HOW TO BREAK THE "INVISIBLE WALLS":

THE ROLE OF COMMUNICATIVE PRACTICES FOR OVERCOMING

CHALLENGES OF SUBGROUPS IN GLOBAL TEAMS

by

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ABSTRACT OF THE DISSERTATION

How to Break the "Invisible Walls":

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Global Teams

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Diversity becomes apparent in interaction and the way researchers could investigate the role of team diversity for contemporary organizations is by focusing on how people form subgroups and their impact on global virtual teams (GVTs). Virtual teams are essential work forms in contemporary organizations. This project investigates how objective team faultlines and subjective awareness of team subgroups as well as geographic distribution in globally distributed teams impact subgroup formation, team processes and outcomes. Utilizing faultline theory (Lau & Murnighan, 1998) and communicatively constructed identification theory (Scott, Corman & Cheney, 1998) and using a multi-method approach, the findings are based on a field study conducted on site of a global software organization drawing on both an international survey of global team members and observation and in-depth interviews with global team members. The survey results identify factors that moderate the relationship between team faultlines, subgroups and global team innovation, and satisfaction among a sample of global teams (n=165 individuals in n = 27 teams).

A smaller number of teams (n = 2) utilizing iterations of agile software development served as an in-depth case study over time. The analysis illuminates which communicative practices lead team faultlines (aligned demographic differences) to turn into subgroups, how they affect global teams and identifies factors that could help teams overcome challenges of objective faultlines and prevent them from becoming salient. Quantitative findings demonstrate that team identification and psychologically safe communication climate (PSCC) moderate the relationship between faultlines and perceived team subgroups. Perceived team subgroups moderate the relationship between team faultlines and satisfaction but have no impact on the relationship between faultlines and innovation. Based on critical incident analysis (Flanagan, 1954) and interview analysis, faultlines were triggered into subgroups by two main factors: social and geographical distance. Communicative practices helped teams in overcoming challenges of subgroups. Proximity and communicative brokers helped teams manage social distance, while distanced leadership skills and strategic Enterprise Social Media (ESM) use helped overcome geographical distance. The study contributes to theory and practice of globally distributed teams as it is taking a more dynamic, communicative view of subgroups and how they evolve over time.

ACKNOWLEDGEMENTS

DEDICATION

To Joseph

My beacon on the foreign land - you've been inspiring me but we did it together!

Melisa and Yakub

I hope you will benefit from this learning journey as well.

Mamusiu

Po prostu dziekuje!

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CHAPTER ONE. INTRODUCTION

Global teams are particularly complex organizational structures that are widely geographically distributed and highly culturally diverse (Gibson & Gibbs, 2006) and that have increasingly been becoming more prominent work forms in contemporary organizations. Global teams enable organizations to benefit from the diversity of backgrounds, perspectives, and expertise of their members. Team diversity has been found to benefit creativity and innovation (Gibson & Gibbs, 2006; Stahl, Maznevski, Voigt & Jonsen, 2009) and satisfaction (Stahl, Mäkelä, Zander, & Maznevski, 2010), yet be difficult to manage. Research has been focused on the issues related to team composition and factors moderating the impact of objective team faultlines on team processes and outcomes. While diversity has often been studied as an isolated factor impacting teams (see for example Stahl et al., 2009), it is important to recognize it as a communicative process. That is, teams form subgroups by interacting more or less with certain individuals and their communicative practices determine the extent to which diversity is beneficial or detrimental for global teams and organizations. This dissertation conceptualizes team diversity as a more subjective and communicative phenomenon, contrary to the emphasis in global teams research on objective characteristics of diversity (Lau & Murnighan, 1998). Looking not only at objective team diversity and distribution but also at perceptual subgroups in global teams and their evolution is important because cultural diversity and geographical distribution create conditions in which team members communicate more often with some individuals than with others (Mäs, Flache, Takács, & Jehn, 2013). The purpose of this study is to investigate how diversity and distribution in globally distributed teams impact subgroup formation, team processes and outcomes as

well as explore the role of communication practices for subgroups dynamics over time in innovative globally distributed teams. The goal is to discover how team processes mitigate negative effects of cultural diversity and geographic dispersion on team outcomes in globally distributed teams.

International organizations benefit from the knowledge economy by encouraging teamwork. For example, such process frameworks as Holacracy (Robertson, 2006) and the agile methodology for software development rely on the strength of effective cross-functional teams. The agile manifesto, which many tech companies have incorporated into their process, starts with: "Individuals and interactions over processes and tools" (Agile Manifesto Online, 2001). Entrepreneurial start-ups have become so trendy that even the large and stable organizations want to benefit from the innovation disruption (Aghina, 2016). Non-profit and corporate sectors have been interested in challenges for teams and global work. For example, Zegenhagen (2016) Deloitte's report concluded that: "decentralizing a technology project team can offer opportunities to save on time and costs, and still achieve quality results. Staffing strategic roles with talent from other locations or countries is a popular strategy" (p. 2). Organizations have been finding the multiple challenges related to virtual teamwork. For example, a KPMG study of outsourced IT (KPMG, 2008) found that 86 percent of companies lost more than 25 percent of IT benefits because of virtual team projects that had to be shelved or severely downsized. Another study conducted by McKinsey (2012) of 5,400 large scale IT projects (projects with initial budgets greater than $15M) found that 17 percent of large IT projects go so badly that they could threaten the very existence of the company. On average, large IT projects run 45 percent over budget and 7 percent over time, while

delivering 56 percent less value than predicted. Therefore, there are many challenges stemming from team diversity and geographic dispersion facing teams, especially global virtual teams (GVT's).

Academic research on objective effects on team diversity has been burgeoning in many disciplines and utilizing different approaches and research methods. There is an indication that research on subjectively perceived diversity is becoming more prominent (Shemla, Meyer, Greer, & Jehn, 2014) and there is a lot that the communication discipline - with its focus on interaction - could contribute to research on how diversity is enacted in daily interactions of work teams. How do we see team diversity in groups and teams? We see them in the way people communicate, create subgroups and alliances. In result, certain individuals participate, have "voice" and others are excluded. Communication practices have the potential to decrease the salience of subgroups. Subgroup dynamics within work teams, particularly geographically distributed work teams, is an area of research that remains largely unexplored. Research shows that internationally distributed teams are prone to subgroup dynamics characterized by an us-versus-them attitude across sites (Cramton, 2001; Polzer, Crisp, Jarvenpaa & Kim, 2006). This dissertation explores if perceived subgroups within global teams have significant impact on team processes that eventually result in teams being effective and innovative over time or otherwise. More specifically, global teams capable of developing certain moderating processes (strong identification and psychologically safe communication climate, PSCC) will be managing subgroups differently (Ashforth & Mael, 1989; Fiol & O'Connor, 2005; Gibson & Gibbs, 2006; Jehn & Bezrukova, 2010). Ultimately, these team processes play a role in processes fostering team innovation and satisfaction. The

purpose of this dissertation is to reveal team processes and communicative practices that affect the relationship between team diversity and outcomes such as team innovation and satisfaction, as well as discovering how communicative practices might help overcome challenges of subgroups for global teams.

One concept that has been gaining prominence in research on team diversity is faultlines. Faultlines represent the overlap of mainly demographic difference (like age, gender or nationality) between team members that by definition reflect the potential of a team to fracture into subgroups. Faultlines refer to objective diversity and reflect the dormant, inactive subgroups that may or may not result in subgroups. The concept of faultlines implies that demographic characteristics are main sources of identity and identification, without considering how different levels of identification (functional, team and organizational) may differently affect subgroup dynamics. Lau and Murnighan (1998) were among the first to suggest that it is not diversity per se that matters for team outcomes, but the way demographic differences are aligned in teams.

Cramton and Hinds (2005) compared faultlines to "the earth's crust: they describe the pathways along which a group would most likely split into subgroups and the vulnerability of the group to this occurrence" (p. 235). Bezrukova, Jehn, Zanutto and Thatcher (2009) attempted to explain the difference between faultlines and subgroups in more detail: "When we refer to faultlines and faultline subgroups, we are basing this on the objective demographic alignment of members" (p. 36). In other words, faultline refers to the strength of demographic differences but reflects neither the actual interaction among group members nor subjective perception of closeness between members. Faultlines may or may not lead to subgroup formation; therefore looking at perceived

subgroups and interaction is necessary for understanding the mechanisms and consequences of subgroup formation in distributed teams, not only in lab settings (e. g. Chiu & Staples, 2013; Yilmaz & Peña, 2012) but in the field.

There are several gaps in research on subgroups in the global team context. Studies explain how geography matters for distributed teams (O'Leary & Mortensen, 2008; Polzer et al., 2006) but research on faultlines (starting with Lau & Murnighan's, 1998 work) has underutilized communicative approaches and theories. One of the more prominent theories used to explain the effects on team diversity and subgroups is the Social Identity Theory/Social Categorization Theory (i.e. SIT/SCT) perspective. Although its contribution is important, we should utilize and develop communication theories as well. SIT and SCT are useful in explaining how team members form subgroups and they might explain why subgroups matter for global virtual teams. Social identification theory explains how positive attitudes towards in-groups and negative attitudes towards out-groups may be barriers to inter-subgroup communication (Sherif, Harvey, White, Hood & Sherif, 1961; Tajfel & Turner, 1979) and in consequence, may hinder team level innovation. Associating with in-groups is a natural social process described by many (Carton & Cummings, 2012; McPherson, Smith-Lovin & Cook, 2001; Tajfel & Turner, 1979; Yuan & Gay, 2006). Theories such as faultlines theory (Lau & Murnighan, 1998), Psychologically Safe Communication Climate (PSCC; Gibson & Gibbs, 2006) and communicatively constructed identification (Scott, Corman & Cheney, 1998) serve as a framework for this study.

Although research on team diversity, subgroups and faultlines has been burgeoning, research on the role of team processes in reducing negative stereotypes and

fostering positive effects of diversity in global teams is limited. As a result, although the gap has been previously identified (Cramton & Hinds, 2005), we have very little knowledge on when faultlines will result in subgroups and how communication might help so they remain dormant. This major gap in teams research has existed even though organizations are increasing not only the number of global expatriates (Finaccord.com, 2014) but especially the number of global teams due to advances in communication technologies.

In research on faultlines the assumption is that a high level of demographic faultlines leads to more subgroups occurring and, in consequence, mostly negative impacts on team outcomes (Thatcher & Patel, 2012). There are a few problems with this approach. Firstly, faultlines reflect a one point in time of the team's surface level diversity (e.g. gender, ethnicity). Secondly, it is team members who perceive and through communicative behaviors give meaning to these differences, and based on interactions may form alliances and subgroups that extend beyond the formal work setting. This research project looks at factors that make subgroups less salient, and how subgroups affect such outcomes as team innovation and satisfaction in globally distributed teams.

Most research has defined faultlines as a static concept (Pan & Cho, 2008) failing to consider that subgroups and alliances may change over time. Faultlines have mainly been considered as one of the input variables in the I-P-O (Input-Processes-Output) model of research. Based on what we know about teams, they are dynamic (Gersick, 1988; Lewin, 1948; Tuckman, 1965); therefore, subgroup identifications are likely to be in flux as well. In addition, research tends to assume that the high level of demographic faultlines leads to more subgroups occurring and, in consequence, mostly negative

impacts on team outcomes (Thatcher & Patel, 2012). There are a few limitations of this approach. Firstly, faultlines reflect one point in time of the team's surface level diversity (example: gender, ethnicity) not considering diversity in values or deep level diversity (Stahl et al., 2009). Secondly, it is team members who perceive and through communicative behaviors give meaning to these differences, and based on interactions may form alliances and subgroups that extend beyond the formal work setting. Team members might also subjectively perceive social distance (Rogers, 1994) regardless of location or demographic distance. Interpersonal liking and interactions (including using Information and Communication Technologies, ICTs) beyond formal meetings and power/status differences are all likely to impact subgroups and alliance formation.

In this dissertation, diversity is not defined as an objective characteristic of team members but it is more subjectively and socially constructed through interactions between team members than previous research might have been. Therefore, this dissertation examines when subgroups are more likely to form, how they change and affect team processes and how subgroup formations could affect such outcomes as team innovation and satisfaction. In other words, as suggested by earlier research (example Stahl et al., 2010), this study focuses on the positive outcomes of team diversity on team process and outcomes (maximizing gains of team divergence). According to previous theorists, depending if it becomes counterproductive and fraught with conflict or beneficial for team creativity, team diversity can be a process loss or process gain (Stahl et al, 2009). The dissertation also focuses on team member geographic distribution and the role of technology for subgroup dynamics in globally distributed teams and the role of communicative behaviors of leaders for promoting positive, more inclusive

communicative behaviors that overcome subgroups.

Certain team processes may moderate relationships between team faultlines and perceived subgroups. These processes are team identification (Ashforth, Harrison, Corley, 2008) and PSCC (Gibson & Gibbs, 2006). These team processes may alleviate negative consequences (process losses of divergence using terminology by Stahl et al., 2010) of faultlines, prevent subgroups from forming and decrease the team's perceived subgroups. In consequence, teams that are able to build these processes through interaction are likely to experience gains from diversity and less likely to perceive challenges related to team diversity and geographic dispersion. Even though team members differ from each other significantly, if the team (and the organization) builds identification and PSCC, teams may perceive subgroups as less salient. In consequence, these processes should increase team innovation and overall satisfaction with the team.

In summary, the purpose of this dissertation is to explore what processes increase gains from team diversity and foster positive outcomes for global teams. Team processes and communication practices make a difference as to when faultlines will be perceived. These perceived subgroups will make a difference as to when fautlines are salient for team outcomes. There is far more research in laboratory settings and experimental research on virtual teams than research on teams in organizational settings and it is necessary to provide in-depth understanding of globally distributed teams in their natural setting to inform this area of research. Based on the review of the literature on team diversity, faultlines and subgroup and identified research gaps, some questions have emerged regarding faultlines and subgroup identification and their outcomes that are suitable for qualitative research and others could be looked at by more deductive,

quantitative approaches. Therefore, a mixed methods field approach (including critical incidents to look at subgroup dynamics) is necessary to answer the research questions. Faultline and identification theory, as well as the concept of PSCC guide in building the framework for this study.

Preview of the Dissertation

The structure of this dissertation is as follows: Chapter 2 presents a literature review and study rationale, introduces concepts important for the study, such as status differences, homogeneity and informal cliques, power, distanced leadership and team diversity and outcomes. Chapter 3 presents the theoretical framework and discusses the concept of faultlines, presents gaps in research on faultlines and subgroups, as well as rationale for research questions and hypotheses. Chapter 4 discusses methods used, which are survey, field observations and interviews. The research site (global technology company), procedures and key variables are also introduced. Chapter 5 contains quantitative results of the survey questionnaire, followed by Chapter 6 with qualitative findings. Lastly, Chapter 7 covers the interpretation of results, limitations and future directions as well as conclusion. This dissertation poses several hypotheses and two research questions: one of them focuses on factors triggering subgroups and the second one on communicative behaviors that help in overcoming subgroups.

Quantitative findings demonstrate that team identification and PSCC moderate the relationship between faultlines and perceived team subgroups. Perceived team subgroups were found to moderate the relationship between team faultlines and satisfaction but had no impact on the relationship between faultlines and innovation. Based on critical incident analysis (Flanagan, 1954) and interview analysis, faultlines were triggered into

subgroups by two main factors: social and geographical distance. Communicative practices helped teams in overcoming challenges of subgroups. Proximity and PSCC helped teams manage social distance, while distanced leadership skills and strategic ESM use helped overcome geographical distance. The findings of this dissertation, therefore, offer a valuable contribution to the lines of research on faultlines and subgroups, global team communication (including technology use and diversity) as well as organizational communication more broadly.

CHAPTER TWO. LITERATURE REVIEW

Lau and Murnighan (1998) started a debate on team diversity that has resulted in many scholars developing better measures of diversity and faultlines in order to better predict such outcomes as team performance, creativity or innovation (Meyer & Glenz, 2013). According to original research by Lau and Murnighan, demographic differences that are not aligned are best for these team outcomes but when differences such as for instance age and gender align, the opportunities for faultlines to result in subgroups are greater. This assumes that subgroups have negative consequences for team processes (such as conflict between cliques) and performance. There are, however, weaknesses in this reasoning that this dissertation attempts to uncover.

My definition of team diversity as perceived and socially constructed through communication might be a novel one that departs from the more traditional view of diversity as uni-categorical (for example gender diversity). We perceive diversity and associate ourselves with others that are similar or different through interactions at work: both formal and informal. The role of each type of interaction needs to be better researched in the context of these new forms of organizing, global virtual teams (GVTs).

Several scholars have recently encouraged teams research to focus on global aspects of global work arrangements and that includes team diversity and distribution (Connaughton & Shuffler, 2007; Gibson, Huang, Kirkman, & Shapiro, 2014; Hinds, Liu & Lyon, 2011). According to these reviews, the goal of research should be to investigate how various dimensions of virtuality (i.e. geographic dispersion and culture) influence important team processes, emergent states, and outcomes. In addition, research on virtuality has increasingly focused on the subjective perceptions of virtuality (Gibbs &

Boyraz, 2015) rather than the objective virtuality (for example team diversity or geographic distribution) and this is the area where the current project is contributing to.

Global virtual teams are likely to be culturally diverse and communicate using ICTs and assembled to perform innovative tasks. Task, cultural diversity, geographic and social distance (Rogers, 1994) are likely to be the main factors contributing the subgroups becoming salient in such teams. According to Carton and Cummings (2012), two or more team members are considered a subgroup if they form a "subset of members of the same work team, whereby a work team is a group (e.g., project team or management team)" (p. 442) and this subset of members can be considered a subgroup only if it is interdependent with other subset of a team. Team diversity and faultlines are different concepts because more diverse teams have weaker faultline levels therefore smaller potential for split into subgroups than less diverse teams. An important feature to note about subgroups is that the team members interact within subgroups interact differently with each other than with other team members because subgroup team members share common cultural values, scarce resource, or knowledge frame that is unique from that shared by other team members.

The role of geographical dispersion and perceived subgroups and their role for team outcomes as well as team processes mitigating negative effects of diversity have been under-researched. Diversity has been found to be beneficial to creativity and innovation (De Dreu & West, 2001; Gibson & Gibbs, 2006; Kratzer, Leenders, & Engelen, 2004). However, many scholars have recently realized that team diversity does not impact outcomes directly but how people form subgroups has stronger impact on such outcomes as innovation or performance (Thatcher & Patel, 2011). According to

Social Categorization Theory (SCT, Tajfel & Turner, 1979; Turner 1987), self-categorization underlies team processes. Cramton and Hinds (2005) argue that subgrouping in virtual teams can activate ethnocentric assumptions toward one's own subgroup and against other subgroups. Geographic distribution may contribute to the 'out of sight, out of mind' dynamic (Cramton, Orvis, & Wilson, 2007) generating negative attributions towards remote team members. Cramton and others (2007) find that distributed teammates are significantly more likely than collocated teammates to make internal dispositional attributions rather than situational attributions because of situational invisibility. These dispositional attributions that occur due to team members not being able to see what is going in other location(s) affect relational outcomes such as satisfaction and cohesion (Cramton et al.). ICTs enable virtual team collaborations, however they may not completely prevent 'out of sight out of mind' mindset. On contrary, teams relying heavily on CMC experience increased levels of task conflict (Mortensen & Hinds, 2001). Cramton and Hinds (2005) argue that subgrouping in virtual teams can activate ethnocentric assumptions toward one's own subgroup and against other subgroups.

Studies are more likely to portray demographic faultlines as problematic rather than as beneficial to teams, especially distributed teams (Lau & Murnighan, 1998; Polzer et al., 2006) even if they are dormant. For example, in a recent meta-analysis by Thatcher and Patel (2011) the strength of demographic faultlines' lead to higher levels of conflict and negatively affected team performance and satisfaction. Negative consequences of in- and out-group dynamics have negative consequences for increased conflict and group

polarization (e.g., Chiu & Staples, 2013; Chrobot-Mason, Ruderman, Weber, & Ernst, 2009; Phillips, Mannix, Neale, & Gruenfeld, 2004).

Research tends to use demographic faultlines and subgroups interchangeably at times, while they are not the same thing. Subgroups have been found to impact a variety of outcomes, including communication (Lau & Murnighan, 2005), learning (Gibson & Vermeulen, 2003), and team decision making (Kameda & Sugimori, 1995). When initially described by Lau and Murnighan (1998), faultlines were latent constructs with potentially negative or even detrimental consequences to teams. Conceptually, the stronger the faultlines, the more potential opportunities for team processes such as counterproductive conflicts and communication breakdowns.

Some studies on the other hand found positive relationship between perceived faultlines and conflict, for example those conducted by Chrobot-Mason and colleagues (2009) or Jehn and Bezrukova (2010). Some of the positive outcomes of subgroups found are: in-group cohesion and faster accomplishment of consensus, better team learning and knowledge sharing (Gibson & Vermeulen, 2003; Thatcher et al., 2003). In their study of 56 MBA student teams, Cronin, Bezrukova, Weingart and Tinsley (2011) found that perceived subgroups negatively impacted team satisfaction and effectiveness. In a recent field study Hinds, Neeley and Cramton (2014) found that differences in locations in terms of power contests caused by status differences between team members in distinctive locations increased the likelihood of faultlines becoming salient and causing negative emotional reactions in global teams.

Team subgroups and faultlines may benefit team collaborations. In research on 156 teams from 5 firms Gibson & Vermeulen (2003) found that moderately strong

demographic faultlines promoted team-learning behaviors. Mäs et al. (2013) also found positive effect of faultlines. In their research of teams over time, they found that strong faultlines lead to structures of interaction that make teams with strong faultlines faster in reaching a consensus than teams with weak faultlines. Moreover, they found that teams with strong faultlines were able to overcome polarization in the long run.

Following earlier research (Gibson & Vermeulen, 2003; Thatcher, Jehn, & Zanutto, 2003), I argue that under certain circumstances resulting from positive communicative practices faultlines may stay dormant and have positive consequences for global virtual teams. I also agree with the researchers that posit that it is not the faultlines alone but subjectively perceived subgroups (i.e. Cronin et al., 2011) that are more problematic for team outcomes such as team satisfaction and innovation. Task, geographic distance, national and gender differences and power contests are important factors contributing to subgroups becoming salient but certain communicative practices and technology use may prevent dormant faultlines from forming subgroups and maximizing positive outcomes of team diversity and dispersion. Social distance defined as "the perceived lack of intimacy between two or more individuals" (Rogers, 1994; p.183) is also likely to be a challenge for global teams.

As proposed by the faultline literature, the overlapping demographic characteristics increase the likelihood of faultlines to trigger into subgroups. This reasoning omits the fact that subgroups in organizational teams might by affected by task and not only interpersonal liking, they are perceived by individual team members, and created through interaction. Communication not only has the potential to decrease the perceived subgroups but also to minimize negative attitudes towards the out-groups (a

sample mechanism through which it happens is the contact hypothesis: Gaertner, Rust, Dovidio, Bachman, & Anastasio, 1994). According to the contact hypothesis, also known as Intergroup Contact Theory (Allport, 1954), interpersonal contact between groups with negative attitudes toward each other is one of the most effective ways to reduce prejudice. Contact hypothesis reflects the power of interaction in changing stereotypes but the process of how it happens communicatively is not well explained by that theory. When members of subgroups interact with culturally diverse and geographically distributed teammates, the preconceived notions about the out-group may be minimized. There are multiple theories that help us explain this dynamic (SIT/SCT, homophily) but the approach that Scott et al. (1998) take on identification is most useful for looking at communicative expressions of subgroups in behaviors and the mechanisms helping in promoting inclusive behaviors in organizational teams. These theoretical frameworks are further explored below.

Power and Status Differences

There is a vast research area on global organizations and teams that looks at how status differences matter for collaboration processes (Hinds, et al. 2014; Leonardi & Rodriguez-Lluesma, 2013; Levina & Vaast, 2008; Metiu, 2006; Neeley, 2013; O'Leary & Mortensen, 2009). A few factors seem to play an especially important role in these differences and magnify status differences: organizational status-related location (headquarters or peripheral locations of the organization), language (proficiency in English as the global language of business), culture, tenure (work experience) or age. The same factors may indicate that existence of subgroups may not be perceived as sources of subgroup identification to team members themselves, therefore an interpretive approach

to unraveling subgroups that may potentially have negative or positive consequences to team outcomes (such as performance and innovation) may be necessary.

Mostly field studies looked at power and status differences in organizations. For example, based on a qualitative field study in global software development teams, Metiu (2006) found that in one of the teams the low-status team members in India knew such details about the American office as the physical setup of the office space and the high-status group used the geographical separation as an excuse for not learning about and not interacting with the low-status group. One of the U.S.-based developers stated: "We don't see each other because of time delay and because of ego. It's easy to blame the others if they're not here" (p. 428). According to Neeley (2013) "the linguistic divide between native and nonnative English speakers and differences in levels of fluency among nonnative speakers provide a powerful lens into how employees manage their status loss and the distinguishing role of their achieved status" (p. 476). Research results suggest that status differences impact creation of cliques and within-team communication, for example an increase in criticism of the work performed by the low-status group (Metiu).

Status differences may cause stereotyping among globally distributed employees (Leonardi & Rodriguez-Lluesma, 2013). Based on observational and interview data from an ethnographic study in engineering centers in Mexico, the United States, and India Leonardi and Rodriguez-Lluesma found that individuals who considered themselves to be "low-status" attempted to increase their status by leading high-status individuals in order for their to reflect dominant occupational stereotypes. These stereotypes were related to specific occupational identities (i. e. accountants, engineers) but were often inaccurate. For example, Mexican engineers held strong stereotypes about how US and Indian

engineers worked and vice versa - the American and Indian engineers held strong

stereotypes about them. Mexican engineers accurately communicated their work practices

to other engineers of the same perceived status in Mexico and India, but told US

engineers that they worked in ways that they had not. The authors explain that Mexican

engineers purposely misrepresented their work styles to US engineers because they

perceived the US engineers to be of higher status and made an effort to align their own

work styles with stereotypes of what made a "good US engineer" so that the high status

engineers would think highly of their work.

Smith, Miller, Maitner, Crump, Garcia-Marques and Mackie (2006) showed that

when individuals did not regularly engage in informal social interaction that comes with

friendships, but focused primarily on task-based interaction, it had negative consequences

for the teams. These minimal social interactions between individuals reduced

individuation and increased the likelihood of stereotyping. This process stemmed from

the lack of 'mutual knowledge' about each others' situations in which faulty attributions

about remote team members are more likely to form (Cramton, 2001). This has been

found to be particularly prominent in teams dispersed globally due to the out of sight –

out of mind dynamic between organizational locations and because global workplace

interaction happens through media that make it difficult to communicate informally and

convey social cues (Cramton; Maznevski & Chudoba, 2000), and the interaction tends to

be relatively formal (Gudykunst & Ting-Toomey, 1988).

Objectively observed and subjectively perceived subgroups matter for team

processes but may be so much taken for granted by team members that they are hard to

perceive by team members themselves. Qualitative or interpretive approaches to

revealing subgroups and their consequences because of the negative connotations of the concept of subgroups and cliques are worthwhile because team members may not admit to the existence of subgroups. Looking at subgroups interpretively, as a process – at how they are manifested in interaction, seems to be an under-researched but valuable approach to investigating subgroup dynamics because it may reveal how team level diversity is enacted in interaction and how it impacts outcomes, such as team satisfaction and innovation. While measuring faultlines at one point in time (Lau & Murnighan, 1998) through survey research has its limitations as well, a mixed-method study has the potential to provide depth and overcome weaknesses of each approaches alone.

Homogeneity and the Role of Informal Cliques

Before moving to examining outcomes, additional concepts related to diversity related to team dynamics are important, as they may impact team dynamics. Cliques, clusters, heterogeneity and homophily - are drawn from the literature on social networks (McPherson et al., 2001). A clique is defined as a group of at least three team members in which everyone communicates with everyone else at least once daily (Kratzer, et al. 2004). The degree of subgroup formation increases with the number of such cliques. Cliques and social subgroups are both identity-based entities because they are characterized by inter-subgroup processes related to social identity. The difference is that cliques are value-based subgroups characterized by inter-subgroup processes related to social communication (Carton & Cummings, 2012; Ulmer, 1965).

Homogeneity and heterogeneity are considered to be two ends of a continuum. While most recommend team heterogeneity for achieving better quality outcomes (Bantel & Jackson, 1989; Bunderson & Sutcliffe, 2002), others recommend minimizing it by

aiming for homogeneity. Heterogeneity within social networks is positively associated with such outcomes as levels of trust and tolerance. Others, like Kossinets and Watts (2009), emphasized the benefits of homophily, in that the ongoing cost of maintaining ties is lower between similar others and these ties last longer. In their research on virtual teams, Yuan and Gay (2006) argued that homophily of certain attributes was beneficial to distributed team performance because more similar people had greater probability of network tie formation. On contrary, I argue that reducing diversity and geographical dispersion has drawbacks for team innovation in global teams, which is stimulated by the divergent thinking, diverse talent and local perspectives brought together. It is more productive for global team leaders and managers in charge of global teams to find ways to reap the benefits of diversity without allowing it to create rifts within the team. In addition, organizations must also be attuned to other sources of cultural difference beyond national culture that may also significantly impact team functioning, such as functional, organizational, or sociodemographic culture (Gibbs, 2009; Hinds et al., 2014).

Distanced Leadership

Connaughton & Daly (2003, 2004a, 2004b) introduced the term "distanced leadership" to reflect specific challenges to leadership in contemporary work arrangements, such as virtual teams or telework. In essence, distanced leadership means leading from afar, it happens when the formal leader is physically separate from his or her reports. Researchers and practitioners have called for redefining leadership considering new forms of organizing (Connaughton & Daly; Lojeski, 2007 among others). Research on leadership in virtual contexts suggests that communication is essential in distanced leadership (Connaughton & Daly, 2005; Kayworth & Leidner, 2002). Connaughton and

Daly (2004a) developed several propositions, recommendations for leaders participating and managing virtual teams that emphasize the importance of face-to-face communication, emphasize importance of small talk, encourage establishing building ground rules for communication, or importance of paying attention to cultural nuances. This study takes a communicative approach to leadership (Brent & Gigliotti, 2016), focusing on communicative behaviors. This approach to leadership is more complex and dynamic than the view that leadership results simply from one's formal position and followership (Barge & Fairhurst, 2008; Ruben, 2006; Ruben & Stewart, 2016). .

Team Diversity and Outcomes

Research on impacts of team diversity on processes and outcomes, including innovation and performance is inconclusive. Several meta-analyses (Bell, Villado, Lukasik, Belau, & Briggs, 2011; Bowers, Pharmer, & Salas, 2000; Guillaume, Brodbeck & Riketta, 2012; Stahl et al., 2009,10; van Dijk, van Engen & van Knippenberg, 2012) were not able to provide evidence as to when diversity is positive or negative for teams. According to several scholars (Joshi & Roh, 2009; Meyer & Glenz, 2013) the effects of diversity on team processes seem to be dependent on context and several mediating and moderating processes. In essence, there seems to be no main effect of team diversity with regard to a specific type of diversity (e.g., gender diversity) on team outcomes. Faultlines appear to be the first construct in diversity research that is associated with a consistent main effect on team-level outcomes across contexts. Faultline theory though, assumes that the different extents to which a team is split into subgroups are associated with different dynamics and outcomes because it is not diversity per se that has an effect on team processes and outcomes but the alignment of potential subgroups within the team.

In addition, recent meta-analyses provide evidence (Thatcher & Patel, 2011, 2012) that strong faultlines are associated with a negative main effect on team-level outcomes such as performance, conflict, and cohesion - even if they are not perceived by team members themselves (Thatcher & Patel, 2012). This leads to the conclusion that team subgroups perceived by team members or outside observers may be more salient for team process and outcomes than the potential for subgroups represented by faultlines alone.

CHAPTER THREE. THEORETICAL FRAMEWORK, RESEARCH QUESTIONS AND HYPOTHESES

Subgroups can have both negative and positive effects on teams. They have been found to impact a variety of outcomes, including communication (Lau & Murnighan, 2005), learning (Gibson & Vermeulen, 2003), and team decision making (Kameda & Sugimori, 1995). When initially described by Lau and Murnighan (1998), faultlines were the latent constructs with potentially negative or even detrimental consequences to teams and majority of studies frame them as associated with negative processes and outcomes. Conceptually, the stronger the faultlines, the more potential opportunities for team processes such as counterproductive conflicts and communication breakdowns. If team members do not share a common coding scheme and technical language, their communication tends to be less efficient and more costly (i.e., Dearborn & Simon, 1958). Negative consequences of in- and out-group dynamics may be counterproductive, such as increased conflict or group polarization (e.g., Chiu & Staples, 2013; Chrobot-Mason et al., 2009; Phillips et al., 2004). Studies found a positive relationship between perceived faultlines and conflict (Chrobot-Mason et al.; Jehn & Bezrukova, 2010). However, it is likely that not faultlines alone but subjectively perceived subgroups (Cronin et al., 2011) are more problematic for team outcomes such as team satisfaction, performance and innovation. A study by Polzer and others (2006) is among the few that looks at how team faultlines are activated across geographical distance. It found that geographic faultlines heightened conflict and reduced trust. These faultlines had high potential to turn into subgroups when a team was divided into two equally sized subgroups of collocated members homogeneous in nationality.

People with similar demographic backgrounds may share similar viewpoints (e.g., Walsh, 1988), and support each other based on common attitudes toward issues (Murnighan & Brass, 1991). In addition, common language and inside-jokes used in subgroups (Leenders, Van Engelen, & Kratzer, 2007; Mikal, Rice, Kent, & Uchino, 2014) may promote positive communication climate in which team members are free to express their opinions and dissent common opinions, in consequence promoting team innovation. In short, positive outcomes of subgroups seem to be associated with the within-subgroup communication and negative outcomes are related to inter-subgroup dynamics.

Geographic Distance as a Faultline

The concept of faultlines is defined as the demographic alignment of team members on several measures of surface level diversity (e.g. age and gender in Gratton, Voigt, & Erickson, 2007). Earlier approaches to team diversity proved to have weaknesses because they accounted for one dimension of diversity at a time (i.e. gender; Blau 1977). For example, a faultline that separates members by both gender and age may be more likely to trigger subgroup formation than a faultline that only separates members by gender (Carton & Cummings, 2013) but it should not be assumed that it always will. Moreover, physical/geographic distance is likely to matter most in team processes and outcomes, yet geographic distance as a faultline is not usually taken into consideration in team studies assuming that location of team members matters less than demographic differences. Geographic distance between team members is associated with higher virtuality of teams and greater reliance on ICTs (Gibson & Gibbs, 2006). Although faultlines may result in rifts within global teams (Lau & Murnighan, 1998), we have

limited knowledge as to if and when different features will impact team processes and outcomes because studies on teams and faultlines are frequently laboratory studies on student teams, rarely looking at the effects of geographical distribution, for example. A study by Polzer and others (2006) is among the few that looks at how team faultlines are activated across geographical distance. It found that geographic faultlines heightened conflict and reduced trust. These faultlines had high potential to turn into subgroups when a team was divided into two equally sized subgroups of collocated members homogeneous in nationality.

Geographic distance between team members incurs higher virtuality of teams and greater reliance on technology (Gibson & Gibbs, 2006). Physical and geographic distance impact team processes and outcomes, yet geographic distance as a faultline is not usually taken consideration in team studies assuming that location of team members matters less than demographic differences. Some studies found that factors other than surface level characteristics contribute to faultlines activated into subgroups over time. For example Gratton et al. (2007) described teams that initially had faultlines on the basis of surface-level characteristics (gender, age) and later developed faultlines based on type A personality attributes but most studies focus on issues related to better calculation of faultlines (Meyer & Glenz, 2013) rather than triggers of subgroups or change over time.

Geographical distribution contributes to the 'out of sight, out of mind' dynamic (Cramton, Orvis, & Wilson, 2007) generating negative attributions towards remote team members. Cramton and colleagues (2007) found that distributed teammates were significantly more likely than collocated teammates to make internal dispositional attributions rather than situational attributions because of situational invisibility. These

dispositional attributions that occur due to team members not being able to see what is going in other location(s) affect relational outcomes such as satisfaction and cohesion (Cramton et al.). There is paucity of research noted previously by Pan and Cho (2008) or Chrobot-Mason and others (2009) about what triggers faultlines to be activated into subgroups, and how geographic dispersion matters for subgroups. We do not know much about the role of communicative behaviors in triggering them.

Previous research found that faultlines may stay dormant and or that high level of faultline may have positive consequences for global virtual teams (i. e. Gibson & Vermeulen, 2003; Thatcher et al., 2003). Faultlines and subgroups are distinct constructs, however overall strength of faultlines increases likelihood that overlapping demographic differences will result in stronger subgroups. In addition, looking at the objective team diversity and faultlines independent of the geographic distribution of the global teams limits our understanding of how diversity affects distributed global teams assigned to work on innovative tasks. Previous studies explain how geography matters for faultlines in distributed teams (O'Leary & Mortensen, 2008; Polzer et al., 2006) but the majority of faultlines research still looks at faultline measure without looking at geographic distribution of employees (Bezrukova, Thatcher, Jehn, & Spell, 2012; Lau & Murnighan, 1998; Li & Hambrick, 2005).

There are many aspects of virtuality described by researchers. Gibson and Gibbs (2006) differentiated four dimensions of virtuality: geographic distribution, cultural diversity, dynamic structure and electronic dependence. This classification of virtuality dimensions remains largely accepted by scholarship. The present study extends research on faultlines by adding the effects of geographic dispersion and looks at communicative

behaviors' role in subgroup dynamics. Demographic and geographical differences likely affect global team subgroups by limiting informal social interactions and as a result, impacting other important outcomes.

Taking all these gaps in research into consideration, my first question is:

RQ1. What are the most important factors triggering faultlines/making them visible and salient in global virtual teams?

Social Identity and Social Categorization Theory (SCT)

Social identity approach provides a theoretical framework for explaining the effects of faultlines on team processes (including perception of subgroups) and outcomes such as innovation and satisfaction. In general, social identity theory describes in-group and out-group membership and refers to a body of ideas to explain intergroup relations and group processes (Hogg & Abrams, 1988). Social identity is defined as "the individual's knowledge that he/she belongs to certain social groups together with some emotional and value significance to him of the group membership" (p. 31, Tajfel, 1972). When it was first developed, social identity theory posited that people tend to satisfy their fundamental self-esteem needs by maximizing differences between in-group and out-group on dimensions that favor positive in-group distinctiveness (Tajfel & Turner, 1979). People tend to spend more time with the in-group members. What it means for team communication is that subgroup members will exhibit more frequent and positive communication towards the in-group and negative towards the out-group potentially resulting in conflict. According to social identity theory (Tajfel, 1979), when a lower status group member believes to be treated unfairly, he/she is inclined to identify with their own group and interact as a collective in an attempt to address the inequity. In

addition, high levels of resulting intergroup anxiety may make it difficult for members of different social identity groups to work together.

According to Social Categorization Theory (SCT), self-categorization underlies all processes of identification (Tajfel & Turner, 1979; Turner 1987). The impact of team diversity on performance is widely researched (Stahl et al., 2009) and so is subgroup identification (Yilmaz & Peña, 2014) but current knowledge of team heterogeneity does not adequately take into account how distributed and multicultural teams form subgroups and how this impacts effectiveness and innovation. There is increasing evidence that internationally distributed teams are more prone to subgroup dynamics than collocated teams because they are characterized by us-versus-them dynamics across sites (Armstrong & Cole, 1995; Cramton, 2001; Cramton & Hinds, 2005, Hinds & Bailey, 2003). How subgroups form and change over time in organizational settings is still an under-researched area. The process of self-categorization can also hinder communication, provoke stereotypes and drive competition for resources (Thatcher et al., 2003). Accordingly, in their review of research on group faultlines, Thatcher and Patel (2011) posit that there has been no systematic, longitudinal study of subgroup formation as a result of faultlines that describes how the initially dormant faultline triggers an active faultline and then changes or remains the same over time. Moreover, it is possible that "faultlines that are not present initially may develop over time as group members realize differences resulting from deep-level diversity attributes" (p. 994).

Perceived subgroups explain team processes and outcomes such as performance and innovation better than dormant faultlines alone. Looking at perceived subgroups as well as adding time component to research on subgroups seem be important to

understand the effects of team diversity on team innovation in today's global organizations. In order to learn more about communicative behaviors associated with triggering faultlines to subgroups, field organizational context and critical incident approaches have been used in previous studies (Chrobot-Mason et al., 2009; Hylmö & Buzzanell, 2002), yet we lack of in-depth knowledge about the role of communicative behaviors for triggering them and overcoming the consequences of subgroups once they are salient. Communicatively constructed identification framework (Scott et al., 1998) and the concept of PSCC seem to provide a good starting point in helping to explain the role of communicative behaviors on subgroup formation and consequences. The next research question is:

RQ2. Can certain team processes and communicative practices help overcome the negative consequences of subgroups in global virtual teams?

Team Processes as Moderators

Perceived team diversity, perceived subgroups. According to recent reviews (Gibbs & Boyraz, 2015; Shemla et al., 2014), research on perceived rather than objective diversity is gaining more attention from scholars. It is important to look at the effects of subjectively perceived diversity because people act based on their individual and socially constructed perceptions rather than reality per se (Hobman, Bordia, & Gallois, 2003). Shemla et al. define perceived diversity as team members' awareness of differences. Perceived diversity/heterogeneity is different from perceived subgroups/awareness of subgroups. The former led to inconsistent research findings: to either negatively or positively affect team processes and outcomes and the latter has mainly negative outcomes for teams (Shemla et al.).

Objective diversity does not impact team processes directly but indirectly – through team members' awareness of subgroups, perceived subgroups and these perceived subgroups impact interaction and team outcomes. These perceived subgroups make a difference as to when faultlines are salient and when they affect such team outcomes as satisfaction, and innovation.

Certain team processes may moderate the relationship between team faultlines and subgroup strength. These team processes alleviate negative consequences of faultlines, prevent subgroups from materializing and avert negative consequences of subgroups to affect team innovation and satisfaction as well as promote positive consequences of subgroups (i. e. knowledge sharing, consensus). The processes of interest are team identification (Ashforth et al., 2008) and psychologically safe communication climate (Gibson & Gibbs, 2006). The distribution of members across time and space creates challenges, more specifically – team members separated geographically have reduced physical cues (Sproull & Kiesler, 1986). This may contribute to team members' lack of 'mutual knowledge' about each others' situations and lead to faulty attributions about remote team members (Cramton, 2001). Based on research on virtuality, we know that this dynamic creates challenges for teams in the sense that the more virtual the team, the more challenges it faces. Identifying the moderating processes is important for ameliorating negative effects of team diversity and distribution while increasing the positive effects.

Team identification. There are multiple targets of identification in organizational contexts (Ashforth et al., 2008; Scott et al., 1998). Thus far, little is known about how virtual team members construct subgroup identification through interaction. In addition,

when the concept of faultlines was originally developed by Lau and Murnighan (1998), the scholars did not utilize identification and social construction frameworks to investigate when subgroups are more likely to form; later studies started to focus on either identity-based, resource-based or knowledge-based subgroups (Carton & Cummings, 2012). This dissertation takes the identity-based lens.

Identification has been defined as a sense of belonging to a social group (Ashforth & Mael, 1989; Fiol & O'Connor, 2005). Mael and Ashforth (1992, p. 105) define organizational identification as the "perception of oneness with, or belongingness to, an organization where the individual defines him or herself in terms of the organization in which he or she is a member."

Identification has been argued to be a communicative process (Cheney, 1983a). From a communicative perspective, organizational identification is the feeling of attachment between the individuals and organizations (Scott et al., 1998). According to Scott et al. identification represents the type of behavior produced by and producing identity, and it is situated in the presence of social actors. They offer mechanism through which identification is communicatively constructed as the attachment to the organization expressed primarily with language. For instance, "statements about team membership may further establish one's belonging to that team, which in turn prompts further expressions of team identification" (p. 306, Scott et al.). The approach that Scott and colleagues take on communicatively constructed identification and identification as behaviors (especially communicative expressions of identifications in behaviors) is the most meaningful in a context of global teams. This approach to identification is the most useful for looking at subgroups as sources of identity and identification. If team members

identify strongly with subgroups and make this subgroup membership salient in communicative behaviors, the resulting team dynamics may well be counterproductive. On contrary, if teams are able to exhibit communicative behaviors that are inclusive regardless of subgroup membership, teams will likely benefit from divergence.

A structurational view of identification that Scott et al. (1998) build on involves a duality of structure in which identities both create and are created by identification in the process of social interaction with others. Identity functions as a set of rules and resources (Giddens, 1984) that structures and is in turn reshaped by the communicative process of identification with groups and organizations. Identities are regionalized, meaning that individuals draw on multiple identity structures or resources (for instance, team or subgroup identities). It is important to note that identities are instantiated in certain situations through interactions, these particular identities (of subgroups or teams) are both produced and reproduced in social interactions and situated activities (Scott et al.). In this manner, identity is perceived subjectively and identification is an ongoing process that impacts team members' communicative behaviors.

Scholars have previously applied this communicative view of identification theoretically. For example Williams and Connaughton (2012) demonstrated the communicative nature of identification during times of organizational change. In their mixed-method case study they looked at how employees communicatively enacted identification. Survey showed significant decrease in organizational identification from before to after organizational change and interviews showed several tensions employees experienced. One of the tensions Williams and Connaughton observed was between loyalty to smaller, local parts of the organization and the larger organization thus

encouraging more research on the tensions between the subunits and the larger parts of the organization. Because identification has communicative (rhetorical) nature (Cheney, 1983b), collective team identification has the potential to communicatively break up subgroup identifications.

Research regards face-to-face communication as crucial in fostering identification and the attachment between the individual and organization may be especially difficult to achieve especially among virtual employees due to the lack of knowledge about the local context and face-to-face interaction (Sivunen, 2006). Limited findings about the role of ICTs suggest however that communication technologies can be used to foster identification. Wiesenfeld, Raghuram and Garud (1999) found that email use was linked with higher identification among virtual workers, and phone played a stronger role for building identification collocated employees. Identification has been even described as the "critical glue" in virtual environments (Fiol & O'Connor, 2005; Pratt, 2001; Wiesenfeld et al.). Scott (2001) proposed that certain ICTs contribute to reduced identification among workers due to their one-way information sharing and limited interactivity. More interactive technologies such as online chat and electronic meeting systems may help facilitate meaningful work relationships due to their two-way exchanges/greater interactivity (Scott, 2001) but it is unclear how are different ICTs could be used to maintain interactions and decrease the salience of subgroups.

It is quite possible that underlying processes of identification will decrease the subjective perceptions of subgroups in teams. Because team identification has been defined as "glue" that holds the team together (Ashforth & Mael, 1989; Fiol & O'Connor, 2005), it has the potential to minimize salience of perceived subgroups or prevent

subgroups and cliques from forming. Lipponen, Helkama and Juslin (2003) found that subgroup identification was positively related to in-group bias, and identification with the organization as a whole (a shipyard) was negatively related to negative bias toward other subgroups in the same organization. According to SIT/SCT, when individuals identify with a shared group membership, the salience of their individuality fades in favor of the superordinate identity (Tajfel & Turner, 1986). In summary, the stronger the higher level (team) identification, the higher the potential to minimize salience of perceived subgroups.

It is likely that teams which through interactions are able to build an environment in which team members are highly identified with the team will be able to reduce losses due to team diversity and therefore, these processes will moderate relationship between faultlines and reduce salience of subgroups. Project by Jehn and Bezrukova (2010) found for example that amicable and friendly atmosphere in work teams reduced subgroup identifications and affected interaction between subgroups. Therefore, it is possible that if through the process of communicative formation of shared team identification global team members are able to build it, shared team identification will reduce the likelihood the subgroups, cliques or alliances will form, increase the likelihood that the objective faultlines as rifts will remain dormant. In result, team identification as a moderator will suppress the negative effects of faultlines and if subgroups are less salient, lead to higher overall team satisfaction in global team membership, and innovation. It is likely that the higher level, team identification will reduce the perceptions of subgroups among team members. Henceforth, here is the hypothesis (the hypotheses and the theoretical model are in Appendix A and B):

H1. Team identification moderates the relationship between faultlines and subgroup strength in global teams, such that with high levels of team identification, the level of perceived subgroups will be low even if the faultline level is high.

Psychologically safe communication climate. Research found that due to having multiple perspectives, culturally diverse teams tend to produce more non-redundant, realistic ideas than homogeneous groups (Daily, Whatley, Ash, Steiner, 1996). In addition, greater participation enhances the probability that minority opinions and unshared information, both helpful for creativity, will become part of the group discussion (Crotty & Brett, 2012). When culturally diverse individuals are comfortable to speak up and participate in decision making and express unsolicited feedback, the team environment provides psychologically safe communication climate, PSCC (Gibson & Gibbs, 2006). It might not be easy to achieve this climate in a diverse and distributed team but it has been found to moderate the relationship between team diversity (measured with Blau's index, 1977) and innovation.

PSCC is an atmosphere in which team members are willing to speak up, provide unsolicited information, and bridge differences by being open to different views and perspectives (Edmondson, 1999; Gibson & Gibbs, 2006). PSCC was found to moderate the relationship between virtuality and innovation (Gibson & Gibbs). Virtual teams with a PSCC engaged in more open and spontaneous communication and knowledge sharing, which led them to be more innovative. PSCC has also been found to help task conflict become positive for team members through the sharing of divergent perspectives and surfacing of new ideas and solutions (Bradley, Klotz, Postlethwaite, Hamdani, & Brown, 2012). Mäs and colleagues (2013) found that so-called crisscrossing actors (team

members who share demographic qualities of several subgroups) may play a similar role for ameliorating negative effects of subgroups by building shared understanding between members of several subgroups and making more team members feel included. When culturally diverse individuals are comfortable to speak up and participate in decision making and express unsolicited feedback, the team environment should encourage interaction between subgroups and diminish the negative effects of faultlines.

Previous studies provided the mechanism through which psychological safety leads to team learning and innovation: when team members feel safe to express their opinions, functional and status differences are minimized and speaking up across the boundaries increases. For example Edmondson (2003) drew on interviews with members of 16 cardiac surgery teams to illustrate the processes through which this happens in interaction and based on this studies recommendations were provided to design preparatory practice sessions for medical staff. Gibson and Vermeulen (2003) found that the differences associated with national demographic heterogeneity in teams could be minimized in average strength subgroups formed in teams which created a psychologically safe environment.

Fostering psychological safety and PSCC can help overcome barriers to innovation resulting from geographic dispersion (Donnellon, 1996), cultural or gender differences, therefore weaken the negative effects of the objective differences (faultlines) so that team members perceive them as less salient. In addition, a PSCC will help to increase informal communication within teams not only face-to-face but through distance using ICTs, therefore helping to overcome the limitations of Computer Mediated Communication (CMC) such as low level of social cues (Sproull & Kiesler, 1986). When

PSCC is high, informal relationships can develop regardless of team members' location or the overlap of objective characteristics. This rationale suggests that:

H2. PSCC moderates the relationship between faultlines and perceived subgroup strength in global teams, such that with high levels of PSCC, the level of perceived subgroups will be low even if the faultline level is high.

Effects of Perceived Subgroups on Team Satisfaction and Innovation

Team satisfaction. Studying perceived similarity enables researchers to move beyond a static view of diversity in teams (Zellmer-Bruhn, Maloney, Bhappu, & Salvador, 2008). This idea that perceived subgroups impact team outcomes directly underlies the following hypotheses. Previous research has demonstrated mainly negative consequences of faultlines and subgroups for team outcomes, such as team performance, team satisfaction and effectiveness (Carton & Cummings, 2013; Lau & Murnighan, 1998) and it is interesting that faultlines have these negative effects even if they are not activated (Thatcher & Patel, 2011). Once faultlines are activated into subgroups, they have stronger impact on team process and outcomes. For example Cronin et al. (2011) found that teams with strong perceived subgroups experienced lower satisfaction from being part of a team and they were less effective. Thatcher and colleagues (2003) found slightly more complex (curvilinear) relationships between diversity faultlines and relationship conflict, process conflict, group morale, and group performance. Groups with either no faultlines (very diverse members) or strong faultlines (split into two fairly homogeneous subgroups) had higher levels of conflict and lower levels of morale and performance than groups with medium faultlines. In an experimental study by Rico, Molleman, Sánchez-Manzanares and Van der Vegt (2007) found that teams with weak

faultline (diverse teams) performed better and reported higher levels of social integration (concept that includes team satisfaction and cohesion) than did strong faultline teams.

Research on impacts of team diversity on performance is far more prominent than on the effects of faultlines on team satisfaction but let me preview some of the findings relevant to team satisfaction. Recent meta-analysis by Stahl et al. (2009) analyzed how team diversity impacts outcomes such as team conflict, creativity or satisfaction and how these results impacted performance. Based on 108 empirical studies included in the analysis, cultural team diversity was positively related to team satisfaction. The results suggest that cultural diversity of teams leads to process losses through task conflict for example, but it also leads to process gains through increased creativity and satisfaction. Another meta-analysis of studies on faultlines by Thatcher and Patel (2011) found that the strength of demographic faultlines' lead to higher levels of conflict and negatively affected team performance and satisfaction.

The research on perceived diversity and subgroups is also a growing. For example Shemla and colleagues (2014) have recently reviewed the literature on the role of perceived diversity on team processes and outcomes. They explained that perceived diversity/heterogeneity is different from perceived subgroups/awareness of subgroups. Perceived diversity/heterogeneity led to inconsistent research findings: to either negatively or positively affect team processes and perceived subgroups had mainly negative outcomes for teams (Shemla).

This dissertation does not look at the direct relationship between faultlines and innovation, but rather at how perceived subgroups change the relationship between faultlines and outcomes such as team innovation and satisfaction. Perceived subgroups

increase interaction with the in-group members and decrease with the out-group (Tajfel & Turner, 1979). As described earlier, based on SIT (Tajfel, 1979), subgroup members exhibit more frequent and positive communication towards the in-group and negative towards the out-group, likely resulting in relational conflict between subgroups. According to SIT, high levels of resulting intergroup anxiety may make it difficult for members of different social groups to work together, resulting in lower satisfaction with the global team experience. In addition, to provide additional rationale for the hypothesis below, let me bring up another meta-analysis by Riketta and van Dick (2005) who found that workgroup attachment (which is a combination of workgroup identification and commitment) was positively associated with group satisfaction and group climate. Cohesive teams with shared identification and less perceived subgroups have better chance to overcome the decline in team satisfaction due to the effects of dormant faultlines.

There are certain benefits of cohesive subgroups but for team innovation in the long run, it is better to have good relationships between subgroups as well. The benefits are not only for task related outcomes like team learning (Gibson & Vermeulen, 2003), but for the safety that is experienced by the members of the cliques or alliances. For example, as mentioned before, Gibson & Vermeulen (2003) found that moderately strong demographic faultlines promoted team learning behaviors.

Theories of homophily (McPherson et al., 2001) and faultline theory (Lau & Murnighan, 1998) predict that people will associate themselves and interact more with those similar to themselves based on the surface level diversity features. Relationships based on homophily might be based on friendship relationships more frequently than it

happens in the workplaces (Lawrence, 1997) but interpersonal liking matters for salience of subgroups. The more relationships that bridge the potential subgroups, the more opportunities for team members between subgroups to like each other and interact with one another. Labianca, Brass and Gray (1998) found that friendships between members of subgroups were conduits for lower perceptions of negative inter-group feelings and conflict. Similarly, Ren, Gray and Harrison (2015) found that friendships that developed between team members from across subgroups diminished the salience of activated faultlines.

If team members do not perceive subgroups as salient, informal relationships that provide self actualization and satisfaction in the workplace (Mayo, 1997) will not be negatively affected by the objective faultlines. If team members perceive faultlines as less salient, the negative consequences of subgroups such as negative perceptions of the out-groups members, lack of knowledge sharing and conflict, will be less likely to occur. Even if the objective faultlines are present but team members do not perceive them as salient, they will not have negative impact on team satisfaction. In other words, if team members through interaction create climate in which subgroups are not perceived, they will still be satisfied from belonging to the same team. On the other hand, perceived subgroups will amplify the negative effect of faultlines on innovation.

Although team diversity might have different effect on team satisfaction, it is assumed that higher faultlines will tend to create opportunities for rifts within teams (Lau & Murnighan, 1998) and result in lower team satisfaction if the subgroups are salient. On the other hand if teams are able to maintain a climate that fosters each team members contributions, faultlines will not only remain dormant but perceived subgroups will not

negatively affect team satisfaction. Based on this rationale, the following hypothesis is proposed:

H3. Perceived subgroup strength moderates the relationship between faultlines and team satisfaction in global teams, such that with low levels of perceived subgroups, team satisfaction will not be negatively affected by high levels of faultlines.

Team innovation. The more team members perceive subgroups and alliances, the more strongly they impact team outcomes because subgroup members tend to interact primarily with each other and not with the out-group members. These dynamics might hurt knowledge sharing. In-group and out-group dynamics frequently lead to conflict between members from different subgroups and lower overall group cohesion (Yoon, Baker, & Ko, 1994).

Research shows that the more group members identify themselves with the members of their subgroup rather than with the team as a whole, the more likely they are to behave in ways that are consistent with in-group/out-group dynamics (Tajfel & Turner, 1986; Lau & Murnighan, 1998). Subgroup members may be more likely to communicate with the other members of the subgroup/clique socially not only during formal meetings. They may also be less likely to voice their opinions contradictory to opinions shared by the members of their own subgroup and the opinions represented by the perceived out-groups in formal meetings. Expressing opinions no matter how valid and informed they are is necessary for innovative results and the lack of inter-subgroup communication stifles innovation. The synthesis of distinct interpretations is necessary for creativity and ultimately innovation (Amabile & Mueller, 2007) but it may be impossible if people are either closed off in their teams so that they do interact frequently across functional

specialties or collocated sub-teams.

When subgroups are salient, consensus is more prominent within the subgroups, but not necessarily in a team as a whole. Perceived subgroups may lead to the creation of inside jokes and jargon that is understandable to others in the subgroup but hardly to those outside (Leenders, et al., 2007; Mikal, et al., 2014). This process may even lead to groupthink within subgroups (Janis, 1982). Teams that are too cohesive but do not have team members who challenge each other are prone to groupthink. Groupthink is counterproductive to innovation, teams need team members who voice their opinions and share knowledge with al team members in order to be innovative. Mesmer-Magnus and DeChurch (2009) found that positive ties between subgroups are beneficial for teams as they allow teams to benefit teams from diversity for innovation. Only if team members are able to share knowledge across real or perceived boundaries despite their objective differences (faultlines) will they be able to gain the resources and support they need to innovate. Therefore, it is in the best interest of the teams that are assembled for innovation to create a climate within the teams in which subgroups are less salient, climate that supports the interaction across all team members. As a result:

H4. Perceived subgroup strength moderates the relationship between faultlines and team innovation in global teams, such that with low levels of perceived subgroups, team innovation will not be negatively affected by high levels of faultlines.

CHAPTER FOUR. METHODS

Research Context

This research project utilizes mixed research methods. Data were collected over 16-month period using multiple sources, including interviews to identify suitable teams, semi-structured interviews with team members, meeting observations and a survey questionnaire. The organization I selected (pseudonym Iggitech) employed teams for software development with main divisions in the US (headquarters), South America and Europe. The research site is a high tech company that has been in business for over 25 years. Access was obtained through a colleague from a U.S. university who had a good relationship with the CEO of the organization. The first meetings at the organization involved top executives and they created perception of credibility in the eyes of other employees. The majority of staff was composed of software engineers working in teams utilizing the agile software development model. In general, the company created development teams that are local but sometimes also distributed across two or more sites. In some cases local teams collaborated across locations with team members dedicated to the joint project. Task interdependence between geographic locations existed and therefore the organization actively supported cross-site collaboration through the use of video- and audio-conferencing.

In order to answer my research questions, I conducted organizational field research. In addition to a company-wide survey questionnaire, I also utilized qualitative field study methods such as participating in meetings and in-depth interviews in order to provide depth to the quantitative findings. Field studies have been highly recommended for studying teams in organizational context (Doerfel & Gibbs, 2013; Hollingshead &

Poole, 2012). Studies have employed field research to analyze subgroup dynamics, for example Hinds et al. (2014) looked at the tensions inherent in subgroup interaction, however still more studies on faultlines and subgroups are conducted in the lab and on student teams rather than organizational teams (Gibbs, Sivunen, Boyraz, in press). The field research project was IRB approved and the consent forms are in appendices C and D.

Observation Procedure

Qualitative field study involved an in-depth case study of two teams different in terms of virtuality (size, geographic dispersion and cultural diversity), life cycle, structurally and in terms of technical products they develop (Table 1 compares two teams on several characteristics). One of the teams is referred to as RTech and the other as WynTech. I observed at minimum 1 and up to 3 of the daily scrum (catch-up) meetings per team per week (scrum meetings take place on weekdays at 10am for 5-15 minutes for one team and between 3 and 5 days per week for WynTech team, meeting time was reduced from 5 to 3 times/week) for a period of time of 10 months for team WynTech (between October 2014 and August of 2015) and 13 months for RTech (between July 2014 and August of 2015). Overall I spent over 170 hours in the field collecting data.

Early on, in the Summer of 2014, based on conversations with few of the mid-level managers I identified the first team that was newly formed (RTech) by combining two existing teams in order to begin work on a new software product by merging a successful existing team with another lower performing team. The second team (WynTech) was identified in November 2014 and I attended some of their daily meetings and team building lunches (every other Wednesday during which team members eat

together and play board games, for example: "Pictionary"). In August 2015 I traveled to a division of the company in Sofia, Bulgaria to conduct participant observation and interviews. I refer to the procedure as "participant" observation rather than "non-participant" observation because although I was not employed by the company, I regularly participated in meetings and team-building activities and at times participants included me in interactions as if I was an employee. Critical incident technique (Flanagan, 1954) was used to analyze data related to subgroup dynamics over time. For example, incidents related to subgroups impacting team interactions (including power and status differences, cultural features impacting interaction) and exhibiting salience of subgroups in interactions were noted and analyzed. As such, critical incidents were precarious and representative instances of ways in which subgroups became salient in team interactions rather than dire or perilous incidents. For example, any time an interaction was observed in which status became salient and mattered for the team process, it was noted in field notes. I audio-recorded some meetings of the smaller (RTech) team but these recordings only served to provide context to the critical incidents.

In-depth Interviews

A total of 42 interviews with 22 team members from RTech and WynTech were conducted in two points in time (22 interviews in time one in the Winter 2014/2015 and 20 in time two in the Summer of 2015) and 40 of them were audio recorded. One team member opted out from participating interviews and another one elected not to be recorded. Except for the two WynTech team members who were laid off few months after time one interviews, I interviewed each member of the two teams twice to be able to capture changes over time.

Some interviews were conducted over Skype and recorded using Call Recorder software. Interviews lasted an average of 50 minutes each. In addition to these interviews with the members of two teams, several other interviews were conducted to obtain background information about the organization, first with the executives of the company, then with key middle level managers as well as with other employees who requested to be interviewed but they were not transcribed or coded.

The 42 interviews with global team members were transcribed and qualitative data was analyzed using Charmaz's (2006) and Tracy's (2012) guidelines (interview protocol is in appendix E). The interview transcripts resulted in over 650 typed pages of double-spaced interview data. Meeting and field notes along with transcribed interviews were saved in Atlas.ti software and subsequently analyzed. The procedure first involved line-by-line coding (Strauss & Corbin, 1998) and critical incidents analysis (Flanagan, 1954) to examine specific excerpts in greater depth. In the last stage of analysis, selective coding (Strauss & Corbin) was used.

Thirty three first level codes emerged from the data (see Table 2 and 3 for first and second level codes). After all data has been coded for the first time, I read and reread transcripts and field notes to identify themes and patterns in the interviews. At first I focused on quotes coded as "subgroups over time" and "subgroup identification" to identify themes and critical incidents that would help answer my two research questions. As the data structure developed, I focused the initial coding by comparing and combining coding categories (Strauss & Corbin, 1998) and I created loose analysis outline document with research motivations, questions and emerging themes as recommended by Tracy (2012). Through the iterative process, a structure of codes emerged. First-order codes

suggested theoretical categories such as for example: "subgroup identification", "formal communication", "informal communication", "challenges" and "benefits of subgroups" or "power/status differences". Table 2 provides examples of first and second level codes.

There were at least three ways I was able to identify subgroups in the teams: quantitatively in the perceptions of salience of subgroups (captured by the survey questionnaire), qualitatively through observing interactions in team meetings or in the field overall, and through subjective perceptions of participants gathered during interviews at two points in time. Handwritten field notes amounted to 150 single-spaced pages when typed. In my meeting observation and office fieldwork, I was looking for subgroups that arose through both formal and informal interactions. I was also speaking with employees informally in such circumstances as in the hall, coffee break room, dining hall or office events. I was open to what could indicate subgrouping in interaction but all events that might have indicated in-grouping or out-grouping and power/status differences were noted in the field notes. The interviews included a visual representation of the other team members the participants interacted with (see the interview protocol, Appendix E). Results of the analysis are described in RQ1 findings and summarized in Table 4. Essentially, in more than 99% of cases members of the two global teams maintained informal relationships solely with team members in their physical location.

All of these sources of qualitative data were systematically analyzed using in-depth case study, an inductive approach (Glaser & Strauss, 1967; Strauss & Corbin, 1998) to identify themes and patterns in qualitative data. One of the main assumptions of grounded theory is not having preconceived assumptions and this enabled an inductive approach to how diversity played out in interaction, how subgroups form and impact

teams and how they became salient. After I conducted and transcribed interviews, I read and reread transcripts and field notes, coded data using Atlas.ti software, and wrote memos to define and elaborate initial coding categories. As the data structure developed, the initial coding was focused by combining coding categories and comparing broader codes to each other (Strauss & Corbin).

Critical Incident Technique

Overall, most participants when explicitly asked if they perceived any subgroups or cliques responded that they did not perceive any subgroups. It is quite possible that because the concepts of subgroups, cliques and alliances have negative connotations, when interview participants were asked directly, they were not willing to put themselves and their team in a negative light. This poses a challenge to researchers because getting at subgroups requires more nuanced approaches to identifying them and interpreting self-reported data. Because I have used few ways to look at communicative behaviors, I was able to look at subgroups in depth, and triangulate the issue. Looking at how surface level diversity characteristics and deep level diversity play out in interaction over time is what I was interested in. When speaking with team members, they described situations involving other team members and through my own interpretation of these stories and observations of team members interacting with each other, I was able to gather that subgroups, in fact, existed. I was able to realize the salience of subgroups when hearing these stories and observing behaviors, something that would not be possible when conducting a survey. Participants' descriptions of various situations and my own interpretations of events based on communicative behaviors served the purpose of identifying subgroups well.

I have identified several critical incidents (Flanagan, 1954) indicating that subgroups are salient for global teams and how we can observe subgroups in interaction. Critical incident technique (Flanagan) seemed very behaviorally grounded and useful for identifying salience of subgroups in visible behaviors and their consequences for teams. Tracy (2012) and Miles and Huberman (1994) describe critical incident sampling as not necessarily "extreme" valence of an issue but a strategic illustration of the argument. Because of the interest in communicatively constructed subgroups, the incidents in which subgroups were salient were limited, therefore the choice of the incidents was made by the researcher to illustrate different factors contributing to subgroups becoming salient (RQ1) and communicative behaviors mitigating negative effects of subgroups (RQ2). These decisions were made inductively. As noted earlier, instances of in-group and out-group interactions were noted and if they were deemed salient by the participants themselves or the researcher based on the criteria of inclusion/exclusion and salience of subgroups, they were either disregarded or noted as salient.

Survey Questionnaire

To test hypotheses in this study a survey on all employees of the organization (n=278) was conducted in December of 2014. Established survey scales described in detail in the measures section below have been pre-tested in a pilot study in the Fall of 2014 (described below). The response rate to the organization-wide survey was 83% globally (n=231). Those who completed the survey were entered into a lottery and three employees received an award of $50. After all individual survey responses were collected, technical teams working on software design and development were identified and mid-level managers (overseeing more than 2 teams) were asked to complete a survey

assessing teams' performance and innovation. In this dissertation, innovation is defined as "the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit role performance, the group, the organization or the wider society" (p.16, West & Farr, 1989). West & Farr as well as others such as Edmondson (2002) argued that innovation inherently occurs at the team level because it requires team learning bounded by tasks that takes place through conversations among a limited number of interdependent people. Some mid-level managers who managed several teams were also excluded from individual level analysis unless the organizational chart obtained from Human Resources (HR) indicated them to be members of technical teams. Departments such as HR, Finance and Accounting and General Office were excluded from further survey analysis because these departments do not rely on global virtual teamwork to a similar extent as the technical teams. The responses from managers are reliable and objective ways to asses team innovation and performance but after excluding the departments mentions, the sample size was n=165 and n=27 teams.

The actual sample for this study consisted of 27 teams because in order to capture innovation at the team level, asking mid-level managers of software engineering (innovative) to rate the teams reporting to them. Individual responses (n=165) within teams were aggregated to team level for analysis. For example, individual ratings team identification were aggregated and the mean of team scores was used for hypothesis testing. More details on how and why variables were aggregated is provided below.

In the sample of 27 teams 122 (74 %) participants were men and 43 (26%) were women. A majority of employees in the team sample were located in Bulgaria (89, 54%),

followed by 56 (34%) in the U.S., 10 in Japan, 6 in Uruguay and 4 in UK. When asked about which nationality participants identify with, 66 (40%) identified with Bulgarian nationality, 30% with American, and over 14% with Uruguayan. It is worth noting that more than half of employees felt that their English language skills are native or very good but that leaves almost half of employees who perceived that their English is either good (with minor errors) or weaker. Most employees in the sample have college degree or more (88%) and Millennials (34 or younger at the time of the survey) constituted over 60% of the sample. See Table 5 for descriptive statistics.

<div align="center">**Measures**</div>

Independent Variables

     Faultlines. The following characteristics were measured in order to calculate team level faultline as an independent variable (Fau) using R software (Meyer & Glenz, 2013, available at http://www.group-faultlines.org/manual.htm): location, function, organizational tenure and gender. I have decided to use Meyer and Glenz (2013) new cluster-based approach, average silhouette width (ASW) because it identifies faultline strength based on various surface level diversity attributes. Location, function and organizational tenure were provided by the Human Resources (HR) department. The item about gender was included in the survey: "What is your gender?". I calculated organizational tenure as a continuous variable in days from the hire date. It is worth noting that although these four characteristics were used to calculate faultlines in this study, they were found to be highly correlated with related variables, for example location was related to nationality item on the survey where respondents were asked: "Which country or nationality do you most identify with?", organizational tenure was

related to age item "Please select the appropriate age range" therefore age was deemed redundant. Researchers who developed the ASW measure discourage using variables that are highly correlated in the faultline calculation. Based on observations of meetings of two teams, the four characteristics were the most salient for forming subgroups.

Several different options of calculating faultlines were considered before deciding on the following diversity factors: location, function, organizational tenure and gender. Table 6 contains examples of three different combinations of factors that could be taken into consideration when calculating faultlines based on the data available. Different characteristics taken into faultline calculation should not be correlated with each other but they could have different weights when calculating them. When making a decision which method (which combination of factors) to choose and how to assign weights to characteristics, the following were considered: correlations between different factors, observation of team meetings and variance between the lowest and highest ASW coefficient. For example: the first column in Table 6 shows faultline coefficient (ASW1) for each team based on nationality, gender, age, location, English proficiency, and organizational tenure measured in days and each of these six factors had equal weights of 1 (as per Meyer & Glenz, 2013 method of calculating ASW). This way of calculating faultlines (ASW1) lead to a lower variance between teams than the second (ASW2) or third (ASW3) method of calculating faultlines. Due to the variance and because it was found that geographic location mattered significantly for subgrouping between team members as well as the factors correlated with geographic location, the third method (ASW3) was selected. It accounts for geographic distance as having more weight (weight of 1) in the faultline coefficient than other factors (for age, tenure in days, and function

assigned weights of 50% of the weight for geographic distance).

Factors correlated with geographic location. Several factors closely related to

geographic location, were: nationality, English language proficiency and functional

differences. For example, at Iggitech, the majority of senior developers were located in

the US and the bulk of Development Support (department responsible for customer

service and resolving customer requests, issues) in Bulgaria. Let me briefly explain how

employee status was coded and correlations calculated. Based on field observations and

interviews, the positions could be classified in at least three different levels of status,

therefore they were coded into three categories: low status positions (Development

Support, Sales staff, Accounting Staff, Software Evangelists), average status (Software

Engineers, User Experience) and high status (senior engineers, architects, project

managers, mid-level managers, Vice Presidents). After coding, simple order correlation

analysis was performed (refer to Table 3 for correlations between the variables correlated

with geographic differences on individual level of analysis). Being in headquarters was

highly correlated with English language proficiency ($r = .62, p < .01$), moderately

correlated with age ($r = .23, p < .01$) but not correlated with gender, tenure ($r = .12$, n.s.) or

status in organizational structure ($r = .08$, n.s.). Interestingly, status was moderately

correlated with organizational tenure ($r = .42, p < .01$), being male ($r = .29, p < .01$) and

with age ($r = .23, p < .01$).

Team identification. This variable was measured by a 5-item scale derived from

Earley and Mosakowski (2000) and Mael and Ashforth (1992) and modified to the team

level. Items were measured on a scale ranging from 1=strongly disagree to 5=strongly

agree. Sample items included "When I talk about my team, I usually say 'we' rather than

'they'" and "my team's successes are my successes". In addition, one item was a modified version of a pictorial measure of interpersonal closeness developed by Aron, Aron and Smollan (1992) to assess team identification. It was used in other studies by Hinds and Mortensen (2005) and O'Leary & Mortensen (2009). This overall scale has high reliability (Cronbach's alpha = .82, M = 4.32, SD = .23). A complete survey protocol for individuals is contained in Appendix F.

Psychologically safe communication climate. This is a previously developed scale (Gibson & Gibbs, 2006) consisting of 5 items measured on a 5-point scale ranging from 1 = not at all to 5 = very great extent. Sample items included "team members are able to say what they think" and "when there's a problem, team members talk about it" (Cronbach's alpha = .9, M = 4.04, SD = .71).

Perceived subgroup strength. This scale consisted of four items based on Cronin et al. (2011). Sample items are: "to what extent has your team split into subgroups?" and "to what extent has your team cracked into smaller cliques?" (Cronbach's alpha = .89, M = 1.85, SD =.82). Respondents rated their choice on a 5-point scale from 1 = not at all to 5 = very great extent.

Team satisfaction. This scale contains item from two separate scales: satisfaction with the team experience (Cramton et al., 2007) that included such items on a 5-point scale (from 1=strongly disagree to 5=strongly agree) as: "I am satisfied with how things in my team are going" or "I am satisfied with how my teammates and I work together and a measure of tenure intentions (Kraut, 1975). Sample items from the tenure intentions scale: "I expect to stay in my team/work unit for a long time" or "I want to change teams"

(this item was reverse coded). This variable was aggregated to team level and the scale was reliable (Cronbach's alpha = .87, *M* = 3.54, *SD* =.54).

Dependent Variable for Manager Assessment

Team innovation. Innovation is defined as "the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit role performance, the group, the organization or the wider society" (p.16, West & Farr, 1989). The scale used on the study for team level innovation was measured using 4 items adapted from Anderson and West (1998) on a 5-point scale (from 1=strongly disagree to 5=strongly agree). Second level managers were asked to think about innovation of each team's reporting to them and rank them before choosing their options (specifically, managers were asked - to what extent do you agree or disagree with statements about each team reporting to you now regarding team innovation? Please try to give different numbers to different teams). Manager ratings resulted in a sample of 27 teams (165 individuals in these teams). Sample items: "Team members often implement new ideas to improve the quality of our products and services" or "Team members often produce new services, methods or procedures". Cronbach's alpha of this scale was .84. A complete survey protocol for managers is contained in Appendix G.

Control Variables

Task interdependence. Finally, task interdependence was initially meant to be a control variable, since it has been shown to impact team outcomes in prior research (Pearce & Gregersen, 1991) and the relationship between team identification, subgroups and innovation is likely to be influenced by the degree of interdependence among team

members. During hypothesis testing, however, the variable was not improving the research model and was not included. This variable was measured by a 5-item scale derived from Pearce & Gregersen, with responses ranging from 1=strongly disagree to 5=strongly agree. Sample items included "I work closely with my team members in doing my work" and "I frequently must coordinate my efforts with other team members." (Cronbach's alpha = .79, M = 3.82).

Team size. Team size has been shown to impact team processes and outcomes in previous research and others have controlled for it in research on distributed teams (Hinds & Mortensen, 2005). Information about belonging to teams was obtained from the mid-high level employees as the HR did not collect and store this information.

Level of Analysis

Responses by individual team members may be interdependent within teams, which would lead to violations of the independence assumption in regression analyses (Kenny & LaVoie, 1985). One way to deal with this violation is to conduct multilevel analyses (Bryk & Raudenbusch, 1992). However, similarly to other studies (for example by De Dreu & West, 2001), due to a relatively small number of observations (n=27 teams) in this dissertation study, multilevel analysis was deemed less than optimal. An alternative solution is to aggregate individual responses within teams for further analyses and this is what was done in the study. For example individual responses about perceived team identification or perceived subgroup salience were aggregated: the mean of team scores was used for hypotheses testing.

Pilot Study

21 respondents completed the pilot survey. Only members of a few teams were asked to complete the survey and there was a buy in from the managers who asked employees to complete the survey on the researchers' behalf. Only the following variables were tested in the pilot: team identification, perceived subgroups, team interdependence, team satisfaction, PSCC, English language proficiency. The scales used in the pilot were found reliable. English language proficiency was sufficient to keep the survey in English to then distribute to all employees in the organization. Based on feedback from employees, only minor details of the question wording were changed, not the scales themselves.

CHAPTER FIVE. QUANTITATIVE RESULTS

Table 5 contains descriptive statistics of the sample of 165 individuals in the 27 teams used for the analysis and Table 7 displays the means, standard deviations, and zero-order correlations for the study variables. Bivariate correlations were conducted to examine relationships among the variables of interest. Due to the small number of teams ($n = 27$), the decision was made to increase correlation significance (p) level to 0.1. Dormant faultlines were positively correlated with perceived subgroups ($r = .36, p < .1$). Faultlines were not directly correlated with the outcome variables (team innovation, team satisfaction), these correlations were not significant even at the $p < .1$ level. Perceived subgroups were negatively correlated only with one outcome variable, team satisfaction ($r = -.34, p < .1$), the relationship with team innovation was also negative but not significant ($r = -.16$, n. s.). Therefore, dormant faultlines were not correlated with team processes or outcomes, but perceived subgroups were correlated with team identification ($r = -.36, p < .1$) and satisfaction. This suggests that subjective perceptions of subgroups mattered more for team processes and outcomes than objective faultlines.

PSCC and team identification were moderately correlated ($r = .55, p < .01$), PSCC and team satisfaction were highly correlated ($r = .78, p < .01$). Team satisfaction was negatively correlated with team identification ($r = -.34, p < .1$) and positively correlated with PSCC ($r = .35, p < .1$). Team innovation and other variables such as faultlines, perceived subgroups and team satisfaction were correlated negatively at a low level ($r = -.16, -.24, -.16$, respectively, n.s.).

Hypothesis Testing

Hypotheses were tested for moderation using PROCESS 2.15 macro for SPSS to perform bootstrapping (Hayes, 2013). Data were aggregated and analyzed on team level resulting in a sample of 27 teams. A first step was calculating faultline strength. I used R software including the ASW package to calculate each team's faultline strength according to the guide developed by Meyer and Glenz (2013) and Meyer, Glenz, Antino, Rico and González-Romá (2014). The following faultlines yielded the most variance: location, organizational tenure, gender and functional differences. Diversity characteristics taken into consideration when calculating faultlines should not be correlated with each other, for example such diversity characteristic as location correlated strongly with nationality and English language proficiency.

Moderation analyses were conducted to test hypotheses. The PROCESS v2.16 macro (model 1) produces bootstrapped unstandardized regression output and estimates of the effect of the predictor variables at values of the moderator variables (Hayes, 2013). It also generates correlations for the models that include all interaction terms and the proportion of the variance uniquely associated with each interaction term. To visualize statistically significant interactions, the PROCESS v2.16 macro produces conditional effects or simple slopes for each predictor at low (one *SD* below the mean), moderate (sample mean), and high (one SD above the sample mean) values of the moderators.

H1. Team identification moderates the relationship between faultlines and subgroup strength in global teams, such that with high levels of team identification, the level of perceived subgroups will be low even if the faultline level is high.

Hypothesis 1 was supported. Table 8 shows that dormant faultlines were significant predictors of perceived subgroups ($b = 39.4$, $p < .05$) when controlling for

team size. In addition, the interaction between faultlines and subgroups was significant ($b = -8.75$, $p < .05$, 95% CI [-16.93, -.58]). The overall model accounted for approximately 40% of the variance in perceived subgroups ($R^2 = .4$, $F=5.1$, $p < .01$). The significant interaction effects were plotted at values of perceived subgroups one standard deviation above and one standard deviation below the mean. The plot is shown in Figure 1. When faultline level is high, there is no relationship between inactive and activated faultlines; when it is low, there is a strong positive relationship. In teams with low level of team identification, faultlines are associated with an increase in perceived subgroups. Team identification weakens the negative effect of faultlines on perceived subgroups.

H2. PSCC moderates the relationship between faultlines and perceived subgroup strength in global teams, such that with high levels of PSCC, the level of perceived subgroups will be low even if the faultline level is high.

Hypothesis 2 was supported. Table 8 shows that dormant faultlines were significant predictors of perceived subgroups ($b = 16.74$, $p = .004$) when controlling for team size. In addition, the interaction between faultlines and PSCC was significant ($b = -3.8$, $p < .01$, 95% CI [-6.49, -1.12]). The overall model accounted for approximately 38% ($R^2 = .38$, $F = 4.8$, $p < .01$) of the variance in perceived subgroups. The significant interaction effects were plotted at values of perceived subgroups one standard deviation above and one standard deviation below the mean. The plot is shown in Figure 2. When faultline level is high, there is no relationship between inactive and activated faultlines; when it is low, there is a strong positive relationship. In teams with low level of PSCC faultlines are associated with an increase in perceived subgroups. In other words, in teams that build PSCC, faultlines remain unnoticed: even though

objectively they might exist, PSCC decreases their salience in perceptions of team members. Therefore, PSCC weakens the effect of faultlines on perceived subgroups.

H3. Perceived subgroup strength moderates the relationship between faultlines and team satisfaction in global teams, such that with low levels of perceived subgroups, team satisfaction will not be negatively affected by high levels of faultlines.

Hypothesis 3 was supported. Table 8 shows that dormant faultlines were significant predictors of team satisfaction ($b = 5$, $p < .01$) when controlling for team size. This is a finding contradictory to expected because of the positive impact of faultlines on team satisfaction. The interaction between faultlines and perceived subgroups was also significant ($b = -2.56$, $p < .05$, 95% CI [- 4.58, -.53]) but it was a negative relationship. The overall model accounted for approximately 32% of the variance in team satisfaction ($R^2 = .32$, $F = 3.6$, $p < .05$). The significant interaction effects were plotted at values of perceived subgroups one standard deviation above and one standard deviation below the mean. The plots are shown in Figure 3. When faultlines level is high, there is no relationship between faultlines and team satisfaction; when faultlines are at low level and when subgroups are not perceived, there is a strong positive relationship. Even if the level of not activated faultlines (the objective faultlines, the potential to split) is high but team members do not perceive subgroups as salient, team member satisfaction increases / remains high.

H4. Perceived subgroup strength moderates the relationship between faultlines and team innovation in global teams, such that with low levels of perceived subgroups, team innovation will not be negatively affected by high levels of faultlines.

Hypothesis 4 was not supported. Dormant faultlines were not significant

predictors of team innovation rated by managers. The interaction effect in which perceived subgroups were hypothesized to impact the relationship between perceived subgroups and innovation was also not significant (at $p < .05$ level).

CHAPTER SIX. QUALITATIVE FINDINGS

RQ1. What are the most important factors triggering faultlines/making them visible and salient in global virtual teams?

Subgroups as "Invisible Walls"

Maybe start with one line that defines faultlines & subgroups. When research participants were asked if they noticed any subgroups, cliques or alliances in their teams, most stated that they did not exist. However, participants did in fact describe situations in which faultlines had emerged during team interactions. Frequently the emergence of faultlines was not obvious for team members and required a deliberate effort to reflect upon and interpret their salience. Faultlines can activate strong and enduring subgroups, which has the potential to affect team processes and outcomes even if they remain dormant. The assumption is that the higher level of potential faultlines will generate negative rifts and result in negative outcomes for the team. Faultlines are unique challenge for global organizations attempting to innovate because they are often ingrained in daily social interaction and therefore unnoticed making the challenges they present difficult to overcome. The nature of fieldwork underlying this study enabled me to directly observe the process and communicative practices of both teams that indicated that dormant faultlines were triggered. When research participants were asked if they noticed any subgroups, cliques or alliances in their teams, most of them stated that their team did not have any. Here I will describe a few critical incidents that illustrate how the presence of various dimensions of diversity activated dormant faultlines. Several interviewees either explicitly or implicitly described "invisible walls" existing within the same teams or between different subgroups within the organization. Specifically,

employees who perceived themselves as lower status were more likely to perceive these "invisible walls" and feel excluded. Findings based on the fieldwork including observation of communicative practices indicate that social and geographical distance were related to the emergence of subgroups during interactions for these teams. This type of faultline activation might be so ingrained in daily social interactions in global organizations that it might be particularly counterproductive to innovation. Faultlines activating into strong and stable subgroups are precarious because they might not be noticeable by interacting individuals or even leaders themselves but they might affect team processes and outcomes even if they are dormant.

Social Distance

According to the definition, social distance is "the perceived lack of intimacy between two or more individuals" (Rogers, 1994; p.183). Although interviewees did not always recognize the emergence of subgroups they nevertheless indicated that they had formed close relationships with a few team members because of working on previous projects together while perceiving more distant to other individuals. One participant described this process in vivo as an "evolutionary thing" – to explain how subgroups formed through certain people going to lunch together. Social closeness related to the nature of work, shared tasks, and functional similarities were the most important contributors to the formation of subgroups according to interviewees. These factors induced certain employees to associate more frequently and engage in higher degrees of informal communication with each other resulting in a decrease in social distance. Social distance (Rogers) was a prominent mechanism through which subgroups became salient.

Interviewees indicated that functions with lower status were treated differently from higher status functions within the company and this made the existence of subgroups more obvious. These functional differences contributed to a phenomenon that a few of the employees named "invisible walls". From the perception of interviewees, the functions with the highest status were the developers (software engineers, architects) and designers in the U.S., as well as the user experience (UX) and design specialties, in this order. These functions require a higher level of expertise, more overall work experience, and therefore are more rare and higher paid positions among the IT employees. In contrast, quality assurance (QA) and development support (DS) employees were perceived as lower in status. Reasons that contributed to these perceptions might be for example, that DS employees have the least technical experience and are the lowest paid employees in the company. Additionally, because they provide technical customer support and act as the primary contact for the organization they did not qualify for telework and could not take lunch breaks if another DS staff was on lunch break. The primary function of QA employees' is to facilitate the work of software engineers by checking and testing the software code that engineers created to ensure it functioned the way it was designed. The DS department also had the most inexperienced and lowest paid employees in this tech company. The functions with the highest status in the perception of interviewees were the developers (engineers, architects) and designers in the U.S., as well as the User Experience (UX) and Design specialties, in this order. These functions were more rare and better paid among IT employees, required more overall work experience and these factors made them higher status. Before the critical incident is described, a short overview of the team's composition and changes over time follows.

Background of RTech team. Table 1 compares two teams observed across several characteristics. RTech team was created by merging two different teams in the Summer of 2014 under the formal leadership of an experienced software engineer, Samuel. Samuel was located in the headquarters and considered to be a "superstar" among engineers. However, Samuel expressed dissatisfaction with the decision, stating that top management had "thrown a team" at him in order to complete a less innovative task on a platform that he and several other team members disliked. It is worth emphasizing that structural changes that Iggitech underwent in the Fall of 2014 did not impact RTech much except for the fact that team members in the HQ sat closer to each other on the same floor. Here is how Samuel described the merging of two teams:

> They even had their name, JTech team, and then we were NTech team. We were
> clearly separate. (…) After about a month or so **we became more of a cohesive
> team (…) once we started to know each other.** I mean we didn't go out for
> drinks or that—it was a slower process, you know, than you normally have.
> (Samuel, RTech HQ)

Samuel indicates that the new team, RTech started off with salient subgroups and low morale. Team members, however, including the leader, tried to make the most of the challenging situation and slowly over time the new team became more cohesive. In the meetings I observed there was lots of bantering and joking, although the frequency of formal and informal interactions fluctuated. Despite this, RTech developed three subgroups each with a different perceived status. The subgroup with the highest status was the "innovation core" comprised of the four most experienced male Caucasian software engineers (Samuel, Derrick, Alex and Daniel), another subgroup consisted of

lower level/lower status employees including a female Russian software engineer and a younger male QA, and the third included two Indian females (one resigned at some point and the last female remained an outcast). These subgroups were relatively stable over time and social distance between them was apparent in interactions as illustrated in the critical incident described below.

Critical Incident from RTech

This critical incident occurred a few months into the team's life (September 2014). In the particular team meeting I observed (in the company headquarters), an Indian female team member, Aparna, stated: "I have an announcement, actually". She spoke softly but the male team moderator (scrum master, Derrick) noticed her comment. However, two of the most experienced and high status software engineers (Derrick and Samuel) continued to speak over each other about the Apple product announcement happening that day for two more minutes before Derrick gave Aparna a turn to speak. This was documented by audio recording of the meeting and confirmed in the data analysis. Although, the team lead (Samuel) might not have seen or heard Aparna as he dialed in through Skype, Derrick, on the other hand, was right in front of Aparna and knew she was waiting to make an announcement. Yet he failed to intervene by interrupting the side conversation. Finally after two minutes, Derrick, the moderator said: "ok, guys, Aparna wants to say something". This is when she said: "I'll be leaving the company. My last day will be next week some time". After that Derrick stated "Congratulations!". All team members laughed as he continued, "What else you're supposed to say?" and more laughs followed. Derrick continued, "Geez! Anything else?". After that team continued to discuss the Apple event, in a way ignoring the news about

their coworker of three years leaving and making it seem irrelevant.

Overlapping faultlines. This critical incident reveals an interaction, which resulted in dormant faultline activation. When Aparna was ignored and not given a turn to speak, while other high status team members chatted over each other, it was not exclusively about one demographic characteristic (i.e., gender) that played a role in triggering the subgroups, but the overlap of several factors that mattered. It was not exclusively about being a woman, or being Indian, rather it was the overlap of several factors (i.e., gender, nationality, job function, English proficiency, shared interests, etc.) that made the subgroups visible. In contrast the high status subgroup of male engineers were given the floor to speak while others were excluded. Social distance between the subgroups became salient in this critical incident and was evident in other meetings of this team that I observed as well.

Based on follow up interviews, this situation from the critical incident seemed to be "normal" in the eyes of several (especially higher status employees), and considered to be a non-issue. For example, Daniel a RTeach team member said in the interview that the situation "was just joking around. There really hasn't been any alliances or anything like that", he only "felt that Derrick's reaction in this moment wasn't the reaction I expected" (Daniel, RTeach HQ). My interpretation of this critical moment revealed that social distance as a result of the overlap of several characteristics impacted team dynamics. The fact is that the team members who ignored the soft-spoken Indian team member were all members of the same subgroup based on function, age, gender and common interest in video games and tech gadgets. In this interaction, it became visible how because of these subgroup dynamics, some team members felt included and others (in this case female

team members and less outspoken team members) were excluded. I will now analyze factors that contributed to "invisible walls" and social distance in this example and this team in general.

As mentioned earlier, based on interviews and observations, RTech had developed three relatively cohesive subgroups. As was visible in the critical incident and other meetings, the "innovation core" held higher status as evidenced by more frequent turn-taking and participation in meetings. This high status group included the four most experienced male software engineers who were all Caucasian, and shared common discussion topics such as video games, and would engage in social interactions such as going to lunch together. The other subgroups consisted of lower level employees: a female Russian software engineer and a younger male QA; and the lowest status subgroup included Aparna and Bhawna, both originally from India, software engineer and QA specialist respectively, for whom English was the second language.

Caucasian male software engineers would normally dominate discussions in team meetings. Females, non-native English speakers and less experienced employees spoke much less in meetings, did not participate in the joking and bantering to the same extent, and overall tended to hold back their opinions about the task at hand. These communicative patterns did not serve the team well in the long run. To provide additional context about this incident, the Indian female team members were described by a few interviewees (Derrick and Daniel, for instance) as soft-spoken, keeping to themselves, and not being assertive enough. Here is how one of the American male engineers described another Indian QA specialist from the same team and the overall team dynamics:

We're a very outgoing team. We joke around. We pick on each other and stuff like that. (…) You can even tell that **Alka is a lot quieter than the rest of us, so in that way she's kind of like an isolated person in the group**. We've tried to include her in stuff like that, but she's just more of a quieter person. She still will joke and stuff but the matter is—where can you roll with the punches? (…) That makes a big difference in the way that we interact. I view the team as kind of fun in that way. [For the team] culturally you want people that can deal with that. (Derrick, RTech HQ)

The second part of this quote represents the overall attitude that high status team members had towards the interaction style of team members. diversity (Derrick recommended teams should have culturally similar team members). In the interview Derrick is not attributing the communication style to Alka's culture although her style of interaction might be related to her culture. Several interviewees, echoed Derrick's preference for communication style homophily, in that teams should consist of members as similar to each other's styles as possible. As a result of these attitudes, high social distance between the perceived in-group and out-group emerged. The out-group in this case included cultural minorities, employees in different locations, and older employees, who were perceived as not fun to be around. These team members were excluded because informal communication was perceived by others as not flowing smoothly and therefore presented challenges for including them in conversations. Thus, in the opinions of several interviewees who were representatives of the higher status subgroup, teams are more successful with high degrees of homophily, as it reduces social distance within the teams. This presents challenges for the dynamics and functioning of innovative global teams,

typically comprised of diverse team members. In this case diversity contributed to higher social distance between subgroups of different status and decreased the quality of inter-subgroup communication.

The critical incident described above provided evidence that social distance can result from shared interests and the ways in which people build informal relationships develop closeness with each other through formal and informal interactions. These factors contributed to the saliency of subgroups. Comments made by another member of (which sub-group) also illustrate this point:

> Whether you want to or not, sometimes you stereotype a little. Your sex, for example, leads you into certain points of interest. For example women who don't do video games, obviously there are, but it's mostly a male sort of activity. As a woman I could probably talk to you more about fashion, getting your hair or nails done (…). **So obviously that creates sort of a barrier**. Culturally, people who have kids and people who don't have kids you end up talking about kids. And culture in terms of passport it does matter because it **makes it easier for certain conversations to occur.** So if you're celebrating the same holidays or you might be interested in the same politics, (…) it bonds people. (Iryna, RTech HQ)

Deep level diversity stemming from the overlap of several characteristics resulted in shared interests, common conversation topics, and created social closeness between certain employees and created higher social distance between sub-groups.

Informal communication and social distance. Informal communication between members of perceived subgroups matters greatly for team effectiveness and satisfaction (i. e. Smith et al., 2006). Employees recognized the importance of informal

communication, which is generally easier to conduct face-to-face and among in-group members. Shared task, nationality, shared demographics, common interests, and work history are all important factors associated with whom (global) team members communicate with more frequently. These factors contribute to informal conversations and the reduction of social distance. Shared task is less likely to result from employees' own choice, and therefore these types of subgroups form because of the structures established by organizational needs. Informal communication emerges during either task related interactions or through spontaneous informal conversations between employees and is an important factor for the triggering of faultlines being triggered into subgroups. For example, the Indian team member from RTech team based in the headquarters stated:

> In my team I would say that Samuel, Derrick, Alex they were already working on a different group. (…)They were all working together on the same team so I'm sure they are a subgroup.
>
> Q: Does a previous history of working together play a role here?
>
> A: Yeah, previous history. And also not work related but me and Bhawna we come from the same country, even though we're not on the same team, that makes us get along. (Alka, RTech HQ)

In this quote we can see how both task and informal communication played an important role for triggering subgroups in the case of the high status subgroup in which several team members had a history of working together, as well as ethnicity and Indian nationality triggering the second subgroup. In this quote, Alka identified two distinct subgroups based on history of working together, as well as gender and nationality, which fostered the informal communication.

The tendency for cultural homophily is ingrained in human nature (McPherson et al., 2001). This is reflected in a quote from one of the team members who offers reasons for associating with similar others and why building relationships with people from the out-groups takes an effort:

> I think people are a lot of times more comfortable around people of similar culture because they feel that they **relate a little better**. They understand that any sort of cultural differences there are, they no longer exist because they're with people in similar cultures. (…) Everybody sort of — like during people's free time, which is lunch, people are kind of separating into their culturally-based cliques almost. (…) **That's kind of human nature** (…) the fact is **people are comfortable around people that they're similar to, people of the same culture, or personality**, however you want to put it. (Connor, WynTech HQ)

These type of opinions about "feeling comfortable" with certain people were common. This tendency for individuals to interact more with similar others highlights the difficulty of breaking up cultural subgroups, As previously noted, these "invisible walls" were most evident in informal communication and created social distance between employees. The frequency of informal interactions among homophilous subgroups as well as the perceived exclusion of out-group members seemed to impact impromptu knowledge and idea sharing, as well as informal social support within the subgroups, negatively impacting innovation in the long run because of insufficient levels of inter-subgroup communication. The positive consequences of informal communication can result in an increase of bouncing ideas off each other or providing social support by listening when coworkers need to vent. Nevertheless, 'invisible walls' are not always

detrimental for team outcomes as illustrated in the comments offered by Andreas (from RTech Uruguay) who explained that most of the time subgroups did not detrimentally impact team outcomes but were indicative of inclusion:

> I don't remember a situation where these kind of alliances or subgroups were a problem to productivity for example. Usually I see these subgroups created for personal preferences. Some people like to go together for lunch for example and they have a group of people that do that but usually it doesn't affect the way they work with other members outside that group. (Andreas, RTech Uruguay)

Although this team member felt that informal interactions did not impact performance, insufficient levels of inter-subgroup communication might decrease awareness of who knows what (Leonardi, 2014). Another interviewee from the same team explained how subgroups were salient on Team WynTech when he was part of that team:

> In the past, when I worked on the team, a lot of the Indian women in the group there were like a subgroup of their own, because they go out to lunch together. They share that cultural, you know, similarity. And they were always with each other. And then you've got the developers. And then you have like product owners. (Daniel, RTech HQ)

This quote provides additional evidence that overlaps of several characteristics like function, nationality, and gender may serve as a trigger for informal interactions. Unfortunately the subgroups based on informal communication may as a result cause some team members to feel included and others excluded. In this quote Derrick from RTech identified all subgroups in time 1:

There was a room and we used it as a lunch room, small and there would be 6 to 8 of us who would go to lunch every day, we would (…) sit down and eat and you kind of knew when you walked in that room that you lost your ability to go to HR when you sat in that room, if it makes sense, you know. You can't get offended in that room, (…) that was the rule. (…) It helps to have the time when you can vent off on your boss, vent off on a coworker, on HR, on your wife, kids, on whatever is bothering you. (…) Daniel has a wife and kids, Alex is married, Samuel is married. We are all the same general area. Would it work if there was a 60-year old guy with us? Probably not. Alka is married, has kids. She has her own sub-tangent over here. I've seen her with the Indian girls. But **that's a normal social organization – who you feel comfortable with.** DJ and Iryna came from one group, they are probably closer. (Derrick, RTech HQ).

In this one paragraph, Derrick identified three different subgroups and provided social benefits of having the social support that being in a subgroup offered. The quote also provides some insight into how having common topics to talk about might trigger subgroups.

Employees from subgroups perceived to be lower in status were more likely to notice the "invisible walls" of subgroups and elaborate on their negative consequences. For example DJ, Quality Assurance (QA) analyst from RTech based in the headquarters was one of the few lower status team members. The following quote illustrates how being lower status impacted this type of employee directly. Sometimes QA and DS employees had to wait a long time to receive a response from developers. They even had to reach out to higher ups due to lack of response:

Because of being QA, you're working with a lot of developers (…) and they're very quick to push aside your emails about a bug or a question (…) because they're more focused on finishing. (…) We get to a point where we get stuck and we go tell them we need this done and they say, well we can't do it. So we kind of **run into a wall** for that and we wound up waiting for a month or we have to take it up with a higher chain in order to try and get them to make time for it. (…) I know developers kind of look down upon QAs a little bit. And developers also look down upon the DS people. **That's just like a little bit of a hierarch**y. (…) Product managers are looking down more upon everyone pretty much. (…) I guess it's not talked about, but it's all just assumed kind of thing. (DJ, RTech U.S)

This quote illustrates the "invisible walls" within the organization, hierarchy that was noticeable in communication, and how employees higher in status (for example project managers) treated the employees lower in status. When asked about the mechanism of how subgroups become visible, DJ answered:

It's just the kind of tone that people talk about when they're talking about this person or that person. Oh, that DS person, **what was he even thinking? Does he even know how to do this?** Blah, blah, blah. And just things like that I guess just from not being so close to seeing that person all the time. Especially with the way it was before with DS being down here and Engineering being over there that it was like you never see each other and you just kind of make assumptions I guess. (DJ, RTech HQ)

This quote illustrates how employees higher in status due to their position/function treated lower status employees from different functions such as DS, as incompetent. The

physical distance between DS employees on a lower floor in the headquarters and their

lack of membership in the engineering teams before the structural changes (i.e. merging

DS with most teams) increased the negative assumptions made by higher status

employees and increased social distance. This perception of certain employees being

lower status seemed to be expressed frequently in communication and the treatment that

the perceived lower status employees received as a result had negative and tangible

consequences for the organization in the form of time wasted. Lower level employees

often did not feel like they could safely ask questions and receive responses from higher

status employees.

The quotes above illustrate the process of how functional subgroups were

communicatively constructed. They also demonstrate that communication behaviors such

as contempt and exclusion of lower status employees can be harmful for innovation.

Another tangible negative outcome of closed off subgroups was time wasted due to social

distance. For example a female Indian (QA) employee described how challenging

cultural subgroups were for her, how communication behaviors based on these subgroups

impacted her because she was afraid to ask questions of her American teammates:

> In India if we got stuck at work for let's say 15 minutes, we immediately asked
>
> someone for help and we kept moving on. But here only if we are stopped for an
>
> hour or so, we try to ask someone. (…) **People don't talk too much within the**
>
> **team.** So you kind of you have to do your research before you reach out to
>
> someone. Because they may be kind of upset that you're interrupting their work.
>
> That upset level is more here than in my previous team; team members that I was

interacting with had come from India. My team lead would say: just don't keep

sitting there just, ask me. (Alka, RTech, HQ time 1)

Alka seemed to be intimidated by the "other" team members who were of

different function and culture (Indian vs. American). It seems that this overlap of culture,

functional and gender differences created the social distance triggering the faultline in

this case. It impacted the willingness to ask questions as soon as technical issues were

blocking her from proceeding with the task. As a result, the organization was losing three

quarters of every hour in which lower status employees were getting stuck on a task, yet

afraid to ask questions of higher status team members. And here is a quote by the same

team member at time 2 demonstrating that not much had changed in team RTech over

time:

> Once we're working on a task it's like: ok, you could have told us this before, **we**
>
> **didn't have to waste time on this**. (…) It's just about clarifications that you need
>
> when you're working. If they gave more explanation, it would help. Even before
>
> you ask, you **spend some time on research like half hour to one hour** and then
>
> you realize that: ok, this is still something that only that person knows, it's not
>
> that you can really find out. (…) If they have said it before, you would have saved
>
> that half hour, one hour. (Alka, RTech HQ).

Both quotes exemplify the role high social distance played in the subjective

perception of subgroups and how the communicative behaviors of team members had a

negative effect on the productivity of this low status team member. Alka perceived

herself to be an outsider and was therefore afraid to ask questions, and also seemed to be

disappointed with the insufficient information team members provided to her every time

she started a new task. The RTech team seemed not to have sufficient levels of either formal or informal communication ("People don't talk too much within the team" – Alka, RTech HQ). It appears that the higher status team members used communication strategies such as being vague about the task and not being open to questions to maintain the "invisible walls" to perhaps guard their uninterrupted work time. In maintaining the "invisible walls", the high status (i.e. more experienced) software engineers might have been successful in securing uninterrupted work time, but they adversely affected lower status team members behind these walls who were afraid to ask questions and wasted time on research. Instead, insufficient information was provided upfront and throughout the progress of the task. This social distance was maintained during meetings as well, in which lower status team members were afraid to participate.

When overlapping with other characteristics, gender played an important role for subgroups becoming salient, especially in the critical moment above. Based on observations and interviews, gender played a role in the informal communication in both teams, influencing who talked to whom. Overall there were 3 women on two teams and they constituted 12.5% of both teams (below the 25% high-tech industry average for IT staff, womenwhotech.com, 2016). All three women belonged to informal subgroups, but there was a high social distance between women and members of other subgroups in the two teams. Based on interviews and observation of team meetings, most women did not care to fit in with the majority and were more likely to find cliques outside the team. Social distance between women and men appeared high. Only one female developed a close informal relationship with a male team member whom she had known from before, while the Indian females created an in-group with other Indian women from across

different teams. However, one of the Indian females from WynTech was eagerly

participating in bi-weekly WynTech team lunches and informal team building events

perhaps because she felt invited and not intimidated during these events (I had a chance

to participate in two of them myself).

Geographical Distance

Geographical distance results from subjective perception of distance between

team members resulting from physical dispersion of organizational members and the lack

of opportunities for face-to-face communicaiton. Based on observations and interviews,

in addition to social distance, the geographical location of global team members was an

important factor in making subgroups salient. A number of factors were associated with

geographic location (discussed below). The interviews I conducted included a visual

representation of the other team members the participants interacted with (refer to the

interview protocol, Appendix E). When members of the two teams were interviewed,

they were asked whom they communicated regularly with in regards to task and whom

they communicated with informally in addition to formally, participants were asked to

complete the chart (see Appendix E). As summarized in the Table 4, there were 12 team

members from WynTech and 8 from RTech who completed charts in both time 1 and 2

(plus 2 team members from WynTech in time 1 who were later laid off). Overall, team

members reported having relationships with about 8 team members on average (and 10

co-workers both within and outside of the team) and this included maintaining informal

relationships with over 2 and less than 3 team members. Participants were asked to mark

the names of the people whom they interact with informally in addition to formally with

asterisks. Out of 106 informal relationships in the two teams (for 21 individuals) reflected

in time 1 and 2, only 2 of these 106 were across locations (this was one reciprocal relationship) and these two locations were New York and New Jersey. The only instance in which two team members from different locations put asterisks next to each other's names, was in time 2 in WynTech. Therefore, the most important finding was that in more than 99% of cases, members of the two global teams observed, maintained informal relationships solely with team members in their physical location. The only instance in which two team members from different locations put asterisks next to each other's names, was in time 2 in WynTech. Out of all the informal relationships in the two teams (for 21 individuals) reflected in time 1 and 2, only 2 of the total of 106 were across locations (this was one reciprocal relationship) and these two locations were New York and New Jersey. This more informal relationship developed among two Caucasian males who grew closer partially because of increased interaction related to a mentoring relationship. This relationship developed over time after the younger team member located in the headquarters emerged as a team leader. Another reason for this close relationship between the locations was that the more senior team member travelled to the headquarters and got to spend some more time with team members beyond the regular formal meetings. Normally, engineering team members very rarely or never traveled to other locations. The team members from Bulgaria and the U.S., for example, never met face-to-face and the team members from NY would only travel to headquarters every few years, with one of these visits happening during field research.

In general, when interviewees were asked about salience of geographic locations for subgroups, they either took them for granted or did not realize how salient location

differences were. Team members often thought of their local team as their "team" not even thinking about the two other locations, as in the case of WynTech:

> I can't think of any subgroups. I don't see. We are not a big team. In Sofia there are 5 guys, in HQ there are more, in NY too so I can't see any subgroups.
>
> Q: Isn't the location as you said naturally creating them?
>
> A: Yeah. (Radko, WynTech Bulgaria).

It was interesting to find that there was not even one example of a close informal relationship that developed over time in different countries; no subgroups based on social closeness overlapping different geographic locations emerged. Even though synchronous ICTs were available, technology did not seem to foster close interpersonal relationships over time. However, to a certain degree as will be examined further in the next research question, communicative practices such as team building exercises and Enterprise Social Media use did aid members of one of the teams (WynTech) but not the other to grow more comfortable, identify more as a team, and increase PSCC. These findings emphasize that geographic location is one of the most important factors for subgroup formation and that informal communication and communication practices can play an important role for fostering PSCC and team identification over time.

Background of WynTech Team

WynTech was a larger, more distributed and older team. In the beginning of my observations, the organization went through a major restructuring. One of the changes was moving employees from the lowest status (Development Support, DS, which were referred to as "third deck" employees) from a separate division into the development teams.

When speaking with mid-level managers before identifying teams to observe, I was informed that WynTech was one of the teams within the company that was not doing too well. I was informed by one of the managers whom WynTech reported to, that the team was in maintenance mode, stagnant and unable to come to decisions after their previous hands on manager left for another position within the company. The product that the team was responsible for was not very innovative. In addition, it was distributed among three locations (the New Jersey HQ, NY, and Bulgaria). Because it was a large team (n=15 in the beginning), participation in meetings was difficult from the low status team members' perspective. In the beginning, the most common channel the team used for within-team communication was the Lifesize teleconference tool for daily scrum meetings. There was not much communication between team members besides the formal meetings.

During the first few meetings of this team, I noticed that several team members did not speak up in meetings at all (they were more likely to be lower status employees: English as second language, DS, QA or Bulgarian team members) with a few team members dominating the conversations (they were more likely to be experienced software engineers). One of the interviewees, Mark, was concerned about the lack of quality communication within the WynTech team but stated that in his present position of regular team member he could not tell others what to do. Several months later he was promoted to be the formal lead of the team and changed the way the team organized work and communicated. Some of the changes included team building activities, one-on-one meetings with all team members, and introduction of the Slack ESM tool for team communication. After being promoted, Mark revived the biweekly team building lunches

and board games for the employees in the HQ, which even lower status employees including the Indian female QA team member gladly attended. They all had fun and a reason to have more casual and informal conversations. Cross-location team building activities were also added: Mark initiated meetings in which all members of the team watched training sessions about scrum every day for 30 minutes, in addition to the regular team meetings.

Critical incident from WynTech. About midway into my observations of the team, one of the designers from the team (Neal) approached me in the hall to say goodbye because he had been laid off. He offered to explain that he had been laid off along with two other members of his department (one of them was also on team WynTech). A few days later, I attended the team's scrum meeting. It started with the regular round robin style status updates but an unusual thing was that the head of the UX/Design department (Ulrich) was in the meeting. After team members completed the updates, Ulrich explained to the team why two team members (whom I had interviewed before: Wang and Neal, both based at headquarters) had been laid off. Ulrich seemed a bit uneasy as he started speaking and employees in the room became quiet as he went on to say that after the reorganization in the company five months earlier, the UX and design departments merged and needed to be further reorganized. Ulrich explained that due to the new redesign of the organizational structure, the UX/design staff would grow in Bulgaria and there would be three more people hired there. The UX/Design staff had already made one hire for the UX position that would start within a month. Employees present in the meeting room seemed visibly concerned, but only one of them (who was calling in) asked a simple question about the restructuring, leaving others' concerns

unaddressed. One female team member approached Ulrich after the meeting was over to inquire about someone else who was also laid off due to this restructuring.

Competition between locations. The way in which Ulrich framed the layoffs communicated to the team members that the organization might have been laying off staff in the U.S. in order to increase hiring in the same function in Bulgaria. Employees were aware of the fact that salaries were approximately 3 times lower in Bulgaria that in the U.S. My impression after this event was that the organization seemed to be cutting costs due to lower salaries in remote locations without concern for what kind of tensions between locations might be created, affecting not only how employees in locations other than HQ might feel—left out when important decisions affecting the company were made without their contribution (only "transmitted" to them), but also affecting how employees in the headquarters felt about their job security. Employees confided in me during the interviews that changes within the company were not well communicated overall and in this case, the stories employees shared contributed to a decrease in employee morale.

I followed up on this specific event in the second round of interviews because it seemed significant for how geographical, functional and status differences became salient and one of the WynTech team members, software engineer Connor, stated that he went to see the Vice President of Engineering in the home office (at headquarters) and was told how the management perceived the status between different locations to be different:

> Shane said that **in the future they're hoping that most of the innovation is done here**. (…) Here is – what do they call it? **The hub of innovation.** (…) I was worried about – we don't seem to be hiring here, all our hirings are remote, makes everybody here feel like **sooner or later our jobs are going to be remote.** (…)

> **They basically picked up Wang and Neal's jobs from here and moved them to remote**. (…) Everything is more expensive here, so the idea is **tasks that are menial**, things that are in maintenance mode that are not innovative can be given to people **that are being paid less** (Connor, WynTech U.S)

There are several issues that the participant unintentionally revealed in this quote. Not only did subgroups exist, but there were significant status differences between locations. The U.S. headquarters was considered the "hub of innovation" and other remote locations were where employees were paid less and English was their second language. Employees in remote locations were meant to perform the menial tasks that were created in the U.S. and follow the lead of the headquarters. This dynamic was not healthy for the team, as it created competition between location-based subgroups with each other.

The location-based subgroups invoked a sort of outsourcing relationship between geographical locations within the same company. This quote exemplifies what engineers in the headquarters thought of the relationship between geographic locations:

> It's beneficial instead of having people do shift work at a particular location, there are probably some language barrier issues. (…) You'd want to keep the projects grouped at a location. (…) [with different locations] you're outsourcing (…) You can't necessarily get that same interdependence across locations, the only area where it might come into play would be DS, but even that's more of the interdependence of the a shared goal but you're not actually ever touching the same things. (Gerard, WynTech HQ)

This quote is only one example of what several individuals stated in interviews—it was much more challenging to work on teams and be interdependent on a task with people in different time locations and time zones, especially between the U.S. and Bulgaria, a 7-hour time difference, than with people in the same or different location in the same country. Based on the critical incident and the quote above, location has importance for team bonding and inter-location tensions incite status differences between locations. When mid-level managers were asked about the teams distributed across different locations, they stated that they could not expect the same productivity from the distributed teams as the collocated teams because of the challenges associated with this type of work arrangements and insufficient resources to overcome these challenges. The use of ICTs did not seem to foster similar quality of formal and informal inter-location communication without deliberate efforts (explored further in RQ2). Due to these challenges, Iggitech tended to prefer collocated teams for developing technology but limiting inter-team knowledge sharing, for example.

Gerard explained why employees preferred to reach out with questions to physically proximal coworkers:

> I mentioned before that resistance to communicating directly and by the time you're actually okay, let me do a little bit more research, although my window to talk with them is out so let me just not bother and I'll put a lot more time into it (…). I'll get plenty of questions immediately from people who are sitting around my desk but people answering the same questions over in Bulgaria and you can tell that they're having similar struggles —I'll rarely or a lot less likely get questions from them. (Gerard, WynTech HQ).

Therefore, "invisible walls" mentioned earlier were salient based on geographical locations. Similar challenges of time wasted due to not reaching out across these perceived "walls" occurred as to those that arose due to social distance. The fact that informal relationships very rarely developed across locations might limit the benefits of team diversity in globally distributed teams.

Based on the findings above, geographic location played a major role for subgroup formation. Other factors were closely related to geographic location, for example: nationality, English language proficiency, and functional differences. For example, in Iggitech the majority of senior developers were located in the U.S. and the bulk of DS (the department responsible for customer service and resolving customer issues) in Bulgaria. Refer to Table 9 for the results of correlations between the characteristics related to location. Location was coded into headquarters versus not headquarters and based on the correlation results, those in the headquarters were more likely to proficient in English, were likely to be older, but not necessarily with higher tenure. Status associated with the type of position was correlated with organizational tenure, with being male and with being older. These correlations between geographic locations of a global company are expected and illustrate how complex the relationships between subgroups are, and how challenging deriving benefits from diverse and distributed teams really is. This quote by one of the most experienced (over 15 years of experience) software engineers illustrates the overlap of few characteristics contributing to challenges related to geographical distance and team participation that actually improved in his team over time:

With the guys in Sofia, I don't know if they're just not confident enough or if it's the language barrier, or a combination of both, but **I definitely see them—they don't speak up** as much. (…) We had a meeting today, Tihomir and Nikolay are working on a new feature. It's very new to them, they both did a great job and (…) demonstrated that they have a good understanding of how (…) to work within our framework. In the meeting (…) it was me, Connor, Tihomir and Nikolay. Connor and I did most of the talking, we both have been here over ten years (…) so I guess that's to be expected that we would do a lot of the talking. (Jonathan, WynTech New York)

In summary, to illustrate why geography matters for subgroups—it matters because it is much easier to develop and maintain informal communication between team members as well as task communication when employees are collocated. As one of the employees based in the headquarters, said:

We used to work closer with Bulgaria before. (…) It's harder to form social relationships through distance, obviously. Some of them they come here to visit so I know some of them better than others. (Iryna, RTech HQ)

Being collocated, however, was not enough for the teams to have successful processes and outcomes, like the example of RTech team provided. This mostly collocated team was actually less effective over time than the larger and more distributed WynTech team. Challenges related to subgroups are further explored in the next research question.

RQ2. Can certain team processes and communication practices help overcome the negative consequences of subgroups in global virtual teams?

While the previous research question explored the ways in which subgroups became visible and salient, this section focuses on how communicative behaviors can diminish the negative consequences of subgroups over time and why it is important for well functioning global teams. The following section of the dissertation emphasizes the factors that help overcome both social and geographical distance.

Social Distance

There were instances in both teams observed where communicative practices decreased salience of subgroups. Based on the analysis of interviews and observational data, the main factors that contributed to a decrease in social distance over time were proximity and PSCC. Each team was different in terms of size, geographic distribution and life-cycle (refer to Table 1 for a comparison), but the younger and smaller team (RTech) was not able to overcome the higher level of activated faultlines that existed at the beginning. The WynTech team had lower morale and unequal participation in the beginning of my observations, but was better able to overcome subgroups based on social differences. Several team members described the process of how a decrease in the saliency of subgroups happened in their teams. Once employees had a chance to interact with others from a perceived functional out-group for example, communication played a crucial role in diminishing the social distance between subgroups as illustrated in the critical incidents described below.

Critical incident from WynTech. In the interviews I conducted, participants described the role of proximity for changing preconceived notions they might have had

about other subgroup members. As described earlier, the WynTech team merged with DS members who joined the teams and instead of being located on a lower floor, DS employees became part of team structures. Shared proximity contributed to greater participation in team meetings and increased interdependence among team members. This resulted in them participating in team meetings and increased interdependence with other team members.

Before the merge, stereotypes about lower status DS employees were prominent due to the "out of sight out of mind" dynamic (Cramton, 2001) towards DS employees who were not physically proximate and low in status. Before the merge, DS staff was the most looked down upon function; the "invisible walls" described earlier were the most prominent between this function and other technical and non-technical employees. DS employees would sit together in one section on the ground floor of the office space in the headquarters. After restructuring, the remaining DS employees (after laying off part of the DS staff) were added into existing engineering teams and their desks were moved. Only then did DS become included in conversations. Several higher status interviewees (i.e. engineers) reported a change in their preconceived notions about DS employees once they got to see how hard DS employees actually worked. As Bhawna, an Indian team member in HQ, told me in the second interview:

> Before that only the Quality Assurance person, Radko, was the part of the team and we were unaware of who was in DS. Through collaboration we came to know who the DS members were. They are handling customers and all. So it's kind of good—this new way of team collaboration—we know what's going on and customer needs. (Bhawna, Wyntech U.S.)

This quotation suggests that before the structural changes, before DS employees became part of the teams, employees did not even know who the DS employees were. In this scenario, if the lower status employees could not even be identified, stereotyping and negative attributions were easy to make. After DS team members joined the teams, negative stereotypes diminished, communicative behaviors changed and, as a result, social distance decreased.

After the merging of existing teams with DS, the organization encouraged teams to become more agile and cross-functional. WynTech was one of these teams that started to change its structure and took the steps of becoming more cross-functional as encouraged by the new leader, Mark. The effects of proximity could be observed as illustrated here:

> Maybe one big advantage of the agile team is **that now we are sitting all together,** for example in Bulgaria. Before then the QA team was located in one place in the office, the developer guys were in a different room. (…) **People sitting next to each other is good for example for the QA and the developer support**. (…) When we sit together now I can say: ok, Tihomir can you come closer and I'll ask you about a bug? The communication is faster and maybe as a mindset that **we are whole team** – he's kind of required to come. (…) **We can do our jobs faster**. Even if it's a small improvement, I see it. (Radko B., WynTech Bulgaria, time 1).

This quote also provides evidence of higher team identification over time and lower social distance after the functions were made to work together. Once lower status employees became part of the team, the higher status employees were required to respond

sooner and meetings to triage outstanding support cases were more frequent (sometimes twice a day; in these meetings cases were distributed to more experienced or less busy team members).

Analysis of critical incident. The more inclusive communicative practices resulting from the merging of DS into the teams and WynTech becoming a more cross-functional team became catalysts for more frequent interactions, more time and cost-efficiency (easier to ask questions, faster and more accurate responsiveness to customers) and (assumed) organizational productivity overall. Two major factors played a role in decreasing the salience of social distance for subgroups: proximity and PSCC.

Proximity. Not only physical but especially perceived proximity (Wilson, O'Leary & Metiu, 2008) helped overcome social distance. Wilson, O'Leary, Metiu and Jett (2008) define perceived proximity as a construct that reflects an individual's perception of psychological closeness to other virtual co-workers. The integration of the DS staff into the teams decreased the social distance between the low and high status team members. As a result, in contrast to the "invisible walls" explored in the previous research question, members of low status subgroups gained easier access to knowledge. Due to the proliferation of interaction, DS employee observed "walls coming down":

> There are times when **I've seen the walls within the team just go away**. I remember there was one day when Denis was out and I had a lot of updates to send and I just brought it up. (…) Everybody just sat down who was in the room. Connor, Mark, Gerard, Jonathan and Frank were all on Lifesize. We just talked about my cases and we got them done. (Ben, WynTech, US).

The integration of the DS employees into the engineering teams resulted in increased proximity, enabled easier knowledge sharing, and ultimately social distance between functions of different status clearly decreased. As a result, the salience of the subgroups declined and the invisible walls came down. More senior/higher status team members changed attitudes towards lower status members over time, for example by giving DS team members a greater benefit of the doubt and appreciating their hard work that they themselves did not want to do (i.e. pick up the calls from customers). A similar scenario where walls came down happened in the RTech team in the beginning of lifecycle (when two teams merged to create RTech) but later three stable subgroups crystallized (as mentioned earlier).

Communicative brokers fostering PSCC. PSCC has previously been found to benefit innovation in diverse teams (Gibson & Gibbs, 2006). Similarly, in this study, PSCC was described by interviewees as an important factor for innovation. For example, an interviewee from Uruguay, when asked about what matters most for innovation, stated that:

> For innovation you only need to be comfortable in a place you work like when you are happy you will be able to innovate much better than if you are under pressure or if you are worried constantly. If you are happy and you have a space in which you can express yourself and express your ideas, you will enjoy it. (Andreas, RTech Uruguay)

WynTech was able to build stronger PSCC than RTech through creating opportunities for informal interactions during team building activities for the employees

in the headquarters (the lunch with board games, for example) and between locations and because of Mark's leadership style.

The fostering of PSSC as well as a decrease in social distance between members of different subgroups was also due in part to WynTech team members who played the role of communicative brokers – they bridged social distance that might be occurring between members of the in-group and out-group in a way fostering PSCC. The following quote by Connor from WynTech explains the communicative behaviors of those I refer to as "communicative brokers". These individuals facilitated "outsider entry" – the role that, several of the WynTech team members played (other than the formal leader) by integrating others from the perceived out-group "into" the in-groups by making them feel confortable and included:

> Lunch time it's a bunch of us guys playing games at the table up here (…) **sometimes having people like Mark or Gerard that will say: "come join us and play a board game with us", that breaks down some of this uncomfortable feeling of being an outsider and then joining.** (…) I think separating ourselves into these cultural cliques pushes us towards being outsiders when people are starting to segregate into these cliques. (…) **Perhaps maybe Bhawna would be a lot more scared to talk to any of us and ask us questions if we didn't do that** [team building lunches]. (Connor, WynTech HQ)

In this example, both Mark and Gerard attempted to open communication channels for outsiders, creating an unthreatening entry into the board gaming in-group. What Connor is also describing are the benefits of team building activities for fostering PSCC and breaking up subgroups. In this quote, Connor discussed the benefits of PSCC

for the team overall. He anticipated that his lower status Indian coworker in the role of

QA might be scared to ask questions of the higher status team employees on the same

team if she did not participate in the team building activities for the team. In this way,

team building fostered PSCC at the same time decreasing social distance because of the

informal setting of the board games during work hours. This quote, therefore, illustrates

the role of communicative brokers in fostering PSCC and reducing the social distance

among perceived subgroups.

In summary, providing more opportunities for employees to interact informally

may decrease this feeling of being an "outsider", the out-group member. Team members

who become communicative brokers might ease the uncomfortable entry for the out-

group members. Communicative brokers and shared proximity communicatively

contributed to decreasing the salience of the "invisible walls". It takes an effort to break

through these "invisible walls" of subgroups and make everyone on the team feel

included. These actions enable teams to benefit from diversity. Those who model

inclusive communicative behaviors help to foster PSCC and reduce vulnerability of team

members but certain change agents (communicative brokers) can model inclusive

communicative behaviors and help foster PSCC.

Geographical Distance

Global teams are especially prone to "core-periphery" dynamics based on

geographic location. For example, previous research found that employees at HQ have

been found to hold more power than subsidiaries (i.e. Hinds et al., 2014; Leonardi &

Rodriguez-Lluesma, 2013) and this dynamic impacts team interactions, knowledge

sharing and innovation. Similarly, as explored in the previous research question, despite

subgroup dynamics due to geographical distance experienced by both teams, WynTech was able to overcome this barrier more effectively than the other.

Based on the analysis of interviews and observational data, two main factors contributed to decrease in perceived geographical distance over time—Enterprise Social Media (ESM) use and leadership style. WynTech for example, used a mix of ICTs for within team communication and the use of a tool called Slack for group communication in particular was useful for fostering both task and informal communication across geographic locations. As a result, this specific ESM tool promoted knowledge sharing and asking questions by the less experienced, lower status team members and fostered stronger bonds between locations. The following critical incident illustrates the role these factors played over time.

Critical incident from WynTech. One day in a meeting a few months after I began my observations, I witnessed team members discussing plans to cover the absence of the Bulgarian team members for a few days in their bi-weekly scrum cycle because of an upcoming holiday. I asked a DS employee sitting next to me: "what's this holiday coming up in Bulgaria?" after which he responded: "who cares? Bulgaria has like 1000 holidays". This expression was concerning for me. I interpreted this is situation in the following way: the team members were not interested in other location-based subgroup members, as geographical and social distance were high and virtual distance (Lojeski, 2007) were high. During previous observations I noticed that the teams' teleconferences did not include any small talk and very little humor between the locations. I sensed that team members in the headquarters did not have positive opinions about their counterparts. Especially lower status members, who rarely spoke up in meetings.

Meetings were typically dominated by the most experienced team members located in the U.S. headquarters. According to the team lead (in the U.S. or someplace else), lower status team members would frequently wait for the end of the meeting to approach him with comments, suggestions, or to disagree with decisions that had already been made in the meeting. As indicated in the survey data, the team was not assessed by mid-level managers as being innovative (refer to Table 1).

I was able to find evidence of low PSCC at the beginning of my field observations of the team when speaking with a newly hired Visual Designer (who was laid off a few months afterwards), who in the first round of the interviews said that:

> I would just wish that there was more openness to make design changes so I could kind of do new things and make my improvements. Which there are opportunities to do that, but it's not a priority. (Neal, WynTech HQ, time 1)

These communicative behaviors of the team affected this new hire because the team did not provide him with sufficient information or training to perform the work he was hired to do (visual design). Additionally, the team was not open to hearing about possible changes that could have improved the product the global team was working on.

However, after Mark became team leader of WynTech and implemented a number of changes there was evidence of an increase in informal communication. I observed another incident in another team meeting. This time, one of the team members in the U. S. asked the Bulgarians – "so, guys? What's happening in Sofia this weekend?" resulting in a brief but more informal communication exchange across geographically distributed subgroups than what I had witnessed in the team previously.

Analysis of critical incident. This incident caused me to immediately recall the meeting from several months before, and I started to analyze the reasons for the change in team communication climate. It appeared that local geographically and nationality-based subgroups had visibly decreased. Team identification and PSCC had increased and a two factors seemed to have contributed the change—strategic Enterprise Social Media use and leadership. This was evidenced by WynTech team members evaluating their team as being a more effective cross-functional team around the time of the second episode of the U.S.-Bulgaria social exchange. To support the SCRUM process, every two weeks WynTech conducted "retrospective meetings", during which process and tasks were evaluated against the goals and strategy. The team had become better at managing subgroups emerging from geographical distance and overall became a more functional team.

Strategic enterprise social media use. As mentioned earlier, most employees were likely to consider their local subgroups as their "team". Team members tended to take the location-based subgroups for granted, and no matter the quality and richness of ICTs, these location-based subgroups remained salient except for the instances in which they helped build closer relationships across locations (one described in RQ1 in which two team members from WynTech U.S. developed a relationship, and the critical incident in which informal communication across the U.S. and Bulgaria occurred). Overall, based on observations and interviews, ICTs alone bridged the subgroups based on geographic distance only to a certain degree. On the contrary, several employees brought up the benefits of developing relationships because of face-to-face meetings with team members. Based on what several interviewees told me, ICTs were not as effective for

facilitating informal communication as face-to-face meetings. This finding is not new, it

has been reported in previous research that face-to-face meetings and kick-off meetings

improve team collaborations by helping to foster relationships (Suchan & Hayzak, 2001).

However, there was evidence of other ways to foster informal communication that

seemed to be effective in overcoming challenges of geographical distance over time.

Strategic ICT use helped the WynTech team overcome subgroups. The team used

Slack, an ESM tool (refer to Appendix H for a sample screenshot of the Slack interface)

as one of its group communication tools. When I started observing the team, Slack was in

the adoption phase and in the initial interviews some employees were still a bit skeptical

about it as a social media tool. In the second round of interviews, several interviewees

tried to convince me as to why Slack was an effective tool for their team. This change in

attitude over time happened not only because the tool was introduced but because of the

constant reminders from the team lead. This quote by Bhawna, a female WynTech team

member based in the HQ described the benefits of Slack for the team, including

knowledge sharing:

> When I have any doubt or when a new feature is coming out or there is anything
>
> about DS, **when you put it on Slack, at least everyone else is reading it and I**
>
> **think a kind of knowledge sharing is happening through Slack**. If there's a
>
> customer issue and someone else comes out with the same question, we can go
>
> back and check and we can see what's the status of it and we don't have to go and
>
> ask people around or shoot an email and wait for the response. Everything is there
>
> on Slack, and I think there's more knowledge sharing about the product and

knowledge about the controls that we're handling here and what's going on and

we are all doing. (Bhawna, WynTech HQ)

Bhawna went on to emphasize the usefulness of segmented audiences of Slack

channel members:

I like that Slack is separated for the team, and because it's separated by topic,

each day we know what's going on because it's something that needs to be done

within the team. (Bhawna, WynTech HQ)

The limited audience of Slack helped the team create a safe place for the team to

ask questions and update others on task progress. In the following quote Miroslav, one of

the Bulgarian WynTech team members, also emphasized the benefits of Slack for

knowledge sharing, making what others on the team were doing more transparent

(visible) as well as helping to foster closer relationships because of its capacity to share

jokes between geographic locations:

I think communication since the last interview is more transparent because let's

say in Slack you can see the problem you're working on and how it was solved

and what everyone said. For example, I had a customer who had a very specific

issue, posted in Slack and shortly I had 2 responses: from Jonathan and Mark. I

responded and let's say in 10 minutes I had 2 more answers from Jonathan and

exact instructions what I should do. Slack helps us very, very much. It is easy to

use. (…) Slack is better than Instant Messaging, emails etc. because in Slack

everyone sees the thread (…) Slack is good for social things, like I post some

funny things, it helps to build the team, to have a general channel for jokes"

(Miroslav, WynTech Bulgaria, time 2).

Mark (WynTech team member located in the U.S.) said that Slack, being a communication tool limited to a smaller audience of only one's team members and not other teams, helped in overcoming challenges related to the disconnect between the two main subgroups (based on geographic distribution—one based in the US and the other in Bulgaria). This particular team only used Slack to communicate within the team: its audience therefore was limited and enabled a sense of openness with which team members posed even the simplest questions or silly jokes that might have been inappropriate in an ESM with a larger audience (i.e. Yammer). The frequency of both formal and informal communication between geographically distributed subgroups increased over time. This particular use of ESM helped in diminishing the impact of perceived geographical and power differences between team members. People who would not normally speak up in scrum meetings chatted informally on Slack channels and asked questions there. For example one of the channels on Slack (discussion threads) was a DS channel and according to several interviewees, it helped the Bulgarian subgroup in obtaining knowledge from the more experienced American team members without feeling intimidated. This channel helped the shared functional subgroup because all team members were getting notifications about new content or questions posted and felt compelled to answer because of Mark's encouragement for all team members to screen Slack posts. Another channel (that Miroslav was referring to above) was dedicated to jokes.

Due to this particular use encouraged by the leader, Slack helped the team overcome the geographical distance that limited participation from the Bulgarian team members on the conference calls. In addition, because of the asynchronous nature of

communication on Slack, it provided other benefits for lower status team members (either in Bulgaria, those whose English was second language or DS function) of editability (Walther, 1996, 2007) and allowed them to communicate confidently, participate in the team more both formally and informally, and "dial-up their engagement" (Neeley, 2015).

  Distanced leadership style. Formal leaders played an important for overcoming challenges of geographical distance for subgroup salience in teams. In team WynTech, Mark emerged as a leader, moving from being relatively low in status (a less experienced software engineer in DS) to the higher-status development team. This move encouraged him work harder to become the leader and become mindful of team dynamics. After being promoted to team lead, Mark read a lot about leadership and communication, became a member of an inter-team group consisting of leaders from different teams, became more aware of leadership behaviors, PSCC, and his role as a facilitator giving everyone a chance to participate in team meetings and encouraging them to ask questions no matter how silly. Mark exhibited strong distanced leadership skills (Connaughton & Daly, 2004). For example, he realized that communication was critical, established ground rules for communication, and recognized that cultural nuances mattered. Here is a quote by Anatoli about Mark's leadership style:

   You need both technical expertise and people skills to be a good leader. [It is important that] the leader is the kind of person with the soft skills and communication skills. We value on our team that we have both. (Anatoli, WynTech Bulgaria)

  Mark was, therefore, assessed by others as having the necessary communication skills in addition to technical expertise. For example, he conducted one-on-one meetings

with each team member and showed sensitivity to cultural nuances. This was visible in

the way he encouraged lower status team members to participate in team meetings and

through Slack communication. This quote (also by Anatoli) summarizes several factors

that were important for the decrease of salience of geographical differences in subgroups

in the WynTech team over time, including Mark's leadership behaviors:

> I think Mark is a great team leader. He can meet directly and ask, what is your
>
> current task and challenges? He's the guy who if you have a question and you're
>
> not sure who to talk about your hesitation, you can ask Mark and he's very nice. I
>
> think that with the help of Mark and **his ability as a leader** and **Slack**
>
> **communication channels** and daily scrum meetings and the global Monday,
>
> Wednesday and Friday meetings over Lifesize and seeing each other and
>
> **occasional jokes** you can see that there's a spirit on the team and it's okay and
>
> we're moving in the right direction. If you compare it with only email, you don't
>
> get the same information or visual about the team members and how we feel
>
> about each other. So the meetings are important. These are the main reason of our
>
> better integration. (Anatoli, WynTech Bulgaria, time 2)

The last part of this quote illustrates the role of distanced leadership and strategic

ESM use in the team. During formal interviews and informal exchanges with Mark as

well as when observing the team, it appeared that he had become a facilitator of team

processes, constantly encouraging the Bulgarian team members or soft spoken Indian

female QA specialist located in the headquarters to learn new things and participate in

team meetings and persistently reminding all team members to post questions to Slack.

By facilitating cross-location team communication and focusing on training the team on

becoming more cross-functional, he changed the communicative behaviors in the team from a low level of formal communication and nonexistent cross-location informal communication to much more communicatively competent communicative behaviors. And as a result, WynTech was able to overcome geographically based subgroups and team effectiveness improved. In addition, Mark did not treat the team as a closed off entity but valued external knowledge sharing between the team and other entities within the organization.

WynTech had a higher geographical distribution and a higher faultline level than the RTech team lead by Samuel. However, WynTech had better communication practices such as encouraging turn-taking, and fostering biweekly and team self evaluation in retrospective meetings. The formal leaders played a big role in structuring the meetings and fostering particular ICT use, and due to their leadership behaviors, differences between how RTech and WynTech managed subgroups—especially ones based on geographical distance—were observed.

Based on the interviews, Samuel started off strong as a formal leader of RTech. Even though he was not happy to be given the new but unchallenging assignment, he took the time to train team members on the new technology platform (i.e., an Android system that was not very popular among team members) and spoke to them one on one. In contrast, Andreas, a RTech team member and the only located in Uruguay, described Samuel's leadership style as not inclusive and communication with the American team members as insufficient. He even felt that communication between himself and employees in Bulgaria was easier and more inclusive than with the team members in the U.S. For reference, there is a 1-hour time difference between Uruguay and the U.S., a 6-

hour difference between Bulgaria and the U.S., and a 5-hour difference between Uruguay and Bulgaria. Here Andreas explained why he perceived the American team members as more distant and Bulgarian employees as less distant, at the same time describing his supervisor's leadership style:

> I know the (U.S.) team in person and I think that the role of the team leader is important, but **Samuel prefers to make decisions himself** and he doesn't communicate so many decisions he's going to make. (…) I feel that the **communication is better with the Bulgarian team** than with the U.S. team. (Andreas, RTech Uruguay)

Samuel represented a centralized, authoritarian leadership style that was not inclusive of others' input. Self-managed and innovation-generating teams tend to have flat structures and call for leadership that facilitates communication, not authoritarian leadership as practiced by Samuel. Team members never praised Samuel's leadership style or cultural sensitivity. Samuel himself described himself as writing 90% of the code for the entire team (the output the team was to produce) and acted surprised about why other team members were not motivated enough to perform well. Team members simply did not buy in to his decisions and felt disengaged and unmotivated according to sentiments shared in the second round of interviews. The following is a quote by Samuel who expressed what he felt about the motivation and engagement of his teammates in a time 2 interview:

> The other members on the team, we have to force it down their throats. Guys, this is new stuff we need to like learn it and try to figure out how we can integrate in our core you know just learn about the new technology so we know how

customers are going to be using our stuff. It's like pulling teeth. **It has nothing to do with culture, it's all about loving what you do**, coding on the side just for fun and stuff like that and that's the type of culture we should be building. (Samuel, RTech HQ)

Samuel evaluated the other RTech team members as not excited about their work, unmotivated and not willing to go above and beyond what was required. He discounted the role of culture and thought that employee motivation came from an intrinsic need. One way to explain his poor reputation as a leader was the fact that although he had a pleasant personality and was technically experienced, talented and motivated software engineer, he did not seem to know much about team communication and therefore not focused on team process. Because of being tech savvy and conscientious, he was pulled in many different directions (was part of many projects) but never focused on within- or between-team communication. Thus, contrary to Mark, Samuel was the main communication link between the team and the higher ups, making RTech a closed off entity.

Unlike Mark, Samuel earned his leadership because of the superiority of his technical skills. Also the fact that Samuel worked 3 out of 5 days a week from home and never offered one-on-one meetings he failed to facilitate the informal communication that the team could have benefited from. He introduced Slack to his team members by email but provided no training or any arguments or explanation about why this new communication channel might benefit the team. In addition, Samuel did not feel that any team building was needed for the team until the second round of interviews.

Samuel's leadership behaviors seemed to decrease subgroups based on geographical and social differences only in the beginning of the team's lifecycle as he tried to spend time on socializing teammates (in the collocated team and by meeting with Andreas from Uruguay) into the team and the new platform. However, his leadership style was a mismatch for the type of virtual agile team expected of RTech. He lacked the necessary qualities for effective distanced leadership such as getting buy-in from other locations, setting expectations and ground rules for communication, identifying effective media choices, and providing equal access to all team members (Connaughton & Daly, 2004).

In summary, leaders played a big role in providing opportunities for informal communication and including members from other geographical locations. Effective leaders played a role in structuring meetings, providing training, and organizing team building activities that were not only for the purposes of training but also created opportunities for socializing. All these communicative behaviors played a role in decreasing social and geographical distance among subgroups but WynTech was better than RTech at managing subgroups.

CHAPTER SEVEN. DISCUSSION

This dissertation chapter will summarize the purpose and theoretical framework of the study and the research methods employed. It will also discuss the main findings and suggest theoretical and practical implications, limitations, and future research directions.

The dissertation extends research on faultlines (Lau & Murnighan, 1998) by adding the effects of geographic dispersion and looking at the role of communicative practices in subgroup dynamics. The driving purpose was to reveal team processes and communicative practices that affect the relationship between team diversity and outcomes such as team innovation and satisfaction, as well as discovering how communicative practices might help overcome challenges of subgroups for global teams. These research goals were accomplished through utilizing a rich mixed-methods approach through an organizational field study.

It was a conclusion of the study that certain team processes (team identification and PSCC) ameliorated the negative effects of faultlines as potential rifts within global teams and enabled such teams to derive benefits of team diversity. The qualitative findings provide greater understanding of GVT subgroup dynamics and how they change over time. The specific contribution of the qualitative study is that the project explains how subgroups are triggered in interaction. The communicative practices identified helped teams overcome rifts within teams. By developing a stronger theoretical understanding of these processes, practical recommendations for organizational members (team members and leaders) operating within the realm of innovation within global organizations are provided.

Summary of Results

Through analysis of survey data from 165 team members in 27 teams who were working on innovative tasks, three out of the four proposed hypotheses were supported. Team identification and PSCC were found to moderate the relationship between faultlines and perceived subgroups. These processes increased the likelihood that faultlines would remain dormant and decreased the negative consequences of demographic faultlines and geographical distance. This last finding is especially important because it suggests that teams can be encouraged and trained to strengthen these team processes and in consequence, prevent faultlines from turning into destructive subgroups, in consequence fostering the benefits of diversity. Based on the quantitative findings, it can be concluded that paying attention to global team and subgroup composition and structure seems to be less important than focusing on communicative behaviors.

In correlation analysis dormant faultlines were not associated with team processes or outcomes, but perceived subgroups were correlated with team identification and satisfaction. This suggests that subjective perceptions of subgroups matter more for team processes and outcomes than objective faultlines. In moderation analysis perceived subgroups were found to moderate the relationship between faultlines and team satisfaction, but they had no impact on the relationship between faultlines and innovation. The finding about team satisfaction is surprising because it was hypothesized that perceived subgroups moderated the relationship between faultlines and team satisfaction in global teams so that if perceived subgroup level is low, team satisfaction will not be negatively affected by high level of faultlines. The survey findings showed that even

when the level of dormant faultlines was high, if team members did not perceive

subgroups as salient, team member satisfaction actually increased. This finding is

particularly interesting because it demonstrates that there are other team processes and

communicative practices at play that might explain a high level of team satisfaction.

When teams with high levels of these objective but not activated faultlines do not

recognize subgroups as salient, team member satisfaction remains high. It is rather

remarkable that faultlines did not impact team satisfaction directly, suggesting that what

matters is how or whether they are subjectively perceived by global team members. This

finding was further explored with more complexity in the qualitative study.

Communicative practices were observable and mattered for perceived subgroups.

Subgroups were visible in formal and informal communication. The qualitative findings

support the quantitative findings about the importance of communicative practices

associated with PSCC and team identification that have the potential to decrease the

salience of subgroups and increase team satisfaction. Although objective faultlines are

static, communication practices impact whether or not they are perceived and triggered

into subgroups. Communicative practices matter for well-functioning global teams as

subgroups arise and are overcome through interaction. The findings reveal that

communicative behaviors associated with the decrease of salience of perceived subgroups

may make teams productive in the long run.

Based on critical incident analysis (Flanagan, 1954) and in-depth case study

analysis (Glaser and Strauss, 1967; Strauss and Corbin, 1998), faultlines became salient

and led to the emergence of subgroups only in certain situations, but they definitely

impacted the quality of communication. Two main factors contributing to making

subgroups salient emerged as themes from the analysis of the interview data: social and geographical distance. The main factors that contributed to social distance were overlapping faultlines and informal communication. A very important factor, not given much attention by the faultline theorists (Lau & Murnighan, 1998; Thatcher & Patel, 2011), but an important one for subgroup salience over time was informal communication. This rich informal communication might result from either task-related interactions or spontaneous informal conversations between employees. Overlapping faultlines (i.e. gender, age, nationality) were activated in certain circumstances in which higher status left lower status subgroups intimidated. The frequency of informal interactions among homophilous subgroups and being closed to the perceived out-group members positively impacted impromptu knowledge sharing and informal social support within subgroups but negatively impacted innovation in the long run because of the insufficient level of inter-subgroup communication. Competition between locations was the main factor that contributed to geographical distance becoming salient.

Based on an in-depth case study of two teams, it was found that communicative practices helped teams in overcoming challenges of subgroups. The main qualitative findings are that proximity and communicative brokers fostering PSCC helped teams manage social distance, while distanced leadership skills and strategic ESM use helped overcome geographical distance. These findings are important not only for GVTs but also for collocated teams because not every team is geographically distributed, but social distance might be perceived even in collocated work teams due to natural tendencies for homophily and overreliance on ICTs. The communication climate in which team members volunteer their opinions no matter how insignificant they might be has recently

been found by organizations such as Google to be more important for productivity than structural composition of teams or leadership style (Duhigg, 2016). This dissertation's findings contribute to the line of thought according to which team's communication climate (psychological safety, Edmondson, 1999, 2003; PSCC, Gibson & Gibbs, 2006) is more important for mitigating challenges of subgroups and distributed teams' productivity than team composition, distribution or leadership.

Also based on case studies of two teams, the team with a lower faultline level (RTech) and thus hypothetically a lower potential to split, actually demonstrated a lower level of PSCC and larger social distance. Communication in this team was collegial but because of less inclusive communicative practices visible in team meetings and a very competent but exclusively task-focused leader, the team did not manage subgroups well. It was a much less engaged and innovative team in the long run. Based on the fact that WynTech had a higher level of faultlines than RTech (based on quantitative calculations in R) but managed its subgroups better, these findings are contrary to what faultline theory (Lau & Murnighan, 1998) would predict. Unlike this dissertation, faultline theory predicts negative main effects for team processes and outcomes. While it might be true that dormant faultlines impact team processes and outcomes directly and indirectly, the findings regarding communicative behaviors that helped WynTech team overcome salient subgroups give hope to the theory and practice of global teams.

Regardless of the lack of statistical significance in the moderating relationship of PSCC and identification for the relationship between faultlines and innovation, the qualitative findings provided evidence that PSCC played an important role for decreasing the salience of social distance. Communicative practices can diminish perceived

subgroups; therefore GVTs with a climate in which any members, regardless of status and experience, can state their opinions and challenge others, are likely to be the most productive and innovative ones.

The ideal communication climate for team innovation and satisfaction in global teams is a climate that includes all team members. This suggests that the most effective global teams are those in which there is the right balance of informal communication and healthy competition so that teammates feel vulnerable enough to participate and question each other regardless of status. This type of climate might be very difficult to achieve especially among distributed team members, however this study hopes to provide some practical recommendations. Without communicative practices that promote interaction between higher and lower status subgroups, status differences become more salient and entrenched, leading teams to increase process losses of divergence (Stahl et al., 2010) instead of benefits from diversity and geographical distribution.

Overall, the findings have important implications for theory and future research in several areas: faultlines and subgroups, global team communication (including technology use and diversity) and organizational communication more broadly. Practical recommendations for organizations operating within the realm of knowledge work and innovation are provided.

Theoretical Contributions

The findings of this dissertation present a valuable contribution to the lines of research on faultlines and subgroups, global team communication (including technology use and diversity) and organizational communication more broadly.

Faultlines and subgroups. This study adds to the faultlines and subgroups

literatures by investigating the role of both objective and subjective as well as dormant and activated subgroups. In line with limited previous studies (i.e. reviewed by Shemla et al., 2014; Thatcher & Patel, 2011), team diversity does not impact team processes and outcomes directly but through team members' awareness of perceived subgroups, which in turn impact interaction and team outcomes. Studying perceived similarity and distance enables researchers to move beyond a static view of diversity in teams (Zellmer-Bruhn et al., 2008). The results of the study complicate the faultline theory (Lau & Murnighan, 1998) and add to the literature on the importance of subjectively perceived, socially constructed subgroups. The findings also suggest that looking at team diversity uni-dimensionally (i.e. only gender diversity) is counterproductive, as the overlap of several surface and deep level diversity characteristics matters for triggering subgroups, similarly to earlier studies on intersectionality that investigated how the intersection of gender and race affected such outcomes as pay gaps or stereotyping (Browne & Misra, 2003).

This study adds two additional components to the faultlines literature. First, the role of geographical differences has been under-appreciated by the faultlines measures (Meyer & Glenz, 2013). This study finds that geographical distribution should be given more weight in faultline calculation than other factors because it contributes to triggering to a greater degree. Second, not only geographical but also social distance contributes to subgroups. This suggests that more attention should be paid to team members' interaction climate as it relates to status differences in organizational teams. Certain communicative practices can diminish the role of objective diversity faultlines (resulting from overlap of geographic location, gender, functional and organizational tenure differences), preventing them from even becoming salient. If team members do not perceive the subgroups, the

result might be well-functioning teams with satisfied and productive employees. If team members through interaction build a climate in which each team member's opinion is valued, they feel free to express opinions and there's an atmosphere of encouragement as well as team identification, objective faultlines might never become activated into subgroups. In line with previous research, awareness of subgroups had negative outcomes for team satisfaction (Shemla et al., 2014). Although subgroups might benefit individual team members because of informal communication and social support within subgroups, inflexible "invisible walls" between subgroups of different status are counterproductive for teams' knowledge sharing and resources (i.e. time).

On the other hand, findings are in line with SIT/SCT in a way that team members were accommodating in their communication towards in-group as it compared to out-group members as a result of positive in-group biases (Tajfel & Turner, 1986). In addition, the findings contribute to the "in-" and "out-group" bias theory (Tajfel & Turner, 1979) in a new context of global virtual teams. Even though individuals have fewer opportunities to choose whom they work with on a given task in an organization, the dynamics resulting from associating with similar others are prominent in these teams.

Global team communication. The study also adds to the global team communication literature because it focuses on the role of team diversity, geographic distribution and technology use for global teams. Foremost, the study adds to the line of research on communication climate and GVT identification literatures (Ashforth & Mael, 1989). PSCC has previously been found to be a moderator in the relationship between team diversity and innovation (Gibson & Gibbs, 2006). This dissertation identifies a particular role of communicative brokers for fostering PSCC. Correspondingly, both

PSCC and team identification played a major role as the processes that decreased the subjective salience of subgroups. Higher-level team identification in this case prevented the challenging crystallized subgroups from occurring. Prior literature has previously explored interactions between different levels of identification (Ashforth et al., 2008) but this study provides deeper insights into the team level of analysis.

The study also adds to the debate on the role of ICTs for organizational teams. Specific ICTs tools (i.e. ESM tools) use can contribute to overcoming challenges of geographical distance in global teams. For example, ESM tools that might increase visibility and knowledge sharing (Leonardi, 2014) such as Yammer, might not be good for lower status team members because their organization-wide audience might make them feel intimidated, while the smaller audience of such tools as Slack enables more willing participation from low status team members (i.e. the less experienced, from locations other than HQ). This might create tensions related to multiple goals of social media use by global organizations explored earlier by Gibbs, Rozaidi and Eisenberg (2013).

Organizational communication. Lastly, the dissertation contributes to organizational communication literature in general because of its focus on bona fide groups (Putnam & Stohl, 1990). Putnam and Stohl recommended to move away from zero-history, experimental or laboratory groups and to strive to research small groups in their natural settings, groups in context. They also encouraged utilizing field studies for groups in organizations and looking into internal and external dynamics of group processes.

This study also adds to the communicatively constructed identification literature

(Cheney, 1983b; Scott et al., 1998) on the subgroup level of identification in teams. The study extends communicatively constructed identification theory to demographic faultlines and subgroups in global teams interacting over distance. Teams that had higher levels of faultlines but were able to build shared team identification through interaction in a collocated or distributed fashion did not build up salient subgroups.

The present project adds to the theoretical debate about the role of diversity for team processes and outcomes in the context of globally distributed teams but unlike network homophily theory (i.e. Yuan & Gay, 2006) would posit, suggests that teams should not strive for stronger homogeneity and reduced geographic distribution. Rather, teams should strengthen their communicative practices, for example by providing ample training on ICT tools, team building and identifying communicative brokers.

Distanced leadership. Lastly, by focusing on leadership behaviors, the dissertation identifies additional communicative competencies (Ruben, 2006) of distanced leaders (Connaughton & Daly, 2003, 2004a, 2004b) important in today's workplace contexts. Inclusion of lower status team members is a skill necessary for more effective managing diverse and distributed team members as inevitably subgroups of different status emerge in such teams. Inclusive behaviors of "communicative brokers" (not formally appointed leaders but emerging individuals who kept encouraging team members from lower status subgroups to participate) reduced the negative consequences of social distance. This dissertation found also that leadership behaviors of formally appointed leaders associated with including team members in interaction mattered for decreasing the salience of geographical distance. It is worth noting that one of the formal leaders who started as a lower level employee and emerged as a team leader might have

had specific brokering skills that preceded and contributed to his promotion. Therefore, if given the opportunity, communicative brokers might have a better chance of success as distanced leaders due to their interpersonal skills and sensitivity. These findings are in line with recent approaches to leadership resulting from a more communicative approach to leadership prioritizing social influence (i. e. Ruben & Gigliotti, 2016) and shared leadership (Eisenberg, Gibbs, Erhardt, in press; Hoch, 2013). This communicative approach to leadership considers the roles of "leader" and "follower" as arbitrary as for example team members create, convey, select, and attach meaning to the messages that inform and shape their lives (Ruben & Stewart, 2016). As such, leadership is much more complex, dynamic, and unpredictable than resulting from formal position and followership (Ruben & Stewart, 2016).

Practical Implications

One potential practical implication of the present study is that certain recommendations for achieving innovation in teams could be provided. The recommendations are focused on team member interaction and ICT use in order to benefit from team diversity and dispersion in order to minimize process losses due to team diversity.

There are a few ways of managing team diversity in order to reap the benefits of global talent. One of them is encouraging teams to build strong communication processes such as identification and PSCC. Inclusion of all team members is likely to diminish team members' subjective perceptions of subgroups even if they occur and encourages an overall culture of appreciation of diverse team contributions. These processes increase the likelihood that faultlines will remain dormant and decrease negative consequences of

team demographic faultlines and geographic distance. These findings are important because they suggest that teams can be encouraged and trained to communicatively strengthen these processes, and in consequence, prevent faultlines from being triggered into destructive subgroups.

Considering the findings, the main actions that organizations could take to manage dormant faultlines and subgroups should focus on training, coaching and breaking up cliques. Training for team members or team leaders at the minimum should be provided. Teams working across distance should be coached on how to organize cross-location team-building activities. Identifying and encouraging communicative brokers (change agents) could also be an effective way of managing subgroups in organizational teams. Another one should breaking up cultural and location based cliques to prevent strong subgroups from forming (Earley & Mosakowski, 2000; Gibson & Vermeulen, 2003). This can be done by organizing work arrangements and office configurations to increase cross-cultural interaction both within and across locations (Gibbs & Boyraz, 2015), as well as organizing cross-location team building sessions. The most salient subgroups are associated with social and geographical differences, therefore, rather than allowing for strong subgroups aligned with geographical location to form and create divisive rifts and negative attributions (Cramton & Hinds, 2005; Hinds et al., 2014; Yilmaz & Peña, 2014), they are best prevented by strengthening competent communicative practices. A decrease in perceived subgroups can be achieved by strategic ESM use in teams in particular but not only by providing the tools but training and providing their benefits to employees who work in global teams.

As mentioned, training should be a big component of practical implications of this

study. Specifically, more attention should be paid to communicative leadership skills in training. Lower level employees, especially technical employees like software engineers, Quality Assurance (QA) specialists or Development Support (DS) usually get meager training about working in teams, communication or leadership skills. Because certain processes like team identification and PSCC were found to moderate the relationship between faultlines and perceived team subgroups, and distanced leadership skills helped overcome geographic distance, fostering them will increase the likelihood that faultlines will remain dormant and decrease negative consequences of team diversity, geographical and social differences. This finding is particularly important because team members can be trained to strengthen these team processes. If not only leaders but especially lower level employees are trained on strengthening PSCC and team identification, it might prevent faultlines from turning into destructive subgroups and foster benefits of diversity. Many team-building and training activities could easily be done across geographical locations by utilizing videoconferencing or ESM tools. For example, such activities as the "Marshmallow Challenge" (Wujec, 2015) could be coordinated using very few resources but providing a non-intimidating place for team members to interact informally.

Moreover, organizations can identify individuals who demonstrate interpersonal qualities of communicative brokers and provide additional training for them to become change agents in order to foster inclusion of all team members. Should resources to train all employees be limited, these change agents could provide the means for the teams to decrease the salience of subgroups. This could be achieved by following a certain structure of team meetings and by brokers following a checklist in order to monitor team interaction for team participation and keeping all team members involved (i.e. by saying:

"Ok, Sally – you haven't talked for a while, what's your take on this?"). Lastly, training could instruct employees on ESM tools for team and organization-level communication and utilizing them for cross-location team building by having their own tech-savvy employees or identified communicative brokers work as part-time trainers.

Top management definitely plays a role in reinforcing the vision and providing the resources for team development as well as the institutional level ICT ecology for organizations. In order for global teams to benefit the organizations and make them satisfying experiences for team members, employees should be constantly reminded about the benefits and meaning of teamwork and informed about how the vision of the organization and goals of teams are aligned.

The headquarters in the U.S. was considered the "hub of innovation" and other remote locations where employees were paid less and English proficiency was lower. Organizations are prone to the headquarters-subsidiary dynamics in which other locations perceive as having less status (Hinds et al., 2014). It definitely impacts GVT relationships, therefore more attention should be paid to status differences and to the way changes within organizations are communicated to employees from different locations. For example, in the present dissertation, those in the headquarters were more likely to be proficient in English and older. Meetings were hosted mainly in the HQ with unequal participation, making employees from lower status subgroups feel left out. The tensions between geographical locations of a global company are expected but they could be minimized for example by higher status subgroup members toning down their status (as suggested for example by Neeley, 2015). Organizations should ensure contributions and buy-in from lower status employees and consider communication between various

stakeholders if they want to benefit from diversity and distribution.

Employees in remote locations were expected to perform menial tasks and follow the lead of HQ. This dynamic was not healthy for employee morale and innovation, yet it is common in global outsourcing arrangements (Gibbs, 2009). Communication does play a crucial role in how status differences are communicated, thus, careful attention needs to be paid as to how different levels of employees are treated. To ensure that lower status locations and functions are being treated fairly from this point of view, such departments as Corporate Communications or HR should play the lead role.

Without communicative practices that promote interaction between higher and lower status team members, subgroups become more salient and teams fail to fully benefit from diversity and geographic distribution. The main motivation for employing diverse teams with team members distributed in different parts of the globe might be driven by the bottom line (cheaper labor in certain parts of the world, high costs of travel) but the way team members treat each other requires more attention (as for example Hinds et al., 2014 posit). Without deliberate efforts on the part of the leaders and without creating a climate of PSCC in global teams, subgroups will become more salient and have the potential to negatively impact team satisfaction, innovation and overall viability.

Limitations

One limitation of this study that the research site is one organization and the case study sample is two teams, which may decrease the generalizability of findings. The high response rate (83%) of the survey is promising, however limitations related to cross-sectional surveys apply to this study. For example, the majority of variables (except for innovation, which was independently rated by managers) were based on self-perceptions

of study participants.

The finding that perceived team subgroups had no impact on the relationship between faultlines and innovation might be related to the way innovation was measured in the study. Mid-level managers rated team innovation from their perspective and these independent ratings may be less likely to be related to each other than self-reported survey questionnaire results. Measurement of team level performance has long faced challenges (i.e Brannick, Salas, & Prince, 1997), although it is a more rigorous measure. Nevertheless, the qualitative findings provided depth into how communicative practices triggered subgroups and how global teams managed subgroups, and as a result, remained effective and innovative.

The sample of two teams that served as the source of data for a case study was small but in order to increase the variance between team characteristics, the two teams were different structurally, in terms of team stage and product. Change over time helped to overcome this limitation as it provided rich source of interactions in order to identify critical incidents in which subgroups were salient.

Another possible limitation is that due to IRB process, it took a while to obtain approval for the field study. Therefore, the team identified first (RTech) in May 2014 as a new team which was shadowed, turned into a more cohesive team by the time I was able to conduct interviews with team members a few months later. An additional limitation has to do with relying on individuals' recall of events in interviews that served as source of data for the critical incidents. It was previously found that the recall of critical incidents decreases over time (Flanagan, 1954).

Future Directions

Because this study emphasized that the team composition mattered less than communicative behaviors within the team for how global teams managed subgroups, studies should look at communication content (verbal, nonverbal, text-based) and context to discover what type of communicative practices are associated with better subgroup management. Concepts such as psychological safety (Edmondson, 1999, 2003; Gibson & Gibbs, 2006) and engagement (Costa, Passos, & Bakker, 2015) are being recognized by such organizations as Google (Duhigg, 2016), Adobe, or Zappos, as important ones for team productivity and deriving benefits of teams. Communication scholars need to be able to provide not only theoretical frameworks but also practical recommendations for organizations trying to change structures from top-down hierarchical structures to flatter ones such as self-managed teams.

In addition, scholars should look at the impacts of both physical and perceived proximity on team collaborations by utilizing such approaches to communication as looking at interaction linguistically, systematically looking at turns at talk (Carter, 2015) or interaction networks with the help of sociometric badges (Wu, Waber, Aral, Brynjolfsson, & Pentland, 2008). Future studies should look at long-term impacts of team diversity on subgroups in larger samples of teams, especially in field studies. It is important for communication scholars to add to research on groups and teams in modern forms of organizing in different types of organizations.

Furthermore, as mentioned earlier, the fact that perceived team subgroups were found not to impact the relationship between faultlines and innovation in the present study, provides an avenue for future research to investigate further how to measure team

level innovation in a reliable manner and which factors may explain and predict team innovation and performance.

Moreover, future studies should continue to look how subgroups are activated and what kind of communicative practices and ICT use alleviate them. Organizations tend to invest money in ICTs, including ESM, assuming that if the tools to communicate are available, employees from all levels of the organization will use them. The benefits of ICTs for within-team and cross-team knowledge sharing do not occur to employees intrinsically. Research on tensions (explored for example by Gibbs, Rozaidi and Eisenberg, 2013) related to multiple goals of social media (i.e. micro-level for team use such as Slack versus organization-wide Yammer) and affordances (Leonardi, 2011) might be a good avenue to move this line of research forward.

More research and training are necessary for organizations to fully benefit from globally dispersed teams. It is natural human tendency to associate ourselves with similar others and it would require a lot of training in communication and "soft skills" for team members to learn how to benefit from team diversity and interaction. The communication discipline should continue to contribute to this line of research on organizational global teams.

Conclusion

Based on this dissertation and previous literature (i.e. Gratton et al., 2007), various factors may foster subgroup formation such as national culture, gender, team identification, functional and organizational culture. This study adds to the literature because it takes a communicative view of subgroups. Perceived subgroups moderate the relationship between dormant faultlines and team satisfaction. Although they were found

not to impact team innovation in the present study, if subgroups are salient, they might impact important processes and outcomes of GVTs such as team satisfaction.

Team diversity is made visible through interactions in teams and impacts who talks to whom. Innovation and team satisfaction seem intrinsically related. Diverse and geographically distributed but effective teams have the potential to achieve more than individuals working alone but are very challenging. The most important finding of this dissertation is that team processes and communicative practices make a difference as to when faultlines will be triggered. Social and geographical distance triggered subgroups in interaction. It is promising that communicative practices can help overcome the challenges associated with high level of faultlines, preventing subgroups from crystallizing. When we think of these subjectively perceived subgroups as attitudes and behaviors, they can be changed. Communication climate, communicative behaviors of team members and formal leaders (including ICT use) make a difference as to when faultlines are salient for team outcomes.

Subgroup formation may stifle innovation and reduce morale but certain team processes and communicative practices help overcome subgroups in global teams. Global teams should have the knowledge of subgroup dynamics and be provided the skills to deal with challenges associated with subgroups. Subgroups are unavoidable but there are ways to manage them and hopefully this study informs research and practice in this area.

It is important to focus on communicatively overcoming challenges of working in global teams as these challenges will continue to be important in global organizations. Future studies should continue to look at how subgroups are activated and what communicative behaviors, team processes and ICT use alleviates them over time.

Faultline calculation should be carefully performed with assigning geographical and time zone differences more weight than other factors. More empirical research on the interaction processes leading to innovation and satisfaction in global teams is definitely needed. Communication scholars have naturally vested interest in processes and interactions, making them uniquely qualified to provide understanding of global organizational forms. It is important to focus on overcoming challenges of working in "bona fide" teams as the challenges related to factors such as geographic distribution, cultural diversity and dependency on technology will continue to be important in the workplace.

Global virtual teams are indispensable work forms in contemporary organizations. Laying the groundwork for research in the examination of communicative practices that overcome subgroups in global teams, this dissertation makes valuable contributions to organizational communication literature. Using faultline analysis along with other research methods, organizational communication scholars can start exploring how various subgroups emerge in virtual work arrangements. Overall, the findings of this dissertation confirm that a closer examination of subgroup interaction is necessary for a profound understanding of diversity and group dynamics in global teams.

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Appendix A. Hypotheses and Research Questions

	Hypotheses
H1	Team identification moderates the relationship between faultlines and subgroup strength in global teams, such that with high levels of team identification, the level of perceived subgroups will be low even if the faultline level is high.
H2	PSCC moderates the relationship between faultlines and perceived subgroup strength in global teams, such that with high levels of PSCC, the level of perceived subgroups will be low even if the faultline level is high.
H3	Perceived subgroup strength moderates the relationship between faultlines and team satisfaction in global teams, such that with low levels of perceived subgroups, team satisfaction will not be negatively affected by high levels of faultlines.
H4	Perceived subgroup strength moderates the relationship between faultlines and team innovation in global teams, such that with low levels of perceived subgroups, team innovation will not be negatively affected by high levels of faultlines.
	Research Questions
RQ1	What are the most important factors triggering faultlines/making them visible and salient?
RQ2	Can certain team processes and communicative practices help overcome the negative consequences of subgroups in global virtual teams?

Appendix B. Theoretical Model
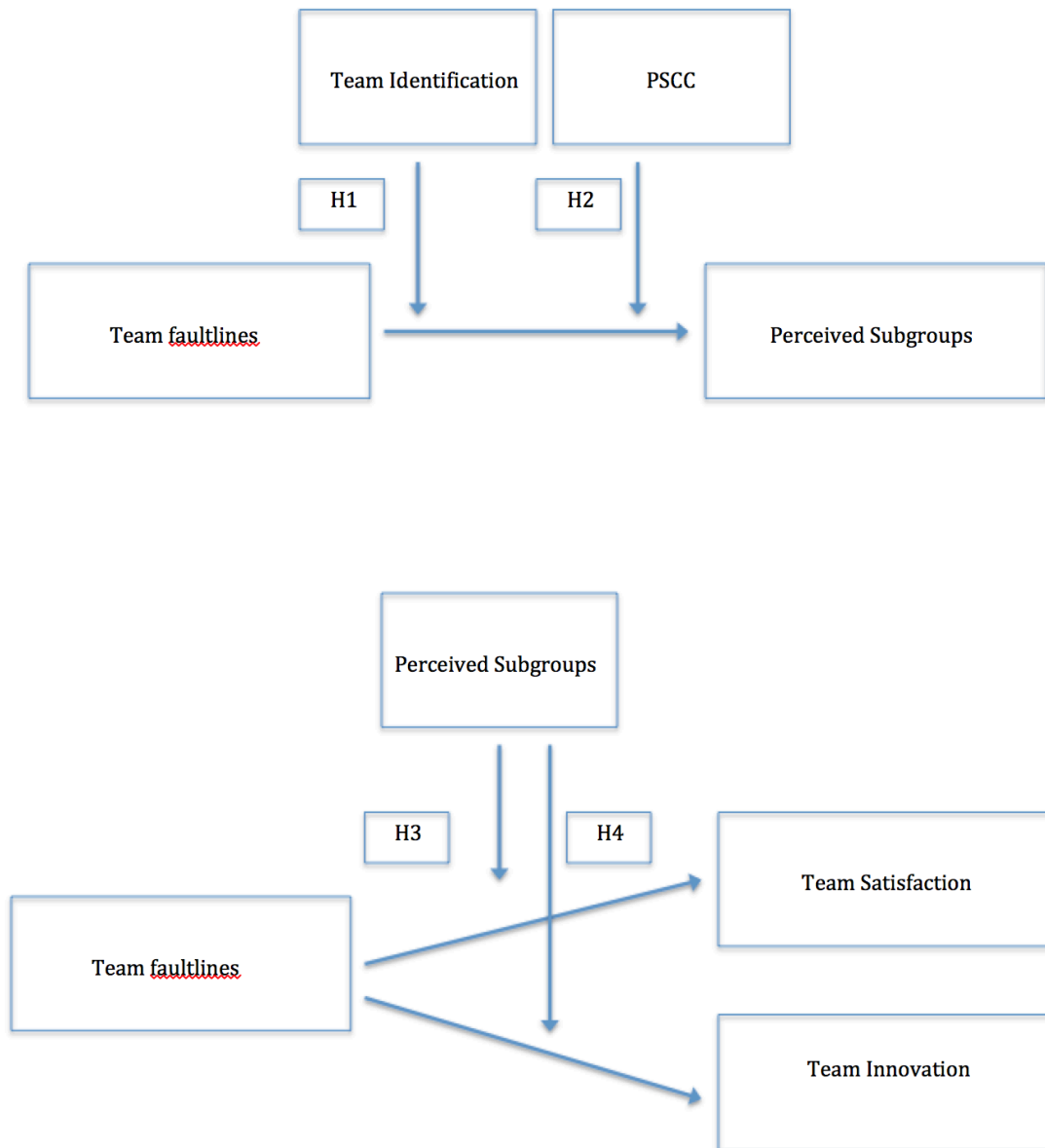
Appendix C: Interview Consent Form

Interview Informed Consent Form (for Institutional Review Board for the Protection of Human Subjects at Rutgers University)
You are invited to participate in the interview as part of a research study on knowledge sharing in a global organization. The purpose of this study is to learn more about the role of technologies and communication practices in enhancing knowledge sharing and collaboration across teams and boundaries. The study procedures include an individual interview, which should take about 15 to 45 minutes.

This research is confidential. The researcher will generate and assign a random code to your identity, and this information will be stored in a secure location to which only the involved researchers have access. The data will be analyzed in the group level; thus, individual responses will not be shared with anyone. If a report of this study is presented or published, only group results will be stated.

Participation in this interview is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you. Also, you may feel some discomfort in sharing or responding to some of the questions asked. You may refuse to answer any question that makes you uncomfortable. Other than that, there are no physical or psychological risks expected from this research.

You will receive a summary of research findings when the analyses are completed. In addition, you may find the questions interesting and useful in terms of reflecting your own working experiences. Your participation is valuable, and it will help us better understand current practices of sharing and collaboration and find a way to improve such practices.

The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the data, except as may be required by law. Data will be kept for three years in an electronic password-protected file, and then destroyed.

This is a scientific study being conducted by Maggie Boyraz (Ph.D. Candidate, Department of Communication, Rutgers University), and Heewon Kim (Ph.D. Candidate, Department of Communication, Rutgers University). Questions or comments about this research should be directed to Heewon Kim at:

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Concerns about your rights as a research subject should be directed to the IRB
Administrator at Rutgers University at:
Rutgers University
Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs
3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: 848-932-0150
Email: humansubjects@orsp.rutgers.edu

Appendix D: Survey Consent Form

Survey on Knowledge Sharing and Collaboration in a Global Organization

You are invited to participate in the following survey as part of a research study on knowledge sharing in a global organization. The purpose of this study is to learn more about the role of culture and technologies in enhancing collaboration for innovation within teams and across boundaries as well as the role of communication behaviors within and between subgroups in distributed teams. The study procedures include an online survey, which should take about 20 minutes to complete.

This research is <u>confidential</u>. The researcher will generate and assign a random code to your identity, and this information will be stored in a secure location to which only the involved researchers have access. The data will be analyzed at the group level; thus, individual responses will not be shared with anyone. If a report of this study is presented or published, only group results will be stated.

Participation in this survey is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you. Also, you may feel some discomfort in sharing or responding to some of the questions asked. You may refuse to answer any question that makes you uncomfortable. Other than that, there are no physical or psychological risks expected from this research.

If you complete the survey, you will be entered into a raffle to win one of three $50 gift certificates to Amazon. You will also receive a summary of research findings when the analyses are completed. In addition, you may find the questions interesting and useful in terms of reflecting your own working experiences. Your participation is valuable, and it will help us better understand current practices of sharing and collaboration and find a way to improve such practices.

The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see your individual responses, except as may be required by law. Data will be kept for three years in an electronic password-protected file, and then destroyed.

This is a scientific study being conducted by principal investigators Heewon Kim and Maggie Boyraz, and their faculty advisor Dr. Jennifer Gibbs. Questions or comments about this research should be directed to the researchers at:

School of Communication and Information
Rutgers, The State University
4 Huntington St.
New Brunswick, NJ 08901-1071

Jennifer Gibbs: jgibbs@rutgers.edu, 848-932-8716

Heewon Kim: techne@rutgers.edu
Maggie Boyraz: mboyraz@rutgers.edu

Concerns about your rights as a research subject should be directed to the IRB
Administrator at Rutgers University at:

Rutgers University
Institutional Review Board for the Protection of Human Subjects
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3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: 848-932-0150
Email: humansubjects@orsp.rutgers.edu

Clicking the button below indicates you agree to participate in this research study.

Appendix E. Interview protocol

[Protocol: start with completion of the chart on p. 140]

1. Who on your team do you communicate with most often in your work?
2. Who on your team do you communicate with most often informally? In other words, whom you would normally go to lunch with? With whom you feel like you share similar values?
3. Who on your team do you rarely communicate with and why? [This question is asking about outgroup team members]
4. Does your task/job require that you collaborate with IG employees that are in other locations? If yes – where are the coworkers and what challenges have you found in this collaboration?
5. If yes to previous question: How do you interact with your distributed colleagues? (question about technology and broader about relationships)
6. Do you think technology may contribute that you feel closer to some team members more than others? Which technology more/less than others and why?
7. Does culture matter for collaboration in your team? How about language skills? [Prompt: meaning national culture, where you come from or functional culture – what profession you are]
8. Can you recall recent situation(s) in your team in which the people from formed a subgroup? Could you describe such example (s) in more detail? What happened? (Prompt: imagine for instance people who talk a lot in a meeting versus people who have a lot of technical knowledge or people of the same age or coming from different cultures supporting interacting differently with each other and treating others ideas without openness; explain that alliances are not necessarily negative).
9. What situation(s) might have caused this/these subgroup(s) to form? What kind of behavior of your team members may cause subgroups to form? (Prompt for other than task related reasons; for example: location, values of team members).
10. Have you noticed these subgroups or alliances changing over time (depending on a situation)? Could you describe an example or two?
11. What do you think outcomes/impacts of subgroups may be?
12. Do you think subgroups could be beneficial for your team? When? Can you recall a situation in which they have been?
13. Do you think subgroups could be challenging for your team? When? Can you recall a situation in which they have been?
14. Can you recall situations in which the interaction with people from different cultures was not as successful in terms of achieving a goal? Could you describe such interaction(s) with your team members?
15. Have you noticed instances in your team in which people should communicate more with each other and yet they do not?
16. Have you observed instances in which tensions of different departments or functions occurred? (for example QA and DEV, Marketing and Sales)
17. Are you a member of a community of like-minded individuals from your profession? Are employees of Iggitech collaborating on similar issues and problems that may be experienced by specialists in your profession? [Prompt for communities of practice,

for example for software engineers or Quality Analysts to share ideas and tips on how to solve issues]


Your Name _____ _____
Date_____

Who do you communicate most often with from your team(for task related purposes)? Write your name and their names in position to yours; the closer the name, the more important the interaction. **Mark names of the people who you communicate most often with informally with an asterisk*.**
Which technology are you more likely to use with those you communicate more with?
Which technology are you more likely to use with those you communicate less with?
Which technology are you more likely to use for task related purposes?
Which technology are you more likely to use with those you communicate with for social/informal purposes?
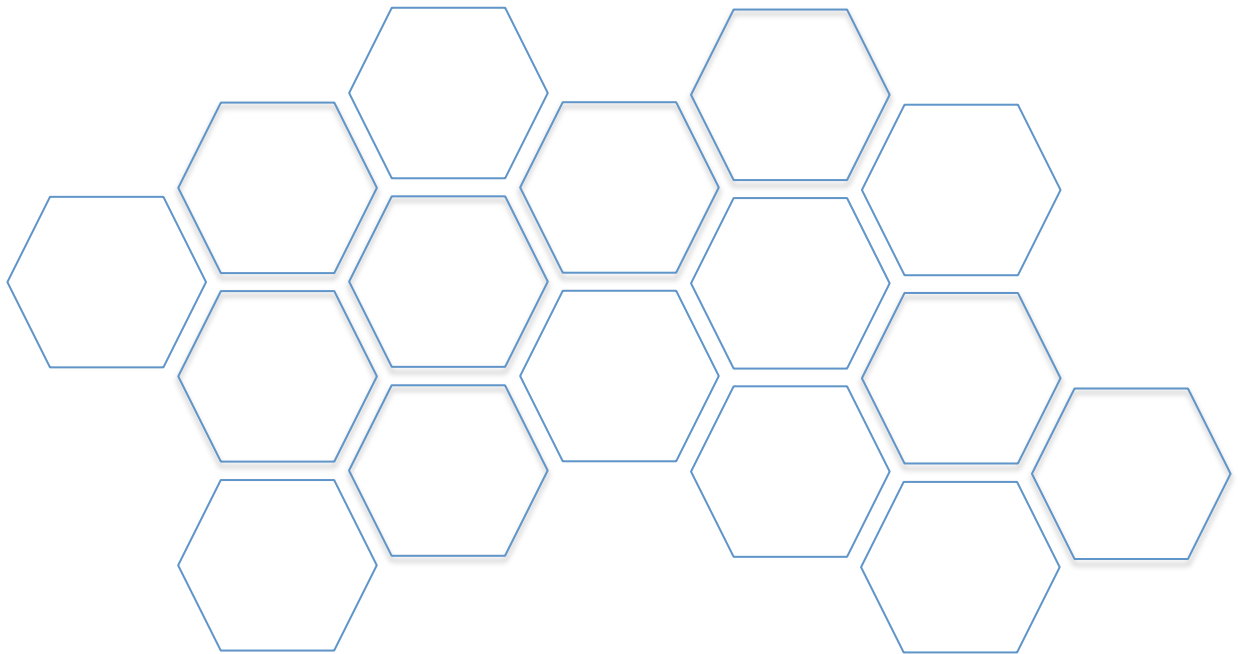
Appendix F: Survey Questionnaire, Individual Survey

Enhancing Team Collaboration Survey

The purpose of this survey study is to learn more about the role of culture and technologies in enhancing collaboration for innovation within teams and across boundaries as well as the role of communication behaviors within and between subgroups in distributed teams.

This research is **confidential**. The researchers will generate and assign a random code to participants' identity. The data will be analyzed at the group level.
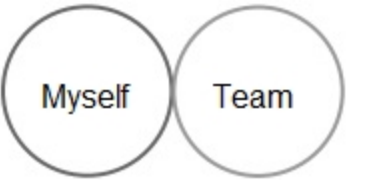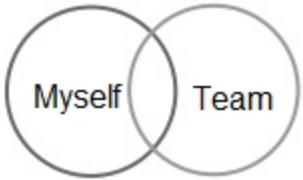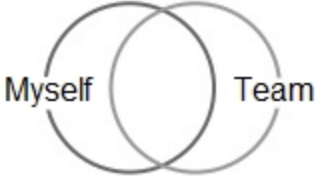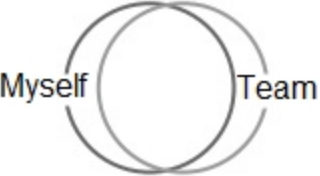
[Team identification]
Please rate the extent to which you agree with the following statements about your primary team. (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)

1. When someone criticizes my team, it feels like a personal insult.
2. I am very interested in what others think about my team.
3. When I talk about my team, I usually say "we" rather than "they."
4. This team's successes are my successes.
5. When someone praises my team, it feels like a personal compliment.
6. If a VP criticized my team, I would feel embarrassed.

[Team identification, visual]
Please view the diagram and think about your relationship with your primary team. Please select the number that most closely matches your relationship with your primary team.

[Perceived subgroup strength]
The following questions ask about subgroups within your main work team. Subgroups and alliances can be explained as subsets or smaller groups within the team that form along social, rather than task-based lines, and may be based on cultural, functional,

gender, age, location, or other differences. (1 = Not at all, 2 = Small extent, 3 = Moderate extent, 4 = Large extent, 5 = Very great extent)

1. To what extent has your team split into subgroups?
2. To what extent has your team cracked into smaller cliques?
3. To what extent has your team divided into subsets of people?
4. To what extent has your team broken into two groups?

[Subgroups as a challenge]

Please answer the following open-ended question:

In what ways are subgroups challenging for your team?

[Subgroups as beneficial]

Please answer the following open-ended question:

In what ways are subgroups beneficial for your team?

[Task interdependence]

The following questions ask about how closely you need to work with others within or outside Iggitech.

1. I work closely with others in doing my work.
2. I frequently must coordinate my efforts with others.
3. My own performance is dependent on receiving accurate information from others.
4. The way I perform my job has a significant impact on others.
5. I work fairly independently of others in my work (R).

[Psychologically Safe Communication Climate]
Please indicate the extent to which the following statements characterize your team. *(1 = Not at all, 2 = Small extent, 3 = Moderate extent, 4 = Large extent, 5 = Very great extent)*

1. Team members are able to say what they think.
2. When there's a problem, team members talk about it.
3. People use words that are considerate of others' feelings.
4. Team members are free to be assertive about what they think and feel.

[Team satisfaction]
The following set of questions asks about your satisfaction with your team. *(1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree)*

1. I am satisfied with how things in my team are going.
2. I am satisfied with how my team members have been performing during our present task.
3. I am satisfied with how my teammates and I work together.
4. I expect to stay in my team/work unit for a long time.

5. I would like to change teams/work unites.
6. If I have a choice, I will be working in the same team/work unit three years from now.

[English language proficiency]
The question asks about your English language proficiency. Choose the option that best reflects your writing and speaking skills.

1. Not so good (I often have difficult finding the correct terms and saying and writing them correctly)
2. Good enough (People understand what I say and write but it is not considered to be good English)
3. Good (I speak and write well but with some errors)
4. Very good (I speak and write fluently)
5. English is my native language.

[Organizational tenure]

How long have you worked for Iggitech?

1. Less than 1 year
2. 1-3 years
3. 4-9 years
4. 10-14 years
5. 15 years or more

[Team tenure]

How long have you worked in your current team?

1. Less than 1 year
2. 1-3 years
3. 4-9 years
4. 10-14 years
5. 15 years or more

[Manager]

Who is your direct supervisor at Iggitech? _____

[Gender]

What is your gender?

1. Male
2. Female.

[Age]

Please select the appropriate age range.

1. 18-24
2. 25-29
3. 30-34
4. 35-39
5. 40-44
6. 50-54
7. 55-59
8. 60 or more.

[Education]

What is the level of your education (please indicate the highest completed)?

1. High school / GED
2. Associate's degree
3. BA, BS or equivalent
4. Some college
5. Master's degree (including MBA or law degree)
6. Doctoral degree.

[Nationality]

Which country or nationality do you most identify with?

1. Bulgaria
2. India
3. Japan
4. Uruguay
5. United States
6. United Kingdom
7. Other (Specify) _____

[Comments]

Do you have any other comments to add? _____

Appendix G: Survey Questionnaire, Manager Survey

Enhancing Team Collaboration Survey [for mid-level managers in charge of 2 or more teams]

The purpose of this survey study was to learn more about the role of culture and technologies in enhancing collaboration for innovation within teams and across boundaries as well as the role of communication behaviors within and between subgroups in distributed teams.

This research is **confidential**. The researchers will generate and assign a random code to participants' identity. The data will be analyzed at the group level.

Thank you for volunteering to participate in our survey. Please answer the following questions to the best of your knowledge, based on your experiences at Iggitech. THIS SURVEY IS FOR MANAGERS TO RATE TEAM PERFORMANCE AND NEXT PAGE INCLUDES QUESTIONS ABOUT INNOVATION.

Please don't spend too long on any one question, even if you are unsure of your answer. Usually your first instinct is the most accurate one. Please answer the following questions to the best of your knowledge, based on your experiences at Iggitech.
THE FOLLOWING QUESTIONS ARE ABOUT TEAM INNOVATION.

[Team Innovation]
To what extent you agree or disagree with statements about each team reporting to you now regarding **team innovation**? Please try to give **different numbers to different teams** (thinking about ranking the teams first may be helpful).
(1 = strongly disagree, 2 = somewhat disagree, 3 = neutral, 4 = somewhat agree, 5 =strongly agree)
1. Team members often implement new ideas to improve the quality of our products and services
2. This team gives little consideration to new and alternative products and services (R)
3. Team members often produce new services, methods or procedures.
4. This team is overall an innovative team.

[Comments]

Do you have any other comments to add? _____

Appendix H. Screenshot of Slack Interface
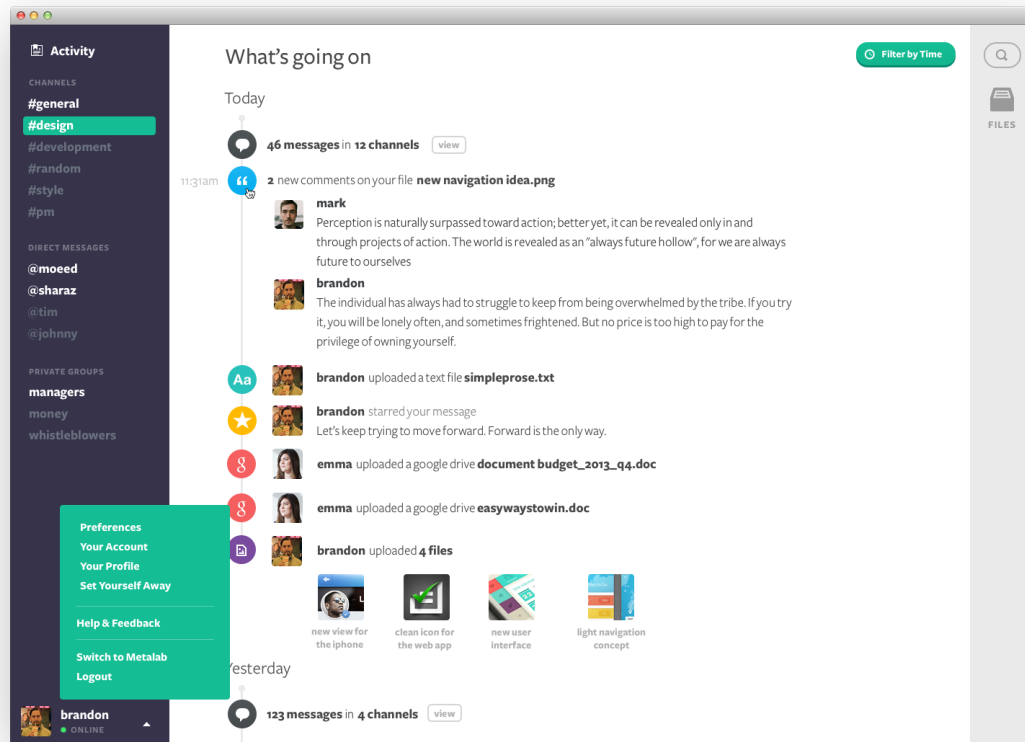
Table 1. Comparison of Team RTech and WynTech Characteristics

	Team Rtech (n=9)	Team Wyntech (n=15)
Gender	2 females + 7 males	1 female (from India) + 14 males
Locations	2: HQ [8 employees] + Montevideo (UY) [1 employee]	3: NJ [8 employees] + NY [2 employees] (US) + Sofia (BUL) [5 employees]
Task innovation	High (newer technology)	Low (older technology)
Team stage	Newer (created by merging two small teams)	Older, established team
ICTs	Email, Skype, IM	Email, Skype, IM, Lifesize (video conferencing), Slack (team use enterprise social media)
Leadership style of the formal leader	Emergent, process and task focused; good distanced leadership skills	Task focused, hands off; weak distanced leadership skills
ASW faultline measure [Range 0 - 1]	.23	.35
Innovation rated by manager (Dec. 2014)	5	1

Table 2. Qualitative Codebook Excerpt, First Level Codes

First Level Codes
Attributions
Benefits of subgroups
Challenges of subgroups
Communication challenges / strategies
Conflict
Critical incident
Cultural differences
Decision making
Deep Level Diversity
Faultline triggers
Formal/Task Communication
Functional differences
Gender issues / differences
Geographical distance
Groupthink
Importance of Relationships
Individual Contributions / Roles
Informal Communication
Innovation
Language differences
Leadership
Motivation
Organizational identification
Power / Status differences
PSCC
Remote work/ teleworking
Role of Face-to-face Communication
Social media communication
Subgroup identification
Subgroups over time
Surface Level Diversity
Team identification
Technology use
Time / coordinating schedules

Table 3. Qualitative Codebook Excerpt, Second Level Codes

Second-level [analytic] codes		
Code	Definition/Explanation	Examples
Geographical distance as trigger	Participants speaking about relationships with employees from other locations and examples of when these differences mattered for the team	Probably the strongest sub-group is the one in HQ. I don't know what goes on in Bulgaria. I think they're probably the second closest sub-group.
Social distance as trigger	Participants speaking about relationships with employees based on associating with others based on surface or deep level diversity feature; examples of when these differences mattered for the team	Sometimes, especially when Derrick talks. All of a sudden he's talking about something different and I'm like: what are you talking about? For example if they are talking about a TV show that they were watching last night and I'm not familiar with that and they're not gonna start with: ok, this happened in this TV show. It sort of happens at random. Those are the places where I get lost.
Strategies to overcome social distance	Participants speaking about relationships with teammates based on triggered subgroups (related for example to common interests or functional differences) and ways that teams were able to overcome these challenges	If you have one leader who is very good technically but he cannot share the knowledge with the team then it's bad but if you have a lead who can improve the quality of communication in the team then if you have smaller technical knowledge in the team but it's distributed within the team then you have overall more knowledgeable team.
Strategies to overcome geographical distance	Participants speaking about relationships with employees from other locations and ways that teams were able to overcome these challenges	Slack helps to overcome challenges related to the disconnect between the two subgroups – people who would not normally speak, chat there. For example there is a Development Support channel there that works well for the Bulgaria subgroup.

Table 4. Within Team Relationships in Teams RTech and WynTech (based on the visual representations of relationships obtained during interviews)

RTech time 1 (n = 8)

	Total number of relationships	Number of informal relationships	Number of informal relationships in same location	Number of informal relationships - different location	Number of formal relationships in different location	Number of formal relationships in same location
Sum	77	32	32	0	10	67
Average	9.63	4.00	4.00	0	1.25	8.38

RTech time 2 (n = 8)

	Total number of relationships	Number of informal relationships	Number of informal relationships in same location	Number of informal relationships - different location	Number of formal relationships in different location	Number of formal relationships in same location
Sum	89	29	29	0	16	73
Average	11.13	3.63	3.63	0.00	2.00	9.13

WynTech time 1 (n = 12)

	Total number of relationships	Number of informal relationships	Number of informal relationships in same location	Number of informal relationships - different location	Number of formal relationships in different location	Number of formal relationships in same location
Sum	122	33	33	0	49	73
Average	10.17	2.75	2.75	0	4.08	6.08

WynTech time 2 (n = 12)

	Total number of relationships	Number of informal relationships	Number of informal relationships in same location	Number of informal relationships - different location	Number of formal relationships in different location	Number of formal relationships in same location
Sum	139	60	58	2	46	93
Average	11.58	5.00	4.83	0.17	3.83	7.75

Table 5. Descriptive Statistics (*n* = 165)

Gender	Male 122 (73.9%)
	Female 43 (26.1%)
Age	18-24 14 (8.5%)
	25-29 51 (30.9%)
	30-34 38 (23%)
	35-39 20 (12.1%)
	40-44 9 (5.5%)
	50-54 13 (7.9%)
	55-59 4(2.4%)
	60 or more 2 (1.2%)
Organizational Tenure	Less than 1 year 23 (13.9%)
	1-3 years 63 (38.2%)
	4-9 years 66 (40%)
	10-14 years 9 (5.5%)
	15 or more years 4 (2.4%)
Education	High school / GED 9 (3.6%)
	Associate's degree 13 (7.9%)
	BA, BS or equivalent 48 (29.1%)
	Some college 45 (27.3%)
	Master's degree (including MBA or law degree) 46 (27.9%)
Nationality	Bulgaria 66 (40%)
	India 7 (4.2%)
	Japan 10 (6.1%)
	Uruguay 24 (14.5%)
	United States 50 (30.3%)
	United Kingdom 2 (1.2%)
	Other 6 (3.6%)
Location	Bulgaria 89 (53.9%)
	Japan 10 (6.1%)
	United States, New Jersey 50 (30.3%)
	United States, New York 6 (3.6%)
	UK 4 (2.4%)
	Uruguay 6 (3.6%)
English Proficiency	Not so good (I often have difficult finding the correct terms and saying and writing them correctly) 6 (3.6%)
	Good enough (People understand what I say and write but it is not considered to be good English) 13 (7.9%)
	Good (I speak and write well but with some errors) 48 (29.1%)
	Very good (I speak and write fluently) 45 (27.3%)
	English is my native language 46 (27.9%)
Functional Differences	Software Engineer 63 (38.2%)

	Software Tester 24 (14.5%) Software Evangelist 3 (1.8%) Development Support 29 (17.6%) Senior Engineer/Project Manager 9 (5.5%) UX/Visual Design 10 (6.1%) IT Sales 23 (13.9%) VP 2 (1.2%)

Table 6. Faultline Strength Measures (ASW)*

	ASW1	ASW2	ASW3**
Calculated based on the factors Team #	nationality, gender, age, location, English proficiency, org. tenure in days all equal weights of 1	location, age, tenure in days, function all equal weights of 1	location, age, tenure in days, function - weights of 1 for location, 0.5 for age, tenure in days, function
1	0.1745	0.2344	0.3824
2	0.3028	0.1929	0.3905
3	0.1503	0.1398	0.1398
4	0.2725	0.1512	0.1512
5	0.1507	0.1673	0.1673
6	0	0	0
7	0.2077	0.1961	0.3998
8	0.2098	0.1730	0.3529
9	0.3	0.1966	0.3255
10	0.1456	0.0892	0.0892
11	0.0751	0.0611	0.2633
12	0.2171	0.188	0.3288
13	0.1647	0.2412	0.3451
14	0.2045	0.1505	0.3387
15	0.2303	0.2167	0.3835
16	0.2062	0.1330	0.3238
17	0.1968	0.1008	0.2892
18	0.2171	0.1824	0.3359
19	0.3319	0.1529	0.3872
20	0.3501	0.2187	0.3979

21	0.2692	0.2113	0.3075
22	0.2756	0.2196	0.3491
23	0.2069	0.1707	0.1707
24	0.2817	0.1538	0.3216
25	0.1994	0.244	0.244
26	0.2022	0.2335	0.3829
27	0.3511	0.2196	0.2196
28	0.2383	0.2536	0.3912
29	0	0	0
30	0.2588	0.1540	0.3414
31	0.25	0.2113	0.2958
32	0.1877	0.1618	0.3417
33	0.3052	0.2776	0.4199
34***	0.2011	0.1715	0.4206

*ASW ranges from 0 to 1

**ASW3 was used to calculate faultline in the research model

***Innovation rating of teams by mid-level managers was not available resulting in a sample of $n = 27$ teams, not 34

Table 7. Means, Standard Deviations, and Correlations Among Study Variables ($N = 27$ teams)

Variable	Mean	S.D.	1	2	3	4	5	6
1. Faultline	.24	.12						
2. Perceived subgroups	1.8	.46	.36[†]					
3. Team identification	4.32	.23	.03	-.36[†]				
4. PSCC	3.98	.44	.00	-.16	.55**			
5. Team satisfaction	3.98	.33	-.08	-.34[†]	.35[†]	.78**		
6. Team innovation	3.54	.54	-.16	-.06	-.24	-.16	.02	-.16

[†]$p <.10$; *$p <.05$; **$p <.01$;

Table 8. Moderation Analyses ($N = 27$ teams), Faultline as Independent Variable

Dependent variable	Perceived Subgroups	Perceived Subgroups	Team Satisfaction	Team Innovation
Direct effect	39.4*	16.74**	5.04*	5.05
Faultline x Team Identification	-8.75*			
Faultline x PSCC		-3.80**		
Faultline x Perceived Subgroups			-2.56*	
Faultline x Perceived Subgroups				-2.97
Total R^2	0.4	0.38	0.32	0.12

*$p <.05$; **$p <.01$

Table 9. Correlations of Headquarters Versus Other Locations and Demographics (*n* = 165)

		HQ vs. other locations	Status	English Proficiency	Tenure in days	Age	Gender
HQ vs. other locations	Pearson Correlation	1	.087	.620**	.119	.236**	-.029
	Sig. (2-tailed)		.268	.000	.128	.003	.710
	N	165	164	158	165	151	165
Rank (function)	Pearson Correlation	.087	1	.044	.425**	.227**	.291**
	Sig. (2-tailed)	.268		.587	.000	.005	.000
	N	164	164	157	164	150	164
English Proficiency	Pearson Correlation	.620**	.044	1	.245**	.175*	-.033
	Sig. (2-tailed)	.000	.587		.002	.032	.681
	N	158	157	158	158	151	158
Tenure in days	Pearson Correlation	.119	.425**	.245**	1	.450**	.118
	Sig. (2-tailed)	.128	.000	.002		.000	.130
	N	165	164	158	165	151	165
Age	Pearson Correlation	.236**	.227**	.175*	.450**	1	-.019
	Sig. (2-tailed)	.003	.005	.032	.000		.815
	N	151	150	151	151	151	151

Gender	Pearson Correlation	-.029	.291**	-.033	.118	-.019	1
	Sig. (2-tailed)	.710	.000	.681	.130	.815	
	N	165	164	158	165	151	165

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 1. The effect of team identification on the relationship between faultlines and perceived subgroups
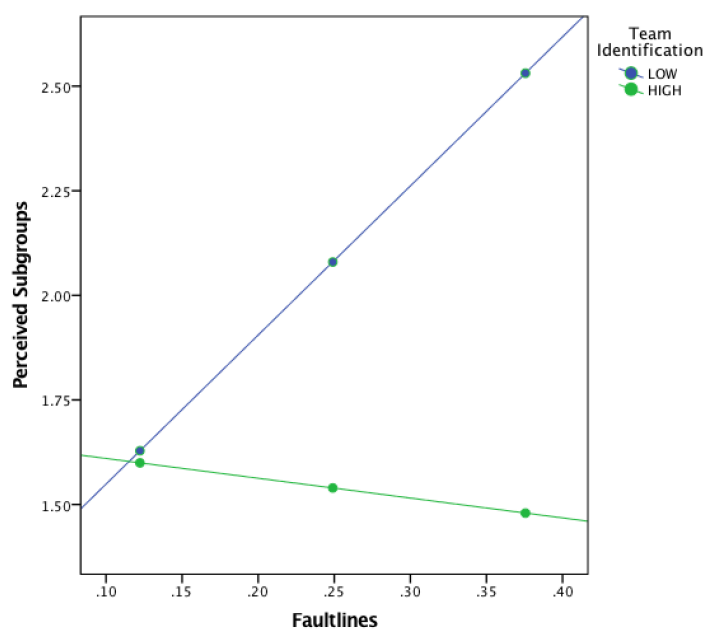

Figure 2. The effect of PSCC on the relationship between faultlines and perceived subgroups
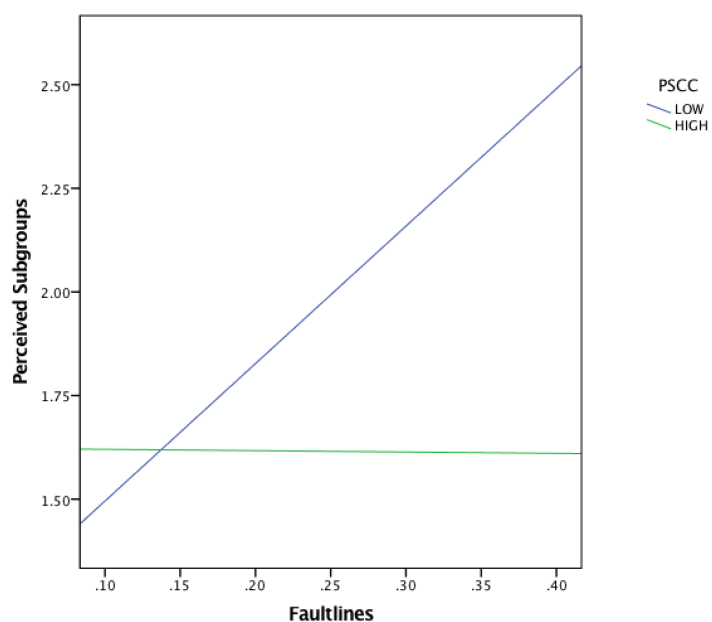
Figure 3. The effect of perceived subgroups on the relationship between faultlines and team satisfaction