

# Coworker Influence and Labor Mobility

## Essays on Turnover, Entrepreneurship and Location Choice in the Danish Maritime Industry

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**Coworker Influence and Labor Mobility**



**Copenhagen  
Business School**  
HANDELSHØJSKOLEN

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Location Choice in the Danish Maritime Industry

**Christine D. Isakson**

PhD Series 5.2013

The PhD School of Economics and Management

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# **Coworker Influence and Labor Mobility**

Essays on Turnover, Entrepreneurship and Location  
Choice in the Danish Maritime Industry

Ph.D. Thesis  
Christine D. Isakson  
November 2012

Department of Innovation and Organizational Economics  
Ph.D. School of Economics and Management  
Copenhagen Business School

Christine D. Isakson

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*Essays on Turnover, Entrepreneurship and Location Choice in the Danish Maritime Industry*

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Christine

Stanford, California





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## Introduction

### HOW DO COWORKERS INFLUENCE LABOR MOBILITY?

It is critically important to understand the connection between social interaction and individual economic choice (Granovetter 2005). This thesis asks the overall question; How do social relations, specifically coworkers, in the organizational context, influence individual economic choice? The three economic outcomes being examined are turnover, entrepreneurship (the choice to start a business or firm) and location choice (the choice of where to live). These three economic choices are linked to social relations in the organizational context by examining different facets of coworker or peer influence. Common to all papers are mechanisms pertaining to communication, knowledge transfer and coworker influence.

The three subquestions are:

1. How do workers, in nationally homogeneous work groups, respond to an incursion of foreigners?
2. Are entrepreneurial peer effects positively influenced or strengthened by the intensity of work relations?

3. Do coworkers in nomadic and isolated work settings influence individuals' location choice (place to live)?

These three questions are examined in the following three essays, respectively:

1. Task Interdependence, Work Group Composition and Turnover: A Longitudinal Study
2. Peer Effects and Entrepreneurship: Coworkers Up-Close and Intense
3. Economic Choices of a Nomadic and Isolated Work Force: Shifts in Social Relations and Their Implications

For all three essays, we use the same empirical setting: The Danish Maritime Industry. Employees on board ships, often for relatively long periods of time, are clearly constrained by this environment; Given the relatively small number of people in this setting, employees are often forced to interact and most likely know each other. Accordingly, social interaction does not need to be assumed to the same degree as in typical land-based organizational settings. In this thesis an econometric approach is taken throughout all three essays. To accomplish this, we utilize two datasets. First, we employ a dataset provided by the Danish Maritime Authority (DMA) which contains individual level data on those who have worked on all Danish vessels between 1980-2006. This is a highly unique dataset which allows us to draw samples of individuals who have worked in this highly controlled setting. Reported are daily data on individual workers, including duration of time on board the vessel, the individual's job position while on the vessel,



and as well as a identifier for the vessel itself. This allows us to establish who has worked with who, for how long, and on what ship. Additionally employed is the The Integrated Database for Labor Market Research in Denmark (IDA) provided by Statistics Denmark which is a matched employer-employee dataset. This panel data, which includes individuals in the Danish labor force, is linked to the DMA data. This creates an extremely unique dataset rich in social and economic demographic variables and allows us to follow individuals over the course of several years. In addition, Chapters two and three include supplementary follow-up interviews. Following is a summary of the essays.

## THE ESSAYS

### **Task Interdependence, Work Group Composition and Turnover: A Longitudinal Study**

In the first essay, *Task interdependence, work group composition and turnover: A longitudinal study*, we investigate whether changes in national homogeneity influences an individual's choice to leave the workplace. We use nationality as a measure of group diversity. Additionally, this paper seeks to determine whether high task interdependency modifies the effect of national representation on turnover. Previous work in organizational demography looked at organizations, and work groups or 'teams' within organizations and examined various demographic variables and their economic outcomes, such as performance or turnover (see e.g., Williams and O'Reilly III 1998). This paper looks at, specifically, the group heterogeneity (as measured by nationality) – turnover relationship, then looking to see if high task interdependency modifies this relationship. Furthermore, there is

an emerging body of literature within organizational demography that maintains that it is not enough to look at these phenomena solely in cross-sectional settings, which is what the majority of researchers have done thus far. This has largely been due to restrictions in the availability of detailed, longitudinal data. Nevertheless, this emerging body of work contends that individuals' economic outcomes are influenced by their demographic histories within the firm (Sørensen 2000, 2004). In other words, individuals remember their past environments and when the demographic compositions change in a way in which the individual finds themselves less represented than they were when they started, they are more apt to choose to exit the workplace (see e.g., Sørensen 2004). In this paper we seek to extend this literature by looking at the *change* in own national representation during their tenure and aim to determine whether an decrease in own representation would increase the likelihood that an individual would exit the workplace.

### **Peer Effects and Entrepreneurship: Coworkers Up-Close and Intense**

In the second essay *Peer Effects and Entrepreneurship: CoWorkers Up-Close and Intense*, I examine individuals in their work setting and look to see whether peers effects become stronger with increased intensity of work relations. It is well known that entrepreneurship is central to economic growth. However, a primary focus of this paper is the contextual factors that facilitate entrepreneurship. The paper argues that since individuals spend much of their time in the workplace, looking at individuals in the organizational context is important for gaining a more thorough understanding what spurs entrepreneurs. Furthermore, I argue that individuals who have frequent interaction with coworkers having prior en-

trepreneurship experience, are more likely to be influenced by those coworkers and become entrepreneurs themselves. This builds on previous work which argues that individuals gain access to resources, ideas and informations from their prior careers and that their career histories, affect their entrepreneurial actions and outcomes (Burton et al. 2002; Freeman 1986; Shane 2000; Shane and Khurana 2003; Sorenson and Audia 2000). It goes on to discuss the influence of an individual's work environment (Perry and Porter 1982) and how, with the exception of the research on coworker influence in the organizational context and how it influences individuals' choice to enter into entrepreneurship (Nanda and Sørensen 2010), virtually no research has been conducted in this setting. In addition to addressing the contextual issues, the paper contributes in an even more unique way. Given the unique micro data, which includes three longitudinal datasets, spanning three 12 years, I am able to determine who has worked with whom, in what job functionality (position) and for how long. This gives me the rare ability to identify and measure the amount of exposure, in days, that coworkers have to one another. In this way I am able to identify those with prior entrepreneurial experience, and those without, and determine whether exposure to entrepreneurial peers is likely to influence an individual's choice to become an entrepreneur. But just *how* peers influence each other is also under investigation. The mechanisms of influence are argued to be social mechanisms and knowledge transfer (Nanda and Sørensen 2010). In addition, the paper argues that working within this context, so closely, in the same job functionality, implies that these workers share a same technical language and system of meaning (Nooteboom et al. 2007) which strengthens the influence they have on one another.

## **Economic Choices of a Nomadic and Isolated Work Force: Shifts in Social Relations and Their Implications**

The third and final essay, *Economic Choices of a Nomadic and Isolated Work Force: Shifts in Social Relations and Their Implications*, examines individuals in nomadic and isolated work settings. The paper aims to determine whether these work settings influence their economic choices, specifically, where they choose to ultimately settle (live). Previous research has shown that location choice (typically, where an individual chooses to live or settle) has an impact on the creation and durability of social ties particularly because their geographic nature (Sorenson 2003b). The purpose of this paper is to determine whether, in a nomadic and isolated work setting, individual choice is shaped by those within that setting. At the core of this paper is the notion that individuals in these settings, due to being away from their friends and families for such long periods of time, first become detached from their home ties. Previous work contends that physical separation triggers emotional and physical reactions which result in detachment (Bowlby 1960). Furthermore, more recent research reveals that extended time away results in negative emotional outcomes (see Vormbrock 1993a: for review). Given this time away from traditional social ties, and the detachment that likely ensues, we argue that the stage is set for formation of strong social ties in the workplace. To construct these arguments, the paper draws from mechanisms within the literature on homophily, which asserts that individuals are drawn to, and more likely to make friends with those like themselves, or through social categorization, where individuals categorize others on outwardly identifiable demographic characteristics and are drawn those those most like them (McPherson and Smith-Lovin 1987;

McPherson et al. 2001). The paper also leans on prior research that argues that peers are one of a major influences in the workplace (Perry and Porter 1982). It also goes on to argue that coworkers ultimately, through attachment mechanisms, influence individual economic choices as measured by location choice. Specifically, individuals, when they choose to stop living the nomadic and isolated life, are more likely to choose to live near their former coworkers than they are to live near their traditional bonds, friends and family. The overall conclusion of the thesis finds that coworkers, in the organizational context, have an effect on various individual economic choices.



## Task Interdependence, Work Group Composition and Turnover: A Longitudinal Study

Christine D. Isakson, and Jesper B. Sørensen

### ABSTRACT

How do workers in nationally homogeneous work groups respond to foreign nationals in the workplace? Does task interdependency moderate the relationship between change in national composition of work groups and turnover? The organizational demography literature tells us that turnover rates of same-race representation, for example, are inversely affected by increases in different-race representation in the workplace. While previous work uses race as one measure of group diversity, this paper uses nationality as a measure of group diversity. The purpose of this paper is to determine whether *task interdependency within work groups* modifies the relationship between group homogeneity and turnover. In this paper we argue, and empirically substantiate, the proposition that task interdependency within work groups moderates the effects of a change in the ratio of foreign to domestic coworkers on the turnover of employees within the work group. It has been difficult for previous researchers to empirically test this relationship because of the unavailability of quality data. The availability of registered panel data at the micro level allow us to revisit organizational demography and national segregation in the workplace through a more refined lens.

## INTRODUCTION

How do workers in nationally homogeneous work groups respond to an incursion of foreigners? In today's globalized economy, individuals of different nationalities are often assembled into teams and work groups in organizations around the world. Understanding the mechanisms that influence the successful performance and retention of the members of these teams and work groups is important for the success and competitiveness of organizations.

To better understand the inner workings of organizations, previous work in organizational demography has focused primarily on the demographic composition of work groups or teams and the effect of that demographic composition on various group outcomes. For example, researchers have looked at demographic characteristics such as age, race, religion, and tenure to see how they influence measurable outcomes such as group performance, productivity and turnover (see e.g., Williams and O'Reilly III 1998). Over the years, organizational demographers have developed a corpus of research literature containing many insights into how the demographic composition of the workforce within organizations influences various organizational outcomes (see e.g., Carrol and Hannan 2000; Pfeffer 1983). Much of this research expands on early works which maintain that as interpersonal attachment among individuals in a group increases, turnover rates can be expected to decrease (see e.g., Evan 1963). Additionally, researchers surmise that low attachment to the group, or low levels of social integration within the group, may also be a root cause for an increase in turnover (O'Reilly III et al. 1989; Williams and O'Reilly III 1998). Conversely, various mechanisms that have been studied in relation to similarity/attraction theory Berscheid and Walster



(1978), homophily (Blau 1977) or personal networks (Lawler and Yoon 1998) may increase attachment to the group. Against this background, we submit that in the context of a globalized economy where the practice of assembling transnational teams has become increasingly common, it is very important for companies that are striving to develop highly productive and innovative groups to understand how the composition of a workplace consisting of citizens from different nations influences attachment to the work group.

Though sparse, some previous research has used nationality as an indicator of cultural background and has examined its relationship to work group performance (Chatman et al. 1997; Watson et al. 1993) and to various other outcome variables including turnover (see Milliken and Martins 1996: for review). Despite the existence of such literature, however, the authors of this study are not able to find any previous study that focuses specifically on how the influx of foreign workers affects the likelihood of local employees leaving the workplace. Moreover, the previous studies that have addressed similar issues have relied primarily on cross-sectional empirical settings.

A predominant research design in the field of organizational demography has been to look at the demographic composition of the workplace in organizations on the basis of cross-sectional data (see Williams and O'Reilly III 1998: for review). While this approach lends insights into the various effects of different demographic characteristics of the workplace, it tells us little about how individuals respond to *change* in the demographic composition of the workplace in their own work setting. Because the existing literature disregards the possible effects of change over time and the implications of employees' memories of the historical

composition of the workplace, we are left with a large gap in the literature and are unable to understand how change in the composition of the workplace affects individual attachment to the group. However, there is now an emerging stream of literature that does examine how *change* in various aspects of the demographic composition of the workplace influences certain outcomes. Some studies, for example, have examined how change in race (Sørensen 2004) and tenure (Sørensen 2000) influence turnover. While these previous works do look at these phenomena in an organizational setting, using longitudinal data, they are unable to identify individuals' movements on a fine grained fashion as is the case in this study. Furthermore, this paper seeks to extend this work and contribute to this new stream of literature by looking at *nationality* as an indicator of cultural background and examining how the influx (or lack thereof) of foreign workers influences individuals' attachment to their work groups and ultimately to the rates of turnover.

Previously, the limited availability of longitudinal micro data made it difficult to examine the issues mentioned above. With the new micro data that has recently become available, it is now possible to examine changes in the composition of work groups over the course of several years. The granular quality of the data allows us to closely examine the changes in the composition of work groups in terms of the nationality of the members from 1990 through 2006. The ability to identify the specific positions that individuals held within their firms allows us to determine the specific work groups with which the individuals were associated. In the particular work setting that we studied, it is also possible to determine whether an individual was a member of a *high* or *low task interdependent* work group. It is also possible to follow an individual's employment history over the

course of several years, and to accurately identify the other members of the work groups to which the individual was attached. In addition, the data that were available to us made it possible for us to determine whether an individual is domestic or foreign. Because of our access to such detailed data, we are able to follow individuals throughout their tenure in organizations, and to measure the extent of their exposure to group diversity, their time in *high* and *low task interdependent* work groups, and the time when they exited the workplace.

This paper makes three contributions to the existing literature. 1) We contribute to the research on work group composition and teams within organizations by considering the demographic variable, *nationality*, as an indicator of group diversity and by examining the effects of changes in the proportion of the workplace who are of one's own nationality on turnover. 2) We determine how *high task interdependency* moderates the effect that group heterogeneity (i.e., *nationality*) has on turnover. 3) We contribute to the organizational demography literature by measuring the longitudinal effects of changes in national homogeneity and particularly the effect of such changes on the rates of individual turnover.

This paper is structured as follows. The empirical and theoretical section comes next, and it is followed by the section in which the hypotheses are presented. After that, the data and methods sections are presented. Finally, the results section, the discussion section, and the conclusion section are presented.

## EMPIRICAL AND THEORETICAL BACKGROUND

### National homogeneity and turnover

How do workers in nationally homogeneous work groups respond to an incursion of foreign nationals in the workplace? In this paper we use nationality as an indicator of group diversity. Specifically, we address the question of how increased heterogeneity of the work force in terms of own nationality influences attachment to the group, as measured by turnover. A person's nationality, in the context of this study, is defined as the nation state of which they are a citizen (passport holder). A definition of the abstract notion of the nation state is offered in innovation literature. It states, in part, that a nation is "defined by cultural, ethnical and linguistic characteristics..." (Lundvall 1992:p. 2). It is important to acknowledge that countries are not equal in the extent to which they are culturally homogeneous – rendering nationality a less than perfect proxy for culture. Nonetheless, culture is an important defining characteristic of nationality, and moreover, although nationality and culture are not perfectly overlapping, research has documented that nationalities differ substantially across a number of cultural dimensions (Hofstede 1991).

In the fields of organizational demography and industrial psychology, a tremendous amount of literature has been published on cultural diversity and its effects on various outcomes (see Williams and O'Reilly III 1998: for review). Many studies within this body of literature have looked at the cultural composition of the workplace in terms of race, ethnicity and national culture, and the way cultural composition affects turnover. Generally, the studies support Evan's (1963)

assertion that a homogeneous workplace will tend to see higher attachment and thus lower rates of turnover. One shortcoming of this literature is that most of it looks at the demographic composition of the workplace from a cross-section perspective. However, there is an emerging body of work that looks at how individuals respond to changes over time in the composition of the work force, or the way individuals respond to various demographic characteristics of their coworkers (Sørensen 2000, 2004). Some studies on cultural diversity and its effects on groups have used "nationality" or "national culture" as the indicators of cultural diversity and have examined the effect of these constructs on various group or organizational outcomes (Milliken and Martins 1996; Williams and O'Reilly III 1998:for reviews). One longitudinal study that looks at cultural diversity (which it measures in terms of national background or ethnic background) examines the impact of cultural diversity on work process and performance over a period of 17 weeks (Watson et al. 1993). However, one limitation of that study is the fact that the group members' involvement was lower than it would be in a typical organizational work group setting. Aside from that one study, research on the effects of nationality, or national culture, on various outcome variables has been sparse. The authors of this study have not been able to find any longitudinal studies that look at the relationship between nationality of the workplace and turnover. In relation to group processes, however, research has shown that diversity based on race and differences in nationality is likely to have a more negative impact than what scholars had previously assumed (Alder 1991). This finding indicates that nationality should be recognized as an important demographic characteristic.

An important link in the cultural heterogeneity-turnover relationship is at-

tachment to the work group. Current research generally indicates that heterogeneity leads to less attachment and higher turnover. For example, previous studies have shown that cultural diversity in the workplace is associated with less attachment to the group. With regard to racial composition, several studies have shown that racial heterogeneity is associated with higher turnover (see e.g., Williams and O'Reilly III 1998). One reason for this finding is the fact that most individuals tend to become more attached, or bonded, to a group when the group includes members who are similar to themselves (Tsui et al. 1992; Tsui and O'Reilly III 1989). This suggests that when there is more diversity, there is less attachment to the group, and that one ultimate result is higher turnover.

Demography researchers have measured variation in the composition of work groups to determine how it influences performance. Group processes are often measured in terms of conflict, cohesion and communication. These constructs have been analyzed on the basis of social categorization theory (Tajfel 1981; Turner et al. 1987) and social identification theory (Turner et al. 1987). Social categorization theory suggests that individuals evaluate and categorize themselves and other people in terms of outwardly identifiable demographic characteristics such as age, race and religion. This categorization process often results in the formation of in-groups and out-groups and in other cognitive biases (see e.g., Ely 1994; Pelled 1996; Riordan and Shore 1997; Smith et al. 1994; Tsui et al. 1992). Researchers also go on to say that "the definition of which groups are ingroups or outgroups is not only determined by objective intergroup relations, but is also a subjectively conceived relationship based on the contrasts that are most salient and meaningful in any particular situation (the same assumption form the basis

of Turner, Hogg, Oakes, Reicher & Wetherell's, 1987, self-categorization theory). That is, a subjective frame of reference is imposed on person stimuli, within which others are divided into ingroup and outgroup category members." (Abrams and Hogg 1987:p. 203-204) Furthermore, they demonstrate that comparative contexts matter in terms of nationality where language is the means of comparison. Group members shift from favoring intranational members to favoring members on an international basis, when the comparative context changes (Abrams and Hogg 1987) suggesting that nationality is a salient characteristic by which individuals identify ingroup members.

The majority of these social categorization studies reveal the negative influence of diversity on group processes and outcomes. Additionally, attraction/similarity theory (Byrne 1971) suggests, in brief, that people who are similar to each other tend to be attracted to each other. This may be the result of the positive reinforcement that comes from having similar personal attributes or attitudes (Byrne et al. 1966; Byrne and Nelson 1965). Blau (1977) employs this idea in his theory on homophily, suggesting that individuals who form friendships are more likely to be similar to one another than those who do not (see e.g., Ibarra 1992; McPherson and Smith-Lovin 1987), building on Lazarsfeld and Merton's earlier definition of homophily as "a tendency for friendships to form between those who are alike in some designated respect" (Lazarsfeld and Merton 1954:p. 23). A likeness between individuals may be measured in many ways; via demographic characteristics such as age, race or sex (e.g., Bott 1928, Loomis 1946), education, social status, or beliefs (Rogers 1995). Furthermore, when such individuals "share common meanings, a mutual subcultural language, and are alike in personal and social charac-

teristics, the communication of new ideas is likely to have greater effects in terms of knowledge gain, attitude formation and change, and overt behavior change” (Rogers 1995:p. 19). And finally, another line of research suggests that repeated interaction, or exchange, strengthens cohesion (Lawler and Yoon 1998). In a study conducted by Chatman, Polzer, Barsade and Neale Chatman et al. (1997) looking at nationality, race and gender as demographic variables, an increase in diversity was found to be associated with a decrease in interaction among group members. This also implies that as the level of diversity goes down, the level of interaction increases. In other words, one would expect more interaction in homogenous groups than in heterogeneous groups, and one would expect cohesion to be stronger in homogeneous groups where repeated interaction is more likely.

*The Effects of Changes in the level of Group Homogeneity.* To extend this emerging stream of literature in organizational demography, we examine the effects of *change* in own national representation. As previously stated, most of the earlier works in the field of organizational demography used a cross-sectional research design to investigate variation in the composition of the workplace and the outcomes of this variation. Using this approach, most researchers failed to take into account the possibility that an individual’s previous experience within the firm or work group might influence that individual’s subsequent choices and performance outcomes. On the other hand, some earlier work has shown that previous exposure to a work group with a certain demographic composition can affect an individual’s subsequent choices as they relate to the demographic heterogeneity-turnover relationship (Sørensen 2000) and to the effects of changes in the racial composition



of work groups (Sørensen 2004). Researchers have argued that individuals with a history of exposure to a more heterogeneous workplace environment are likely to be less attached to the organization or work group and more likely to exit the workplace (Sørensen 2000, 2004). Furthermore, with regard to race and the way changes in the racial composition of the workplace influence turnover, researchers have argued that homogeneity within groups promotes attachment through mechanisms such as communication and cohesion that are associated with homophily and similarity/attraction outcomes (Sørensen 2004). More importantly, we consider how a history of exposure to changes in the level of homogeneity or heterogeneity in the workplace influences turnover. For example, the change in racial composition of a group from the time an individual joined the workplace will influence attachment, and ultimately turnover, but not necessarily in a symmetrical manner. Previous work argues that when the proportion of other workers of an individual's own race decreases, the individual seems to become less attached and more likely to exit the workplace (Sørensen 2004). Interestingly, though, if the proportion of other workers of an individual's own race has increased since the time the individual entered the workplace, that change has little effect on the individual's likelihood of exiting the workplace. "When it comes to *change* in same race-representation and attachment, [...] less is worse, but more is neither better nor worse." (Sørensen 2004: p. 660). To contribute to this literature stream we will examine the effects of *change* in *nationality* on turnover.

## High Task Interdependent Work Groups

In this section, we examine high task interdependency in order to evaluate the extent to which it moderates the group homogeneity–turnover relationship. The concept of task interdependency is addressed in the literature on organizational teams and in the literature that examines work groups. In the teams literature, high task interdependent work groups are referred to as *real teams*, whereas low task interdependent groups are simply called *work groups*. In this paper, although we draw on concepts from both literatures, we will henceforth use the term *high task interdependent work groups* wherever possible to refer to either *high task interdependent groups* or *real teams*. Two types of task interdependency in organizational teams or work groups are *high task interdependency* and *low task interdependency* (Wageman 1995). *High task interdependency* groups require the input of their members in order to complete the group's tasks or to achieve the group's goals. Project teams are an example of this type of work group because the input of several types of workers is necessary to produce the project team's final product. *Low task interdependency* groups exist in situations where the members of the group work independently in a group setting to produce a given result (Wageman 1995). An increasing number of global firms are using *high task interdependent* teams and groups made up of individuals from all over the world, but there has been little research on the moderating effects of task interdependence on the performance of such groups. We therefore restrict our investigation to high task interdependence and the way it moderates the relationship between group homogeneity and turnover.

In recent years, there has been increasing interest in task interdependency and

its effects on various performance outcomes (Barrick et al. 2007; Guzzo and Shea 1992; Van Der Vegt et al. 1999). The literature that addresses outcome variables such as *productivity* and *performance* provides insights into the work processes observed in successful high task interdependent groups. The mechanisms within teams characterized by high task interdependence (i.e., real teams) that lead to higher performance are high levels of communication among team members and opportunities to experience more cohesiveness (Barrick et al. 2007). Another study in this stream of literature showed that within-team communication is associated with higher team performance (Campion et al. 1996; Hyatt and Ruddy 1997). These research findings support the notion that cohesion and communication are both critical components of well functioning high task interdependent work groups.

There has also been some interest in the way task interdependency moderates the relationships between various demographic variables and outcomes. For example, researchers have examined how task interdependency moderates the relationships between various demographic variables and the performance of athletic teams (Timmerman 2000). Other researchers have examined the performance of various organizational teams and working groups (Barrick et al. 2007). For example, one study found that high task interdependency positively moderates the relationships between both communication and cohesion with performance (Pelled 1996). This provides further support for the notion that communication and cohesion are both key mechanisms that contribute to the superior performance of successful high task interdependent teams and work groups.

## HYPOTHESES

### National Homogeneity and Turnover

We propose, as a baseline hypothesis, that a higher level of own national representation will be associated with lower turnover. Because nationality is an easily identifiable demographic characteristic, individuals in work groups that are homogeneous in terms of nationality are likely to develop social bonds via processes such as social categorization, similarity/attraction and homophily, that result in the activation of attachment mechanisms (i.e., communication, cohesion). Individuals of the same nationality are likely to share similar cultural norms and are likely to speak the same language. These similarities are likely to facilitate and ease efforts to communicate—and where communication is easier, it is likely to happen more often. Work groups where the composition of the workplace is more homogeneous are more likely to have group members who are more attached to the group because of more communication and higher cohesion. The members of groups that are more homogeneous in terms of nationality will be more attached to the group and will therefore be more likely to remain in the workplace. Accordingly we propose:

*H1: Higher own national representation decreases the hazard to exit the workplace.*

*High Task Interdependency.* How does high task interdependency moderate the relationship between group homogeneity and turnover? To answer this question we look, first, at the mechanisms that reduce turnover in nationally homogeneous

groups. As stated above, previous research has shown that mechanisms associated with social categorization, similarity/attraction and homophily make it easier to create friendship ties, they facilitate a higher level of cohesion, and they facilitate communication. In this way, they make it easier for individuals to communicate knowledge and information. The same mechanisms facilitate the processes that high task interdependent groups depend on such as communication and knowledge transfer. Specifically, high task interdependent work groups draw on the same characteristics and mechanisms that are found in the nationally homogeneous work groups, such as better communication of information, more cohesion, and factors that facilitate the formation of friendship ties. The easier formation of friendship ties helps to improve the channels of communication and likely makes group processes more efficient. The reason *high task interdependency* has such an important moderating effect is because of the necessity in the context of high task interdependent task situations to communicate important information from one team member or group member to another. The members of *high task interdependent* groups are required to interact with each other because of the nature of the group process, and they are also required to interact more frequently. And because communication typically proceeds more easily in a nationally homogeneous group, the process of transmitting information in the context of a homogeneous group is easier due to greater cohesion. In turn, the frequent, repeated, interaction likely strengthens the cohesion of the group therefore rendering individuals less likely to leave.

To further clarify our reasoning, we suggest that *low task interdependent* work groups would not reap the benefits of a nationally homogeneous work group

in the same way. Because tasks are performed independently, members do not need to rely so heavily on the characteristics of a nationally homogeneous work group, such as more extensive communication and more cohesion. Therefore, we would not expect a low task interdependent group to moderate the relationship between national homogeneity and turnover in the same way.

Because *high task interdependency* requires efficient communication and the unrestricted flow of information to get the job done, and because the level of cohesion and the ease of information exchange tends to be higher in homogeneous groups, *high task interdependency* will positively moderate the relationship between national homogeneity and turnover. Consequently:

*H2: High task interdependency positively moderates the effect of own national representation on hazard to exit the workplace.*

### **Changes in Work Group Composition**

In Hypothesis 3 we turn our attention to *change* in the composition of the workplace *since time of entry* into the workplace. (This is different than the focus in Hypothesis 1 and Hypothesis 2, which was on the *level* of homogeneity in the workplace.) How do individuals who are accustomed to a nationally homogeneous workplace react to changes in the composition of the workplace in terms of national homogeneity? In addition, how do changes in the composition of the workplace in terms of *nationality* affect an individual's choice to stay in the workplace? *Nationality*, like race, is an easily identifiable characteristic. For this reason, individuals are likely to become attached to others who are similar to themselves through social categorization or mechanisms associated with ho-

mophily. Individuals will self-select into a workplace where the composition of the workplace (in terms of the proportion of members with a different national culture) is below their threshold for exit. As more foreigners enter the workplace, and as the level of representation of the individual's own nationality decreases, these individuals will become less attached to the workplace and will be more likely to exit the workplace. In sum, we hypothesize:

*H3: A decrease in own national representation since the time an individual was hired will result in an increase in the hazard to exit the workplace.*

## DATA AND METHODS

### Overview of the Study

The following sections include a descriptions of the data and measures used in this study as well as an explanation of the research methods. This paper uses an *Explanatory Design-follow-up explanations model*, which is a type of mixed method design employing both quantitative and qualitative methods (Creswell and Plano Clark 2007). Quantitative analyses being the primary mode of investigating the phenomena are followed by quantitative investigation, which in this case are in the form of interviews. The interviews were conducted after the quantitative analysis was completed. The information gathered from the interviews allow us to gain a deeper understanding of the general human resource practices that take place in this context giving us the ability to refine our interpretation of the quantitative results. In the upcoming sections, we will first present the quantitative

methods and then follow up with a description and discussion of the qualitative methods.

### **Data and Method in the Quantitative Component**

In this study, we use two data sets to examine whether task interdependency moderates the effects of the national composition of the work group on turnover. The primary dataset, consisting of registered data, was provided by the Danish Maritime Authority (DMA). The second dataset, known as the Integrated Database for Labor Market Research (IDA) was provided by Statistics Denmark.

The primary data set, provided by the Danish Maritime Authority, includes panel data consisting of all individuals, both foreign and domestic, who have worked on board Danish vessels at any time between 1990 and 2006. Among the kinds of information included in the dataset are the day each individual was signed on to (i.e., joined) a vessel and the day the individual was discharged from (i.e., left) the vessel<sup>1</sup>. The dataset also includes the position the person held while he/she was on the vessel as well as the vessel's type and each vessel's unique identifier. This micro level data makes it possible for us to track the movements of individuals from the day they signed on to a vessel until the day they left, and it also allows us to ultimately determine the identities of all the other people the focal individual has worked with, on what ships, and for how long. In addition, knowing what position the individual held while employed on a particular vessel allows us to precisely identify and categorize the different levels of task interdependence that the individual experienced. The data set also allows us to follow

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<sup>1</sup>The dataset does not include contractual data. Only actual time/days on a vessel is known. It is therefore not possible to distinguish between voluntary and involuntary exits.



individuals over time and between different work locations and firms within the same industry.

The second dataset, IDA, contains individual-level data for Danish residents in the workforce. By combining the mariner data with the IDA data, we were able to include various demographic control variables in the analysis. The IDA dataset also contains firm-level data. Combining this firm level data with the two individual-level datasets mentioned above allowed us to control for the hiring tendencies of particular firms.

### **Measures in the Quantitative Component**

*Dependent Variable.* The dependent variable is exit from the workplace. Individuals were followed from the time they began working on a particular vessel until the time they exited from the workplace. A workplace is defined as a vessel. Salient to understanding *exit* in this context, is in understanding the working norms of the maritime industry. When an individual works on a vessel, they will not 'go to the office' every day. A mariner will get on a vessel for a defined period, which we will refer to as a *trip*. Typically, different vessel types will have different average *trip* lengths. For example, a mariner who sails on a container ship, which sails from Los Angeles to the Far East and back, may stay on that vessel for four months. This would constitute one *trip*. The mariner may get off the ship and stay home for six months, then return to the same vessel for another four month *trip*. In this analysis, the clock is started on the first day of the first *trip*. The clock continues every time that individual returns to that same vessel. If the individual moves to a different vessel, it is defined as an exit. Exit is also de-

defined as an individual's continuous absence from any workplace for at least nine months. Individuals who reenter the workplace, by either moving to a new vessel or by getting on a vessel that is covered by the dataset after a nine month (or longer) absence, are given a new identification code that combines employee and vessel identifiers, and the clock starts from zero. We examine Danish workers as representative of a nationally homogeneous work group. We look to see how the influx of foreign nationals influence turnover and how high task interdependency in the workplace moderates that effect. The study examines nationality in terms of foreign' and domestic' workers. Danish workers represent domestic workers and all non-danes represent foreign workers.

*Key Independent Variables.* To determine the way the relationship between the national composition of the workplace and turnover is moderated by task interdependency within work groups, we constructed a dummy variable representing *high task interdependency* (*high task interdependency*=1 and *low task interdependency*=0). Of the three departments on a ship, the *navigation and engineering departments* were placed in the *high task interdependent departments* category, while the *steward's department* was placed in the *low task interdependent department* category. Employees in *High task interdependent work groups* need high levels of communication, and must rely on each other to get the job done. Employees working in the *navigation department* were placed in the *high task interdependent* category on the basis of the nature of their primary task. Immediate and accurate transfer of information is imperative for individuals working in this department. Inefficient or the inaccurate transfer of information may result

in damage to the vessel, and could prove fatal. Similarly, employees in the engineering department must communicate information efficiently in order to keep the vessel in good repair and in working order at all times, particularly while it is navigating at sea. Failure to communicate effectively may result in death or injury to the crew, or damage to other vessels while at sea.

It may be true that certain tasks can be performed without immediate input from any other group member and that certain routine tasks (such as taking readings of machinery or cleaning up equipment) can be performed independently. However, the primary responsibilities of the members of this group do require accurate and timely communication. It is often necessary for members of this group to engage in problem-solving activities relating to system failures while under much duress. For these reasons, we have categorized the navigation and engineering departments as *high task interdependent work groups*. On the other hand, we have classified the groups assigned to the *stewards department* as *low task interdependent work groups*. The members of groups assigned to the *stewards department* typically work independently. Their responsibilities include various cleaning duties and some galley duties that can be performed by individuals working independently. The majority of the tasks in this department are performed by individuals working independently who do not need input or critical information from other individuals in their department to fulfill their responsibilities. Furthermore, while the failure of any members in this group to do their job well (e.g., a poorly cleaned room or poorly prepared food) may result in an unhappy crew, the poor performance is not likely to result in death or injury.

To determine how *high task interdependent work groups* moderates the group

homogeneity – turnover relationship, we create a variable which interacts the *high task interdependent work groups* with the proportional variable *proportion domestic in own work group* and another variable which interacts the *high task interdependent work groups* variable with *proportion domestic in all other work groups*. The first proportional variable, *proportion domestic in own work group*, is a continuous variable which represents the proportion of domestic (Danish) workers in the worker's own work group. The second proportional variable is *proportion domestic in all other work groups*, represents the proportion of domestic workers in all other work groups, excluding the worker's own work group. So, in this context, it is the proportion of domestic workers on the rest of the ship (not including the worker's own work group). Both proportional variables are calculated on the first day of each month that an individual is on a vessel. So, for example, if we were to look at an engineer in the sample, the engineer would be in the *high task interdependent work group*. The *proportion domestic in own work group* would be representative of the proportion domestic workers in the engineering department during that month. The *proportion domestic workers in all other work groups* would represent the proportion of domestic workers on the rest of the ship, which would be comprised of the navigation department and the stewards department, combined. Both *Proportion domestic in own work group* and *Proportion domestic in all other work groups* are interacted with the *high task interdependent work groups* dummy variable in order to get a sense of how *high task interdependency* moderates the change in homogeneous work group's effect on exiting the workplace.

The *Proportion Danish upon hire (vessel)* variable expresses the proportion

of Danish employees in the workplace that the individual would have encountered at the time s/he was initially hired. We then examined the way the proportion changed over the course of the individual's employment. If the change turned out to be positive, the value of the variable was expressed as continuous and represents the proportion changed since they were initially hired. It is called *Proportion Danish (vessel) since hired: Change positive*. If the change turned out to be negative, or otherwise zero, the value of the variable was expressed as continuous, represents the proportion changed since they were initially hired, and is called *Proportion Danish (vessel) since hired: Change negative*.

*Control Variables.* We controlled for various individual and ship-level characteristics that could influence turnover rates. The mariners database contains information on several such variables. For each individual, we included a dummy to distinguish between domestic and foreign (i.e., Danish and Non-Danish) workers. Although the DMA data provides us with detailed information relating to both foreign and domestic individuals, we were only able to gather information for individual control variables that pertain to domestic individuals in the Danish workforce at that time. We therefore restrict the study to an examination of the turnover of Danish workers. As controls, we included a dummy for each year from 1990-2006. We took the log value of the wage paid to each individual and entered it as a continuous variable. Also included were variables for *age*, *education* and *gender*. The education variable was divided into 5 categories that represent the level of education an individual had received. In addition, we control for the type of training they received, in terms of level of responsibility, by

creating a control variable for rank. An individual can (and will) be either an *officer* or a *rating*<sup>2</sup>.

Prior research shows that as workplace tenure increases, the turnover rate decreases (Jovanovic 1979). To control for this factor, we included two variables relating to tenure: *vessel tenure* and *career tenure*. The amount of time that a person had spent on a particular vessel is captured by the *vessel tenure* variable. This variable was calculated from the time the individual initially signed on to the vessel until the current split month. The *career tenure* variable was obtained by calculating how many years the individual had been working on Danish vessels over the course of his or her entire career (i.e., since the person's entry into the dataset).

Vessels are classified in three categories: *passenger*, *long haul* and *short haul vessels*. Each vessel type shares distinctive characteristics. *Passenger vessels* are just what the name implies. They carry passengers. This is an important consideration because it means that there is interaction not only amongst the crew, but also, potentially, with passengers. This communication with passengers may dilute the effect of the crew members' interaction with each other. *Passenger vessels* take on passengers and are in port more frequently than the other types of vessels. This also results in a slightly different type of an environment than what a worker would experience on *long haul* or *short haul vessels*. *Long haul* and *short haul vessels* are work vessels that carry cargo or perform a duty, such as towing a barge. Because there are typically no passengers, everyone onboard the vessel is an employee. *Long haul vessels* are typically larger in size (tonnage)

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<sup>2</sup>These two variables will account for the whole population on a given vessel.

and their average time between ports is relatively long. *Short haul vessels* are typically smaller in size than *long haul vessels*, they tend to stay closer to shore, and their average time between ports is shorter. The average *trip* length (when including all vessel types) is 116 days.

To better understand how different work groups are affected by changes in the national composition of the workplace, we separated the sample by departments. The working environment on a ship can be easily separated in relation to 3 well-defined departments: *steward's*, *navigation*, and *engineering*. In this study, each department represents a work group. The steward's department consists of individuals who perform kitchen and housekeeping duties. We can think of these as lower skilled employees. They have common skills, but extensive, specialized training is not always required. Both the *navigation department* and the *engineering department* require specialized training specific to shipboard work and are highly specialized both in their skill sets and in their nomenclature.

Several variables were created to control for the size of the vessel (population of the workplace) and the size of the work groups. *Number on vessel at time of hire* represents the total number of individuals who were employed on the vessel at the time the focal individual was hired. *Change in number on vessel since time of hire (number)* measures the change in the total number of individuals employed on the vessel from the time the focal individual was hired to the current spell. To control for the size of the individual's own department, we included a variable called *size own department (number)*. This variable represents the number of employees in the focal individual's own department (for each split time).

One possible concern that must be addressed in studies examining turnover

is the question of whether exit occurred because of the worker's own choice or because of a decision or policy of the firm. For example, a firm may decide to hire individuals from a specific country for strategic reasons. To control for a firm's overall human resource policies, or for the strategy of an individual firm, we created two variables. The first variable, *Firm HR Average (prop Danish by dept, ship type, year)*, represents the average number of Danish workers that the firm employed during a particular year. For each firm, we calculated the average percentage of Danish workers (domestic) on each vessel for each year. Next, we grouped vessel types and calculated the average percentage of Danes on each vessel type operated by the firm. We then calculated the average percentage of Danish workers in each department on that particular vessel type for that year. A control variable that was assigned to each employee was based on the department to which an individual was assigned, the vessel he or she was on, and the firm by which he or she was employed. In this way, we attempted to control for the decisions that were made by the firm that employed each individual, or the policies that applied to the vessel where the individual worked. In the case of a person who was part of the navigation department on a container ship (long haul vessel), for example, the value of this variable will reflect the HR average for that particular year for an employee in the navigation department of a container ship operated by of the firm that manages the vessel. Each year, a new value is assigned for each firm. The next variable, *change in firm HR average since previous year*, was designed to capture and control for changes in overall firm hiring tendencies from one year to the next.

The *proportion Danish on vessel* variable is a measure of the proportion of



Danish workers in relation to the total number of workers on the vessel. In order to compare the effect of an individual's own work group to the effect of the workplace on the rest of the ship, we split this variable up into two parts; *proportion Danish in own work group* and *proportion Danish on the rest of the ship*. The *proportion Danish in own work group* variable represents the proportion of workers in the focal individual's own work group who were Danish. For example, if the individual was an engineer, then the variable would be a measure of the proportion of positions in the engineering department that were occupied by Danes in the relevant period.

The *proportion Dane on rest of ship* variable represents the total number of Danish employees relative to total workplace on the rest of the ship, excluding the employees in the focal individual's own department. For example, if the individual is an engineer, then the measure would represent the proportion of Danish workers relative to all workers in the other two departments in the relevant period, but it would not include the employees in the engineering department. When these two variables are combined, they represent the total proportion Danish employees relative to the entire workplace on the whole vessel for the relevant period.

*Method in the Quantitative Component.* For our analysis, we used a piecewise constant hazard rate specification methodology. This method is well suited for an examination of the way task interdependency moderates the effects of changes in the national composition of the workplace on turnover. The piecewise constant hazard rate specification allows us to examine "slices" of time, and the change in the composition of the workplace within each "slice," while still

allowing the values of the variables to vary between slices. As stated earlier, the data we utilize contains several vessels. This data is daily data and allows us to see variation in the movement of individuals on a daily basis. There is variation in the change in composition on each vessel each day and therefor each month. Due to this volume of movement on and off the ships each month. Due to the month to month variation in turnover within this context, we decided that splicing each month would be prudent. This allows for variation between months, giving us a more precise overall measure of change over time. Each slice, or spell, is one month. A snapshot of the composition of the workplace is taken on the first day of each month.

The piecewise constant exponential model is expressed as:

$$r_k(t) = \exp \{ \bar{\alpha}_l^{(k)} + A^{(k)} \alpha^{(k)} \} \text{ if } \tau_l < t \leq \tau_{l+1}$$

Where  $\tau$  is period of time defined by splices (in this case, nine segments of time),  $k$  is the destination state (failure),  $\bar{\alpha}$  is the constant coefficient,  $l$  is the time periods,

The vector of covariates is defined as  $A^{(k)}$ , in Model 1 equals

$$\begin{aligned} &Y_{ijvk} C W_{ijvk} B_{ijvk} E_{ijvk} G_{ijv} F_{ijvk} C T_{ijvk} V_{ij} T_i N_{ijvk} N C_{ijvk} \\ &S O_{ijvk} C S O_{ijvk} H_{ivk} H C_{ivk} P H_{ijvk} P W_{ijvk} P O_{ijvk} \end{aligned}$$

and in Model 2 it represents

$$Y_{ijvk}C W_{ijvk}B_{ijvk}E_{ijvk}G_{ijv}F_{ijvk}CT_{ijvk}V_{ij}D_{jv}N_{ijvk}NC_{ijvk}$$

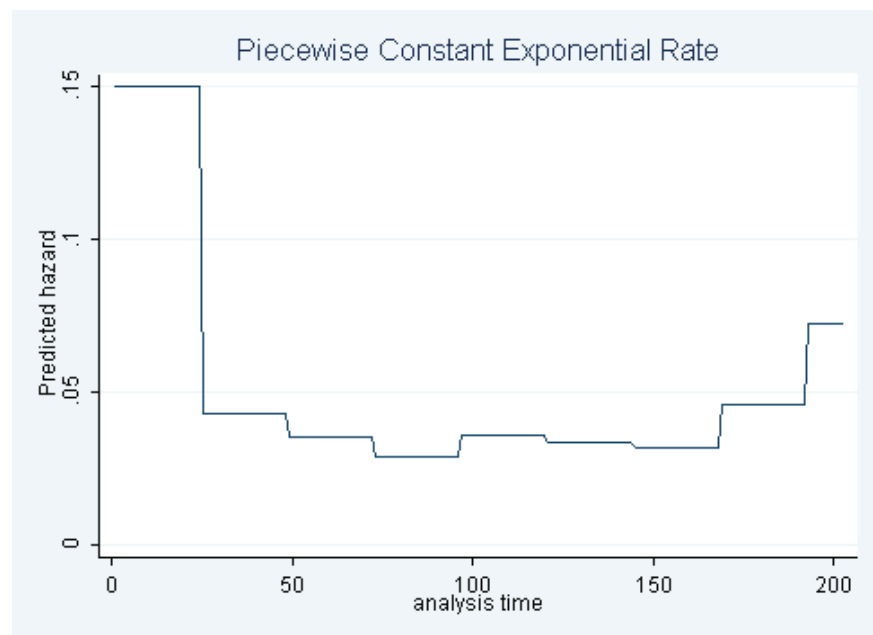
$$SO_{ijvk}CSO_{ijvk}H_{ivk}HC_{ivk}PH_{ijvk}CPP_{ijvk}CPN_{ijvk}$$

Where  $i$  is variation across individuals,  $j$  is variation across firms,  $v$  is variations across vessels, and  $t$  is variation across time. Additionally,  $Y$  is year,  $C$  is the *piecewise constant dummy*,  $W$  is wage,  $B$  is age,  $E$  is education,  $G$  represents gender,  $F$  is vessel tenure,  $CT$  is career tenure,  $V$  is vessel type,  $T$  represents high task interdependent work group,  $D$  represents department,  $N$  is the number on vessel at time of hire,  $NC$  is the change in number on vessel since time of hire,  $SO$  is size own department,  $CSO$  is change in size of own department,  $H$  is firm HR average,  $HC$  is change in firm HR average since time of hire,  $PH$  is proportion Danish upon hire,  $PW$  is proportion Danish in own work group, and  $PO$  is proportion Danish in all other work groups,  $CPP$  represents change in proportion Danish: positive, and  $CPN$  represents change in proportion Danish: negative. Excluding  $C$ ,  $D$ ,  $G$ ,  $V$ , and  $T$ , all vary across individuals, firms, vessels and time.  $C$  does not vary across individuals, firms or vessels, or time.  $D$  varies across firms and vessels and is time invariant,  $G$  varies across individuals, firms, vessels, but is time invariant,  $V$  varies across individuals and firms and is time invariant, and  $T$  varies across individuals and firms, but not across vessels, and is time invariant.

Furthermore, after initially assessing the overall hazard to fail, splices, or splines have been placed after every two year (24 month) period for a total of 204 months (see Figure 2.1). This resulted in 9 dummies. As noted above, we

included the dummies in the model to control for the overall tendency of failure during each period.

Figure 2.1: Piecewise Constant Splices Baselines



## Method in the Qualitative Component

To gain a more in depth understanding of general human resource practices within shipping companies, we conducted a series of interviews with selected shipping companies with the central motivation being to better interpret potential endogeneity issues that may be present in the quantitative results. The interviews took place during the summer-fall period in 2012, after the quantitative analysis was complete. Two companies representing each of the three vessel type categories (*Long Haul*, *Short Haul*, and *Passenger*) were selected from among known Danish shipping companies.

*Interview process.* The interviews were conducted by one of the authors and they took place in Denmark via telephone. The shipping companies were called and the interviewees were selected given the following criteria; they had to work in the human resources department and they must have in depth knowledge about human resource practices at that shipping company—specifically with how individual crew members were selected, hired and placed onboard vessels. With only one exception<sup>3</sup>, each individual worked in the human resource department and was a crewing agent or manager. Once the interviewee was identified, permission to be recorded was asked and all complied. The interviewer then gave each interviewee a brief background summary as to why the interview was being conducted. They were told that the interview was part of a research project and that we were trying to get a better understanding of how individuals were placed on

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<sup>3</sup>The one exception was the interviewee who worked in the human resource department of a passenger vessel company, but specialized in 'wages'. However, he had in depth knowledge of company hiring and placement practices and was able to answer the interview questions with a confidence that demonstrated such knowledge.

Table 2.1: Interviews

Firm (by primary vessel type)	Interviewee’s Job Title	Interview timing
Long haul	Crewing Manager	Summer 2012
Long haul	Senior Crewing Manager	Summer 2012
Short haul	Crewing Manager	Summer 2012
Short haul	Crewing Manager	Summer 2012
Passenger	Crewing manager	Fall 2012
Passenger	Human resources manager *	Fall 2012

\*Wage specialist with in depth knowledge of company’s HR practices regarding crew placement.

Danish ships. Specifically, that we were looking to understand companies’ general HR practices, specifically with regards to crew members and their placement onboard vessels. They were then asked an open ended question; What are your general HR policies for placing crew members or employees on vessels<sup>4</sup>? During this phase of the interview process, the aim was to understand whether the individual crew member was able to select which vessel they were placed on. If necessary, the interviewer would ask the interviewee a probe (question) that inquired as to whether it was a general practice for individual crew members to be able to choose which vessel they were to work on. The second phase of the interview was aimed at getting a better understanding of how companies placed workers of different nationalities onboard their vessels. During this phase a series of open ended questions were asked. During the course of this interview phase an additional probe was asked as to whether the company would systematically remove crew members of particular nationalities based on the trade route of the vessel.

<sup>4</sup>The interview guide is available upon request

## RESULTS

### Results for the Qualitative Component

One concern is that the results may contain bias as a result of issues stemming from possible endogeneity. One type of endogeneity that is a common concern in studies involving social influence is that of self-selection (Manski 1995). One could easily imagine individuals self-selecting into particular groups where they might be more comfortable, which would be the case if individuals were allowed to choose which ship they were to go on. Another concern would be that of management selecting which groups (based on common characteristics such as nationality) would be placed on certain ships at given times. The aim of the interviews was to gain a better understanding of general human resource practices within Danish shipping companies, particularly with regards to how individuals were placed onboard the companies' vessels. The interviews were designed to focus on two elements of the process. The first element was focused on determining how much choice that crew members had in selecting which vessel they worked on. The second element focused on uncovering whether the shipping company had policies or general practices that resulted in placing and/or removing groups of individuals on and off of vessels and whether those policies or general practices were based on the nationality of the individuals.

The results of the interviews revealed that individuals were generally hired by office based human resource personnel<sup>5</sup>. The selection criteria were based largely on an individual's professional qualifications. Many qualifications are based on

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<sup>5</sup>With the single exception being one passenger vessel company.

prior experience, but emphasis was placed on qualifications and certifications that are based on International Maritime Organization (IMO) requirements. These qualifications are required by the IMO and adopted by all IMO member countries, and consequently required by all ship owning companies within those countries. Qualification requirements differ by vessel type and by the crew member's position on the vessel. Each time an individual satisfies particular IMO requirements it results in a certification. These certifications are international and they are held by all individuals of all nationalities who want to work on IMO class vessels world wide. To the best of the author's knowledge, all firms (and their vessels) within this study aim to satisfy IMO requirements. Once individuals were deemed qualified by the company and after they were hired, they were then placed on the vessels where they were needed. None of the interviews revealed a general practice of company policy which allowed individuals to choose which vessel they would work on when they were initially hired. Furthermore, once hired and on-board a particular vessel, they were generally left on that vessel until they were needed elsewhere or until they requested to leave. Individuals who would request to leave a vessel and change to a new vessel to enhance their skill sets or learn something new was often thought of as an asset to the company. However those who would request to leave a vessel due to personal differences or as a result of a conflict were generally viewed as acceptable, on occasion. However, frequent requests to change vessels would raise a red flag for some of the crew managers. This would trigger the question as to whether the individual was a good fit for the company. Consequently, individuals did not request to leave a vessel, as a norm. And when they did request to leave, they did not always request to move



to a specific (new) vessel as it was commonly accepted that such requests were merely 'wishes' that might be granted, but that those requests were not granted as a norm. Though when they were granted, they were generally granted for reasons related to either getting away from personal conflict, or for reasons related to gaining new professional skills. In no interview was it revealed that individuals requested to go to a particular vessel for reasons related to having a preference for working with a particular group of people. In general, individual crew members are placed on the vessels where they are needed and these placement decisions are made by shore side human resource personnel.

That said, it is worth noting the one exception. One passenger company which owns and operates passenger vessels, indicated a much different hiring practice during the interview. They indicated that while the shore side human resources personnel would identify potential candidates as new hires on board a vessel, the potential candidate was then sent to the vessel itself to be interviewed onboard the vessel while it was in port. Each department onboard the vessel (*navigation department, engineering department, and steward's department*) had a designated business manager. That manager was responsible for hiring all of the crew members for their own department. So while the initial selection process was conducted by the shore side human resources personnel, the final selection was made by personnel onboard the vessel that the new crew member would work on. This company is considered unusual within the Danish shipping industry as there is evidence that they restructured to decentralize the hiring practices of their organization in the 1970s. There is no indication that the passenger vessel division of this company ever returned to the standard organizational structure

known to be used in typical shipping firms, which would include the process of shore side personnel individuals for positions on the vessels. Nevertheless, having crew members ultimately selected by onboard personnel does introduce a possible bias. This will be considered in the Discussion and Conclusion section.

Central to this paper is the assumption that it is primarily the individual's choice to leave a vessel and either move to another one, or quit working on vessels altogether. Clearly management plays a key role in who is placed on which vessel. But how much of a role does management play in who leaves the vessel? If management were to systematically remove individuals or groups of individuals from vessels, this would suggest that the results we see may not be representative of an individual's choice to leave, but may also reflect management decisions. The results of the interviews suggest that management places individuals on the vessels, on which that are needed, based on their individual qualifications. This applies across all nationalities. Individual crew members are then left on the vessel for the duration of their contractual agreement for that *trip*. In some cases, for example on *tramp ships* (they operate on no set schedule and 'go where the cargo is'), it is not possible to give the individual an exact *sign-off date*<sup>6</sup>. To illustrate this point, one interviewee stated, "But it is hard for an owner who is doing tramp shipping, which is basically trading all over the world. Lets say that after 6 months, the vessel is in the middle of the pacific, its hard to tell the crew member now youre signing off today if you have like 2,000 nautical miles from shore, right? Its just to paint a sharp picture of how difficult it could be, right?"

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<sup>6</sup>*Sign-off date* is an industry term that describes the day the individual officially *signs off* the ship. Meaning, they no longer work on that ship (until they *sign on* again). This does not necessarily indicate termination of employment, but indicates that they are released from the responsibility of their position onboard the ship until they *sign on* again.

This type of uncertainty in terms of when the individual will be able to *sign off* the vessel also introduces exogenous variation in that it causes the crew member to be exposed to their shipmates for longer than what they might choose otherwise. In contrast, companies that operate other vessel types are able to give exact *sign-off* dates. For example, one interviewee stated that on an accommodation vessel they are able to give exact *sign-off* dates due to the fact that they remove and replace crew members via helicopter. Most other companies described a scenario somewhere in between the two; individuals have fairly set schedules (i.e., 28 days to six months per *trip*) and companies have the ability to predict (within a few days to a week) when the individual would be able to *sign-off* the vessel. To get a better sense of whether management moved groups of workers based on nationality, additional probes were asked. To investigate this, probe question that was asked was whether the company would remove groups of crew members, in terms of nationality, based on the vessels trade route. The overall response to this question was *no*. One interviewee elaborated on this notion by stating, "Nope. Nope. Nope. It could have just as well be a Danish guy relieving and Filipino, a Danish guy relieving an Indian, an Indian relieving a Danish. There's no policy on relieving them all due to the trade of the vessel." And though these responses suggest that management did not select individuals based on their nationalities; it is worth noting that there may be another mechanism at play. It is conceivable that management may make a strategic decision to drop crew members' wages. This drop in wages may affect which nationalities are on board the vessels. For example, individuals coming from nations where the cost of living is lower may be more willing to work on Danish vessels for lower wages, whereas those of

Danish origin may not choose to work for those lower wages since the cost of living in Denmark is relatively high<sup>7</sup>. However, the overall sense resulting from these interviews was that individuals were placed on the vessels based on their qualifications and they were generally removed from the vessels based on the normal course of their standard work rotation.

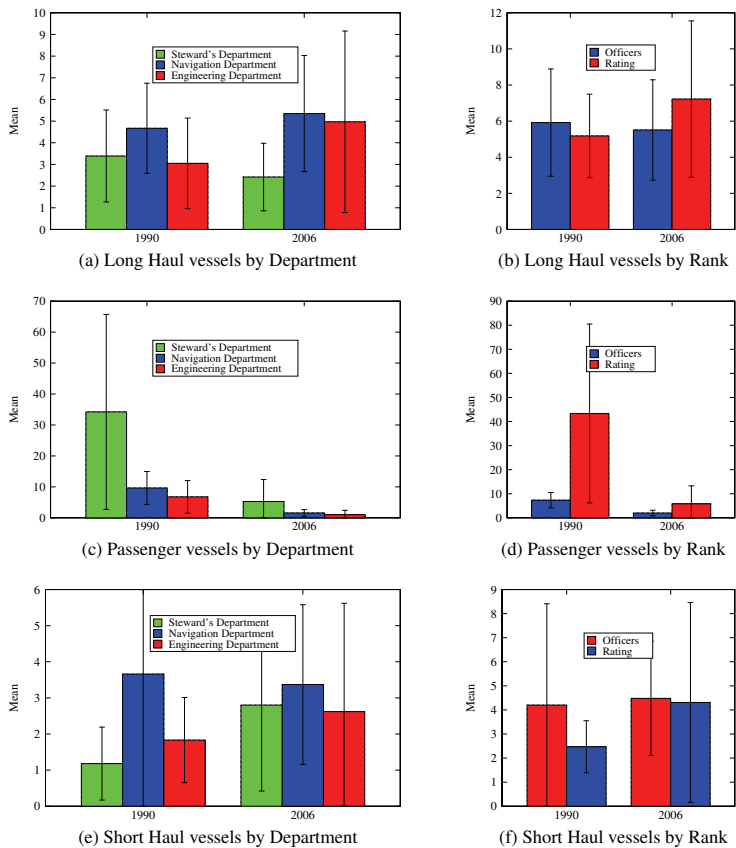
### **Results for the Quantitative Component**

Figure 2.2 displays the mean and standard deviation number of employees by department and the ratings for the years 1990 and 2006. On all vessel types, the average number of employees in each department has decreased. The most prominent decrease is in the steward's department, particularly on passenger vessels. This may be because the size of passenger vessels has decreased over the relevant period. The average number of employees in each department has remained fairly constant on long haul vessels, and also on short haul vessels.

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<sup>7</sup>To account for this, a control for *wages* was included in the models. See Tables 2 and 3 in the Appendix

Figure 2.2: Descriptive Statistics for Number of Workers by Department, Rank, and Vessel type for 1990 and 2006



In Figure 2.3, we see that there has been a gradual increase in the number of Non-Danish workers and a decrease in the number of Danish workers. There has also been a decrease in the number of workers overall from 1990 to 2006. This is in line with the decrease in the number of vessels reported in 2006 compared to the number in 1990, as shown in Table 2.4. Passenger vessels tend to have the highest proportion of workers in the steward's department.

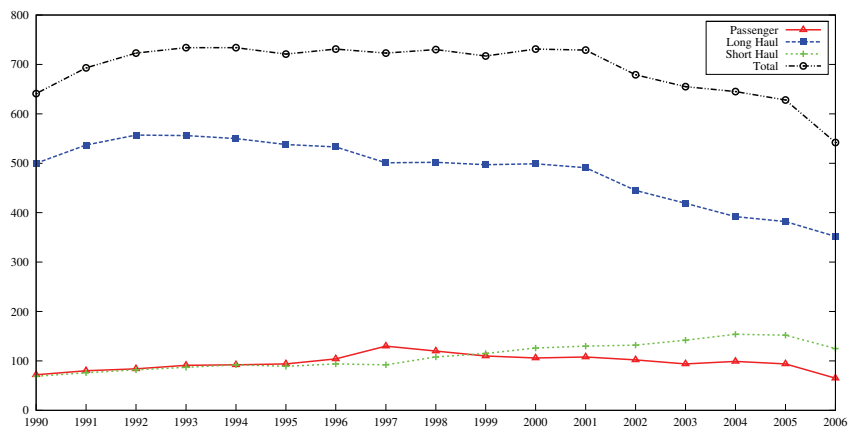
In Figure 2.5 we can see that the composition of the workforce changed from 1990 to 2006. For instance, we see that the sample population of Danish workers declined from 10,569 in 1990 to 5,698 in 2006. Conversely, the sample population of Non-Danish workers rose from 1,502 in 1990 to 5,065 in 2006. However, it is clear that the distribution of Danish and Non-Danish workers is unequal in different types of vessels. This shows that it is important to control for different vessel types. All vessel types do have some Non-Dane employees, but most short haul vessels have very few, and some have none at all. This may be because the short haul vessels are often much smaller than the other types, they have a much smaller crew, and they may have more frequent work rotations (i.e., two weeks at sea and two weeks ashore). The long haul vessels that have less frequent work rotations (i.e., four months at sea and four months ashore) have the highest proportion of Non-Dane workers.

In 1997, there was a dramatic rise in the number of vessels (Figure 2.4). This may be attributed to a reclassification of one company type from the public sector to the private sector. This resulted in a change in the way individuals were recorded in the dataset provided by the Danish Maritime Authority. The majority of the increase in vessels came in the passenger vessel category, as is reflected in

Figure 2.3: Descriptive Statistics for All Employees in sample: 1990 and 2006



Figure 2.4: Vessel Types by Year



the increase in the number of workers (Figure 2.5).

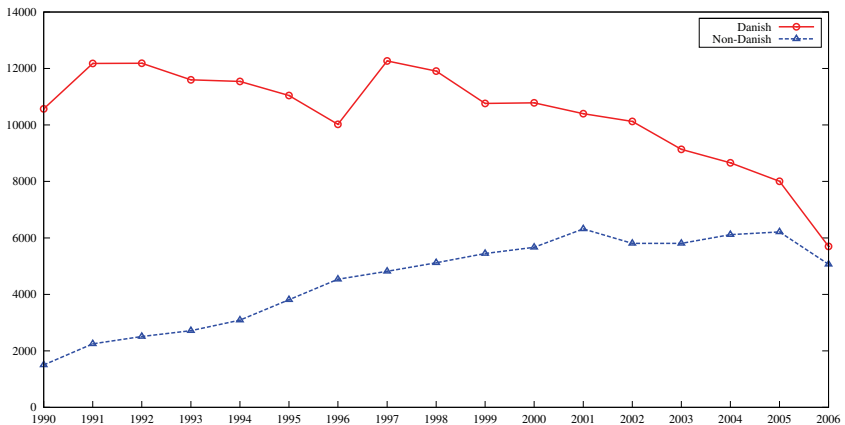
To get a sense of whether the rates of individual turnover are influenced by a firm’s tendency to hire domestic workers, we turn to the *Firm HR ave* in Table 2.2<sup>8</sup>, Model 1. We see that the *Firm HR ave* variable is positive, but not significant. However, the change from the previous year in firm HR average is negative and significant. This suggests, in general, that as the firm average changes (i.e., as the average number of Danish workers increases), Danish workers are less likely to leave the workplace.

To understand how turnover is influenced by an increase in the proportion of workers in the overall workplace who have the same nationality as the focal individual, we also add the variable ‘proportion Danish on vessel’ (see Model 2). This variable represents the proportion Danish workers relative to all workers on the whole vessel at the relevant period. It is evident that the result is negative and

<sup>8</sup>For the full table (including all covariates) see Table2 in the Appendix



Figure 2.5: Danish and Non-Danish (foreign) Employees by Year



significant. This is consistent with what we would expect. It suggests that as the proportion of Danish workers on the whole vessel increases, the probability that Danish workers will leave declines.

To examine Hypothesis 1, which claims that higher own national representation decreases the hazard to exit the workplace, we turn to Model 3. In this model, we use two variables (namely *proportion Danish workers in own work group* and *proportion Danish workers in all other work groups*) to essentially divide the total number of workers on a ship into two groups. In other words, each department, *engineering, navigation, and steward's*, is individually measured relative to *own work group*<sup>9</sup> and *rest of ship*<sup>10</sup>. For example, if an individual is a member of the *engineering department*, then the value given to the first variable would represent the proportion of positions in the *engineering department* that are occupied by

<sup>9</sup>Each department is a work group. For example, the *engineering department* is one work group, the *navigation department* is one work group and the *steward's department* is the final work group.

<sup>10</sup>*Rest of ship* and *all other work groups* have the same meaning and are used interchangeably in this paper

Danish employees in the relevant period. The value given to the other variable, *proportion of Danish workers in all other work groups* would represent the average share of positions in the *steward's department* and the *navigation departments* that are occupied by Danish workers. The results show that Danish workers are more likely to stay as the proportion of Danish workers in their own department increases. Here we find support for the first hypothesis. However, when we consider the way Danish workers are affected by an increase in proportion of Danish workers on the rest of the ship, we see that the effect sign is positive, but it is not significant. This suggests that Danish workers are most sensitive to an increase in proportion Danish individuals in their own work group.

Table 2.2: Baseline Piecewise Constant Hazard Rate Model of the Effects of Racial Composition on Turnover: Proportion Danish in own department vs. on rest of ship (ros) by High Task Interdependency

	Model 1	Model 2	Model 3	Model 4
High Task Interdependent work group (dummy)	-0.151*** (0.01)	-0.158*** (0.01)	-0.156*** (0.01)	-0.158*** (0.04)
Number on vessel at time of hire	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)
Change in size	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)
Size own dept	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)
Change in size own department	0.002*** (0.00)	0.002*** (0.00)	0.002*** (0.00)	0.002*** (0.00)
Firm HR ave (proportion Danish by dept, ship type, year)	0.013 (0.02)	0.101*** (0.03)	0.094*** (0.03)	0.098*** (0.03)
Change in firm HR average since previous year	-0.481*** (0.04)	-0.497*** (0.04)	-0.484*** (0.04)	-0.472*** (0.04)
Proportion Danish on vessel		-0.117*** (0.02)		
Proportion domestic in own work group			-0.103*** (0.02)	0.188*** (0.03)
Proportion domestic in all other work groups			0.010 (0.02)	-0.320*** (0.03)
High Task Interdependent work group (d) x Proportion Danish in own work group				-0.385*** (0.04)
High Task Interdependent work groups (d) x Proportion Danish in all other work groups				0.405*** (0.03)
Constant	-3.086*** (0.40)	-3.028*** (0.41)	-3.059*** (0.40)	-3.001*** (0.40)
Observations	767035	767035	767035	767035
Standard errors in parentheses				
* $p < 0.10$ , ** $p < 0.05$ , *** $p < 0.01$				

Table 2.3: Wald

Variable	Model 5	sig	dof
High Task Interdependent work group (d) x Proportion Danish in own work group	-0.197	***	1
High Task Interdependent work group (d) x Proportion Danish in all other work groups	0.085	***	1
* $p < 0.10$ , ** $p < 0.05$ , *** $p < 0.01$			

In relation to the effects of high task interdependency, Hypothesis 2 argues that high task interdependency positively moderates the effect of own national representation on hazard to exit the workplace. Examining the results for the analysis in accordance with Model 4 for *High Task Interdependent work group (d) x Proportion Danish in own work group*, *High Task Interdependent work groups (d) x Proportion Danish in all other work groups* we can see that employees in high task interdependent work groups become less likely to exit the workplace as the proportion of Danish workers in their work group increases. We performed a Wald test and confirmed that the differences between the *High Task Interdependent work group (d) x Proportion Danish in own work group* and the *High Task Interdependent work group (d) x Proportion Danish in all other work groups* estimates are significant (see Table 2.3). This result provides support for our second hypothesis.

To test Hypothesis 3, which asserts that a decrease in own national representation since time of hire will result in an increase in the hazard to exit the workplace, we turn to the results presented in Table 2.4<sup>11</sup>. Model 8 shows the change since an individual was hired in the proportion Danish employees on the vessel. Interestingly, the results show that when the change in proportion domestic workers

<sup>11</sup>For the full table (including all covariates) see Table3 in the Appendix

was becoming increasingly positive, individuals were more likely to leave. This is inconsistent with the previous findings (Sørensen 2004) (We will return to this issue in the Discussion and Conclusion sections). We then see that as the change in proportion of domestic employees was becoming increasingly negative, individuals also became more likely to leave. This seems more reasonable, and it is consistent with the findings of previous research (Sørensen 2004), which suggest, in general, that as the proportion own nationality decreases, individuals are more likely to exit the workplace. Overall, Model 7 shows that when the change in the proportion of employees on the vessel who represent the same national culture is examined over time, individuals become more likely to leave when they are less represented. This finding supports the third hypothesis.

Table 2.4: Piecewise Constant Hazard Rate Model of the Effects of Change in Foreign/Domestic Composition on Turnover: Change in proportion domestic (on vessel)

	Model 6	Model 7	Model 8
Steward's department	0.095*** (0.01)	0.099*** (0.01)	0.122*** (0.01)
Navigation department	-0.112*** (0.01)	-0.112*** (0.01)	-0.108*** (0.01)
Engineering department	baseline	baseline	baseline
Number on vessel at time of hire	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)
<b>Change in number on vessel since time of hire:</b>			
Change in size: Positive	-0.001*** (0.00)	-0.001*** (0.00)	-0.003*** (0.00)
Change in size: Negative	-0.000 (0.00)	-0.000 (0.00)	0.001*** (0.00)
Firm HR ave (proportion Danish by dept, ship type, year)	0.018 (0.02)	0.051** (0.02)	0.051** (0.02)
Change in firm HR average since previous year	-0.461*** (0.04)	-0.468*** (0.04)	-0.421*** (0.04)
Proportion Danish upon hire (vessel)		-0.045*** (0.02)	0.058*** (0.02)
<b>Change in proportion Danish (vessel) since hired:</b>			
Change in proportion Danish: Positive			3.710*** (0.10)
Change in proportion Danish: Negative			-2.906*** (0.07)
Constant	-3.139*** (0.41)	-3.120*** (0.41)	-3.289*** (0.40)
Observations	767035	767035	767035
Standard errors in parentheses			
* $p < 0.10$ , ** $p < 0.05$ , *** $p < 0.01$			

## DISCUSSION AND CONCLUSION

In this paper, we asked the overall question of how a nationally homogeneous group of workers responds to an incursion of foreign nationals. To examine this question we had to use nationality as the indicator of group homogeneity. In our analysis we found support for the first hypothesis, which stated that higher own national representation decreases the hazard to exit the workplace. This is consistent with the principles that have emerged from prior research in organizational demography, namely, that homogeneity leads to stronger attachment to the group and greater cohesion (see e.g., Williams and O'Reilly III 1998), and that as attachment to group increases, turnover is likely to decrease (Evan 1963).

Next we examined *high task interdependency* to see if it would positively moderate the group homogeneity-turnover relationship. We did find support for the hypothesis that *high task interdependency* positively moderates the effect of own national representation on the hazard to exit the workplace. This suggests that *high task interdependent* work groups that require efficient communication and an unrestricted flow of information to function well capitalize on, and perhaps strengthen, the mechanisms of cohesion and communication that are present in a nationally homogeneous work group. However, these results should be viewed with caution because the results also show that *low task interdependent* work groups are more likely to exit the workplace as the level of their own national representation increases. This finding conflicts with a central argument in this paper. We did argue that *high task interdependency* capitalizes on mechanisms present in homogeneous groups and we acknowledged the implication that *low task interdependent* groups would not benefit from these mechanisms to the same extent.

Therefore, we did not expect low task interdependence to positively moderate the homogeneity-turnover relationship to any significant degree. What is surprising, however, is that an increase in own representation results in an increased likelihood to exit the workplace. This suggests that some other mechanisms may be at work. One possible explanation is that workers in *low task interdependent* groups may view new co-workers as their competitors because their work is independent in nature. It is possible that for individuals in *low task interdependent* work groups, homogeneity in the workplace may be less important than perceived opportunities for advancement. If this is the case, any additional employees, whether they represent the same or a different nationality, would be perceived as competition so their presence would result in a lower level of attachment to the group and ultimately to an increase in turnover. Indeed, when we see that as the proportion own nationality employees outside their own work group increases (i.e., when there is an increase in the proportion of own nationality employees who do not pose a competitive threat to their own jobs), the likelihood of exit decreases. This is consistent with the notion that some workers consider coworkers in their own low interdependent work groups as competitors but they consider others who are not in their own work group as non-competitors. As such, they may form greater attachment to own nationality employees who are not in their own work groups. Clearly, these results warrant additional scrutiny through future research.

We find support for the third hypothesis where we argued that a decrease in own national representation in the period after an individual was hired will result in an increased hazard to exit the workplace. This finding is consistent with prior research that shows that individuals do remember the conditions they previously



experienced within the firm, and that they are more likely to exit the workplace if they find themselves less demographically represented. In other words, our findings suggest that when individuals having a certain national cultural background find themselves increasingly outnumbered in their workplace by individuals from a different country, they will become less attached to the workplace and be more likely to leave. However, our results also show that in some cases an increase in the proportion of workers in a workplace who represent an individual's own nationality will also cause the likelihood that the individual will exit the workplace to increase. This suggests that perhaps *change* may be a cause of turnover. Another plausible explanation may be that what we see is the result of the "Ashenfelter's Dip" (Ashenfelter 1978) phenomenon. A possible scenario in this context could be that there is a problem on the ship causing unfavorable working conditions, which in turn causes Danish crew members to choose to leave the vessel. This results in a drop in Danish crew members and, by default, an increase in the proportion foreign workers on board the vessel. Management then perceives an effective solution to the problem to be to replace foreign workers with more Danish workers. The problem on the vessel remains and the new Danish workers also choose to leave. The critical weakness in this scenario is that it relies on the assumption that management hires and moves groups of individuals on and off of vessels based on the crew members' nationality. The interviews have indicated that management hires crew members based on qualifications and not based on nationality, making this explanation less likely. It also suggests that further investigation of the moderating effects of both *high* and *low task interdependency*, and the ways that individuals are affected by other workers who are outside their own

work groups, would be warranted.

To address concerns of self-selection, we conducted interviews which revealed that overall, companies did not have policies which would allow individuals to choose which vessel they would go on when they were hired. This significantly reduces endogeneity concerns in terms of self-selection. Another selection concern was whether management would move groups of crew members on and off the vessel, based on the crew members' nationality or possibly based on the vessels' ports of call. Interviews revealed that individuals were hired largely based on their qualifications and were moved on and off the vessel based on whichever standard rotational schedule was the norm for that company. None of the companies interviewed revealed a policy of moving groups of individuals on and off of vessels based on crew member nationality suggesting that the findings in this paper reflect movements that are largely based on individual choice. It should be noted, however, that due to the unusual hiring practices of one passenger ship company (ship board crew ultimately hiring crew members for the vessel) may introduce a different type of bias. Consequently, there may be quite a bit of heterogeneity in the *passenger vessel* category.

These findings may be relevant to organizations that are thinking about hiring foreign nationals. In particular, the results suggest that it is important to consider the level of task interdependency that their jobs will entail and the kinds of tasks that the work groups will need to successfully perform. For certain types of high task interdependent operations, it is possible that a high level of homogeneity within groups is advantageous. This concern may be particularly important if the organization is building work groups with the ultimate goal of achieving high

performance and low turnover.

The findings of this study also contribute to the organizational demography literature by using nationality as a measure of culture. While organizations continue to assemble teams and work groups from around the globe, it is important to understand the way a workplace that is composed of employees from many countries with diverse national cultures may affect organizational performance and other economic outcomes. Researchers who have examined attachment mechanisms often draw conclusions based on assumptions about similarity, and they often measure similarity in terms of culture. Culture is assumed to be the experiential commonality that makes it possible for individuals to identify and relate to each other. A vast majority of the studies in this research stream use ethnicity or race as measures of cultural commonality. However, this study highlights the possibility that in the case of work groups that are heterogeneous in terms of race, ethnicity and nationality, indicators of nationality may be the most accurate measure of cultural commonality among coworkers. And while this idea goes beyond the scope of this paper, an understanding of the way individuals in nationally homogeneous groups appear to become more attached to their work groups, and hence to their organizations, would fill an important gap in the existing literature. By using nationality as a measure of culture, it may be possible to contribute to both the relational literature and the organizational demography literature.

Several limitations to the generalizability of the findings from this study must be noted. One limitation is that the findings may not apply to high task interdependent work groups that are engaged in creative activities that depend on a certain level of heterogeneity. In fact, complete generalizability may be restricted

to high task interdependent groups where there is a risk of dire consequences in the case of a failure to communicate. In future research that examines task interdependency as a moderator, it might be useful to also consider reward outcomes. For example, when individuals work in groups in situations that involve high task interdependence and that involve a high risk of dire consequences or a monetary penalty if there is ineffective or inaccurate communication (e.g., firefighters, airline pilots, mariners) the individuals may be more sensitive to changes in homogeneity. On the other hand, the outcome might be different in situations where the penalty for poor communication is low. Future research may also look at whether the same mechanisms apply for all nationalities to the same degree.

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The undersigned who is  
☐ corresponding author  
☒ co-author

on the paper/manuscript above, hereby confirms that \_Christine D. Isakson has contributed to  
the work as stated below:

1. Intellectual input:

less than 25%      25 - 50 %      **X** 50 - 75%      75 - 100%

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2. Experimental results (indicate contribution to individual figures, tables and supplementary  
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less than 25%      25 - 50 %      50 - 75%      **X** 75 - 100%

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was purely advisory.

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Comments: \_Christine drafted the paper and I made only minor suggestions.

\_\_\_\_\_  
Jesper B Sørensen  
Written Name

  
\_\_\_\_\_  
Signature

## Peer Effects and Entrepreneurship: Coworkers Up-close and Intense

Christine D. Isakson

### ABSTRACT

This paper examines whether entrepreneurial peer effects are positively influenced or strengthened by the intensity of work relations. It argues that individuals who have frequent interaction with coworkers who have prior entrepreneurship experience are more likely to transition to entrepreneurship themselves. Recent work has shown that an individual is more likely to become an entrepreneur if he or she works in a firm that employs individuals who have an entrepreneurial past. This paper offers a discussion of whether entrepreneurial peer effects are amplified by 1) spending more time with peers who have had prior entrepreneurial experience or 2) working in the same job functionality with workplace peers who have had prior entrepreneurial experience. The results of this study reveal a strong, positive general peer effect and also a stronger peer effect among those in the same work functionality than among those engaged in different job functionalities. A unique combination of three longitudinal data sets (spanning 12 years) provides a granular view of the intensity of the work relations and the level of interaction among coworkers within the firm.

## INTRODUCTION

It is well established that entrepreneurship plays a central role in job creation and in determining economic growth and development. A central issue in this discourse pertains to the contextual factors that spur entrepreneurship. Previous research has demonstrated both that an individual's entrepreneurial actions and outcomes are affected by his or her own career history and experiences and that these prior experiences have an impact on an individual's access to resources, ideas and information (Burton et al. 2002; Freeman 1986; Shane 2000; Shane and Khurana 2003; Sorenson and Audia 2000). In an effort to gain an understanding of what influences individuals to transition to entrepreneurship, research examining the contextual effects of organizations and the social influence of peers in the workplace has garnered increased attention. This attention may stem from the general understanding that, of the numerous motivational influences in the workplace, contextual effects are a highly important consideration (Perry and Porter 1982). The context of the firm in which an individual works plays a significant role in the generation of new entrepreneurs and can trigger the transition to entrepreneurship (Dobrev and Barnett 2005; Freeman 1986; Ozcan and Reichstein 2009; Sørensen 2007). One of the most critical factors that influences an individual in the immediate work environment is the worker's peer group (Perry and Porter 1982). Of course, research on the peer effects of entrepreneurship falls within this context due to the very nature of the variables under consideration. However, despite the fact that the extant literature has broadened our understanding of the factors that affect an individual's choice to transition to entrepreneurship, there has been little effort to understand the extent of entrepreneurial peer effects. One important



exception is the work of Nanda and Sørensen (2010), who suggest that as individuals spend more time in the workplace, potential entrepreneurs are increasingly likely to find their coworkers to be an important source of social influence. In addition, while Nanda and Sørensen (2010) have established a theory with supporting evidence for this important finding, they do not address the issue of whether individuals are more likely to transition to entrepreneurship as a result of a) increased exposure to their entrepreneurial peers and b) shared work functionality with their entrepreneurial peers. These are important questions, and researchers have yet to provide adequate answers to them. Understanding the mechanisms of peer influence in the workplace contributes to our knowledge of the factors that bring about transitions to entrepreneurship and consequently to our understanding of the issues that promote the flow of entrepreneurs from organizations to the marketplace. Indeed, understanding these mechanisms in greater detail ultimately enables us to better comprehend the generating forces of the economy's supply of entrepreneurs.

This paper examines the question of whether entrepreneurial peer effects are strengthened by *up-close and intense* work relations. The terms up-close and intense are defined by the extent of exposure to workplace peers who 1) have prior entrepreneurial experience<sup>1</sup> and who also 2) work within the same job functionality. This paper argues that context, social influence, and cognitive proximity each play a role in how entrepreneurial workplace peers influence an individual's decision to transition to entrepreneurship. To gain a more complete picture of the extent of the influence that entrepreneurial peers have on their coworkers, this pa-

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<sup>1</sup>Throughout this paper, the term "entrepreneurial peers" and "entrepreneurial workplace peers" will be used interchangeably to refer to "workplace peers with prior entrepreneurial experience".

per looks more closely into the workplace and considers the context of their job characteristics. Job characteristics are "... the nature of the job or the collection of tasks that comprise the job" (Perry and Porter 1982: p. 90). This paper attempts to show that sharing the same job characteristics (or job functionality) increases the extent of the influence that entrepreneurial peers have on their coworkers.

Both organizational context and peer context in the immediate work environment are important considerations in the assessment of how likely an individual is to transition to entrepreneurship. While we already know that, in the context of the work environment, individuals are positively influenced by workplace peers to transition to entrepreneurship (Nanda and Sørensen 2010), we do not know whether individuals are further encouraged to transition to entrepreneurship by their peers when they work more closely together. This paper will investigate the mechanisms in two ways. First, it will examine the overall peer effect in the context of the workplace and how exposure to entrepreneurial peers can affect the transition to entrepreneurship. This paper argues that within the organizational context, an increase in a coworker's exposure to entrepreneurial peers increases the likelihood of inducing a transition to entrepreneurship via social mechanisms and knowledge transfer (Nanda and Sørensen 2010). Second, the paper argues that working *up-close and intense* within the firm strengthens the influence that coworkers have on one another as a result of cognitive proximity, including sharing the same technical language and system of meaning (Nooteboom et al. 2007). Nooteboom et al. (2007: p. 1017) have viewed cognitive distance between organizations as differences in "systems of shared meanings... established by means of shared fundamental categories of perception, interpretation and evaluation in-

culcated by organizational culture.” In other words, cognitive distance includes ”sharing a same technical language and meaning.”

In the past, it has been difficult to test this notion due to the limited availability of data. The characteristics of new microdata, however, now allow me to investigate whether entrepreneurial peer effects are strengthened by the up-close and intense nature of work relations. In addition, given the granular quality of the newly available data, this paper contributes to the discussion of social networks and their effects on an individual’s choice to transition to entrepreneurship in that it at least partially addresses and minimizes the concerns of self-selection issues which are common in peer effects research (Manski 1993). Two fundamental challenges in peer effects research are 1) self-selection and 2) the ability to identify individual interaction. First, I seek to minimize the self-selection concerns by arguing that the individuals in this study are, for the most part, randomly placed into their respective workgroups. The second challenge in peer effects research involves the ability to identify and measure individual interaction. While previous studies have been able to identify those who work together in the same firm, it has been difficult to identify whether or not those individuals in fact interact. The ability to accurately assess individual interaction is an element that is important to, and yet missing from, peer effects research. The utilized data, which allow for the identification of individual interaction with a greater degree of certainty, permit me to refine our understanding of coworker peer effects on the transition to entrepreneurship. The results of this study suggest a strong, positive general peer effect that indicates that the more intense an individual’s exposure to peers with prior entrepreneurial experience is, the more likely the individual is to tran-

sition to entrepreneurship. The findings also suggest that there is a stronger peer effect among those in the same work functionality than among those engaged in different job functionalities. This result indicates that when an individual with no prior entrepreneurial experience works up-close and intense with peers who have prior entrepreneurial experience, the individual is likely to be influenced by his or her entrepreneurial peers and thus be more likely to transition to entrepreneurship. Finally, I argue that the new data can minimize concerns relating to self-selection.

The paper is structured as follows. In the next section, I present theoretical arguments connecting coworkers' past entrepreneurial experience with how they may influence an individual's choice to transition to entrepreneurship. In section 3, I link individuals' cognitive proximity, relative to their workplace peers, to entrepreneurship. Section 4 discusses the reflection problem and how these concerns are minimized. Section 5 offers a description of the data and the assessment values. Section 6 contains the results, and the final section 7 presents a discussion and conclusion.

## **THEORETICAL BACKGROUND**

Both organizational and social influences play a part in an individual's choice to move into entrepreneurship. The organization of origin is of particular importance as it can play a substantial role in the potential entrepreneur's subsequent career decisions, i.e., when he or she forms new ventures. A majority of entrepreneurs transition into entrepreneurship after having spent time as an employee in an already established firm (Bhide 2000; Burton et al. 2002). Indeed, entrepreneurs are viewed as a product of the parent organization, in that the firm

provides that the potential entrepreneur with market knowledge and the ability to both attract and allot resources (Freeman 1986). The organization is also significant in that the experience and status gained at prior firms (Shane and Khurana 2003) or the prominence of the originating firm itself (Burton et al. 2002) allow entrepreneurs to more easily assemble the resources needed to start a new venture. Moreover, prior career experience (Carroll and Mosakowski 1987) and the structure of the firm (Burton et al. 2002) affect the choices that entrepreneurs make when they start their own venture. These insights further highlight how critical it is to consider the individual's pre-entrepreneurial organizational setting when one investigates the drivers that influence individuals to transition to entrepreneurship. Because a majority of potential entrepreneurs have spent time in an already established firm and because the firm of origin has such an impact on potential entrepreneurs, understanding the dynamics within the firm may help us gain insight into how coworkers influence potential entrepreneurs into leaving an organization and starting their own firm.

Contextual effects play an important role in influencing an individual's motivation in the workplace (Perry and Porter 1982). Although understanding organizational context is important for our overall knowledge of the supply of entrepreneurs, it is particularly key to understanding the drivers that influence transitions to entrepreneurship. Underscoring this truth, Sørensen (2007: p. 409) maintains that "...context matters. Entrepreneurs are made, not simply born." In other words, contextual effects drive entrepreneurial activity. Indeed, various firm characteristics influence the likelihood that an individual will choose to exit to entrepreneurship. For instance, recent work has shown that the bureaucratic na-

ture of the firm (Ozcan and Reichstein 2009; Sørensen 2007), the size of the firm (Sørensen 2007) or the position of the individual within the firm (Dobrev and Barnett 2005) may predict the likelihood of exit to entrepreneurship.

While understanding the individual's firm origin gives us clues as to the hows and whys of their entrepreneurial exit, what happens within an individual's social network is also an important part of our overall understanding. A key assumption in peer effects research is the mechanism of social interaction, in particular, that individuals transfer knowledge and information via that social interaction. Social interactions are manifested through social networks. Social networks act as channels for the distribution of information in society (Hayek 1945), and potential entrepreneurs make use of these social networks when they consider their options. For instance, before founding a firm, individuals may glean information from and obtain access to valuable resources via their social networks (Granovetter 1985, 1992), thus lowering the hurdle to entrepreneurship. Social networks both inside and outside the workplace have been shown to be important sources of support and information to the establishment of a new firm (Dubini and Aldrich 1991), suggesting that social networks are a central mechanism by which entrepreneurial knowledge is transferred.

However, because the firm of origin and organizational context do influence the potential entrepreneur, we can gain more precise insights into the drivers of transition to entrepreneurship by restricting our focus on the social influences within the workplace. Saxenian (1994), for instance, suggests that the flow of knowledge in the workplace provides individuals with an environment that is strongly supportive of an entrepreneurial culture. In such a setting, individu-

als with prior entrepreneurial experience may share their experiences with their coworkers, providing them with information about how to acquire the skills and resources needed to start their own firm. Because knowledge and ideas are shared through social interaction in the workplace, it is important to pin down the importance of the social interaction component of coworker peer effects. One salient outcome of this social interaction is social learning (Bandura 1977). Indeed, research in entrepreneurship literature claims that "employees learn from their coworkers about what it takes to start a new firm." (Gompers et al. April, 2005: p. 612). This form of information-sharing may lower the hurdle to entrepreneurship. For example, as Nanda and Sørensen (2010) also argue, prior entrepreneurs who share information with their coworkers about the details of setting up a new firm or by sharing market knowledge may instill confidence in the potential entrepreneur by implying an "if I can do it, you can do it" sentiment. Prior entrepreneurs may also lower the hurdle by minimizing the "stigma of failure"(Landier 2005). They may do this by demonstrating that even if the potential entrepreneur does fail in his or her new venture, it is not catastrophic because they are likely to find future employment if their venture fails (Nanda and Sørensen 2010). The sharing of information within the network of one's coworker peers may be a primary conduit for entrepreneurial influence.

## **HYPOTHESES**

An increased interest in understanding the influence of peers in the workplace may be attributed to an increased awareness of the importance of the need to understand the social context and to recognize the heterogeneity of social influences

when one seeks to analyze the social forces at play in the workplace. Workplace peers are an important subset of an individual's social network and as such, are worthy of study; after all, individuals in the workforce spend a considerable amount of their time among workplace peers. Thus, an increasing amount of attention is being paid to the characteristics of coworkers and how they affect coworker productivity (Mas and Moretti 2009) and academic entrepreneurship (Bercovitz and Feldman 2008). A paper of particular interest in this regard examines coworker peers and their influence on the potential entrepreneur (Nanda and Sørensen 2010). Although the authors have shown that those with a higher proportion of entrepreneurial coworkers are more likely to transition to entrepreneurship, they were unable to determine whether the individuals were likely to have had social interactions in the workplace. Determining social interaction is a critical component of social learning. Indeed, social learning theory asserts that individuals learn from others either indirectly or through observation (Bandura 1977). This type of social learning is a salient mechanism in the peer effects process. For instance, we know that when faced with economic choices individuals may turn to their coworkers for valued information (Sorensen 2006). Because the sharing of information and learning is partly a function of repeated interaction (Vanneste and Puranam 2010) and given that repeated interaction takes time, it stands to reason that as time together (intensity) increases, so does the likelihood that coworkers will share information and ideas related to their past work experience. If social interaction is indeed central to the transfer of entrepreneurial knowledge, then it would follow that having more intense social interactions would result in a higher likelihood of coworker influence on the transition to entrepreneurship. I propose



that social interaction among coworker peers is needed and, furthermore, that it can be shown in that those having more intense interactions are indeed influenced to a greater extent. I therefore put forth that:

*H1: Individual rates of entrepreneurship increase with the intensity with which workers are exposed to coworkers with prior entrepreneurial experience.*

An additional contextual effect worthy of consideration (and one that refines our understanding of the mechanisms of peer effects in the workplace) is that of job characteristics. Porter and Miles (1974) list job characteristics as one of the important variables when motivation in the workplace is considered. Job characteristics consist of "... the nature of the job or the collection of tasks that comprise the job" (Perry and Porter 1982: p. 90). Thus, it follows that sharing job characteristics (same job functionality) with coworkers leads to increased knowledge transfer between them and consequently to a greater likelihood of peer influence. With this in mind, this paper focuses on the job characteristics of each individual within an organization and looks at the impact that coworker closeness, or *up-close and intenseness*, has on the level of coworker influence. *Up-close and intenseness* indicates an individual's position within the firm in relation to his or her coworkers, i.e., having either the *same*, or a *different* job functionality<sup>2</sup>.

There are two primary mechanisms that shed light on our understanding of the work-related activities that mechanisms which increase the likelihood that coworkers will share entrepreneurial knowledge and that will ultimately influ-

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<sup>2</sup>A dichotomous measure is employed. Coworkers are defined as either *same* or *different* in terms of job functionality.

ence potential entrepreneurs to transition to entrepreneurship. First, a shared job functionality makes it easier to transfer knowledge because of the share common meanings and a subcultural language. Second, a shared job functionality makes it easier to transfer knowledge because a knowledge base is in fact shared (low cognitive distance).

The first mechanism originates in social learning theory. As previously mentioned, social learning theory posits that individuals learn from each other in a vicarious fashion (Bandura 1977; Manz and Sims Jr. 1981). Shared job functionalities will heighten this learning process. Another catalyst smoothing the way for more fluent communication of ideas is homophily. Homophily is defined as a tendency for friendships to form between those who are alike in some designated respect (Lazarsfeld and Merton 1954:p. 23). Individuals with the same job functionality will share common experiences as well as other characteristics (such as education) that are salient to homophilous bonding. To this point, previous research claims that "More effective communication occurs when two or more individuals are homophilous." (Rogers 1995:p.19) Furthermore, and perhaps more importantly, research states that "When they share common meanings, a mutual subcultural language, and are alike in personal and social characteristics, the communication of new ideas is likely to have greater effects in terms of knowledge gain, attitude formation and change, and overt behaviour change. When homophily is present, communication is likely to be rewarding to both participants in the process." (Rogers 1995:p.19)

As coworkers who work within the same job functionality share an informal narrative and engage in vicarious learning, they become credible sources of valued

information. This credibility would likely extend to other recommendations that are made based on past experience and knowledge, and potential entrepreneurs would probably find them credible. In this exchange, it is not difficult to imagine that there would be a spillover of knowledge and information leading to conversations about entrepreneurship. Indeed, a shared technical language increases the likelihood that coworkers will share previous experiences and knowledge with each other. For instance, Saxenien (1994) claims that communities with a shared language and shared meanings are more likely to reinforce a shared technical culture and increase the viability of a startup environment. Thus, it seems likely that those sharing the same job functionality are likely to share past experiences and knowledge, and if those past experiences include entrepreneurial experience, they are likely to share that as well. As coworkers become credible sources of information, it is hard to imagine that the knowledge being shared would be limited to the job at hand. There may in fact be a wide variety of ideas and exchanges that could include knowledge regarding entrepreneurial resources and opportunities. Specifically, potential entrepreneurs may calculate that the information will be more costly to obtain elsewhere and that they have a more credible, low-cost source of valuable information right in their coworker; they may thus opt to accept the information given to them by their peers as credible and valuable. Moreover, for the entrepreneurial peers, the cost of sharing the information is quite low, and in fact, there may be intrinsic gains (see e.g., Wasko and Faraj 2000). That they have the knowledge in the first place is the first consideration; in fact, Jeppesen and Laursen(2009:p. 1583) claim "...that although motivation to share are a necessary condition for knowledge contribution, actually holding the necessary

knowledge to make a sensible contribution will also increase the likelihood that a given individual go ahead and make such a contribution.”

While homophily and social learning may increase the likelihood of knowledge transfer between coworkers, what is it about being *up-close and intense* that makes them more likely to share entrepreneurial knowledge in particular? For further insight, we turn to the notion of cognitive proximity. The concept of cognitive proximity implies that individuals with the same knowledge base may more easily transfer that knowledge and learn from one another. Nooteboom (2000:p. 153) states that “a tradeoff needs to be made between cognitive distance, for the sake of novelty, and cognitive proximity, for the sake of efficient absorption. Information is useless if it is not new, but it is also useless if it is so new that it cannot be understood.” A similar notion is expressed in the innovation literature, claiming that while homophily aids in the transfer of information and ideas, a certain amount of heterophily<sup>3</sup> is necessary where the transmission of new knowledge is key. “In fact, when two individual are identical regarding their technical grasp of an innovation, no diffusion can occur as there is no new information to exchange.” (Rogers 1995:p. 19) I claim that the same principles apply to diffusion of entrepreneurial knowledge.

In this setting, in which individuals share the same job functionality, having cognitive proximity promotes a higher level of interactive communication due to their shared knowledge base. This milieu provides a favorably balanced setting: it contains cognitive proximity (the individuals share the same knowledge base) and cognitive distance (to the individual with no entrepreneurial experience, virtually

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<sup>3</sup>Heterophily is defined as “a tendency for friendships to form between those who differ in some designated respect.” (Lazarsfeld and Merton 1954:p. 23)

all knowledge shared by the entrepreneurially experienced coworker is new).

In sum, *upclose and intense* coworkers will share a similar technical language and culture, are likely to engage in vicarious social learning and have the right balance between cognitive proximity and cognitive distance. The combination of these conditions will increase the probability of shared ideas and the diffusion of general knowledge, and it will consequently increase the influence that coworkers have on their peers. In addition, in this *up-close and intense* setting, in which coworkers with previous entrepreneurial experience work alongside individuals with no entrepreneurial experience, entrepreneurial knowledge is likely to be shared. In other words, all peers are not created equal. *Upclose and intense* coworkers increase the likelihood of peer influence on an individual's transition to entrepreneurship.

*H2: The positive impact of prior entrepreneurial experience among workplace peers on the individual rate of entrepreneurship increases with shared job functionality.*

## DATA AND METHOD

### Overview of the Study

In this section, I present an overview of the overall design of the study. This study uses a mixed method research design known as an *Explanatory Design–follow-up explanations model* (Creswell and Plano Clark 2007). In this type of design, and in this paper, both quantitative and qualitative methods are used. However, the quantitative component is the primary mode of investigating the questions posed. The investigation is conducted using detailed registered micro data. Once the

qualitative portion of the analysis was completed, the qualitative portion of the study was conducted in the form of a series of interviews. The interviews were conducted to get a better sense of the extent to which endogeneity issues were a concern in this setting. Self-selection issues are notoriously difficult to tease out in any social influence research (Manski 1995) and this study is no exception. Conducting interviews provided us with the opportunity to better understand to what degree self-selection issues were a concern and to potentially make a meaningful contribution to peer effects literature. So while the quantitative portion of this study is the main mode of investigation, the interviews provide salient detailed information regarding the movement of crews. The combination of these two methods offer a well-rounded view of the context under scrutiny. The upcoming sections are presented as follows; the data in the quantitative component is followed by the measures then methods sections of the quantitative component. Subsequently, the method section of the qualitative component is presented. After these sections come the results of the quantitative and qualitative sections, respectively.

### **Data in the Quantitative Component**

The quantitative portion of this paper makes use of three datasets: 1) registered data, provided by the Danish Maritime Authority (DMA); 2) the Integrated Database for Labor Market Research in Denmark (IDA), provided by Statistics Denmark; and 3) a comprehensive data set on Danish entrepreneurs, also provided by Statistics Denmark.

The first dataset, the data provided by the Danish Maritime Authority, in-

cludes all individuals who have worked on Danish vessels in the period 1994–2006. These data provide a granular view of the work setting, as they include the days that an individual was on a particular vessel, the vessel to which he or she was assigned, and the position that the individual held while on the vessel during that period. The second dataset, IDA, is a matched dataset that includes all individuals within the Danish labor force. These data are assembled in November of each year. A number of recorded characteristics make these panel data appealing for this study. For instance, the IDA database contains data on an individual's education, salary, and employment history as well as information on personal characteristics and family composition (age, parents, siblings, children). The IDA database has also been used in prior studies on entrepreneurship (see e.g., Nanda and Sørensen 2010). Finally, the third dataset is a comprehensive dataset comprising Danish entrepreneurs; provided by Statistics Denmark, it contains a list of all entrepreneurs from 1994 to 2006.

The sample dataset was constructed in stages. First, using the DMA data, I identify all individuals working on a Danish vessel during a given year, beginning in 1994 and ending in (and including) 2006. These data include their personal identification number, the specific vessel they were on, and their position. Second, the DMA sample dataset is then combined with the data on Danish entrepreneurs. The information on each individual who went to sea in a given year was reviewed to see if he or she had become an entrepreneur in the following year.

By combining the DMA data and the Danish entrepreneurs data, it is possible to see who transitioned to entrepreneurship. A dummy variable was created to indicate whether or not individuals transitioned to entrepreneurship in the subse-

quent year. They are censored if they were otherwise no longer found in the DMA dataset (indicating that they were no longer employed at sea). Third, the resulting dataset was then combined with the IDA, which allowed me to obtain control variables. Demographic variables were obtained for all domestic individuals; these included age, gender, if they had children, and wages earned.

### **Measures in the Quantitative Component**

*Dependent Variable: Transition to Entrepreneurship.* The dependent variable is transition to entrepreneurship. Beginning with the cohort in 1998, I look at a two-year change in career choice. To obtain this variable, I look at an individual for a given year and then check again to see if the individual transitioned to entrepreneurship the following year. Individuals are counted as having transitioned to entrepreneurship in the following year if they show up as being an entrepreneur during that following year.

*Key Independent Variables: Measuring Peer Closeness.* The key independent variables: *Intense: Up-close* (same job functionality) and *Intense: Not Up-close* (different job functionality).

One of the challenges that prior research had to face was the inability to determine with any degree of certainty whether or not two people within a work setting ever actually interacted with each other. In this study, I examine individuals in a highly defined work setting with clearly defined roles and physical work places, which placed them in close proximity for defined periods of time. Work place *intensity* is defined by days spent together in an environment in which communi-



cation with individuals outside the workplace is limited. In this case, we can think of these individuals as living in an enclosed environment with strict boundaries. The longer the peers are in this environment, the more intense the relationships between them may become. We will assume that if an individual is unable to speak with friends, family and colleagues outside the work environment for days, weeks or months at a time, that they will begin to form stronger bonds and share more personal experiences with their coworkers than they would under 'normal' (daily commuter job) work conditions. The data provide information on what day each individual signed on (began working on the vessel) and signed off (left the vessel). I then look to see how many days each individual worked together with each peer by comparing the overlapping schedules on the vessel. The number of days together is calculated for each pair of individuals. It is possible for one focal individual to sign on and off a given vessel or different vessel several times in any given year. The overlapping days for each pair is then totaled for the year, which provides us with the *intensity* measure. The *intensity* measure is the total number of days a focal individual has worked with each individual coworker.

This setting is ideal for measuring coworker influence. I have used the job position of the individual as a measure of *up-closeness*. The data provide information on what positions individuals held while they were in the workplace. The workplace has been divided up into three clearly defined departments: Navigation, Engineering and Steward's Department. Each individual has been coded as belonging to one of the three departments.

The individual is coded as a one if he or she is working with a peer in the same category (department). The individual is coded as a zero if he or she was working

with someone from a different category. This process resulted in a dummy variable indicating that they held positions in either the same or different job functionalities. This value was created for each individual for each term together. It may be the case that two individuals worked together and held different positions during different terms within the same year, and in extremely rare cases, they may switch departments altogether. In either case, the period of time containing the most days (sea-days) was chosen to be representative for the year. I use job position in relation to others in the *up-close* measure.

*Intense: Up-close (peers with the same work functionality\*days together\*entrepreneurial experience):* This variable is obtained by capturing the weighted value of the "up-close" and "intense" measures. Individuals are split up according to the departments they worked in. Each peer that a focal individual worked with in the same department is given a weighted value based on the number of days he or she worked together and the amount of entrepreneurial experience that that peer had in the previous 5 years.

*Intense: Not Up-close (different work functionality\*days together\*entrepreneurial experience):* This variable is the weighted value of the 'up-close' and 'intense' measures. Individuals are split up according to the departments they worked in. Each peer with whom a focal individual worked, who was in a department other than his or her own, was given a weighted value based on the number of days he or she worked together and the amount of entrepreneurial experience that peer had in the previous 5 years.

*Control Variables.* I create control variables for the different vessel types to account for the fact that different vessel types have different characteristics. This variable consists of three categories: 1) *Long-Haul Vessels* 2) *Short-Haul Vessels* and 3) *Passenger Vessels*. This variable is intended to control for heterogeneity across vessel types and its potential effects on the *up-close* and *intense* measures.

*Long Haul Vessels:* A vessel that carries oil to distant countries may be out to sea for long periods of time, whereas a small tugboat may only leave shore for one day at a time. I therefore created and called the first category *Long-Haul Vessels*. This category captures the likelihood that individuals will experience increased interaction with their coworkers because they are on the same vessel together, away for long periods of time, and often isolated from communicating with family and friends on a regular basis. A person may work more closely, share more common experiences, share more information and build more trust with a coworker under these conditions, which may cause bias in both the *up-close* and *intense* measures. Additionally, the *Long-Haul Vessels* category may be thought of as a control for the *up-close* measure as these vessels commonly have well-defined work functionalities. Each department has specific work areas and tasks or responsibilities on the vessel, and these areas and responsibilities are often distinct and not overlapping. This organization implies that there may be more distance (less interaction) between work functionalities on *Long-Haul Vessels* than on *Short-Haul Vessels*.

*Short Haul Vessels:* On *Short-Haul Vessels* conversely, there are often fewer crew members, some of whom may at times share job functionalities. For example, on a small tugboat, the crew members may rotate the responsibility to prepare

the meals (which is commonly the job function of the Steward's Department) because the vessel may have no Steward's Department. This suggests that there may be less distance (more interaction) between work functionalities on *Short-Haul Vessels*, which may account for a possible bias in the *up-close* measure. In addition, these types of vessels often operate close to shore and rarely go to sea for long stretches of time, which results in fewer days at sea together. The sea-days may be the same in total, but they often occur within shorter, more frequent periods of time and are interspersed with regular interaction with family and friends at home, in contrast to life in the Long-Haul environment.

*Passenger Vessels:* The final category, *Passenger Vessels*, captures the bias that may exist as a result of a larger Steward's Department and the dilution of coworker interaction as a result of other 'souls' (passengers) being on board the vessel. Passenger vessels are typically in port for longer periods of time — more often than either the *Long-Haul Vessels* or the *Short-Haul Vessels*. This fact affords individuals more time to be exposed to outside influence, such as during time ashore and contact with family and friends via standard modes of communication.

### **Method of the Quantitative Component**

A discrete-time hazard rate model is used because the event representing the dependent variable may occur at any point during the year, but it is observed at only one point each year, thus rendering it discrete. Estimates are generated using a rare event logistic regression. The analysis is carried out using unbalanced panel data, from 1994 to 2006, with the number of observations per employee equal to

number of years passing until they exited to entrepreneurship.

The data used in this analysis have the advantage that they can address the challenges that are particular to peer influence research. For example, one assumption that is typically made in sociological research is that individuals interact in groups. Indeed, much of the literature on social networks looks at individuals interacting in groups with the assumption that those individuals who are outside the group have no influence or effect on the group. Of course, it is difficult to measure an individual's level of interaction with individuals outside the group under observation. The data used in this study are unique: as long as the individuals are in the group, we can safely assume that there is daily proximal contact during the period that they are under observation and that there is virtually no daily proximal contact with individuals outside the group under observation. For example, individuals on *Long-Haul Vessels* may be at sea for several months at a stretch and go for weeks or months with little or no contact with anyone other than fellow shipmates. What contact they do have may be limited to an email or the occasional phone call. This work setting, which is represented by a highly unique micro dataset, provides us with the opportunity to measure peer effects while substantially reducing the noise caused by the potential influence of individuals outside the observation group.

Additionally, much of the literature that has studied peer influence suffers from one or more of three limitations (Manski 1993). The first limitation is that of endogenous effects. One can argue that individuals may self-select into certain types of firms, i.e., there are characteristics that certain individuals share that would cause them to be attracted to certain types of firms. Mariners, for example,

may share common characteristics that would cause them to choose their particular profession. And as companies typically own certain types of vessels one can not rule out the possibility that individuals may be attracted to a company or firm based on the type of vessel they own, operate or manage. However, irrespective of whether individuals are randomly assigned to vessels by the firm or management company, the workgroup on that vessel is typically in constant flux, as people leave the ship or stay aboard often at random intervals and at different times. Consequently, by controlling for the vessel type, I aim to reduce this endogeneity concern.

The second limitation is that of exogenous effects, i.e., the effects of the firm (contextual) (Manski 1993). In peer effects research, it is often difficult to say whether the effect is the result of peer influence or if the effect is the result of an organizational characteristic. For instance, the organization itself may put policies into place or support certain types of behavior that would be more conducive to, or be more likely to reward, entrepreneurial behavior. The best possible setting for a study such as this would be one in which all work environments were exactly the same. Although the environment in this setting of onboard vessels is not exactly the same, each vessel or vessel type has similar characteristics. The work practices and daily routines onboard all vessels are very similar, and there is no evidence that any one work environment or vessel type is more entrepreneurial in nature than another. In this way, then, the contextual effects are minimized, and we can be more confident that what we find is the result of the influence of workplace peers.

Finally, correlation effects are a concern when teasing out the peer effects of

group interaction (Manski 1993). It could be said that individuals who come from the same background and have the same education or the same level of earnings may make similar choices and that what we find is not the result of peer influence but the result of correlated variables. However, by using demographic control variables, I reduce the correlation concerns.

My claim is that I minimize these concerns through the use of data that were previously unavailable.

### **Method of the Qualitative Component**

*Interviews.* As previously considered, much of the research that examines social influence suffers from endogeneity issues—one such issue being self-selection (Manski 1993, 1995). The quantitative portion of this study strives to address several endogeneity challenges via the introduction of covariates. However, the issue of self-selection has not been adequately addressed. A weakness in the quantitative analysis is that it falls short of providing satisfactory evidence that self-selection is not a critical concern. Interviews were therefore employed in an effort to gain a deeper understanding of how shipping companies place individuals on vessels. The primary motivation is to determine whether there are company policies in place which generally allow individuals to choose which ship they go on or whether the shipping companies generally determine which ship an individual goes on.

*Interview process.* [See Chapter 2 for a similar exposition.] The interviews were conducted by the author during the summer-fall period in 2012. They took place

over the telephone and were recorded (after permission was granted by the interviewee). To get an overall sense of how shipping companies placed crew members onboard vessels it was important to get a representative sample of vessel types. Therefore two companies were chosen for each vessel type; *long haul*, *short haul* and *passenger vessels*, for a total of six companies (see Table 3.1). Once the companies were identified, the interviewer called and asked for human resources and made efforts to identify and contact the crewing manager or agent. The requirement for the interviewee was that they had to possess an in depth knowledge of human resource practices, specifically with regards to company policy and general practice in relation to how individuals were placed onto and taken off of vessels. With the exception of one person<sup>4</sup>, all interviewees were crewing managers working in the human resources department. Once the interviewee was identified the interviewer then provided the interviewee with background information as to the purpose of the interview. The interviewee was told that this was part of an academic research project and that the purpose of the interviews was to gain a better understanding of how individuals were placed onboard vessels. They were then asked the open ended question: What are your general HR policies for placing crew members or employees on vessels<sup>5</sup>? The interviewee was allowed to answer this question in any way they saw fit, but were asked a probe question if they did not eventually address the issue of how individuals were placed on vessels. The probe question was more specific in that it asked whether it was a general practice for individual crew member to be able to choose which vessel they were to work

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<sup>4</sup>One individual who was interviewed worked in human resources, though stated that he specialized in *wages*. However he did display an in depth understanding of company policy and general practices

<sup>5</sup>The interview guide is available upon request



Table 3.1: Interviews

Firm (by primary vessel type)	Interviewee's Job Title	Interview timing
Long haul	Crewing Manager	Summer 2012
Long haul	Senior Crewing Manager	Summer 2012
Short haul	Crewing Manager	Summer 2012
Short haul	Crewing Manager	Summer 2012
Passenger	Crewing manager	Fall 2012
Passenger	Human resources manager *	Fall 2012

\*Wage specialist with in depth knowledge of company's HR practices regarding crew placement.

on when they were hired.

## RESULTS

### Results of Qualitative Component

The purpose of the interviews was to gain a deeper understanding of the general HR practices and policies of Danish shipping companies, specifically with regards to how crew members are placed on ships. Since self-selection remains a common concern in research addressing social influence (Manski 1995) it is therefore important to understand these practices. This understanding helps us gain insights into the extent to which self-selection is an issue in this context. A primary concern in this context is that if an individual is able to choose which vessel they work on, as a norm, then the results we see in the analysis are more likely to be a reflection of individuals choosing to be with individuals they are comfortable with, rather than a reflection of peer influence. It is notoriously difficult to alleviate this problem, though this study makes an effort to greatly reduce it.

The results of the interviews revealed that, with one exception<sup>6</sup>, individuals

<sup>6</sup>One passenger ship company has a two teared interview process. Shoreside personnel select a group of candidates and send them to the vessel when it is in port. The candidates go onboard where shipboard personnel conduct

were hired by shoreside personnel. Shoreside personnel select candidates that they believe are the most qualified for the job. Most interviewees openly stated that (International Maritime Organization) certifications and other professional qualifications were the standard requirements for the job, and what determines who gets hired. The International Maritime Organization (IMO) is a branch of the United Nations. The IMO determines the international Standards of Training Certification and Watchkeeping (STCW) requirements for all member nations. All vessel owning companies in this study (to the best of the author's knowledge) strive to adhere to STCW and IMO requirements. It is these certificates that the interviewees are referring to. After the initial qualifications are satisfied, the individual is sent to the vessel where they are needed. When asked if the company has a policy which allows crew members to select which ship they are on when they are hired, all responses were negative. When asked if there were ever instances where individuals could ask to be placed on a specific vessel, some interviewees responded with "they can make a wish". They went on to explain that employees may at times ask to be placed on a different vessel, but it is common knowledge that this is a 'wish' and was not necessarily granted. Furthermore, one interviewee went on to explain that while they do try to allow individuals to change vessels, it is not that easy. Increasing demands for specialized certification constrains individuals' ability to move from ship to ship. For those individuals must attend courses and acquire the additional certifications specific to the new vessel. Furthermore, when this interviewee was asked whether individuals ask to move to be with certain people, he said no. He said crew members typically want to

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interviews. Shipboard personnel make the final hiring decisions.

move in order to gain new skills and new experience. The overall results from the interview were that as a general practice, shoreside personnel select and hire the crew members and place them on the vessels where they are needed.

### Results of the Quantitative Component

Table 3.2 shows the total number of individuals at risk (14,528), how many of those individuals transition to entrepreneurship and how many are censored (leave shipping altogether) per year, from 1999-2006.

Table 3.2: Number of Individuals and Transitions to Entrepreneurship by Year (1999-2006)

	Total Individuals at Risk	Total Transitions the Following Year	Total Censored the Following Year
1999	14,528	56	4,564
2000	9,908	30	2,002
2001	7,876	20	1,146
2002	6,710	10	843
2003	5,857	11	617
2004	5,229	13	491
2005	4,725	10	487
2006	4,228	4	<i>rt</i>

Table 3.3 displays the number of individuals in each department for each year, while Table 3.4 shows the number of vessels in each category. There is a decrease in Passenger and Long Haul Vessels, and a slight increase in Short Haul Vessels over the years.

Table 3.5 shows the average number of individuals in each department according to Long-Haul, Short-Haul and Passenger Vessels. The average number of individuals in each department decreases from 1999 to 2006. There is a notable

Table 3.3: Number of Individuals in Each Department by Year (1999-2006)

	Navigation Depart- ment	Engineering Depart- ment	Steward's Depart- ment	Total
1999	7,151	2,977	4,400	14,528
2000	5,625	2,328	1,955	9,908
2001	4,846	1,949	1,081	7,876
2002	4,289	1,688	733	6,710
2003	3,856	1,439	562	5,857
2004	3,481	1,286	462	5,229
2005	3,192	1,153	380	4,725
2006	2,870	1,035	323	4,228

Table 3.4: Vessel Types by Year (1999-2006)

	Long Haul Vessels	Short Haul Vessels	Passenger Vessels	Total
1999	481	102	119	702
2000	465	100	104	669
2001	466	103	98	667
2002	447	104	90	641
2003	394	113	87	594
2004	367	113	87	567
2005	352	106	84	542
2006	321	108	79	508

decrease in the Steward's Department of the Passenger Vessel category. This finding may be due to an increase of foreign labor on Passenger Vessels during these years.

Table 3.6 contains Models 1-4. This table displays the results of the logistic regression estimates of transition to entrepreneurship (general peer effect). A stepwise technique is employed, which allows me to observe how the variables interact. I first run an initial baseline model (not shown in this table) that includes,

Table 3.5: Descriptive Statistics by Department and Vessel Type for 1990 and 2006

	1999		2006	
	Mean	SD	Mean	SD
Long haul vessels				
Navigation Department	8.17	6.34	4.14	3.00
Engineering Department	4.12	4.80	1.95	1.73
Steward's Department	.74	1.40	.17	.48
Short haul vessels				
Navigation Department	8.53	7.83	5.97	5.34
Engineering Department	2.18	3.18	1.89	1.91
Steward's Department	.64	1.26	.25	.64
Passenger vessels				
Navigation Department	19.72	22.50	11.34	10.66
Engineering Department	6.49	10.65	2.58	3.41
Steward's Department	33.44	81.35	3.04	9.21

as the key independent, a variable representing the exposure to entrepreneurial coworkers (dummy \* experience during the previous five years) along with demographic controls (age, gender, marital status, children), which resulted in a significantly positive peer effect<sup>7</sup>. This result suggests that individuals who transition to entrepreneurship are more likely to have had coworkers with previous entrepreneurial experience, which is consistent with previous research (Nanda and Sørensen 2010).

When I replace this variable with the more sophisticated version, measuring the number of days a person has worked with entrepreneurial peers, as shown in Model 1, the effect is both significant and much stronger. This finding suggests that individuals who have chosen to transition to entrepreneurship are likely to have had increased exposure to entrepreneurial peers. Next, the wage variable is

<sup>7</sup>Results are available from the author upon request.

Table 3.6: Rare Event Logistic Regression estimates of the Transition to Entrepreneurship (General Peer Effect)

	1	2	3	4
Entrepreneurial Coworkers	21.357*** (5.10)	21.103*** (5.07)	21.689*** (5.23)	22.664*** (5.46)
Wage		-0.002 (0.00)	-0.002 (0.00)	-0.002 (0.00)
Steward's Department			baseline	baseline
Navigation Department			-0.272 (0.35)	-0.203 (0.36)
Engineering Department			-0.383 (0.39)	-0.253 (0.41)
Long Haul Vessels				baseline
Short Haul Vessels				0.747*** (0.28)
Passenger Vessels				0.272 (0.27)
Gender	0.204 (0.32)	0.183 (0.32)	-0.018 (0.40)	0.007 (0.41)
Age	-0.038*** (0.01)	-0.035*** (0.01)	-0.033*** (0.01)	-0.033*** (0.01)
Marital Status	-0.078 (0.23)	-0.044 (0.23)	-0.024 (0.23)	-0.068 (0.23)
Child	0.798** (0.35)	0.805** (0.35)	0.811** (0.35)	0.773** (0.35)
Constant	-4.657*** (0.63)	-4.459*** (0.63)	-4.082*** (0.76)	-4.349*** (0.76)
Observations	34415	34415	34415	34415

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

added. Note that the effect is still significantly positive although slightly reduced. To control for possible endogeneity across vessels, in Model 3 I add categorical variables for the three vessel types. We see that there is a slight increase in peer effect, and it remains significantly positive. In Model 4, categorical variables for Navigation, Engineering and the Steward's Departments are added to account for possible endogeneity among departments. Again, we see little change in the estimate for entrepreneurial peers; it increases slightly and remains positive and significant.

Table 3.7 contains Models 5-7 and shows the results of the logistic regression estimates of the transition to entrepreneurship for the same and different job functionality. In Model 5, I begin with a baseline regression that includes the demographic control variables for age, marital status, wage, and a dummy for whether or not the individuals had children. The baseline model also includes the control variables for both vessel and department types. I then add the key independent variable for Same Job Functionality in Model 6. We see in all three models (5, 6 and 7) that the effect is stronger on short haul vessels than on long haul vessels. This may seem counter intuitive, but may be due to the fact that short haul vessels are in and out of port more often. Frequent docking and undocking and cargo movements require communication and coordination among crew members and across departments. This increased interaction may account for these results.

The estimate is significant and positive, suggesting that those who transition to entrepreneurship were likely to have had co-worker peers with prior entrepreneurial experience working with them in the same job functionality. In Model 7, I add the different job functionality variable and observe that the ef-

fect is also significant and positive but much less so than that of those with the same job functionality. There is also little change in the same job functionality estimate from Model 6 to Model 7, suggesting that the same job functionality estimate is robust<sup>8</sup>. These suggest that those who transition to entrepreneurship are likely to have worked with entrepreneurial peers from different job functionalities, though those who transition to entrepreneurship are far more likely to have worked together with entrepreneurial peers who had the same job functionality.

## DISCUSSION & CONCLUSION

This paper aimed to determine whether individual rates of entrepreneurship increase with the intensity at which workers are exposed to coworkers with prior entrepreneurial experience. First, testing to see if there was an overall peer effect, I found support for prior findings (Nanda and Sørensen 2010), namely, that individuals who transition to entrepreneurship are more likely to have had peers with entrepreneurial experience. When including a more sophisticated variable, e.g., incorporating time (days) into the analysis, we found that people who transition to entrepreneurship are likely to have had increased exposure to entrepreneurial peers. This result suggests that social learning takes time and that the longer one is exposed to entrepreneurial peers, the more likely it is that one will be influenced by them.

I also found support for the second hypothesis, which evaluated whether the positive impact of prior entrepreneurial experience among workplace peers on individual rates of entrepreneurship increases with shared job functionality. In other

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<sup>8</sup>A Wald test was performed and it confirmed a significant difference in the estimates for the same, and different, job functionality.



Table 3.7: Rare Event Logistic Regression Estimates of the Transition to Entrepreneurship (Same/Different Job Functionality)

	5	6	7
Intense: Up-close		2.044*** (0.59)	2.040*** (0.59)
Intense: Not Up-close			0.101*** (0.02)
Steward's Department	baseline	baseline	baseline
Navigation Department	-0.177 (0.36)	-0.125 (0.36)	-0.149 (0.36)
Engineering Department	-0.240 (0.41)	-0.184 (0.41)	-0.207 (0.41)
Long Haul Vessels	baseline	baseline	baseline
Short Haul Vessels	0.749*** (0.27)	0.745*** (0.27)	0.747*** (0.27)
Passenger Vessels	0.290 (0.27)	0.275 (0.27)	0.263 (0.27)
Gender	0.034 (0.41)	0.033 (0.41)	0.020 (0.41)
Age	-0.033*** (0.01)	-0.033*** (0.01)	-0.033*** (0.01)
Marital Status	-0.055 (0.23)	-0.056 (0.23)	-0.060 (0.23)
Child	0.763** (0.35)	0.759** (0.35)	0.760** (0.35)
Wage	-0.002 (0.00)	-0.002 (0.00)	-0.002 (0.00)
Constant	-4.336*** (0.77)	-4.390*** (0.77)	-4.358*** (0.77)
Observations	34415	34415	34415

Standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

words, I wanted to determine whether peer effects were stronger among those having the same work functionality (*intense: up-close*) compared with those having different work functionalities (*intense: not up-close*). Indeed, this relationship was the case. The effect remained positive for both types, but the effect was much stronger among those in the same work functionality (*intense: up-close*), suggesting that shared technical language and cognitive proximity increased the likelihood and efficiency of the transfer of entrepreneurial knowledge.

Finally, I argued that by using newly available microdata, I could minimize some of the concerns laid out in the reflection problem. There is no evidence to support the notion that one ship has a greater entrepreneurial environment than another or that individuals can choose to work on a particular vessel, as one often does in the average firm setting. Additionally, it may be argued that a positive peer effect may be due to the characteristics of the individual's self-selection of the 'seagoing' life, e.g., that individuals share the non-risk adverse characteristics of those most likely to become entrepreneurial. If this were the case, we would expect to see a higher overall rate of entrepreneurship for mariners. However, the rate of entrepreneurs among mariners in this sample averages 3%, which is consistent with the average entrepreneurial activity among the Danish population overall (Nanda and Sørensen 2010).

In Chapter 2, I addressed two endogeneity concerns: *management's selection* of employees to be on and off the ship <sup>9</sup> and individuals' self-selection on and off the ship. In this chapter, management selection is less of a potential problem: Management is likely to place individuals on ships depending on their skills and

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<sup>9</sup>The concern was that management would remove and replace individuals or groups of individuals on and off the vessels based on their nationality.

competencies. There is no reason to believe that management should systematically select people with an entrepreneurial inclination to work on certain ships. From an empirical point of view, interviews also revealed that as a general practice, crew members are hired by shoreside personnel and placed on the vessel where they are needed. However, individual employees with an entrepreneurial inclination could have a preference for working with other employees with an entrepreneurial inclination. This could be a concern. Here, the interviews revealed that it is not a general practice to allow individuals to choose which vessel they will work on when they are hired. It is managements decision. This suggests a random placement with respect to individuals' entrepreneurial inclination and this observation reduces concerns of self-selection. However, it is not without limitations. Some individuals may be allowed to 'wish' their way to another vessel under the guise of wanting to 'gain new experience'. Also, it should be noted that it is conceivable that where shipping companies only own one ship, that the individual may essentially be selecting into a workplace based on personal recommendations (or because they know people who work on that ship already) similar to how one would select into a workplace on land. And finally, it is important to keep in mind that there may be a good deal of heterogeneity in the *passenger vessel* category due to the unusual hiring practices of one *passenger vessel* company, which were revealed during the interview process. Hiring individuals from onboard the ship may introduce a type of selection bias on the part of ship board crew.

These findings may be interesting and relevant for organizations looking to create or encourage spin-offs. For example, organizations that seek to create an

entrepreneurial environment should introduce individuals with prior entrepreneurial experience into the work group, as such placements seem to encourage the exchange of entrepreneurial knowledge. This practice would in turn increase the likelihood that potential entrepreneurs would transition to entrepreneurship. Alternatively, if organizations wished to avoid promoting these transitions, perhaps they should avoid hiring individuals with prior entrepreneurial experience.

In an attempt to tease out the details of peer effects, future research should consider the contextual effects of the setting from which an individual originates. Because the majority of entrepreneurs originate in an organizational setting, peer effects research in the organizational context warrants further examination. Furthermore, future research might examine the type of entrepreneurial learning that takes place in the work setting. The knowledge that coworker peers influence individuals to transition to entrepreneurship is only an initial step. What entrepreneurs learn from their peers, whether that knowledge is valuable or useful in terms of what type of business they start, where they start it, or how successful it is, would make a useful contribution to the current literature. While this study does shed light on the influence of coworkers on the transition to entrepreneurship, there is much to be learned about the type and value of the knowledge that is being shared and its effects on entrepreneurial choice and outcomes.

## **Economic Choices of a Nomadic and Isolated Work Force: Shifts in Social Relations and Their Implications**

Christine D. Isakson, Toke Reichstein, and Michael S. Dahl

### **ABSTRACT**

Previous research has shown that individuals' social and life-shaping choices are socially determined. The purpose of this paper is to study whether these choices are associated with individuals' work settings, particularly when the work settings are nomadic and isolated. The paper argues that nomadic and isolated work settings cause individuals to become socially detached from traditional and family-based relations, and thereby change their social and life-shaping choices. In particular, the paper investigates the location choice of a sample of former mariners (who represent the individuals exposed to the nomadic and isolated work force), and a matched sample of traditional workers. Empirically, the paper provides evidence suggesting that a nomadic and isolated work force relies to a lesser extent than other workers on traditional and family-based social relations when making choices. Furthermore, the paper indicates that workers coming from nomadic and isolated settings choose to locate close to their past peers, suggesting a shift in social relations and a re-defined set of social ties that influence the choices that the individuals make. This implies that the nomadic isolated lifestyle influences the

focus of social attachment, shifting it away from traditional and family-based relations to relations defined and shaped by professional ties.

## INTRODUCTION

It is important to understand the extent to which economic action can be linked to individuals social relations (Granovetter 2005). One way to investigate whether such a link exists is to disentangle the way individuals' economic choices are reshaped by exposure to work settings which redefine the individuals social relations. This paper seeks to determine the degree to which individuals working in nomadic and isolated work settings make different economic choices than otherwise comparable individuals who work in traditional settings.

One of the most important economic decisions individuals make regards location choice with respect to private life settlement. This choice has wide-ranging implications for a persons life quality, and it often involves one of the largest investments an individual makes in his or her lifetime. In connection with where to settle, the choice of location also has an impact on the emergence and durability of social relations because such relations are often geographically bounded (Sorenson 2003a). Social interaction is therefore likely to be influenced by this particular economic decision. Therefore, investigating this particular choice and its implications for individuals living arrangements and living standards is critically important.

The specific objective of this paper is to provide evidence that indicates that nomadic and isolated work settings are associated with individuals who choose to locate their private life settings away from traditional and family-based social relations. Recent studies on the location choice of individuals have emphasized the importance of families and friends (Dahl and Sorenson 2009, 2010a,b). These studies suggest that family and friends play a more important role compared to

economic incentives in shaping an individual's location choice. However, these contributions rely exclusively on data on the migration of workers who are employed in more traditional settings, and they say little about the associations with family and friends that exist among members of a work force that is characterized by its nomadic and isolated context. Furthermore, this literature provides little insight into the relationship between social relations and economic decisions because it lacks a comparative dimension with regard to work settings.

This paper seeks to provide evidence suggesting nomadic and isolated work contexts alter the economic decisions individuals make because they rely relatively less on family-based and traditional social relations when they make their choices. Instead, we suggest that individuals working under such conditions form new ties within their work context producing a positive association between the location choice for settlement and the chosen private life location of their past peers.

In its examination of this research question, this study also offers some insight into the potential consequences of nomadic and isolated work conditions. The characteristics of work and the work settings have tremendous implications for an individual's life quality and the work-life balance, and they are issues that may therefore have a substantial impact on an individual's well-being and social capabilities. However, this study suggest that the work context may shape the individual's social relations. An individual's work setting may shape his or her living arrangements in an indirect way by changing the choices he or she ultimately makes outside the context of work.

The paper is organized as follows. In the following section, we forward some



empirically and theoretically founded arguments suggesting that nomadic and isolated work settings will be associated with stronger ties between peers. Given that such a work context leads to a social detachment from traditional and family-based social relations, the section forwards some arguments that once they relocated, individuals in such work context choose to rely less on the traditional and family based relations. We argue that they tend to move further away from these and possibly move to a region which locates them closer to their past peers suggesting a reconfiguration of social relations. The following section presents the data and method for investigating these propositions. The fourth section presents the results of the analysis and the fifth section holds the discussion and conclusion.

## **THEORETICAL AND EMPIRICAL BACKGROUND**

The analysis relies on three levels of arguments. First we suggest that the nomadic and isolated work setting creates a social detachment from the traditional and family based social ties. Second, we propose that this social detachment leads to the creation of new or to the strengthening of existing social linkages beyond the traditional and family based ties. Third, we propose that this shift in social relations has implications for the economic choices (e.g. private life location choice) of the individual exposed to such a reconfigured social attachment. The following sections forward the arguments in favor of these three mechanisms and are presented in the aforementioned order.

### **Social Detachment of the Nomadic and Isolated Worker**

Previous research on labor mobility has described the nomadic worker as itinerant, wandering and uncommitted to the organization. Some recent research refutes the putative negative relationship between mobility and a workers commitment to organization and mobility (Pittinsky and Shih 2004), but we still know very little about the level of social attachment a mobile worker retains when he or she increasingly spends time away from home. A nomadic worker's place of employment is often geographically separated from his or her place of residence. In fact, for many individuals, the place they work and the place they call 'home' are very far apart. The work place may even be in constant motion, as it is in the case of journalists, military contractors, long haul airline workers, truck drivers, mariners, and many types of consultants and diplomats.

The extensive time these mobile, nomadic workers spend away from their physical homes cause them to spend ever more time away from traditional attachment figures, such as family and friends. Earlier work in the field of psychology has examined attachment by investigating the effects of physical separation on children who were separated from their attachment figures, in this case, their mothers. A main finding was that the subjects exhibited several distinct stages of detachment when the attachment figure was physically distant over a period of time (Bowlby 1960; Robertson and Bowlby 1952). Physical separation is principle concept in Bowlby's (Bowlby 1969, 1973, 1980) attachment theory. Bowlby contends that physical separation triggers emotional and physical reactions that are ultimately indicative of detachment. In subsequent years, a stream of literature has emerged that applies attachment theory to adults. A comprehensive

review of this literature, in Vormbrock (1993b) reports the common research finding that an extended separation from an attachment figure results in various forms of emotional disruption. Attachment figures can provide a means of modulating emotions and can influence emotional control and day-to-day affect regulation (Feeney 1995; Kobak and Sceery 1988). This suggests that proximity to a person's attachment figures provides comforting emotional benefits. Moreover, the job related distance that occurs when one spouse travels away from home tends to result in negative emotional reactions that are consistent with what is predicted by attachment theory (Diamond et al. 2008). Physical distance between individuals triggers mechanisms of social detachment because it removes people's sense of having a secure base and it hinders the day-to-day expression of affection. In this context, the shared experience between individuals tends to be limited. This creates social separation which may provoke social detachment.

For the above reasons, nomadic and isolated work settings may result in a decline in social attachment to social relations that are defined by traditional and family based ties. Long periods away from home may render close communication impossible. The breakdown of communication could, in turn, cause a decline in the level of contact and a reduction in the strength of family bonds. In comparison to a person working in a more traditional setting, people who have been engaged in nomadic and isolated labor may be less likely to give priority to families and traditional social relations when they choose where to locate because of the limited contact and face-to-face interaction they had during their nomadic career.

## **Peers and Social Relations**

The process of social detachment from family-based and traditional social relations may create space for other types of social attachments. Such social attachments often tend to build on homophily, which causes contact between similar people to happen more often than contact between dissimilar people. The similarity that leads to homophily may build on numerous dimensions or characteristics. Some of the most prominent are education (Marsden 1987) and occupation (Verbrugge 1977). The importance of educational and occupational homophily may imply that nomadic and isolated individuals are likely to choose to become more socially attached to their work peers. Indeed, homophily, and therefore social relations, are more likely to arise in situations of a shared geographical location (Cambell 1990) and a homogeneous work setting (McPherson and Smith-Lovin 1987). Nomadic and isolated work settings may indeed be a hotbed for the formation of strong homophily-based social relations which can, in turn, become instrumental for strong social attachments. Furthermore, studies indicate that peers can significantly influence the individual at the work place (Perry and Porter 1982). Therefore, it is reasonable to suggest that peers may play an important role for members of a nomadic and isolated work force as alternatives to the family-based and traditional social relations.

It is evident from the above that a selection effect often causes individuals with similar perspectives to find similar work places. However, homophily in the workplace may also occur through isomorphism, which is the social tendency that causes individuals to adopt the practices that were also adopted by their closest peers (Burt 1982). The shared environments that exist in the context of nomadic

and isolated work places may indeed lead to isomorphisms. This is often referred to as a socialization process (Kandel 1978). Peers become a major social influence and processes become more articulated the more the peers work together and interact (Nanda and Sørensen 2010). Individuals who have frequent and successful exchanges with others in their social network may experience positive feelings and emotions that lead to more cohesive social relations (Lawler and Yoon 1998). The mechanisms of homophily, and the tendency among peers to adopt more shared values and practices become a cradle for strong social relations. This is particularly true among peers in settings such as nomadic and isolated work places where they spend an extensive amounts of time together and continuously interact. Such relations among peers may at least partially compensate for some of the social detachment experienced by individuals in nomadic and isolated settings with regard to family-based or traditional ties.

Given these considerations, it seems plausible that peers could become a more important input for individuals in a nomadic labor force with respect to their economic choices than they would be for other individuals who are in more traditional occupations. When these individuals make their economic choices, there may be a tendency to turn away from connecting to family and past social relations and to connect, instead, to work based relations. The extensive contact and close friendship that emerges in such settings could, to a degree, take the place of families as a basis for social attachment.

### **Location Choice of the Nomadic Isolated Work Force**

We explained above that members of a nomadic and isolated workforce may become socially detached to some extent from traditional and family-based social relations. In addition we proposed that such workers rely on their relations with their peers to partially substitute for traditional and family-based relations. These relations with peers arise on the basis of homophily and extensive social interaction. Consequently, we propose that the former peers become more important as a factor in these individuals' economic decisions, and that the traditional and family-based social ties become less important. The selection of the location where they will live in their private life is a major decision for most individuals. It is also a decision that will shape not only the individual's current situation but also their future social interactions as well. Examining the way individuals make this decision is, therefore, an excellent way to gain a better understanding of the association between social relations and economic decisions. We suggest that the benefits of physical proximity to peers, in connection with the stresses of being physically distant friends and family at home, may contribute to the tendency of many individuals to shift their attachment away from friends and family and towards their workplace peers. This social attachment to coworkers may then play a dominant role in these individuals' location choice.

One unique circumstance that is shared among people engaged in this type of nomadic labor is the fact that it is not necessary for them to move their place of residence whenever they change jobs. They may have to travel from their homes to their workplace only once a month, or possibly only twice a year. This gives them a special kind of freedom when they choose a location for their residence.

They become footloose and unfettered in their search for a home. However, unlike the majority of the population, these individuals travel far from their land-based homes in the course of their work, and they are often away from home for very long periods of time. The working conditions and the degree of social isolation from the rest of the world vary from job to job. Many jobs take workers to remote locations where communication is virtually impossible for days, weeks, or even months at a time. Under these circumstances, given this lack of proximity, it is difficult for individuals to maintain close, frequent contact with family and friends back at home. This lack of contact may increase the negative emotions associated with detachment and decrease the emotional benefits associated with day-to-day contact (Diamond et al. 2008). This may ultimately provoke a sense of detachment.

By way of summation, individuals who were engaged in nomadic labor would be expected to locate near former peers due to the strong bonds that develop between them over the course of their careers. When these individuals face a choice concerning where to live, they pay less attention to traditional and family based social relations than they would otherwise, had they not spent their working careers in nomadic and isolated work settings.

## **DATA AND METHOD**

This paper investigates how occupational choice influences an individual's social attachment, and how that social attachment shapes their economic choices. Specifically, it investigates whether individuals working in nomadic and isolated settings have a tendency to detach themselves from traditional and family based

social reference points. This is done by studying the private-life location choice of individuals, taking into account the location of the people to whom they are traditionally socially attached. We investigate whether workers in nomadic and isolated work-settings are less inclined than workers in more typical work-life settings to choose to locate in their home region where they will be close to their parents, siblings, and other traditional social relations.

We focus on former mariners as representatives of a nomadic and isolated work force. Mariners' occupational settings are characterized by isolation and remoteness over long periods of time, and the absence of any fixed geographical location. Their work setting dictates a rather withdrawn professional environment typified by a high level of solitude because they usually interact socially with only a small number of peers with whom they share a similar perspective. Mariners are, therefore, suitable subjects for an examination of the research questions that are the focus of this study.

We exploit an extensive dataset on mariners (the Mariners Database) containing information on all individuals who worked on Danish commercial vessels at any time between 1997 and 2005. This dataset was provided by The Danish Maritime Authority. It contains information, at the individual level, relating to each individual's job position, the type of vessel on which the individual worked, and the employment start and employment stop dates for each trip onboard a vessel. These data make it possible for us to study not only when and for how long the mariners were out to sea, but to also identify who their colleagues were on each specific trip. We use the individual mariner's duration at sea as a proxy in measuring how nomadic and isolated the work setting was. That measure is used as



an indicator in this paper of each individual's degree of social detachment from traditional and family-based social reference points.

For the purpose of this study, we identified a subsection of mariners referred to as 'former mariners'. These are individuals who had been working at sea as their primary occupation for at least two consecutive years, and who then chose to go ashore and remained ashore for at least one year (the third year). To capture (at least) a minimum level of the effect that the nomadic and isolated work settings may have had on the mariners' social attachments, we included only those who had been at sea for two consecutive years. By focusing on mariners who had come ashore, we were able to ensure that we were investigating individuals who were moving into private life settings that were similar, and hence comparable, to the life settings of individuals that are not coming from a nomadic isolated work setting. This makes the location choice of the individuals who came from a nomadic and isolated work force more similar (and hence more comparable) to that of individuals who came from more traditional settings. To that end, we investigate the former mariners who relocated their home during the third year and examine their new location choice.

We combine the Mariners Data with data we obtained from the Danish Database for Labor Market Research (IDA). IDA is collected and maintained by Statistics Denmark. The information obtained from this database make it possible for us to retrieve background information about the subjects and their social relations. This database contains merged information from Government registers at the level of individuals covering almost the entire labor force in Denmark. It covers the years 1980 to 2008, and it provides a panel of each individuals' marital status, family

status, home location, work location, educational and employment history. Furthermore, it contains family based identifiers allowing researchers to determine family linkages through parent identifiers. This dataset has also been used in previous studies (Bingley and Westergaard-Nielsen 2004; Dahl and Reichstein 2007; Sørensen 2007).

Both foreign and domestic mariners in the Danish commercial fleet are included in the raw mariners dataset. Domestic mariners are easily tracked through both the mariner's database and the IDA database on the basis of their personal social security numbers. But it is not possible to do the same with the foreign mariners sailing on Danish vessels. The IDA database does not include foreign mariners because it is based on Danish social security numbers. The majority of foreign mariners are not given a social security number because they are not deemed to be working on Danish soil. All the conclusions derived from this study are, therefore, applicable only to domestic workers and cannot be generalized to encompass foreign workers.

The panel structure of the combined data extends from 1997 to 2005. This allows us to study seven cohort groups of mariners because the identification of the mariners who are considered in the study requires data for a period of three years. The final cohort group consists of mariners who were at sea during the years 2003 and 2004, but were on land in 2005. In total we consider 1,171 former mariners and their location choices.

## Variables

The analysis considers one dependent variable, several traditional social relations variables, several family-based social relations variables, a homophily-based social relations variable and some control variables.

*Dependent Variable.* The dependent variable is the location choice of the individual. We divided the country into 271 regions that correspond to the territorial boundaries of the municipalities. We then identified the municipality in which the former mariner chose to relocate when he or she came ashore. That municipality then became the basis for identifying our dependent variable expressed in terms of the individuals location choice.

*Traditional Social Attachment Variables.* We considered a large number of components that are attached to regions to investigate the degree to which individuals chose to locate in the proximity of the traditional social attachment regions. First we considered whether the chosen municipality was the *Home City* of the individual, which we defined as the municipality from which the subject had originally moved. A positive estimate associated with this variable would indicate a tendency for social attachment driving an autocorrelation in location choice.

Second, we included a non-family based local social relations variable by measuring the logarithm of distance in kilometers ( $\log(\text{distance to home})$ ) to the home region prior to relocating.

Third, we considered the potential of social relations by including a variable expressing the logarithm of city size ( $\log(\text{City size})$ ) of the municipality. This

was necessary because there might be an urbanization effect occurring in places where there is a richer environment for social interactions. We therefore expected this variable to portray a positive estimate.

Fourth,  $\log(\text{distance to prior residences})$  measures the distance of the municipality in which the individual chose to live from the prior municipality where the individual had lived during the two years prior to coming ashore. If the individual lived in more than one municipality, we averaged the logged kilometers between the municipalities. Finding a negative association for the distance-based variables would indicate an attachment to localized traditional social relations.

*Family Based Social Attachment Variables.* The strongest social attachments are mostly family based. We used two family relations variables to consider the family-based social attachments in connection with location choice after moving.

First,  $\log(\text{distance to parents})$  measures the logarithm of distance between the municipality in which the parents live and the focal municipality. We used the average distance in the cases where the two parents were living in different municipalities.

Second and similarly, we used  $\log(\text{distance to siblings})$  to measure the distance, in logged kilometers, between the municipality in which the brothers and sisters of the individual lived and the focal municipality. Again, we used an average distance when there were siblings living in different municipalities.

*Homophily Based Attachments.* To determine the importance of peers in the individuals choice of a location, and the extent to which individuals who have been working in more severe nomadic and isolated context have a greater tendency than

individuals less exposed to such contexts to shift their social attachments away from traditional and family based relations to homophily based relations, we considered a measure of the distance to peers. The variable  $\log(\text{distance to past mariner peers})$  represents the average distance from co-workers that the individual had worked with on vessels within the previous two years. These peers included only peers that were on the ship in the same deployment period as the focal individual. Finding a negative estimate for this variable would suggest a homophily based agglomeration of similar individuals and hence a tendency to shift priorities in social relations which could, in turn, change the individual's economic decisions.

*Controls.* We recognize that many characteristics of locations might influence their attractiveness. Existing research has emphasized the importance of political differences, cultural amenities (Glaeser et al. 2001) and culture. Accordingly, we add *labor market region dummies* to all regressions following the classification of Andersen (2000).

Some regions may be more attractive than others for various reasons. Some regions may, for instance, offer a richer set of career opportunities than others and for this reason be more attractive as a relocation choice. We include two time varying regional attraction controls to account for these effects. First, we include the regional attractiveness in general by measuring by region and year the ratio of movers that chose the specific region. Second, we estimated the regional attractiveness for former mariners by calculating the share of moving former mariners that chose that specific region.

### **Analytical Design and Econometric Technique**

We used a conditional logit methodology to investigate the association between social attachment and location choice. As a result, we considered each of the 271 regions a potential choice. That resulted in 270 of them receiving a score of zero because the individual did not relocate to that municipality, and one municipality receiving a score of 1 indicating that it was the municipality to which the individual moved. Each individual is thus observed 271 times in the dataset where each observation represents an individual-municipality combination. Therefore, each of the distance measures described above was calculated in terms of the distance between each municipality and the municipality of reference point (e.g. in the case of the  $\log(\text{distance to parents})$  variable, the distance to the municipality in which the parents live). Our analysis relied on 317,341 observations because we have 1,171 subjects and we examine 271 municipalities.

The conditional logit specification is also known as the McFadden choice model (McFadden 1974). It effectively compares the characteristics of each potential choice and provides an indication of the likelihood that a particular choice is made given certain covariates. In our case the covariates express the characteristics of the municipalities and the distance of the municipality to the subjects' social relations. Using this methodology provides an opportunity to run fixed effects specifications taking into account the within subject covariations in observations. The method makes a comparison of municipality characteristics, while keeping the characteristics of the individual constant. The conditional logit methodology is frequently used to estimate location choice models for individuals and firms (Dahl and Sorenson 2010b; Davies et al. 2001; Figueiredo et al. 2002)

Conditional logit models are characterized by the Independent of Irrelevance Alternatives (IIA) assumption (Ray 1973). The McFadden choice model (McFadden 1974) assumes that all alternative options (in this case the 271 municipalities) are equally relevant. Adding an additional option will lower the odds of any given choice equally for all locations. The problem here could be that the IIA is violated because some locations (choices) could be practically and logically irrelevant or possibly clustered. This could bias the estimates. To resolve this possible bias, we estimated mixed logit versions with all independent variable estimates treated as random covariates. The mixed logit does not depend on the IIA assumption. These regressions are displayed in Table 1 in the Appendix. The mixed logits provide overall support for the findings of the conditional logits. This suggests that any potential bias from violating the IIA assumption in the conditional logits must be negligible.

*Matched sample.* The research question emphasizes the comparative nature of considering whether experience in the nomadic and isolated work setting changes the individual's social attachments, and hence his or her economic choices, with regard to living arrangements. To conduct this investigation, we sought to identify a sample of comparable control subjects. The control sample represents what the former mariners and their location choice would have been if the mariners had not been in the nomadic and isolated work settings. Put differently, we identified a group of individuals who had worked in a traditional setting and had not been in a nomadic and isolated work settings, but who otherwise have some shared commonalities with the former mariners. The implication is that they were equally

likely to have chosen to be in the kind of nomadic and isolated work setting that is exemplified by becoming a mariner.

The purpose for creating such a comparable control sample was to avoid the possibility that any significant findings that were identified could be attributed purely to self-selection effects. Individuals who seek nomadic and isolated work settings tend to be detached in relation to their families and social ties in general, and they find it less of a problem socially to spend long periods away from their family and friends. By creating a matched sample of non-mariners who were just as likely to have become mariners on the basis of some observable social attachment conditions, we intended as much as possible to eliminate this possible endogeneity bias. The matched sample was therefore formed to lower the likelihood that any uncovered significance could be attributed to the fact that the former mariners were inherently detached and footloose individuals.

The matched sample was drawn from the population for the same year when the mariners came ashore and were employed full time. The sample is an exact match in terms of full time employment, year and gender. Furthermore, we ensured the matched individual also moved location and that the individual not only changed jobs but also changed to a different industry. The remaining variables used in the matching procedure were the parents' wages, parents' age, parents' education, parent is/was a mariner, sibling is/was a mariner, mothers' education and fathers' education. Individuals with parents who have only a basic education may be more likely to pursue free educational opportunities that provide a high monetary payoff. The variables indicating that the parent was a mariner and/or that the sibling was a mariner were included based on the assumption that in-



dividuals who had mariners in the family were more likely to become mariners themselves.

We used a propensity score matching procedure (nearest neighbor, with replacement). More than one control individual may be matched by this procedure to more than one treated individual. This possibility tends to increase the precision of the match and to decrease bias (Caliendo and Kopeinig 2008). In total, there were 576 unique individuals matched to 1,171 treated individuals.

We tested the performance of the matching procedure by running a logit regression *ex post* matching with the treatment condition of being a mariner as the dependent variable. We found only a weakly significance difference between the two groups in relation to the parents' wages variable. That indicates that the matching procedure was successful.<sup>1</sup>

## RESULTS

Table 4.1 reports descriptive statistics with regard to the explanatory variables. Four sub-samples are considered. These are based on the two dichotomous variables. First, we split the sample according to whether the observation involves a former mariner or part of the control sample. Second, we split the observations according to whether it involves the chosen municipality or whether it involves one of the 270 municipalities not chosen by the focal individual.

By comparing the descriptive statistics of the former mariners and the chosen municipality to the corresponding statistics of the control sample and the chosen municipality, we see a tendency for  $\log(\text{distance to home})$ ,  $\log(\text{distance to prior residence})$

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<sup>1</sup>Results of the logit regression are available upon request.

$\log(\text{distance to parents})$  to be higher for the former mariners than for the control sample. These descriptive tendencies are the first indications that former mariners tend to move further away from their social relations than members of the control group do, suggesting that social detachment mechanisms may have been operating when the individuals were working in nomadic and isolated settings. However, these descriptive statistics also suggest that former mariners tend to move to a municipality closer to the location where their siblings are living than the control sample subjects. This challenges the theoretical arguments of the paper. The conditional logit will reveal whether this feature is simply an artificial bi-product caused by spurious correlations.

When the observations of former mariners involving the chosen municipality are compared to the observations involving the not-chosen municipality, the descriptive statistics indicate that there may be a tendency for the former mariners to relocate closer to their past peers when they move. The average distance in kilometers to past peers seems to be lower for the chosen municipality sub-sample than for the not-chosen sub-sample of former mariners. These descriptive statistics provide weak indications that some shift in social relations has taken place which, in turn, caused a change in the economic choices of the individuals with a prior experience in a nomadic and isolated work setting.

Turning again to the not-chosen municipality observations, comparing the descriptive statistics between the former mariners and the control sample we consider  $\log(\text{distance to prior residence})$ ,  $\log(\text{distance to parents})$  and observe that the distance is greater for the former mariners than for the control sample. Of those regions not chosen, we again see that distance to siblings is less for former

mariners than for members of the control.

Table 4.1: Descriptive statistics considering the observation which was the overall for the chosen location

Variable	Former mariners		Control	
	Mean	SD	Mean	SD
Chosen Municipality				
Regions attractiveness to former mariners	0.059	0.079	0.018	0.047
Regions attractiveness in general)	0.019	0.020	0.009	0.012
<i>Home city</i>	0.534	0.499	0.528	0.500
log(distance to home)	1.676	1.844	1.340	1.466
log(City size)	10.186	1.534	9.487	1.087
log(distance to prior residence)	2.780	1.000	1.381	1.035
log(distance to parents)	2.310	1.940	1.330	1.718
log(distance to siblings)	1.879	1.922	2.290	1.487
log(distance to pst mariner peers)	3.768	0.710	n.a.	n.a.
Not Chosen Municipality				
Regions attractiveness to former mariners	0.003	0.013	0.004	0.014
Regions attractiveness in general	0.004	0.005	0.004	0.005
<i>Home city</i>	0.004	0.064	0.004	0.060
log(distance to home)	4.158	0.723	4.177	0.751
log(City size)	8.721	0.806	8.723	0.813
log(distance to prior residence)	4.175	0.589	3.076	1.917
log(distance to parents)	3.000	1.993	2.383	2.136
log(distance to siblings)	2.478	2.109	3.437	1.685
log(distance to pst mariner peers)	4.128	0.632	n.a.	n.a.
Individuals	1,171		1,171	
Municipality (options)	271		271	
Observations	317,341		317,341	

Table 4.2 presents the Pearson correlation coefficients between the variables under consideration for the entire sample of observations used in the regression analysis. In general, the coefficients indicate what might be expected with regard to the signs, providing some evidence for the validity of the data. None of the coefficients cause any concern regarding potential bias due to multicollinearity in the regression. This conclusion was supported by low Variance Inflation Factors.

Table 4.2: Pearson Correlation Coefficients (N=634,682)

Variable	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
[1] Location choice variable	1.000								
[2] Regions attractiveness to former mariners	0.148	1.000							
[3] Regions attractiveness in general	0.118	0.750	1.000						
[4] <i>Home city</i>	0.420	0.200	0.170	1.000					
[5] log(distance to home)	-0.212	-0.078	-0.109	-0.301	1.000				
[6] log(City size)	0.083	0.462	0.822	0.114	-0.117	1.000			
[7] log(distance to prior residence)	-0.062	-0.024	-0.034	-0.092	0.300	-0.035	1.000		
[8] log(distance to parents)	-0.025	-0.005	-0.011	-0.041	0.123	-0.013	0.100	1.000	
[9] log(distance to siblings)	-0.030	-0.020	-0.030	-0.043	0.180	-0.032	-0.133	0.113	1.000

Table 4.3 presents the results of the conditional logit regression against location choice. The table is split into three parts. The first three columns provide a step-wise introduction of explanatory variables involving only the former mariners. Column 4 is based on only the control sample observations. The final column, column 5, involves the combined sample where both former mariners and the control sample are included. This regression also includes the interactions between the explanatory variables and the dummy which indicates whether the observation is a former mariner observation (1) or a control sample observation (0). Because the conditional logit method exploits the variation among variables within the subject by controlling for subject-fixed effects, the regression analysis automatically leaves out the former mariner dummy. Finally, it should be mentioned that the  $\log(\text{distance to past peers})$  is calculated for the former mariner observations only and is therefore present only in the regression results relating exclusively to former mariners.

Focusing on columns 1-3, the results suggest that the former mariners chose locations close to their home municipality, close their parents, and close to their siblings. The results also indicate that the former mariners tended to choose the municipalities of their home city and to locate in more urban sites as expressed by the city-size variable. This last effect may, however, only reflect the tendency for individuals to agglomerate in city regions. The findings are consistent throughout the step-wise introduction of the variables. These results also follow all our expectations with regard to individuals who were not in nomadic and isolated work settings. For these reasons, similar patterns can be observed when considering the results for the control group subjects as displayed in column 5. Here it should be

Table 4.3: Conditional Logit Regressions on the Location Choice of Former Mariners

	Former Mariners Sample			Control Sample	Combined Sample
	(1)	(2)	(3)	(4)	(5)
Regions attractiveness to former mariners	19.792*** (1.68)	19.549*** (1.67)	19.263*** (1.68)	12.786*** (2.54)	17.335*** (1.40)
Regions attractiveness in general	-88.954*** (11.15)	-88.154*** (11.11)	-87.442*** (11.11)	-95.878*** (15.42)	-92.458*** (8.93)
<i>Home city</i>	0.857*** (0.16)	0.874*** (0.16)	0.903*** (0.16)	-1.228*** (0.15)	1.465*** (0.15)
log(distance to home)	-0.955*** (0.05)	-0.996*** (0.05)	-0.993*** (0.05)	-1.102*** (0.05)	-1.155*** (0.05)
log(city size)	1.110*** (0.09)	1.118*** (0.09)	1.104*** (0.09)	0.798*** (0.10)	0.629*** (0.07)
log(distance to prior residences)	-0.184*** (0.06)	0.061 (0.07)	0.099 (0.07)	-6.191*** (0.24)	-6.076*** (0.24)
log(distance to parents)		-0.212*** (0.05)	-0.211*** (0.05)	-0.430*** (0.05)	-0.426*** (0.05)
log(distance to siblings)		-0.197*** (0.05)	-0.196*** (0.05)	-0.114* (0.06)	0.026 (0.06)
log(distance to past peers)			-0.282*** (0.12)		
Mariner $\times$ Home city					2.434*** (0.21)
Mariner $\times$ log(distance to home)					0.154*** (0.21)
Mariner $\times$ log(city size)					0.596*** (0.05)
Mariner $\times$ log(distance to prior residences)					6.150*** (0.25)
Mariner $\times$ log(distance to parents)					0.263*** (0.07)
Mariner $\times$ log(distance to siblings)					-0.249** (0.07)
Labor market region dummies (79)	Yes	Yes	Yes	Yes	Yes
Pseudo $R^2$	0.51	0.51	0.51	0.69	0.59
Observations	317,341	317,341	317,341	317,341	634,682

Note: Standard errors in parentheses  
Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

noted that the distance to prior residency is not significant for the former mariners. This may indicate that individuals exposed to a nomadic and isolated settings become footloose and detached.

However, a comparison of columns 3 and 4 shows that some of the estimates are different. The estimate relating to distance to home and the estimate relating to

distance to prior residences is higher in absolute terms for the control sample than it is for the former mariners. This may be a first indication that mariners become more socially detached, and that they therefore become less inclined to look to the traditional and family-based social relations when choosing the location where they will live. Before jumping to any crude conclusions, however, we should consider whether there are significant differences in the estimated coefficients found for the former mariner sample and the control group sample.

To make it possible to investigate the degree to which the results of these two samples are different, column 5 presents the observations for the entire sample and includes the interaction of the explanatory variables with the dummy for whether the observation involves a former mariner. In this way, the interaction effect becomes an estimate of whether the estimated effect sizes between the two sub-samples are significantly different and of the direction in which the two differ.

Column 5 shows all interaction terms to be significant. Indeed, the results suggest that former mariners chose a location that, on average, are further away from home, from prior residences, and from parents. This regression also provides support for the proposition that former mariners are significantly more likely than members of the control group to locate in urban areas. Column 5 indicates that former mariners tend to locate close to their siblings than the control sample.

Finally, we consider the degree to which the former mariners tend to locate close to their former peers. Column 3 contains a negative estimate associated with the  $\log(\text{distance to past peers})$  variable. This indicates that the former mariners tended to choose a location that, on average, is relatively closer to the location where their former peers were living.

In terms of the control variables, table 4.3 indicates that the regions attractive to the general public tend to be selected away in this sample, while those regions that tend to be attractive to former mariners tend to be the regions to which our sample choose to relocate to. We consider this to be an indication of the satisfactory match since this tends to hold both for mariners and for the non-mariners control sample.

### **Supplementary Analysis**

To further investigate the way that the experience of having worked in nomadic and isolated settings is associated with location choice, we divided the observations into sub-samples based on the duration of the mariners' work periods, which in this context means the average number of days at sea. We expected the associations to be stronger among those who had experienced working at sea for longer periods of time because they had less opportunity to sustain their social relations outside their work settings. To test this expectation, we relied on the fact that the careers and lifestyles of mariners vary to a great extent. Some mariners are away from home for longer periods, while other mariners work closer to home or have fewer days at sea. To determine whether the number of days at sea per year is associated with different considerations regarding social relations when the former mariners make their location choices, we divided the mariners into groups depending on their average number of sea days *per year*, for the last five years of their career at sea. We created a dummy variable which was determined by how the observations were categorized into each group. This dummy was used as an indicator of the extent to which the individual had been exposed to a nomadic and



isolated work setting. Interacting this dummy variable with the various explanatory variables allow us to investigate how the degree of isolation and nomadic life style had an influence on the economic choices of the individuals. The results are shown in Table 4.4. We split the observations into mariners who averaged from 1-98 days at sea per year and the other consisting of mariners who averaged from 99-365 days at sea per year. We also considered the number of seadays per spell per year. We construct this variable seeking to understand the degree to which having seadays back to back would allow him/her to maintain or rekindle social relations.

The regression results presented in Table 4.4 suggest that former mariners who can be included in the highest number of sea days category are more likely to be located near siblings. The longer the duration of their work-periods, the lower the absolute value of the estimated coefficient. As the number of sea days experienced by a mariner increased, the significance of the distance to siblings variable declined in the mariners location choice. On the other hand, individuals in the group with the most sea days were more likely to locate near their prior residences. The results also suggest that the association between distance to peers and location choice was stronger when the duration of work in a nomadic and isolated work setting increased. These results suggest that those who worked for longer periods at a time in the nomadic and isolated work setting tend to choose a life setting close to their past peers.

While the results presented in Table 4.4 do provide some support for the propositions examined in this study, we must acknowledge that the results are weak. It is possible that the number of sea days per year is too crude a measure

Table 4.4: Conditional Logit Regressions on the Location Choice of Former Mariners

	Average Seadays Per Year (1)	Average Seadays Per Spell Per Year (2)
Regions attractiveness to former mariners	19.152*** (1.69)	19.163*** (1.69)
Regions attractiveness in general	-88.924*** (11.18)	-87.936*** (11.14)
<i>Home city</i>	0.779*** (0.26)	0.834*** (0.30)
log(distance to home)	-1.021*** (0.09)	-1.004*** (0.10)
log(city size)	1.293*** (0.10)	1.221*** (0.11)
log(distance to prior residences)	0.190 (0.13)	0.183 (0.15)
log(distance to parents)	-0.450*** (0.08)	-0.270*** (0.09)
log(distance to siblings)	-0.218*** (0.08)	-0.370*** (0.09)
log(distance to past peers)	-0.062 (0.17)	-0.173 (0.19)
Seadays variable $\times$ <i>Home city</i>	0.001 (0.00)	0.001 (0.00)
Seadays variable $\times$ log(distance to home)	0.000 (0.00)	0.000 (0.00)
Seadays variable $\times$ log(city size)	-0.002*** (0.00)	-0.002** (0.00)
Seadays variable $\times$ log(distance to prior residences)	-0.001 (0.00)	-0.002 (0.00)
Seadays variable $\times$ log(distance to parents)	0.002*** (0.00)	0.001 (0.00)
Seadays variable $\times$ log(distance to siblings)	0.000 (0.00)	0.003*** (0.00)
Seadays variable $\times$ log(distance to peers)	-0.002 (0.00)	-0.002 (0.00)
Labor market region dummies (79)	Yes	Yes
Pseudo $R^2$	0.51	0.51
Observations	317,341	317,341

Note: Standard errors in parentheses

Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ 

to adequately examine this question. Some mariners might have gone on longer trips that result in their being granted longer breaks at home between trips. Other mariners who had a larger number of sea days might still have been able to stay at home more often because they were working on ferries or close-to-home cargo ships. We did find stronger results when we divided the sample into three groups

compared to the results we obtained when we divided the sample into only two groups. This suggests that research techniques that result in more variation in the days at sea variable might produce stronger results in support of the propositions examined in the study.

## DISCUSSION

This paper takes the literature on physical separation and attachment and the literature on the choice of a location within a country as the place to live as its point of departure. We study the extent to which the location of family members influence the choice of a location for living for former mariners. Compared to a matched sample of land-based workers, we find that former mariners put less weight on the location of family, and particularly on the location of their parents, which are at the heart of attachment theory (Bowlby 1969; Diamond et al. 2008; Vormbrock 1993b).

Our second finding was that among mariners, those who had experienced more sea days or more spells at sea, and those who had been employed on deep sea ships, are less likely than others to locate near their parents or siblings. We argue that this finding indicates that the lifestyle of mariners at sea causes them to become more socially detached from their families.

These findings add to the literature on the location choice of individuals within a country by emphasizing the fact that certain types of individuals, and particularly those who had been employed in jobs that exposed them to nomadic lifestyles, put less weight on the social factors that are the most critical factor for most other people in the choice of the region where they will reside. The fact that

former mariners appear to substitute the importance of their relationships with former workplace peers for the importance of family relationships suggests that the availability of frequent opportunities for face-to-face contact affects the extent to which individuals value social relations. Thus, this paper contributes to the literature on location choice as well as the literature on the formation of social relationships in the workplace. Perhaps more importantly, it adds to the literature on social attachment and on the psychological effects of nomadic lifestyles and careers.

The findings of this study also speak to several literatures on work cultures and organizations, in addition to the above literature. Working in remote locations is becoming increasingly common, and certain types of workers often have to work far away from their friends and families. This is said to increase the attachment between co-workers, but to also increase some workers loneliness and potentially lower their productivity. New communication technologies that have resulted in increased reliance on computer-based communications have also led to a decline in the perceived importance of face-to-face communication. In the case examined in this study, mariners show a lower level of attachment to families despite the prevalence of tools for online communications. We have no data on how frequently mariners actually use of these technologies but we know that such technology is widely available on modern vessels. This may indicate that the use of new forms of communication are not sufficient to maintain strong social ties. Future research on these issues should focus on the role of these forms of communication in maintaining close and productive relationships at distributed work places and social attachment in families. Our results provide a preliminary indica-

tion that new forms of communication are far less effective for maintaining social attachment in families. Moreover, in the utmost consequence, the decreasing attachment hurts families independently of whether the choice to enter a nomadic lifestyle is dependent on the attachment of the individual (Bowlby 1980).

This study shows that the mariners become attached to their peers and less attached to members of their own families. It thus appears that the mariners might substitute the close relationships that they have developed with coworkers during their career at sea for their relationships with their earlier friends and family.

### **Limitations**


While our findings and arguments are plausible, we are unable, in the context of this study, to rule out the possibility that our findings could be explained by the characteristics of the individuals who self-select their entry into the maritime industry. We did closely match the mariners to land-based workers who shared a similar background and observable characteristics, but we cannot fully rule out the possibility matching was incomplete due other unobservable factors. In a perfect setting, we would need to include some proxies for the strength of the individuals social relations to partially alleviate this concern. Unfortunately, such details are unavailable. We do, however, provide some evidence in the descriptive statistics relating to variables not included in the matching procedure that suggests that the matching procedure based on observable characteristics was fairly successful and that the samples were comparable. Future research should nevertheless take advantage of more experimental settings, where it is easier to control for the issue of selection bias in the sample.

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## Co-author statement:

20 April, 2012

I hereby declare that the paper entitled Economic Choices of a Nomadic and Isolated Work Force: Shifts in Social Relations and Their Implications, (being part of Christine D. Isakson's PhD Thesis entitled Coworker Influence and Labor Mobility: Essays on Turnover, Entrepreneurship and Location Choice in the Danish Maritime Industry), is authored by Christine D. Isakson, Toke Reichstein and Michael S. Dahl. Christine D. Isakson contributed to the initial idea, estimations and writing of the theory and methods section. Toke Reichstein contributed to the estimations and the writing of the entire paper. Michael S. Dahl contributed to the initial idea, estimations and the writing of the methods, results and discussion sections.



Christine D. Isakson



Toke Reichstein



Michael S. Dahl





## Conclusion

In this thesis I, and my coauthors, looked at various ways in which coworkers in the organizational context influence individuals' economic choices.

In the first essay, *Task interdependence, work group composition and turnover: A longitudinal study*, we looked at how nationally homogeneous groups of workers respond to an influx (or lack of) foreign nationals. Using nationality as a cultural measure, we find support for the first hypothesis. The first hypothesis puts forth that higher own national representation, results in individuals being less likely to leave the workplace. This congruent with previous studies in organizational demography that argue that increased homogeneity tend to lead to greater cohesion and attachment to group (see e.g., Williams and O'Reilly III 1998), and furthermore, that as attachment to group increases, turnover tends to decrease (Evan 1963). To get a sense of the moderating power of high task interdependency, in the second hypothesis, we argue for and hypothesize that high task interdependency positively moderates the group heterogeneity (nationality)-turnover relationship. Finding support for this hypothesis suggests that high task interdependent work groups capitalize on some of the very mechanisms that are

prevalent in homogeneous work groups; communication and cohesion. In the third hypothesis, we aim to extend an emerging body of literature by examining whether *change* in work group composition since time of entry into the workplace influences individuals rates of turnover. We find mixed results. Though we do find support for our hypothesis, it can not go un-noted that while as an individual becomes less nationally represented, they are more likely to leave, perhaps the more curious result is what happens when there is an increase in national representation. Previous work states that if the proportion own cultural representation increases, it has little or no effect on individual rates of turnover (Sørensen 2004). In our results however, it shows that if there is an increase, that again, the likelihood to exit the workplace increases. This is in conflict with previous studies and suggests that in situations where nationality is a measure of cultural diversity, *change* is what spurs detachment and ultimately, raises the likelihood that an individual will exit the workplace.

In the second essay *Peer Effects and Entrepreneurship: Coworkers Up-Close and Intense*, examined individual rates of entrepreneurship to see if they increase with the intensity with which workers were exposed to entrepreneurial coworkers. With the goal of revealing an overall peer effect, the results support prior findings (Nanda and Sørensen 2010), which state that individuals who transition to entrepreneurship are more likely to have had peers with prior entrepreneurial experience. Furthermore, when time (days) together was added to the analysis, we find that individuals who transition to entrepreneurship are more likely to have had increased exposure to peers. There is thus support for the argument that social learning takes time suggesting that the more time you are exposed to en-

trepreneurial peers, the more probable it is that you will be influenced by them. The second hypothesis looked to see if peer effects were stronger for those sharing the same work functionality as compared to those with different work functionalities. Support was found for this hypothesis suggesting that both cognitive proximity and a shared technical language increased the likelihood, as well as the efficiency, of the transfer of entrepreneurial knowledge.

The final essay *Economic Choices of a Nomadic and Isolated Work Force: Shifts in Social Relations and Their Implications* examined former mariners to see if time spent in a nomadic and isolated environment influenced their decision to locate to a region near their coworkers. Mariners are compared to a matched sample of land-based workers on similar variables that would indicate a detached, or independent lifestyle. Former mariners put less weight on the location of the family, but much less on the parents. This supports attachment (or in this case, detachment) theory (Bowlby 1969; Diamond et al. 2008; Vormbrock 1993a) in that individuals become detached from the friends and family when they are not within geographic proximity of them. Furthermore, we found that the more time coworkers spent with each other in these isolated environments, both in terms of days together and spells together at sea, the less likely they were to locate near parents and siblings. The findings in this essay contribute to the literature on social attachment, particularly with regard to the fact that individuals who are away from their home based ties (family and friends); they appear to fall prey to detachment anxieties making room for new, proximal, social attachments to their coworkers. This is shown by their choice of region, when they choose to leave the nomadic lifestyle and make a choice of personal residence. It also adds to the

literature on the psychological effects of nomadic careers and lifestyles.

When we take the results from all three studies and look at them together, the most striking outcome we see is that individuals who work within the same work group, sharing the same job functionality, are intimately influenced by their coworkers resulting in various economic outcomes. Same job functionality increases share of technical knowledge in the workplace, not limited to knowledge about the job at hand, but rather increasing the probability of sharing past experiences and resources. Same nationality, and an increasingly homogeneous environment, increases the likelihood of attachment to the group, cohesion and communication, and decreased the likelihood of turnover. Individuals sharing the same isolated work environment also increased the likelihood of attachment, the development of strong ties, ultimately increasing the influence of their coworker's economic choice of future residence. Clearly, individuals run the risk of being influenced by their coworkers in ways which may determine various economic outcomes. Another interesting outcome is that of mobile worker. We have discovered that those in a nomadic, isolated professions are quite likely to become attached to their coworkers when they are away for long periods of time. Similarly, it is important to keep in mind that with the nomadic workforce, you are likely to have individuals from different nations in the same, heterogeneous group. It may be the case that being sensitive to levels of homogeneity within work groups, will give organizations a better chance at assembling high performing teams, which are communicative, cohesive, and less likely to leave the workplace.

The primary contribution that this thesis makes to the addressed literature streams is by way of the work setting. Having the luxury of investigating these

phenomena with such detailed data allow us to more precisely measure and more confidently confirm previous studies which have assumed social interaction with much lesser degrees of certainty. Two ways that these studies have contributed to the literature are by way of confirming the general peer effect, showing that individuals who exit to entrepreneurship are more likely to have worked with previous entrepreneurs, and also by confirming the homogeneity-turnover relationship, showing that individuals in culturally homogeneous groups, as measured by nationality, are less likely to exit the workplace. Both of these confirmations contribute to the literatures discussing both peer influence on economic choice and organizational demography, respectively. Perhaps more importantly, and also as a benefit of the controlled work setting represented with this data, we understand with greater precision how task interdependency is a moderator of the group homogeneity-turnover relationship. This contribution to the relational demography literature gets us a step closer to unraveling the relationship between types of task interdependency and attachment to organization. Furthermore, having the ability to measure the economic outcomes, turnover, entrepreneurship and location choice, gives us insights into how influential one's coworkers are in the workplace.

This thesis contributes to both the organizational and relational demography literatures, specifically with regards to task interdependencies. We gain insights into how high task interdependency is a moderator of the economic choice to leave the workplace. It also contributes to literature streams addressing coworker influence in the workplace, specifically, peer influence on economic choice (exit to entrepreneurship), and attachment to work groups (homophily, similarity/attraction,

social categorization). This raises interesting questions regarding the level of influence individuals have on one another in the workplace, particularly given the increasing time individuals spend in the workplace.

## Appendix

Table 1: Mixed Logit Regressions on the Location Choice of Former Mariners and Comparison Group

	Former mariners				Comparison group	
	Mean	SD	Mean	SD	Mean	SD
Regions attractiveness to former mariners	18.242***	0.253	16.892***	0.262	12.261***	-3.690
Regions attractiveness in general	-59.740***	-10.250	-54.108***	-5.484	-168.293***	-64.422***
Home city	-1.478***	4.300***	-1.520***	4.468***	-2.694***	1.152**
Ln (distance to home)	-1.677***	1.500***	-1.660***	1.622***	-1.622***	1.330***
Ln (city size)	1.091***	0.093	1.048***	-0.007	1.323***	0.313*
Ln (distance to prior residences)	-1.041***	-1.115***	-0.927***	0.926***	-9.640***	1.872**
Ln (distance to parents)	0.158	1.421***	0.197	1.440***	0.021	1.580***
Ln (distance to siblings)	-0.304*	0.630**	-0.267**	-0.670***	0.010	0.632**
Ln (distance to peers)			-0.657***	-1.020		
Log-likelihood	-3,024		-3,011		-2065	
Observations	317,341		317,341		317,341	

Note: Standard errors in parentheses

Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 2: Baseline Piecewise Constant Hazard Rate Model of the Effects of Racial Composition on Turnover: Proportion Danish in own department vs. on rest of ship (ros) by High Task Interdependency

	Model 1	Model 2	Model 3	Model 4
Year dummies: 1990	baseline	baseline	baseline	baseline
1991	0.006 (0.02)	0.009 (0.02)	0.009 (0.02)	0.013 (0.02)
1992	0.087*** (0.02)	0.089*** (0.02)	0.089*** (0.02)	0.094*** (0.02)
1993	0.081*** (0.02)	0.083*** (0.02)	0.083*** (0.02)	0.091*** (0.02)
1994	0.129*** (0.02)	0.130*** (0.02)	0.131*** (0.02)	0.137*** (0.02)
1995	0.117*** (0.02)	0.116*** (0.02)	0.119*** (0.02)	0.122*** (0.02)
1996	0.080*** (0.02)	0.078*** (0.02)	0.082*** (0.02)	0.082*** (0.02)
1997	0.169*** (0.02)	0.168*** (0.02)	0.171*** (0.02)	0.171*** (0.02)
1998	0.260*** (0.02)	0.258*** (0.02)	0.262*** (0.02)	0.262*** (0.02)
1999	0.196*** (0.02)	0.193*** (0.02)	0.199*** (0.02)	0.200*** (0.02)
2000	0.188*** (0.02)	0.185*** (0.02)	0.190*** (0.02)	0.191*** (0.02)
2001	0.205*** (0.02)	0.201*** (0.02)	0.207*** (0.02)	0.207*** (0.02)
2002	0.168*** (0.02)	0.165*** (0.02)	0.170*** (0.02)	0.167*** (0.02)
2003	0.095*** (0.02)	0.091*** (0.02)	0.097*** (0.02)	0.097*** (0.02)
2004	0.151*** (0.02)	0.145*** (0.02)	0.154*** (0.02)	0.153*** (0.02)
2005	0.327*** (0.02)	0.323*** (0.02)	0.331*** (0.02)	0.331*** (0.02)
2006	0.568*** (0.02)	0.564*** (0.02)	0.571*** (0.02)	0.576*** (0.02)
PW Constant 0-23mo	-0.039 (0.40)	-0.059 (0.40)	-0.049 (0.40)	-0.070 (0.40)
PW Constant 24-47mo	-0.304 (0.40)	-0.322 (0.40)	-0.314 (0.40)	-0.334 (0.40)
PW Constant 48-71mo	-0.396 (0.40)	-0.412 (0.40)	-0.406 (0.40)	-0.423 (0.40)
PW Constant 72-95mo	-0.591 (0.40)	-0.605 (0.40)	-0.600 (0.40)	-0.613 (0.40)

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Table 2 – continued from previous page

	Model 1	Model 2	Model 3	Model 4
PW Constant 96-119mo	−0.440 (0.40)	−0.452 (0.41)	−0.448 (0.40)	−0.458 (0.40)
PW Constant 120-143mo	−0.422 (0.41)	−0.435 (0.41)	−0.430 (0.41)	−0.434 (0.41)
PW Constant 144-167mo	−0.516 (0.42)	−0.532 (0.43)	−0.525 (0.42)	−0.526 (0.42)
PW Constant 168-191mo	−0.186 (0.44)	−0.199 (0.44)	−0.196 (0.44)	−0.193 (0.44)
PW Constant 192-204mo	baseline	baseline	baseline	baseline
Log annual wage	0.018*** (0.00)	0.017*** (0.00)	0.018*** (0.00)	0.017*** (0.00)
Age	−0.007*** (0.00)	−0.007*** (0.00)	−0.007*** (0.00)	−0.007*** (0.00)
Education: Undocumented	baseline	baseline	baseline	baseline
Primary General Secondary	−0.060*** (0.02)	−0.059** (0.02)	−0.060*** (0.02)	−0.063*** (0.02)
Vocational Secondary	−0.026 (0.02)	−0.025 (0.02)	−0.025 (0.02)	−0.026 (0.02)
Vocational Training - Short higher education	−0.006 (0.02)	−0.004 (0.02)	−0.005 (0.02)	−0.008 (0.02)
Medium higher education and above	−0.050** (0.02)	−0.049** (0.02)	−0.051** (0.02)	−0.053** (0.02)
Gender	−0.236*** (0.01)	−0.236*** (0.01)	−0.236*** (0.01)	−0.239*** (0.01)
0 to 3 mo	1.175*** (0.01)	1.174*** (0.01)	1.174*** (0.01)	1.169*** (0.01)
3 to 6 mo	1.468*** (0.01)	1.467*** (0.01)	1.468*** (0.01)	1.465*** (0.01)
6 to 9 mo	0.554*** (0.01)	0.553*** (0.01)	0.554*** (0.01)	0.552*** (0.01)
9 to 12 mo	0.326*** (0.02)	0.325*** (0.02)	0.326*** (0.02)	0.325*** (0.02)
1 year or more	baseline	baseline	baseline	baseline
1 to 5 yrs (Career)	0.159*** (0.02)	0.163*** (0.02)	0.159*** (0.02)	0.176*** (0.02)
6 to 10 yrs (Career)	0.076*** (0.02)	0.080*** (0.02)	0.076*** (0.02)	0.091*** (0.02)
11 to 15 yrs (Career)	0.011 (0.02)	0.011 (0.02)	0.010 (0.02)	0.017 (0.02)
More than 15 yrs (Career)	baseline	baseline	baseline	baseline

Continued on next page

Table 2 – continued from previous page

	Model 1	Model 2	Model 3	Model 4
Passenger vessel	baseline	baseline	baseline	baseline
Long haul vessel	0.526*** (0.01)	0.518*** (0.01)	0.527*** (0.01)	0.511*** (0.01)
Short haul vessel	0.190*** (0.02)	0.191*** (0.02)	0.191*** (0.02)	0.183*** (0.02)
High Task Interdependent work group (dummy)	-0.151*** (0.01)	-0.158*** (0.01)	-0.156*** (0.01)	-0.158*** (0.04)
Number on vessel at time of hire	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)
Change in size	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)
Size own dept	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)
Change in size own department	0.002*** (0.00)	0.002*** (0.00)	0.002*** (0.00)	0.002*** (0.00)
Firm HR ave (proportion Danish by dept, ship type, year)	0.013 (0.02)	0.101*** (0.03)	0.094*** (0.03)	0.098*** (0.03)
Change in firm HR average since previous year	-0.481*** (0.04)	-0.497*** (0.04)	-0.484*** (0.04)	-0.472*** (0.04)
Proportion Danish on vessel		-0.117*** (0.02)		
Proportion domestic in own work group			-0.103*** (0.02)	0.188*** (0.03)
Proportion domestic in all other work groups			0.010 (0.02)	-0.320*** (0.03)
High Task Interdependent work group (d) x Proportion Danish in own work group				-0.385*** (0.04)
High Task Interdependent work groups (d) x Proportion Danish in all other work groups				0.405*** (0.03)
Constant	-3.086*** (0.40)	-3.028*** (0.41)	-3.059*** (0.40)	-3.001*** (0.40)
Observations	767035	767035	767035	767035
Standard errors in parentheses				
* $p < 0.10$ , ** $p < 0.05$ , *** $p < 0.01$				

Table 3: Piecewise Constant Hazard Rate Model of the Effects of Change in Foreign/Domestic Composition on Turnover: Change in proportion domestic (on vessel)

	Model 6	Model 7	Model 8
Year dummies: 1990	baseline	baseline	baseline
1991	0.012 (0.02)	0.013 (0.02)	-0.002 (0.02)
1992	0.089*** (0.02)	0.090*** (0.02)	0.071*** (0.02)
1993	0.082*** (0.02)	0.083*** (0.02)	0.056*** (0.02)
1994	0.128*** (0.02)	0.129*** (0.02)	0.102*** (0.02)
1995	0.116*** (0.02)	0.116*** (0.02)	0.073*** (0.02)
1996	0.080*** (0.02)	0.079*** (0.02)	0.036 (0.02)
1997	0.170*** (0.02)	0.169*** (0.02)	0.136*** (0.02)
1998	0.260*** (0.02)	0.259*** (0.02)	0.217*** (0.02)
1999	0.203*** (0.02)	0.201*** (0.02)	0.170*** (0.02)
2000	0.190*** (0.02)	0.189*** (0.02)	0.162*** (0.02)
2001	0.210*** (0.02)	0.209*** (0.02)	0.171*** (0.02)
2002	0.172*** (0.02)	0.170*** (0.02)	0.138*** (0.02)
2003	0.102*** (0.02)	0.101*** (0.02)	0.072*** (0.02)
2004	0.160*** (0.02)	0.158*** (0.02)	0.138*** (0.02)
2005	0.338*** (0.02)	0.336*** (0.02)	0.319*** (0.02)
2006	0.574*** (0.02)	0.572*** (0.02)	0.528*** (0.02)
PW Constant 0-23mo	-0.057 (0.40)	-0.064 (0.41)	-0.002 (0.40)
PW Constant 24-47mo	-0.322 (0.40)	-0.329 (0.41)	-0.269 (0.40)
PW Constant 48-71mo	-0.413 (0.40)	-0.419 (0.41)	-0.354 (0.40)
PW Constant 72-95mo	-0.609 (0.41)	-0.615 (0.41)	-0.556 (0.40)
PW Constant 96-119mo	-0.456	-0.461	-0.415

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Table 3 – continued from previous page

	Model 6	Model 7	Model 8
	(0.41)	(0.41)	(0.40)
PW Constant 120-143mo	-0.434	-0.439	-0.413
	(0.41)	(0.41)	(0.40)
PW Constant 144-167mo	-0.525	-0.531	-0.485
	(0.43)	(0.43)	(0.42)
PW Constant 168-191mo	-0.192	-0.196	-0.240
	(0.44)	(0.45)	(0.44)
PW Constant 192-204mo	baseline	baseline	baseline
Log annual wage	0.017***	0.017***	0.019***
	(0.00)	(0.00)	(0.00)
age	-0.007***	-0.007***	-0.007***
	(0.00)	(0.00)	(0.00)
Education: Undocumented	baseline	baseline	baseline
Primary – General Secondary	-0.067***	-0.066***	-0.069***
	(0.02)	(0.02)	(0.02)
Vocational Secondary	-0.022	-0.021	-0.027
	(0.02)	(0.02)	(0.02)
Vocational Training - Short higher education	-0.015	-0.014	-0.017
	(0.02)	(0.02)	(0.02)
Medium higher education and above	-0.060***	-0.060***	-0.049**
	(0.02)	(0.02)	(0.02)
Gender	-0.250***	-0.250***	-0.261***
	(0.01)	(0.01)	(0.01)
0 to 3 mo	1.170***	1.170***	1.161***
	(0.01)	(0.01)	(0.01)
3 to 6 mo	1.467***	1.467***	1.403***
	(0.01)	(0.01)	(0.01)
6 to 9 mo	0.554***	0.553***	0.551***
	(0.01)	(0.01)	(0.01)
9 to 12 mo	0.326***	0.326***	0.320***
	(0.02)	(0.02)	(0.02)
1 year or more	baseline	baseline	baseline
1 to 5 yrs (Career)	0.156***	0.158***	0.155***
	(0.02)	(0.02)	(0.02)
6 to 10 yrs (Career)	0.080***	0.081***	0.079***
	(0.02)	(0.02)	(0.02)
11 to 15 yrs (Career)	0.013	0.013	0.009
	(0.02)	(0.02)	(0.02)
More than 15 yrs (Career)	baseline	baseline	baseline

Continued on next page

Table 3 – continued from previous page

	Model 6	Model 7	Model 8
Passenger vessel	baseline	baseline	baseline
Long haul vessel	0.526*** (0.01)	0.523*** (0.01)	0.503*** (0.01)
Short haul vessel	0.192*** (0.02)	0.192*** (0.02)	0.203*** (0.02)
Steward's department	0.095*** (0.01)	0.099*** (0.01)	0.122*** (0.01)
Navigation department	-0.112*** (0.01)	-0.112*** (0.01)	-0.108*** (0.01)
Engineering department	baseline	baseline	baseline
Number on vessel at time of hire	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)
Change in size: Positive	-0.001*** (0.00)	-0.001*** (0.00)	-0.003*** (0.00)
Change in size: Negative	-0.000 (0.00)	-0.000 (0.00)	0.001*** (0.00)
Firm HR ave (proportion Danish by dept, ship type, year)	0.018 (0.02)	0.051** (0.02)	0.051** (0.02)
Change in firm HR average since previous year	-0.461*** (0.04)	-0.468*** (0.04)	-0.421*** (0.04)
Proportion Danish upon hire (vessel)		-0.045*** (0.02)	0.058*** (0.02)
Change in proportion Danish: Positive			3.710*** (0.10)
Change in proportion Danish: Negative			-2.906*** (0.07)
Constant	-3.139*** (0.41)	-3.120*** (0.41)	-3.289*** (0.40)
Observations	767035	767035	767035
Standard errors in parentheses			
* $p < 0.10$ , ** $p < 0.05$ , *** $p < 0.01$			



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## English Summary

This Ph.D. thesis investigates the links between social influence and individual economic choice, asking the overall research question; How do coworkers influence labor mobility? We consider this question in the form of three essays; *Task interdependence, work group composition and turnover: A longitudinal study*, *Peer Effects and Entrepreneurship: CoWorkers Up-Close and Intense*, and *Economic Choices of a Nomadic and Isolated Work Force: Shifts in Social Relations and Their Implications*. Each paper, from a different vantage point, contemplates and contributes to our understanding of the overall research question.

Common throughout the dissertation is the use of a highly unique combination of datasets. The first dataset is provided by the Danish Maritime Authority (DMA) and it contains all individuals who have worked on Danish vessels between 1980-2006. This data is combined with panel data within The Integrated Database for Labor Market Research in Denmark (IDA) provided by Statistics Denmark. The combination of these two datasets provides extraordinary detail allowing us to examine individuals in a highly controlled setting. It also gives us the ability for follow individuals throughout the course of several years. The nature of the data affords us the rare opportunity to investigate social mechanisms

and their ultimate economic outcomes in ways that are typically difficult to look at.

The first paper asks whether workers, in nationally homogeneous work groups, respond to foreign nationals in the workplace. It also asks whether high task interdependency moderates the effect of change in national cultural composition on turnover. This paper contributes to the discussions in organizational demography which address the social mechanisms which commonly result in increased attachment to work group and decreased turnover. It examines the effects of both *level* of composition of national homogeneity in work groups, as well as *change* in the composition of national homogeneity in the workplace. The main finding is that high task interdependency positively modifies the national homogeneity-turnover relationship.

The second paper examines whether entrepreneurial peer effects are increased by spending more time with peers who have had prior entrepreneurial experience. Additionally, it investigates coworker influence, by way of knowledge transfer and as measured by entrepreneurial exit, among those working within the same job functionality. This paper enters the discussion within the literature which addresses whether coworkers share knowledge and whether they are more inclined to do so if they share the common job functionalities. The findings suggest that those who exit to entrepreneurship are more likely to be influenced by coworkers with prior entrepreneurial experience who are within their own workgroup.

The third paper asks whether individuals' social attachments are defined by their work setting, and whether those attachments influence their economic choices. This paper enters current discussions in several literatures which address levels of

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social attachment and location choice. The paper argues that those who spend time away from their 'home' become less attached to traditional attachment figures, leaving room for and becoming more attached to coworkers, ultimately influencing their economic choice. Empirically, these questions are examined using individuals who are employed in nomadic and isolated work settings and we find evidence that the economic choices made by individuals who work in these settings are shaped by professional ties.

The thesis looks at various ways in which coworkers influence the individuals they work with within the organizational setting. The setting itself is of great interest as it allows us to examine social phenomena and their economic outcomes through a more refined lens. These studies contribute to literatures on national homogeneity and turnover by lending insights into the mechanisms at play within high and low task interdependent groups; to coworker influence, social learning and entrepreneurship literatures by revealing more about knowledge transfer within work groups; and to social attachment and location choice by examining and unfolding social detachment and attachment theories and uncovering the resulting influence on the individual economic choice of where to live.



## Danish Summary

Denne ph.d.-afhandling omhandler forholdet mellem sociale relationer og individers økonomiske valg. Afhandlingen stiller spørgsmålet: Hvordan påvirker kollegaer arbejdskraftmobilitet? Vi betragter dette spørgsmål i tre essays: *Arbejdsopgavers indbyrdes afhængighed, arbejdsgruppesammensætning og arbejdsgruppers omsætningshastighed: et longitudinalt studie* *Peer effekter og entreprenørskab: tæt på kollegaer* *Økonomiske valg i en rodløs og isoleret arbejdsstyrke: forandringer i sociale relationer og disses betydning*. Ud fra forskellige perspektiver betragter hver artikel det overordnede forskningsspørgsmål, samt bidrager til vores forståelse af det.

Fælles for hele afhandlingen er brugen af meget unikke kombinationer af datasæt. Det første datasæt er tilvejebragt af Søfartsstyrelsen og indeholder alle individer, som har haft ansættelse på danske fartøjer mellem 1980 og 2006. Dette datasæt kombineres med den Integrerede Database for Arbejdsmarkedsforskning (IDA) fra Danmarks Statistik. Kombinationen af disse to datasæt giver en ekstraordinær detaljerigdom, som tillader os en høj grad af kontrol i analyser af individer. Derudover giver kombinationen os mulighed for at følge enkeltindivider over flere år. Dataenes struktur giver os en sjælden mulighed for at studere

sociale mekanismer og deres endelige økonomiske effekter på måder, som oftest er utilgængelige.

Den første artikel spørger om arbejdere i kulturelt set homogene grupper påvirkes af tilførslen af udlændinge på arbejdspladsen. Den spørger ligeledes, om arbejdsopgavers indbyrdes afhængighed er en moderator for effekten på arbejdsgruppens omsætningshastighed af en ændring i den nationale kulturelle sammensætning af gruppen. Artiklen bidrager til diskussionen indenfor organisationel demografi vedrørende de sociale mekanismer, som generelt bidrager til stærkere tilhørsforhold til arbejdsgruppen samt lavere omsætningshastighed for arbejdsstyrken. Artiklen undersøger både effekten af niveauet for homogenitet i kulturel sammensætning samt effekten af en ændring i homogeniteten i kulturel sammensætning på arbejdsstedet. Det primære resultat er, at en høj grad af indbyrdes afhængighed mellem arbejdsopgaver modificerer forholdet mellem kulturel homogenitet og arbejdskraftens omsætningshastighed i positiv retning

Den anden artikel undersøger, om entreprenørskab-peer effekten forstærkes ved at tilbringe længere tid med kollegaer, der har tidligere erfaring som entreprenører. Derudover undersøger artiklen indflydelsen fra kollegaer blandt individer med samme jobfunktion, gennem vidensoverførsel og med entreprenørskab som resultat. Artiklen bidrager til diskussionen i litteraturen om, hvorvidt kollegaer deler viden, og om de er mere tilbøjelige til dette, hvis de har fælles jobfunktion. Resultaterne viser, at de, som forlader jobbet for at blive entreprenører, har relativt større sandsynlighed for at være blevet påvirket af kollegaer fra deres egen arbejdsgruppe med tidligere entreprenørerfaring.

Den tredje artikel spørger, om individers sociale bånd er defineret af deres

arbejdsforhold, og om disse bånd har indflydelse på individers økonomiske valg. Artiklen bidrager til diskussionen, som er fælles for flere retninger indenfor litteraturen, vedrørende styrken af sociale bånd og valg af lokalitet. Artiklen argumenterer for, at de, som tilbringer tid væk fra 'hjemmet', bliver mindre knyttede til lokaliteter af traditionelle årsager, hvilket giver plads til kollegaer, som de bliver stærkere knyttet til. Dette har i sidste ende en effekt på deres økonomiske valg. Dette undersøges empirisk ved at studere individer i en rodløs og isoleret arbejdssituation og vi finder indikationer på, at økonomiske valg foretaget af individer i disse arbejdssituationer er relativt stærk påvirket af kollegial tilknytning.

Afhandlingen undersøger forskellige måder, hvorpå kolleger påvirker hinanden inden for deres arbejdsforhold. Arbejdsforholdene selv er af stor interesse, fordi de giver mulighed for at undersøge sociale fænomener og deres økonomiske effekter ved hjælp af en mere raffineret linse. Disse studier bidrager til litteraturen om kulturel homogenitet og arbejdskraftens omsætningshastighed ved at give indsigt i de mekanismer, der er i spil i grupper med høj og lav grad af indbyrdes afhængighed mellem arbejdsopgaver; til litteraturen om kollegial påvirkning, social læring og entreprenørskab ved at afdække mere viden om vidensoverførsel i arbejdsgrupper; og til teorierne om sociale bånd og valg af lokalitet ved at undersøge og udfolde teorier om social adskillelse og tilknytning og afdække den deraf kommende påvirkning af det individuelle økonomiske valg af bopæl.





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