeddedness are important yet in different ways. Community embeddedness appear mostly to be associated with a higher probability to leave, whereas job embeddedness increases likelihood of staying. Having a spousal increases likelihood to stay except when the spouse share a person's foreign nationality. Implications for research and practice are discussed.

Introduction

One central result of the internationalization of businesses is the expanding number of university-educated individuals who choose to become global workers and permanently, or semi-permanently, work in countries other than their own. So far, the scholarly conversation has explored topics such as the importance and impact of skilled international immigrants in both businesses and nations (Carr, Inkson, & Thorn, 2005), “the war” on global talent (Cappelli, 2008; Schuler, Jackson, & Tarique, 2011; Tarique & Schuler, 2010), and the connection between global migration and knowledge flows when skilled immigrants act as knowledge agents moving between countries (Minbaeva, Pedersen, Björkman, Fey, & Park, 2003; Oettl & Agrawal, 2008; Wang, 2015). This focus on skilled professional immigrant workers is merited as they bring transfer global knowledge and practices, and are said to be key drivers for innovation process (Truelove & Kellogg, 2016). However, as illustrated research has mostly been focused “global workers” as workers who contribute to firms and firm processes. We argue that too little attention has been paid to the word “global” and what causes skilled immigrants to stay or leave a foreign country of residence.

Generally, the literature states that skilled immigrants bring diverse thinking to a host country and proactively contribute to the development of international human capital in firms which are then helped to stay on top of best global practices (Morris, Snell, & Björkman, 2016; Stahl, Tung, Kostova, & Zellmer-Bruhn, 2016). Scholars of sociology and labor economics, however, have also been interested in skilled immigrants and how they affect the cultural diversity at both country-level and smaller (micro) communities of society (Abascal & Baldassarri, 2015; Putnam, 2007). As a result of this research, scholars have been investigating the effects of immigrants sorting into certain neighborhoods and how this sorting mechanism connects to

different labor market outcomes such as job retention (Damm, 2014). Moreover, labor economists have been particularly interested in the effect of neighborhood quality, including being embedded in network structures, on labor market outcomes for immigrants (Borjas, 1995; Hellerstein, McInerney, & Neumark, 2011). Relatedly, an emergent stream of management literature holds that in a modern global career, a good family life has a positive impact on, for example, expatriates' and highly educated immigrants' work-life decisions and success (Greenhaus & Powell, 2012; Powell & Greenhaus, 2012; Takeuchi, Wang, & Marinova, 2005). This line of literature underlines the complex interplay of work-life and private-life factors that shape the career trajectories of mobile international workers, however most are interested in the careers within a country and few focus on the question of what makes a person stay or leave the country of current residence.

Skilled professionals migrate because of job opportunities, career development, and income perspectives (Barrett & O'Connell, 2001; Gill, 2005; Suutari & Brewster, 2001). Despite this initial motivation for going abroad, research has found that skilled immigrants sometimes 'go native' (Gregersen & Black, 1992) and begin to assimilate to host country norms and values by adaptation and acculturation (Berry, 1997). We conceptualize this a dual process of embeddedness which is shaped by social interaction and relations (Granovetter, 1985; Polanyi & MacIver, 1944). in both job-embeddedness (Mitchell, Holtom, Lee, Sablinski, & Erez, 2001; Ragins, Gonzalez, Ehrhardt, & Singh, 2012; Tharenou & Caulfield, 2010) and community-embeddedness related to the private life (Ng & Feldman, 2012).

Specifically, we study how embeddedness influences foreign STEM (Scientists, Technicians, Engineers, and Medical professionals) immigrants who are working in firms in Denmark. We focus on the "stay-or-leave" decision that is inherent in the life of global workers and which have not been widely studied. We argue that social embeddedness in the workplaces as

well as in private life is important yet not in straightforward ways. Research on embeddedness suggests that being part of a social community may provide social comfort and opportunities for success that ties a person to a given place, but also provide knowledge about opportunities and work and living conditions other places that increase the likelihood of a move to another country. Focusing on the individual-level job and community embeddedness of foreign STEM immigrants, we aim to answer the following question: *To what extent does an individual's job and community embeddedness matter in foreign STEM workers' decision to stay in or leave the host country?*

To gain a greater understanding of why foreign STEMs stay in a country or leave, our analysis focuses on the individuals' within-country embeddedness of foreign STEM workers in Denmark by using the Integrated Database for Labor Market Research (referred to by its Danish acronym, IDA). As speculate, we find, through our longitudinal register data, that embeddedness in different forms ties skilled immigrants to the host country. Particular do international professional workplaces create a need of belonging for skilled immigrants. Similar effect we find for skilled immigrants having spouse versus those without a spouse. On the hand, our findings also give an indication of embeddedness as an access point, to global knowledge and knowhow within their local community, that reinforce the pull of skilled immigrants away from the host country. We will elaborate further in the sections below.

Theory

Foreign STEM workers can be categorized into a wide range of definitions and acronyms such as skilled immigrants (SIs), organizational-expatriates (OEs), self-initiated expatriates (SIEs), and, lastly, qualified immigrants (Qis). For this study, we operationalize our STEM worker target group as highly skilled immigrants following the definition by Tharenou (2015: 162):

“Managerial, professional and technical persons usually holding at least a bachelor's degree gained in their home country and a skilled occupation, who self-initiate migration for the long-term usually to settle permanently in a new country for reasons of economic motivation, career progress, lifestyle, establishment of better lives and living conditions, and/or family and relationships, either migrating through employer sponsorship of a job in the new country or independently by a skilled migration program seeking to gain employment once there.”

The work by Portes and Sensenbrenner (1993) highlighted the importance of social structures for immigrants in the US, and they argue that social embeddedness as a concept is a suitable umbrella to capture various ways in which social structure affects economic action for immigrants. When analyzing embeddedness into local communities, they suggest the use of social capital to identify important social structures. The concept of social capital is well-known in social research (Bourdieu, 1990; Coleman, 1988) and gained massive momentum during the 1990s within management research (Gulati, 1995; Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998; Uzzi, 1997). Still today, scholars are using the concept of embeddedness and social capital within both management and sociology studies (i.e. Ebers & Maurer, 2014; Simons, Vermeulen, & Knoblen, 2016). To understand global migration among STEM workers, in the following we focus on how different types of embeddedness shape the stay or leave decision. Our working definition of embeddedness follows Collins and Mossholder (2017: 294) thinking and relates to why individuals stay:

“Embeddedness refers to forces keeping employees in their positions, focusing on what inspires them to stay rather than what impels them to leave”

Mitchell et al. (2001) introduced the job embeddedness theory as a ‘broad constellation of influences on employee retention’ following the classic idea of job embeddedness as an ‘anti-withdrawal’ construct (March & Simon, 1958). To explain how skilled immigrants’ embeddedness affects individual retention, the push and pull factors by Toren (1976) are useful. As such, the job embeddedness theory proposes three important dimensions: links, fit, and sacrifice, and the authors further argue that these are not only important on-the-job but should also be considered as off-the-job embeddedness dimensions (Mitchell et al., 2001). The three dimensions are defined as follows: *Link* refers to ‘formal or informal connections between a person and institutions or other people’, *fit* helps to understand the ‘perceived compatibility or comfort with an organization’, and *sacrifice* is ‘the perceived cost of material or psychological benefits that may be forfeited by leaving a job’. All three dimensions are connected to factors within (job) as well as outside (community) the organization in which they are working (Mitchell et al., 2001). While research initially focused on the effects of job embeddedness, it has been pointed out that it is necessary to concurrently consider community embeddedness in order to understand how employees perform in their jobs and whether they are likely exit (Ng & Feldman, 2014). Further, we follow the notion by Singh, Shaffer, and Selvarajan (2018: 341) on organization and community domains for embeddedness: ‘organization is where the individual works, and the community is defined as the town, city, or suburb where the individual resides’ inspired by Ragins et al. (2012).

Hypotheses

Embeddedness

While embeddedness can be created in many different ways and may differ from person to person, we focus on the embeddedness that formed when a person works with or lives closer to more similar individuals. For STEM immigrants, the social similarity may, in particular, be defined as

other immigrants sharing similar challenges, and individuals in related employment that may share norms and values and where professional knowledge can be exchanged. Spousal relations constitute a particular type of embeddedness that differs depending on the nationality of the spouse. Lastly, we are investigating the specific location of work and residence. We know from agglomeration economics and theory that firms tend to be clustering in the same area to utilize spillover effects. In Denmark, this is especially visible in the capital area. We speculate this might amplify the effect of embeddedness.

3.1 Community embeddedness

Sociology research has consistently shown that foreigners and ethnic minorities tend to cluster, compound, form communities and small societies within the same geographic areas (Abascal & Baldassarri, 2015; Putnam, 2007). One branch of research indicates that immigrants tend to cluster in areas with people similar to themselves. An example of this was found by Simpson, Gavalas, and Finney (2008) in their study of Asian immigrants in two British cities. The general idea is that people tend and prefer to live among other people who are similar to themselves.

On the other hand, a more recent and longitudinal study by Pan Ké Shon and Verdugo (2015) found that immigrants in France did not exist per se cluster in mono-ethnic clusters, but instead, they lived in areas with high ethnic variety. Thereby, they mobilize embedded social capital structures through their network in the community as it will help the foreign individuals in resolving information asymmetries which is often non-existent for the host-country nationals. For example, some pieces of information are not likely to be known by the locals like how to obtain working permits, health care and different kinds of insurances. Another stream of literature, also on this theme, finds that Danish expatriated workers in Saudi Arabia were clustering with similar people, both in terms of ethnicity and profession (Lauring & Selmer, 2009), which then enhanced

the exchange of information about the host location. The social embeddedness of immigrants in this way, is a pull towards remaining in the host country compared to leaving. Network in certain communities has been argued to increase immigrants' adjustment and hence increase the likelihood of retention. Through actors in the community network, immigrants' uncertainty will decrease due to informational support about the host country institutions (Farh, Bartol, Shapiro, & Shin, 2010). Communities with larger numbers of foreigners, not only professionals like STEMs but also other occupations, will provide useful informational support to all immigrants.

On the other hand, new information of on international jobs and reallocation opportunities may arise in more professionally biased communities based on weak and loose ties (Granovetter, 1973; Yakubovich, 2005). Embeddedness exposes immigrants to a professional international community where information about other international assignments and how life and opportunities are in other countries (cf. Blau, 2017; Brief & Motowidlo, 1986; Farh et al., 2010). In this way, community embeddedness is not only a pull-force but may also be a push-factor. While theories offer partly opposing predictions we expect that foreign STEM workers living in communities with high multicultural diversity will have access to a network that will positively assist them in settling in, resolving problems, and providing information related to life in the new country. It may also be easier to access international products and food which may make life easier in a foreign country. In total, this will increase the likelihood of STEM workers' retention in the host country.

Hypothesis 1a: Clustering with other foreigners will positively affects the likelihood that foreign STEM workers will stay in the host country.

Another type of embeddedness is formed when immigrants live close to other with similar professional background and work. Here we expect the other effect of embeddedness to be dominant. Foreigners may experience professional communities as tightly knit and hard to access

(Portes & Sensenbrenner, 1993). Immigrants come from different educational institutions and are not part of deep social networks. They also do not have as intimate knowledge about firms and work traditions which may make it difficult to engage in a professional conversation with locals. These effects, we speculate, make exit more likely.

Hypothesis 1b: Clustering with other STEM workers negatively affects the likelihood that foreign STEM workers will stay in the host country.

Finally, we look at embeddedness shaped by the combination of a multicultural community where many similar professionals are also living. While arguments go in different directions, we expect this embeddedness increase the likelihood that an individual leaves the host country. We build this on social network theory and the likelihood that this type of embeddedness is likely to be characterized by higher levels of professional information sharing. This provides knowledge about opportunities and work and living conditions in other countries; a knowledge that will perhaps make the STEM immigrants advance in their global careers. The notion by Granovetter (1973) that such knowledge is particularly useful when social relations are weak.

Hypothesis 1c: Clustering with other STEM foreigners negatively affects the likelihood that foreign STEM workers will stay in the host country.

3.2 Job embeddedness

Research on embeddedness at the workplace has found that embeddedness at the workplace strengthens the connectivity between the organization and the worker and lead to the creation of social capital, which in turn is advantageous for the organization as it nurtures stability and success (Holtom, Mitchell, & Lee, 2006; Origo & Pagani, 2009). Skilled immigrants can become job-

embedded in the host country in a way that creates a pull for remaining in the host country rather than leaving. When job embeddedness is high, immigrants that are less willing to sacrifice their current job, salary or colleagues by moving away from the host country.

Moreover, some recent studies indicate that skilled expatriates or immigrants tend to have higher host-country embeddedness due to a strong motivation for workplace engagement (Tharenou & Caulfield, 2010; Van Emmerik & Sanders, 2004; Wang, 2015). Professional communities on the job are argued to enhance professionals' embeddedness in the organization as it fosters strong problem-solving units, transfers of best practices, and helps to develop professional skills (Wenger & Snyder, 2000). Therefore, in strong professional and international workplaces, stronger ties between co-workers may develop (c.f. Nelson, 1989; Rost, 2011). Moreover, Perry, Hunter, and Currall (2016) find a positive association between organization commitment and chosen profession among scientists and engineers.

We expect foreign STEMs working in host country companies who employ a relatively large fraction STEM workers to develop stronger job embeddedness, hence providing opportunities to advance the individual foreign STEM workers' professional skills and social belonging in the workplace. Therefore we hypothesize the following:

Hypothesis 2a: A higher proportion of other STEM workers in the workplace positively affects the likelihood that foreign STEM workers will stay in the host country.

On the other hand, we expect foreign STEMs working in companies with a large among foreigners, but not necessarily high-skilled professionals, to experience lower job embeddedness. In such organizations, there is fewer opportunities for professional development and thus a minimized sacrifice by leaving the host country. This may be further spurred by engaging

immigrants in other professions in the workplace who may provide knowledge and information about life in other countries.

Hypothesis 2b: A higher proportion of other foreign workers in the workplace negatively affects the likelihood that foreign STEM workers will stay in the host country.

Finally, again we consider the combination of nationality and professional similarity among coworkers. We expect the strongest embeddedness to develop in highly internationalized professional organizations, and therefore that these organizations are most likely to be able to retain STEM immigrants. Such organizations are likely to offer vibrant pro-diversity climates that motivate employees and reward good performance.

Hypothesis 2c: A higher proportion of other foreign STEM workers in the workplace positively affects the likelihood that foreign STEM workers will stay in the host country.

3.3 Co-habitation and spousal embeddedness

One central element that shapes stay-or-leave decisions of international movers is their spousal relation. A study by Takeuchi et al. (2005) found that not having your spouse along with you positively affects the expatriates' perceived psychological workplace strains. On the same line, other research found that spouse/family adjustment in a host country is related to expatriate work adjustment (Caligiuri, Hyland, Joshi, & Bross, 1998). In that sense, spousal support might generate a pull to stay in the host country as they will act as moral support and create a feeling of doing it together. On the other side of the debate, some scholars argue that family and spouses can negatively affect whether an international worker stays, or even complete an assignment in the host country (Shaffer & Harrison, 1998). The issue of spouse and family effects in connection to

international management has been called upon by Jaskiewicz, Combs, Shanine, and Kacmar (2017) in their recent review.

The topic of how firms and organizations can foresee challenges and better utilize potential benefits from heterogeneous family types are currently arising in the western world. New family types also include mixed nationally couples. On the other hand, international movers and expatriates have reported that they often have to cope with solitude, self-reflection, and emptiness (Cerdin & Dubouloy, 2004). If the foreign STEM worker is not married when arriving in, for example, Denmark, getting married could change the attitude to host country nationals and thus create a pull to remain, as the foreign STEM worker becomes more personally embedded in the country. Another indication on push and pull comes from expatriate research investigating the spousal effect, particularly less successful ones, on relocation to a host country (Bhaskar-Shrinivas, Harrison, Shaffer, & Luk, 2005; Caligiuri et al., 1998; Hechanova, Beehr, & Christiansen, 2003). The indication is that when the spouse is from the same country as the foreign STEM, there is a push towards the home country and away from host country. That being said, research has noted that those who are married tend to fare better during stay in a host country compared to those international workers that are singles (cf. Thomas, 1998). We expect that having a spouse will positively affect foreign STEMs workers' likelihood to stay in the host country compared to those with no spouse. We further build on existing studies to expect this effect to depend on the nationality of the spouse such that couples from the same home country will be more likely to leave (compared to other types of couples) and couples with a host country spouse will be even more likely to stay (compared to other couples).

Hypothesis 3a: A spousal relationship positively affects the likelihood that foreign STEM workers will stay in the host country

Hypothesis 3b: When the spouse is of the same home country nationality, a spousal relationship negatively affects the likelihood that foreign STEM workers will stay in the host country

Hypothesis 3c: When the spouse is of host country nationality, a spousal relationship positively affects the likelihood that foreign STEM workers will stay in the host country

Methodology

To study whether foreign STEM workers stay or leave their country of occupation as well as their marital situation and embeddedness in community and workplace, detailed, longitudinal data are necessary. Fortunately, these data are available for Denmark in the Integrated Database for Labor Market Research (IDA). This database is perfectly suited for our needs as the register data contains matched employer-employee data with detailed information about employees' demographic and workplace characteristics. We will explain the data structure and variables below, but first introduce Denmark as a research context for this study.

Denmark is a very good case for the present study. As a small and open economy (Pedersen, 2006), Denmark is a country where firms are used to recruiting foreign specialists for high skilled positions. In the population, there is a high degree of English proficiency, and English is a corporate language in many large firms meaning that there is a low language barrier for most foreigner specialists taking a position in Denmark. For many years Danish governments have tried to attract high skilled foreign employees by offering some years of attractive taxation when entering the Danish labor market at relatively high salary levels. These characteristics make Denmark a relevant case for this study. We are able to observe a flow of foreign STEM workers

taking employment in Denmark and explore the factors that are related to whether they leave the country or stay longer.

Data

The IDA data provides matched employee-employer data with yearly observations ranging back to 1980. In the data it is possible to observe the employment of each individual in the Danish labor market as well as a range of individual characteristics and a more limited amount of firm-level variables. The data are hosted by Statistics Denmark and obtained from various public registers including tax records. All data are linked using the unique personal identification number that all Danes receive at birth and foreigners upon immigration.

We constructed our main data set in different steps. First, we excluded all Danes from the data (though they were used to construct some of the variables as described below). Second, we excluded all public sector employee to only focus on foreigners hired by firms. Next, to focus on STEM workers we limited the data to only include individuals with occupation at the “highest skill level”. This is an occupation category defined by Statistics Denmark following occupational categories from the International Labor Organization. Employees in this category are highly skilled professionals working in occupations such as research, development, education, and the medical profession. We contend that “high skilled professionals” is not a perfect operationalization of STEM workers. Yet, the professionals hired by firms are likely to predominantly take on important specialist functions and, as we have excluded employees from the public sector, most teachers and medical professionals will not be in our data.

Due to availability of some of our key variables, our data set include the period from 1999 to 2010. In total, we include 73,998 individual-year observations as unit of analysis. This is

not a sample but the population of foreign professionals working in private firms in Denmark in the period of observation.

Variables

The dependent variable of our study is whether an individual leaves the Danish labor market in the following year to any focal year in our longitudinal data. We rely on Statistics Denmark's record of this. We use the detailed information in the IDA data to construct our independent variables. Our first hypotheses focused on community embeddedness and whether the place of living affects the likelihood that a STEM worker will leave Denmark. Denmark is divided into 98 municipalities and we focus on these as the community-level. The municipalities are too big to make it feasible to know everyone yet they are small enough to make it likely that foreigners and individuals in similar occupations have opportunities to meet and interact in formal and informal networks. We created the variable *Share of foreigners in municipality* as the municipality-level share of foreigners among the employed citizens. *Share of STEM workers in municipality* was created by, for each municipality, dividing the number of high skilled professionals with the total number of employed individuals. Finally, in the same way we created an indicator for the *Share of foreign STEM workers in municipality* as the share of foreigners among all high skilled professionals in the municipality.

For the second set of hypotheses, we utilized that the IDA data matches employees to place of employment. In the data, each firm is divided into a set of separate workplaces if a firm is split in different locations. While the data is anonymized and we do not know what work takes place in each workplace or how work is organized, this does enable us to develop reliable measures of on-the-job embeddedness. Because we are interested in the embeddedness that develops for an employee in his/her immediate work environment, we choose to focus on the specific workplace

(as opposed to the whole firm) as we develop the next set of variables. We follow the approach from the variables above and create: *Share of foreigners in workplace*, *Share of STEM workers in workplace*, and *Share of foreign STEM workers in workplace*. Recall, the last variable indicates the share of foreigners among the group of professionals employed in any given workplace.

The third set of hypotheses look into the marital status of an individual. In the data, we can observe whether a person is married or cohabitating in a marriage-like relation (defined by Statistics Denmark). While the latter is difficult to observe in public records, we believe quite few highly paid foreign professionals would cohabit with a person of different gender (or same) without being in a relationship and follow the official statistics developed by Statistics Denmark. We separate this variable into three dummy variables. *Spouse* indicates whether any spouse is present, *Danish spouse* whether the spouse is a Danish citizen, and *Native spouse* whether the spouse is from the same foreign country as a focal individual.

Finally, we were interested in whether the workplace was located in the capital area which arguably is the only location in Denmark that can be coined a global city. The capital house the government, most major firms located in Denmark, a range of cultural opportunities and attractions, as well as largest airport in Scandinavia.

Control variables

We included a range of control variables that might affect embeddedness and marital status as well as likelihood of leaving Denmark. We include the individual level factors gender, age, and age-squared, as well as salary. Salary information is obtained by statistics Denmark based on tax records and thus highly reliable. For a limited number of individuals salary information was assessed by Statistics Denmark to be of doubtful quality and we excluded these observations.

Likewise, we included a variable indicating the year of employment in the current workplace to measure experience. Unfortunately, we do not have data on year of immigration to Denmark. We also included size of workplace as that may affect embeddedness dynamics as well as size of municipality measured as number of citizens. We also included an indicator of whether a person lives in the Copenhagen area in addition to the main variable indicating whether the workplace is in this area.

Country of origin is likely to be important in determining likelihood to stay or leave a foreign country of residence. Because we do not hypothesize about any home country effects, we chose to include home country dummies for all individuals. This means that all our estimations are with-in home country effects comparing foreign STEM workers with the same citizenship but with different degrees of embeddedness in Denmark. We consider this a strong test as country stable characteristics are controlled such a culture, educational system, economic development etc. We also included year dummies.

Analysis

As the dependent variable is a dichotomous indicator of whether a person leaves Denmark (1) or not (0), we employ a series of logistic regressions. We use year dummies to account for the longitudinal nature of the data and clustered standard errors to address non-independence of our panel data.

It is well known that care must be taken when interpreting outcomes of non-linear models like the logit (Hoetker, 2007). Coefficients provide estimates at the mean but these may change over the range of the variables. Therefore, we calculated predicted probabilities and their standard errors over the full range of our independent variables and display those as our main results.

Statistical significance test can be found in table 1, though it must be emphasized that inference is less meaningful for population data like ours.

Results

The result of our analysis reveals that some of the hypotheses are confirmed while others are not; see table 1 which shows the statistical results of the logit analysis. Firstly, we tested community embeddedness, and our analysis predicts that overall, foreign STEM workers are a bit more likely to stay in the host country when the municipality has higher ratios of other foreigners than others. The plot in figure 1 shows that by a share change of foreigners in the foreign STEM workers municipality from .05 to .3 the prediction for leaving the host country drops by nearly 2%. Hence, these findings confirm hypothesis 1a. The share of other STEMs, both locals and foreigners, indicate that foreign STEM workers are more likely to leave as this increases. The plot for share of STEM workers in the municipality shows that an alteration in a foreign STEM worker municipality in term other STEM professional by .35 increases the likelihood of leaving by 1% confirming hypothesis 1b. When assessing the share of other foreign STEM workers in the municipality, the predictions on a foreign STEM worker's likelihood of leaving, we find that with an increasing share, the likelihood of exits increases. We find this to be a strong predictor as we see in plot in figure that, by an increase of the share from only .02 to .12 the exit predicting increases by nearly 5%.

Table 1. Logistic regressions predicting a foreign professional leaving Denmark

	Model 1	Model 2	Model 3	Model 4
Female	-0.253*** (-5.58)	-0.254*** (-5.59)	-0.247*** (-5.44)	-0.149*** (-3.32)
Age	-0.162*** (-9.57)	-0.160*** (-9.42)	-0.151*** (-8.81)	-0.0934*** (-5.23)
Age squared	0.00123*** (5.86)	0.00121*** (5.78)	0.00112*** (5.25)	0.000540* (2.44)
Hourly pay	0.00188*** (12.49)	0.00183*** (12.06)	0.00188*** (12.47)	0.00168*** (12.09)
Municipality size	0.000000624** (2.88)	0.000000777** (2.58)	0.000000476* (2.18)	9.95e-08 (0.45)
Workplace size	0.000130*** (5.37)	0.000125*** (5.09)	0.000173*** (6.77)	0.000121*** (4.90)
Year of hiring	0.0537*** (7.43)	0.0537*** (7.44)	0.0583*** (8.00)	0.0455*** (6.29)
Live in Copenhagen area	0.341*** (6.11)	0.164* (2.23)	0.312*** (5.63)	0.195*** (3.42)
Work in Copenhagen area	-0.233*** (-4.82)	-0.238*** (-4.80)	-0.282*** (-5.83)	-0.167*** (-3.35)
Share of foreigners in municipality		-3.658* (-2.49)		
Share of professionals in		1.152**		

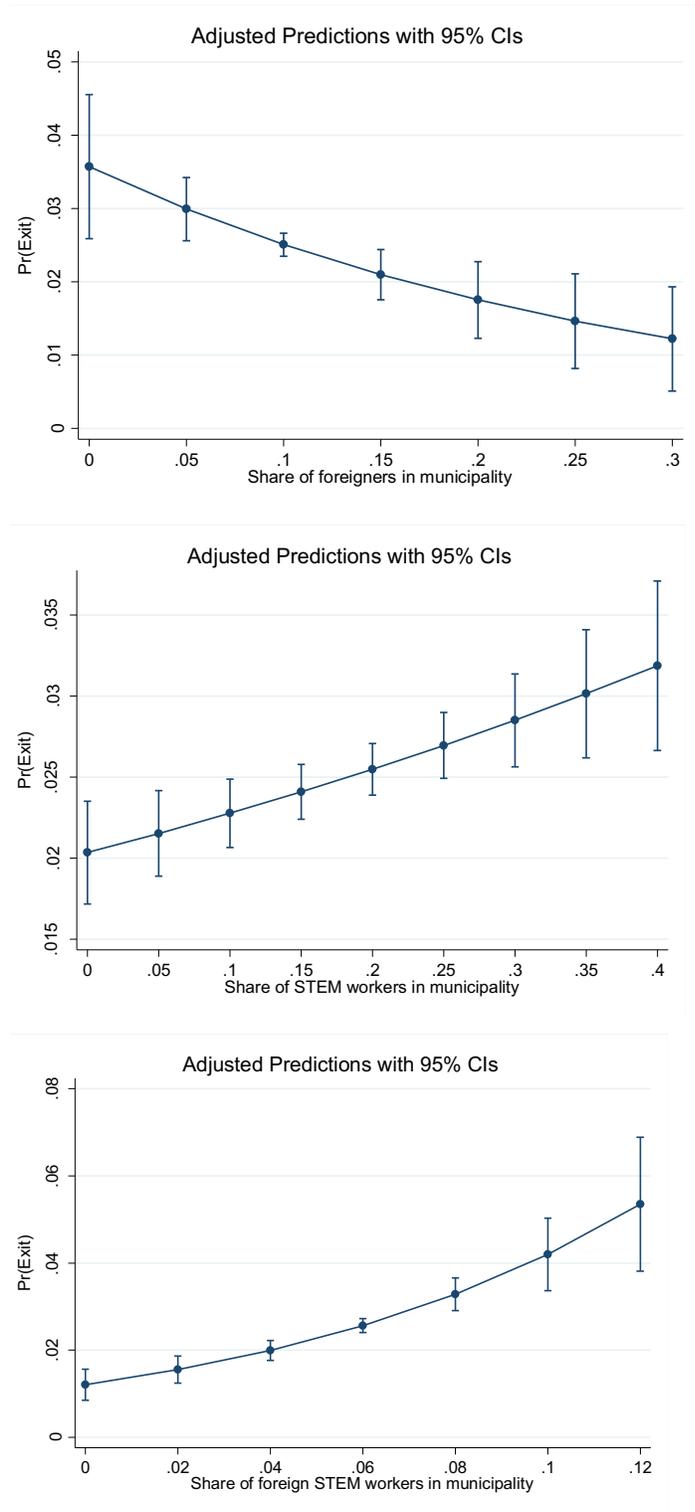
municipality		(2.99)		
Share of foreigners among professionals in municipality		12.76***		
		(5.08)		
Share of foreigners at workplace		1.620***		
		(10.55)		
Share of professionals in workplace		0.00852		
		(0.10)		
Share of foreigners among professionals in workplace		-0.575***		
		(-4.31)		
Spouse				-0.506***
				(-11.00)
Spouse from same home country				0.387***
				(6.27)
Spouse from Denmark				-1.007***
				(-16.37)
Citizenship dummy	Included	Included	Included	Included
Constant	-108.5***	-108.9***	-117.9***	-92.94***
	(-7.50)	(-7.53)	(-8.09)	(-6.42)
<i>N</i>	73998	73998	73998	73998

t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Home country and year dummies included in all models.

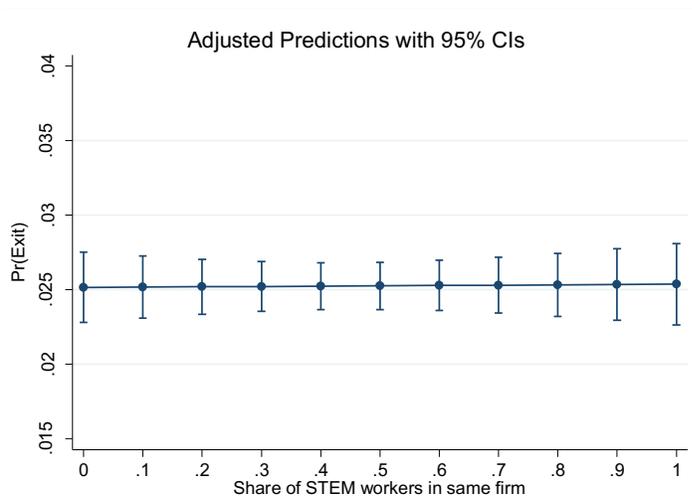
Next, in our analysis, we tested the on-the-job embeddedness in terms of shares of other foreigners, other STEM professionals, and other foreign STEM workers. First, we hypothesized that increasing shares professional networks in terms of other STEM workers at the work place is positively decreasing the likelihood for foreign STEMs to leave. Our analysis, on the other hand, indicates that there is an effect of this, and we therefore find no support for hypothesis 2a. Following this, we tested the effect of a more multicultural work place on foreign STEM workers' retention. We found that with increased shares of foreigners at the work place, foreign STEM professionals are more likely to leave the host country. This is clearly depicted in second plot in figure 2, with increasing shares of foreigners it shows that the moving from a share of .1 to .5 more than doubles the propensity of foreign STEMs leaving the host country. This result provides support for hypothesis 2b. We then tested hypothesis 2c by assessing the likelihood of leaving by the share of other foreign professionals at the workplace. Our test finds support for the hypothesis (2c) as we find that with increasing shares of foreign STEMs at the work place, the likelihood of individual foreign STEMs leaving the host country is decreasing. The bottom plot in figure 2 depicts this relationship as we see that moving from a share of .1 to .5 lowers the exit prediction by roughly 1%.

Figure 1. STEM Embeddedness in municipality and exit from host country



Furthermore, we assess the cohabitation in terms of living together with a spouse, a spouse of same nationality, or a local spouse. We find that cohabitation in general decreases the likelihood of foreign STEMs leaving compared to those who do not live together with another person, and this is clearly shown in table 2. As such, and by the analysis, we find support for hypothesis 3a. Hereafter, we tested the push effect of the cohabitant being from the same country as the foreign STEM worker. The result indicates a push away from the host country as foreign STEMs are more likely to leave the country when the cohabitant originates from them same country. This result supports hypothesis 3b. We then assessed the pull effect toward the host country by testing the likelihood of foreign STEMs staying due to cohabitation with a local. We find that this lowers the likelihood of foreign STEM workers leaving the host country. Therefore, this supports hypothesis 3c.

Figure 2. STEM Embeddedness in same firm and exit from host country



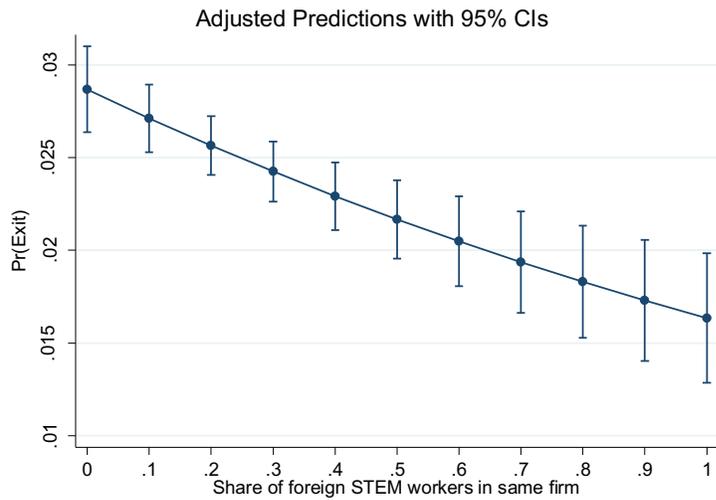
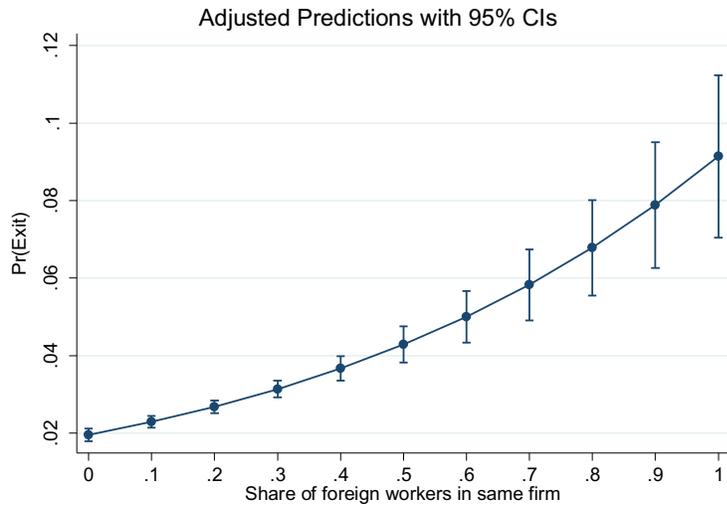


Table 2. Spousal relation and probability of leaving Denmark*

Predicted probabilities of cohabitation on exit for foreign STEM immigrants			
No spouse	Spouse (all)	Same country spouse	Host country spouse
0.0346	0.0211	0.0429	0.0110

*Predictions obtained using Stata's *margins* command based on Model 4 in Table 1.

In addition to our analysis, we test both social and job embeddedness in relation to the capital city of Denmark, Copenhagen. The result of the analysis can be found in table 3 below. We tested both whether there was an effect for living in the greater Copenhagen area, and if the work place is located in that area. Our result shows that there is only a small negative effect of the work place being located in Copenhagen, on foreign professional embeddedness, reinforcing the direct effect. This is implying that being part of more foreign professional job situated in Copenhagen will further decrease the likelihood of the foreign STEM leaving.

Table 3. Embeddedness factors moderated with immigrant work and living in Copenhagen

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
1.work_globalcity #c.relforeignkom	-0.278					
	(-0.27)					
1.work_globalcity #c.relstemkom		0.473				
		(0.80)				
1.work_globalcity #c.relforeignstemkom			-0.743			
			(-0.34)			
1.work_globalcity #c.relstemlbnr				-0.00254		
				(-0.02)		
1.work_globalcity #c.relforeignlbnr					-0.272	
					(-1.45)	

1.work_globalcity #c.relforeignsteml bnr						-0.348*
						(-2.17)
_cons	-118.0***	-118.0***	-118.0***	-118.0***	-117.7***	-117.2***
	(-8.10)	(-8.10)	(-8.10)	(-8.10)	(-8.08)	(-8.04)
N	73998	73998	73998	73998	73998	73998

t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

All models include all controls from Table 1 including year and country fixed effects..

Discussion and conclusions

This paper attempts to address one key question: To what extent does an individual’s job and community embeddedness matter when foreign STEM workers decide to stay in or leave the host country? Thus, our research adds to our understanding of on-the-job and off-the-job embeddedness following (Mitchell et al., 2001) regarding factors that may be associated with skilled immigrants’ individual embeddedness.

Through our analysis, we have produced new insights on a sets of factors that may help us to understand skilled immigrants’ embeddedness on retention. We started off by testing the off-the-job embeddedness operationalized as community embeddedness, which should be dominant for immigrant individuals with global careers in terms of retention (Ragins et al., 2012; Singh et al., 2018). We find that when skilled STEM professionals are residing in a multicultural municipality, this community embeddedness will effectively contribute to a positive retention, thus mitigate the propensity to leave. This finding couples with the results from the study by Pan Ké Shon and Verdugo (2015); namely that some information cannot be resolved or retrieved through social interaction with locals only. We find that living among similar professionals, that is STEMs

who are both local and non-locals, that the community embeddedness is not likely to assist in retaining skilled foreign STEM workers. We went further and tested community embeddedness in municipalities that were similar to the skilled STEM immigrants themselves, being more professional and at the same time very multicultural. We found that such municipalities are likely to increase the skilled immigrant's propensity to leave the host country. Common for both communities with higher ratios of STEMs and foreign STEMs is that the network in which the skilled immigrant resides may introduce opportunities that are good for the career outside the current host country, as it provides access to both professional and international experience mobilized through weak ties. By assessing the two bottom plots in figure 1, we clearly see that by increasing the fraction of professional or international professional municipalities, an increase will follow in the prediction for skilled immigrants to leave. Interestingly, the residing in municipalities with low ratios will decrease individual foreign STEM workers' likelihood to leave.

We similarly tested on-the-job embeddedness by a new set of factors. Job embeddedness (Mitchell et al., 2001) has been argued to be important for the commitment and retention of workers. Our analysis tested job embeddedness of foreign STEM immigrants by assessing the ratios of professionalism and cultural diversity at their respective workplaces. Our first result, clearly indicated that on-the-job embeddedness by working professionals, both locals and non-locals, were not related to whether or not foreign STEMs decide to leave or stay in the host country. We had expected that foreign STEM workers would be more embedded due to higher levels of competences creating a feeling of commitment to the organization, as was found by Perry and colleagues (2016). Also, we know from studies of engineers that through professional communities within the organization, they are being encultured by participation in knowledge sharing and professional dialogs (i.e. Wenger & Snyder, 2000), generating a feeling of belongingness.

Nevertheless, as we test ratios of job embeddedness, there are no effect on retaining foreign STEM workers. This is shown in figure 2, the upper plot, where it is easily observed that by increasing ratios of STEMs at the workplace, no trending pattern is occurring (just a flat line). When testing for ratios of foreign STEMs at the workplace, we find that this type of professional organizations with increasing ratios create a job embeddedness, thus importantly decreasing foreign STEM professionals' propensity to leave. This finding provides more empirical evidence on the argument that the combination of a professional environment (Van Emmerik & Sanders, 2004) and a pro-diversity climate (McKay et al., 2007) is a retention mechanism for foreign STEM workers (Tharenou & Caulfield, 2010). When neglecting the professional aspect, thus only testing if various degrees of embeddedness in a multicultural workplace affect retention or not, we expected that the effect of this would be rather small, as diversity is claimed to be good for an organization. Yet, by increasing the ratios of foreigners in the company, we find an increase in individual foreign STEM workers likelihood to leave. The result is interesting: In terms of embeddedness, this reflects a very clear distinction between community and job embeddedness. Community embeddedness through residing in a multicultural municipality meant a lot for the foreign STEM retention, but this is not the case when job embeddedness assists firms to retain foreign STEM employees. By this study, we operationalized on-the-job and off-the-job embeddedness by (Mitchell et al., 2001) by including two macro-level constructs. This was tested against the population of foreign STEM workers in Denmark for a period of 12 years, and the result indicates that on-the-job embeddedness is more likely to mitigate the individual foreign STEMs likelihood to leave.

Lastly, with this study we contribute to the increasing research concerning spousal effects on international skilled personnel. In some ways, our study extends the extant literature on several

key points. First, we empirically move beyond survey and aggregate-level indicators; as such, our findings on spouse relation bring nuances to the push and pull factors for international skilled workers staying in a country or not. We find that partaking in cohabitation with a spouse increases foreigner STEM workers' retention in the host country compared to those that do not. This may provide an indication of a more predominant host country embeddedness, and furthermore this finding is corresponding with arguments about married expatriates who tend to fare better and that are likely to be less lonely (Cerdin & Dubouloy, 2004; Thomas, 1998). Our result also adds to the ongoing dialog on push and pull factors relating to spouses. We utilized our macro register data to its fullest, and we matched the spouse nationality to whether it mattered if the spouse was from the same country as the foreign STEM worker, or was from the host country, however the baseline was spouse or no spouse. Table 3 shows the predicted values for the spousal effect on foreign STEM workers. Our analysis reveals that foreign STEM workers, whose spouse is from the same country as the foreign STEM worker, are more likely to experience a pull effect away from the host country. This result is well in line with the findings of other authors on same country spouses (c.f. Bhaskar-Shrinivas et al., 2005; Shaffer & Harrison, 1998). Our analysis clearly predicts that having a spouse from the host country assists the push effect toward remaining in the host country.

Our study contributes to illustrate the skilled immigrants' embeddedness and retention, and by the use of longitudinal register data, we proposed a set of of macro indicators for job embeddedness capturing important factors on-the-job as well as off-the-job (Mitchell et al., 2001). We furthermore displayed very individual factors such as the spousal effect for foreign STEM workers, and we therefore add to the understanding of the push and pull effects in spousal relations. Lastly, we contributed to the literature on resettlement and assimilation to the host-country just as

Qin (2015) did, and our findings extend our understanding of working skilled immigrants' host-country embeddedness.

Limitations, implications and further research

Despite these findings that derive from sets of data, including, years, individual data, firm specific data, which provided us with data to do a macro economic research design, some limitations warrant causation regarding the findings. Firstly, our embeddedness factors only capture the workforce and in that sense, it is great at capturing the embeddedness at the foreign STEM workers' workplace. However, in the municipality, the ratios consist of working STEMs, working foreigners, or other working foreign STEMs only.

Secondly, our data is only investigating foreign STEM workers working in one country. Hence, we do not know if the results of our analysis are generalizable to other countries, as Denmark does not mirror countries transitioning or developing into developed economies. That being said, our findings may prove useful for other economies that are knowledge-driven and resemble Denmark, such as Norway, Sweden, Finland, and the Netherlands, all counties in top-five at the World Bank's Knowledge Economy Index (KEI) rankings. Nevertheless, these findings might also generate results in countries catching up on the KEI. We therefore urge other scholars to test these ratios in other countries, higher and lower on the KEI index.

Thirdly, we do not know if there are other reasons for leaving or staying in the host county than the factors we tested for in our models. As such, we do not know where the STEM workers are leaving to, or why. Furthermore, we do not test for any shock or alteration in legislation. Connected to this, we have no controlling mechanisms to capture the various variations of

expatriates, in particular those who are organizationally expatriated (OE). These are often subjected to a fixed timeframe, and will only be in Denmark for that period, hypothetically. Yet, from expatriate literature, we know that organizational expatriates are often in managerial positions, and by our selection of the highest level of professionals, we anticipate that OEs are representing a small fraction of our data foundation. Lastly, in our data we did not have the opportunity to capture the effect of STEM immigrants having children, which is an important limitation, as children are argued to be a strong predictor of host country embeddedness.

Our findings have important implications, both managerial and policy wise. As highly skilled engineers' and technology professionals' mobility is closely associated with knowledge flow and technology transfer (Kogut & Macpherson, 2011; Qin, 2015), it is important for policymakers and firms to know how they retain their knowledge stock. Therefore, connected to community and job embeddedness, policymakers wishing to create development tech-parks for international tech-firms must understand the importance of a good blend of diversity in neighborhoods within the vicinity of these parks. However, not just to have multicultural neighborhoods per se, but to have multiethnic neighborhoods with both locals and foreigners with jobs. In addition, it is important to stress that the creation of compounds for foreign professionals might assist foreign STEMs only while in the host country, but it does not provide any effect on retaining foreign talent within the country. There is value in going native.

Another key finding in our study for policymakers in our study is the importance of spouses. Therefore, schemes where spouses are supported with relation to integration programs and job market possibilities are highly recommended. This finding also relates to managing firms and organizations that attract foreign talent; they should likewise implement schemes or facilitate programs for spousal support. Common for both policymakers and managers is that, for foreign

STEMs with a same country spouse, more effort has to go in to retaining the talent in the host country. Schemes and policies that will help to minimize the pull away factor from the host country and instead generate a push factor towards the host country should be encouraged. Such matters should and could be managed by policymakers and private sector organizations in collaboration to ensure maximal outcomes, in our case, seizing global talented knowledge and retain it in the host country.

Our analysis provides other implications for leaders and managers in private firm organizations. Firms should strategically ensure a steady increase of skilled immigrants thus keeping up a coherent ratio of foreigners into the local mix of professional workers. Furthermore, global talent is attracted to firms that have a global knowledge stock and is more likely to remain in the company, and hence the country, due to this.

In conclusion, this paper explores community and job embeddedness for STEM immigrants in Denmark. The community embeddedness was assessed by weak ties through the degree of either professionals or foreigners in the individual STEM immigrants' neighborhoods it was also assessed by the effect of a spouse, and these predicted different outcomes for staying or leaving Denmark. Overall, to have a spouse and to live in a multiethnic community increase the likelihood of the individual foreign STEM worker to stay in Denmark. We assess the on-the-job embeddedness by the degree of professionals and immigrants in the STEM immigrants' work place, and we find that overall that if STEM immigrants are in companies with higher ratios of foreign professionals, this increases the likelihood for foreign STEMs workers to stay in Denmark. We discussed these outcomes, and found them useful for both companies and policymakers to address, thus ensuring the retention of STEM immigrants in the future.

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Co-author Statements



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Declaration of co-authorship*

Full name of the PhD student: Kenneth

This declaration concerns the following article/manuscript:

Title:	What makes foreign specialists stay? Embeddedness and Foreign STEM workers' likelihood to stay of leave Denmark
Authors:	Kenneth Nygaard, Anders Ryom Villadsen

The article/manuscript is: Published Accepted Submitted In preparation

If published, state full reference:

If accepted or submitted, state journal:

Has the article/manuscript previously been used in other PhD or doctoral dissertations?

No Yes If yes, give details:

The PhD student has contributed to the elements of this article/manuscript as follows:

- A. Has essentially done all the work
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- C. Equal contribution
- D. Minor contribution
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Element	Extent (A-E)
1. Formulation/identification of the scientific problem	B
2. Planning of the experiments/methodology design and development	C
3. Involvement in the experimental work/clinical studies/data collection	C
4. Interpretation of the results	C
5. Writing of the first draft of the manuscript	A
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If published, state full reference:

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2. Planning of the experiments/methodology design and development	C
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