The Effect of Asynchronous Communication on the Relationship between Intragroup Conflicts and Transition Processes.

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Dissertation written under the supervision of Ph.D. Patrícia L. Costa

Dissertation submitted in partial fulfillment of requirements for the International MSc in Management, at the Universidade Católica Portuguesa, 21st December 2017

Abstract

Title

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The aim of this research is to evaluate the effect of asynchronous communication on the relationship between intragroup conflicts and transition processes. Data was collected from 332 respondents with the help of a questionnaire. Results of the moderation analysis showed that asynchronous communication has a significantly negative impact on the association of relationship conflict and transition processes. Even though, the impact of asynchronous communication on the relationship between task conflict and transition processes was not significant. The discussion part focuses on the moderation model and reasons why the negative effect of low synchronous communication might be stronger than the negative effect of high synchronous communication. Implications for real business cases are that transition processes should be seen as important, as they are the basis of successful projects. Moreover, managers should invest in team building in the beginning of every project in order to avoid possible disadvantages, which may arise in teams which communicate from different places and mainly virtual.

Keywords: *virtual teams, synchronicity in communication, task conflict, relationship conflict transition processes*

Resumo

Título

O efeito da comunicação assíncrona na relação entre conflitos intra-grupais e processos de transição

Autor

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A tese que se apresenta tem como objetivo a avaliação do efeito da comunicação assíncrona na relação entre conflitos intra-grupais e processos de transição. A recolha de dados foi obtida através de 332 indivíduos entrevistados sob forma de questionário. Os resultados da análise ponderada demonstram que a comunicação assíncrona tem impactos significativamente negativos na associação com conflitos intra-grupais e processos de transição. No entanto, os resultados indicam que o impacto da comunicação assíncrona na relação com o conflito de tarefas e processos de transição não é significativa. Na seção de discussão sobre os resultados, a qual é efetuada com base no modelo de moderação, o enfoque está assente nas razões pelas quais o efeito negativo de fracos níveis comunicação assíncrona poderá ser mais intensa que o efeito negativo de elevados níveis comunicação assíncrona. As implicações deste caso no mundo empresarial têm a ver com a importância dada aos processos de transição, a qual deveria ser elevada, sendo que estes se consideram estar a base de projetos bem-sucedidos. Adicionalmente, os gestores devem investir em ações de atividades em grupo na fase inicial de cada projeto, por forma a eliminar e evitar dificuldades no futuro, as quais são passíveis de surgir em qualquer equipa que comunique de locais diferentes e na maioria por via virtual.

Palavras-chave: *Equipas virtuais, sincronia na comunicação, conflito de tarefas, conflito de relacionamento, processos de transição*

Acknowledgements

First, I would like to thank my master thesis supervisor Patrícia Costa for the strong commitment, support and dedication she provided me during the process of writing this dissertation. This would not have been possible without her assistance nor without the help of my seminar colleagues Julia Erhart, Benjamin Berggold, Maria Marcos, Soraia Badrudin and Alexandra Matos. It was a pleasure working with all of them. Moreover, I would also like to show my appreciation to all the people who participated in this study's data collection.

I would like to acknowledge and thank my parents, my brothers, my grandparents and all the members of my family for relentlessly motivating me to reach this stage. A very special thanks to Lukas for patiently and caringly sitting next to me while writing the thesis.

Finally, I would like to thank my friends Pilar Mateos, Jan Lauer, Amela Tschas, Nicole Tschas and Kathrin Ranegger for all the great advices, support and words of wisdom, but more importantly, for helping me relax in stressful times during the past 5 months.

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1 Introduction

The aim of this research is to evaluate the moderating role of asynchronous communication on the relationship between intragroup conflicts and transition processes.

The traditional view of organizations is changing. Due to current developments in information technology, more and more people are working away from their company premises, or work from home (Aubert & Kelsey, 2003). In the course of technological development, organizations are increasingly depending on virtual teams for the accomplishment of core work tasks. Next to virtual teams or co-located teams, also hybrid Partially Distributed Teams do exist (PDT). PDTs generally consist of virtual team members, who participate in team processes primarily on a virtual basis, and co-located team members who have direct contact with each other but exchange information with the whole team on a virtual level (Cheshin, Kim, Nathan, Ning & Olson, 2013). This virtual communication can differ in the degree of synchronicity, while face-to-face communication and videoconference are more synchronous communication channels, instant messages and phone calls have a medium degree of synchronicity and voice mail, fax and e-mail have a low degree of synchronicity (Dennis, Fuller & Vallacich, 2008). As these team types are communicating on different degrees of synchronicity and are subdivided by physical distance, different challenges can arise (Cheshin et al., 2013).

One major challenge in virtual teams is the absence of social cues like body language, tone of voice and facial expression. Most of the time in communication channels, which are low or medium in its degree of synchronicity, social cues are missing. Due to the lack of social cues electronic communication can lead to misunderstandings, which is counterproductive for team communication and productivity and may lead to team conflict in the end (Daim, Ha, Reutiman, Hughes, Pathak, Bynum & Bhatla, 2012). Conflicts are more negatively related to team performance in virtual teams than in co-located teams. However, as task conflict may have positive effects on team performance in face-to-face teams, this could also be the case in virtual teams when they communicate through videoconferences (Martinez-Moreno, Gonzalez-Navarro, Zornoza, & Ripoll, 2009).

A possibility for teams who mainly communicate asynchronously could be to meet face-to-face at the beginning of every new project which can further help them to build trust (Daim, Ha, Reutiman, Hughes, Pathak, Bynum & Bhatla, 2012). The meetings are especially important during the teams' planning or transition phase (Maynard, Mathieu, Rapp & Gilson, 2012). The transition phase helps to form a team charter in which goals are set, a team's norm

and a task performance strategy is developed and ultimately a shared understanding within the team is formed (Morgeson, DeRue & Karam, 2010). Despite the fact that virtual teams sometimes only work together for a short time, and therefore the planning phase is crucial for their success, literature about the transition phase in virtual teams is still rare (Gilson, Maynard, Jones –Young, Vartiainen & Hakonen, 2015).

Considering all the aspects mentioned above, the question that arises here is **what moderating role does asynchronous communication play on the relationship between intragroup conflicts and transition processes.**

2 Literature Review

2.1 Virtual Teams

To better understand the purpose of this study we consider a team as a "small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable" (Katzenbach & Smith, 1993, p. 41).

Due to technological and organizational developments in the last years, teamwork and team composition has been more decentralized. Virtual teams constitute the predominant form of team composition (Martins, Gilson & Maynard, 2004). Virtual teams have been enforced by the evolvement of new communication technologies such as the Internet (Hertel, Geister & Konradt, 2005). According to a Survey of the Society of Human Resource Management (2012), almost one-half of business organizations (46%) use virtual teams in their workplace. Companies took advantage of the increasing decentralization and globalization of work processes to act in a more dynamic environment with virtual teams. In virtual teams, the members are geographically dispersed while working predominantly with electronic information- and communication technologies (e.g. email, Skype, instant messages) (Hertel et al., 2005). The main reasons why organizations make use of virtual teams are the possibilities to include talent and resources in different geographic locations and boost the partnership among employees who are geographically dispersed. Moreover, the productivity of organizations can be improved with the help of virtual teams and the cost of travelling can be minimized. Companies can act more globally by allowing a greater flexibility and make use of technological advancements, which make virtual work easier (Human Resource Management, 2012). On the other hand, there are still a lot of challenges accompanying virtual teams. One of these challenges is the diminished direct interaction with team members and ~~with~~ the team leader: some issues may be delayed because, for example, team members do not reply to an email exactly after it is received, and the lack of social cues in communication (e.g. tone of voice, facial expressions, etc.) may lead to misunderstandings. Especially during team formation (Kozlowski, 2009) and performance monitoring (Marks, Mathieu & Zaccaro, 2001), effective communication between all members is crucial. Furthermore, the time zone differences as well as cultural boundaries can lead to difficulties in virtual teams (Bell & Kozlowski, 2002; Human Resource Management, 2012).

The interest in virtual teams keeps rising. Nevertheless, knowledge about virtual teams still lacks in clarity and there are various definitions about virtual teams (Martins et al., 2004).

According to Hertel et al. (2005, p.71) out of all the definitions the consensus is that *"virtual teams consist of (a) two or more persons who (b) collaborate interactively to achieve common goals, while (c) at least one of the team members works at a different location, organization, or at a different time so that (d) communication and coordination is predominantly based on electronic communication media (e-mail, fax, phone, video conference, etc.)".*

Kirkman and Mathieu (2005) contradict that a virtual team has to be geographically dispersed as co-located team members can coordinate their task in a virtual manner even if they are in the same room. Hence, more recent conceptualizations of virtual teams highlight its *virtuality*, which is multidimensional, and includes the geographic dispersion of team members and the technology usage (Gilson et al., 2015). Virtuality can be defined by three dimensions (Kirkman & Mathieu, 2005):

a) **Extent of Reliance on Virtual Tools:** The existence of virtual teams who coordinate their work completely through virtual means is rather low. For instance, global virtual teams where the usage of virtual communication is substantially higher are scheduling periodic face-to-face meetings (Maznevski & Chudoba, 2000). On the other hand, a rising number of teams, which normally communicate "face-to-face", have now a higher reliance on virtual tools. For example, even when working in the same building or the same room, some team members may send an occasional email to their colleagues. In conclusion, it is unlikely that teams will communicate exclusively face-to-face or virtually, they fall between these extremes and the use of virtual tools can be perceived in a continuum. The more people work with virtual tools and communicate differently than face-to-face, the higher the level of virtuality (Kirkman & Mathieu, 2005).

b) **Informational Value:** The theory of information values derives from the media richness theory (Daft & Lengal, 1986) and concerns how valuable the data or communication, which virtual tools send or receive, are for team effectiveness (Kirkman & Mathieu, 2005). The media richness theory states that the information richness of media is different, depending on the ability to convey shared meaning within a given time interval. Face-to-face communication is the richest medium as it transmits multiple cues such as body language, the tone of voice and natural language in which message content is expressed. On the contrary, media with lower richness are processing fewer cues and providing just limited, immediate feedback. For example, a text message is unable to convey the tone of voice of the sender and when the receiver reads the text, the sender does not immediately perceive his or her reaction to the content of the sent text. These lower richness media are more suitable for unequivocal

information, which does not need further explanation (Daft & Lengal, 1986). They may be informed about minor details as location, date and time. Therefore, the richer the media used to communicate, the lower the level of virtuality (Griffith, Sawyer & Neale 2003; Griffith & Neale, 2001). When members use technologies that transfer rich, valuable information, their exchanges are less virtual, than when they use technologies, which provide less valuable information. The virtuality level of the communication does not depend on the richness of the medium, but it concerns the extent to which the combination of virtual tools being used conveys communication and data that are important for the team to be effective. A practical example would be a team or architects who try to design something and want to illustrate the spatial relationship between objects. Only by text alone, it would be a highly virtual exchange as the text does not adequately convey a three-dimensional relationship and offers only limited information value. On the contrary, illustrating the three-dimensional relationship via joint authoring computer animations would represent a higher value of information, which is conveyed by the computer program, and therefore is lower in virtuality (Kirkman & Mathieu, 2005).

c) **Synchronicity:** Synchronous exchange happens in real time, whereas asynchronous exchange lags in time. For instance, during face-to-face communication, video- and telephone conferences sending and receiving a message happens at the same time, whereas communication through email and fax lags in time as it may take some time to send it, or the other person does not reply immediately. It depends on the nature of the performance environment to see which exchange would be more advantageous. For instance, the interruption of audit team members to provide them with background information would be counterproductive. In this case, face-to-face communication would make less sense and be less effective than asynchronous communication as they need some time to consult over background information. Greater virtuality is seen in e-mail, fax and voice mail because there is no simultaneous exchange with members as it occurs in face-to-face interactions, videoconferences or instant messages. This dimension has to be seen jointly with the other two dimensions (Kirkman & Mathieu, 2005).

With the help of this background information and a clearer view of virtual teams, one continues with a deeper explanation of synchronicity.

2.2 Synchronicity

Media Synchronicity Theory (MST, Dennis, Fuller & Vallacich, 2008) will be used in this thesis as a framework to explain the degree of synchronicity in communication. It is further supposed to explain how different degrees of synchronicity affect team processes and conflict.

Media synchronicity is described as the extent in which individuals work together on the same task at the same time. The focus of the theory lies on the two communication processes (conveyance and convergence), which are supported by the following media capabilities: transmission velocity, parallelism, symbol sets, rehearsability and reporcessability (Dennis & Valacich, 1999; Dennis, Fuller & Vallacich, 2008).

Dennis and colleagues (2008) state that communication is composed of two fundamental communication processes, which are conveyance and convergence, and these two have different requirements for information transmission, information processing and therefore, synchronicity. Conveyance processes need more deliberation as they are focusing on raw and new data. Therefore, transmission and processing of information by participants have less of a need to happen at the same time (Dennis et al, 2008). For instance, an auditor team receives a lot of information and mostly new information, which need to be processed. If they would receive the information only over the telephone or through face-to-face communication, it would be difficult for them to process all the received information. In this case, low synchronicity media, such as email, offers the advantage that individuals can take their time, reflect on the messages they receive and carefully consider their response (Warkentin, Sayeed & Hightower, 1997).

On the other hand, fewer cognitive resources are required for the convergence process as most of the information is familiar and already integrated into the participants' mental models. The discussion focuses on already processed information and its meaning. Higher synchronous media are more suitable for this process as more current interaction is needed to arrive to a mutual understanding (Dennis et al., 2008). A practical example for this would be members of a management team, who need to make a fast decision if they should acquire another company or not. The team already has all the background information about the other company and now has to come to a mutual agreement (Baum & Wally, 2003). Communication via e-mail would take too long as there is a danger that other companies have the same idea, so the best option would be a face-to-face meeting (Marlow, Lacerenza & Salas, 2017).

Transmission velocity, parallelism, symbol sets, rehearsability and reprocessability support the communication process and all together show the degree of synchronicity of a medium (Dennis et al., 2008). To get a better understanding of the five capabilities, a more detailed description including practical examples follows.

Transmission velocity, is the speed at which messages can be delivered by media. It is higher in face-to-face communication as well as in video- and telephone conferences. This is due to the fact that high transmission velocity media messages reach the recipient the same time they are sent. By sending instant messages transmission velocity can be between medium and high, for instance during a What's App communication it can occur that the receiver does not notice the new message at the same moment it arrives and replies after some time. Voice mail, fax and e-mail have a low to medium transmission velocity, as someone either replies after a short time or needs more time to reply (Dennis et al., 2008).

The number of simultaneous conversations that can exist effectively can be explained by the capability parallelism. Parallelism is rather high in e-mails and instant messages, as it is possible to have different conversations with different people simultaneously. It is medium during videoconferences and face-to-face communication as the possibility that another person is interrupting during the discussion is medium. However, in telephone calls usually only one conversation takes place and so parallelism is low. During fax and voice mail the medium is used at one time and no simultaneous transmissions are happening (Dennis & Valacich, 1999).

The most symbol sets are possible during face-to-face communication. A person can communicate in visual ways by nodding the head and speaking at the same time. For instance, nodding the head can be more efficient to show a person you agree to something than writing "I agree with you". Other symbols are written or digital symbols, such as words, tables, images, video and more (Dennis et al., 2008). Voice mail and telephone conferences have few symbol sets as it is just the conversation without any digital symbols or visual ways. Few to medium symbol sets are in videoconferences, e-mail, fax and instant messages. In the first, one's communication partner can recognize the social cues, such as facial expression body language and tone of voice. In the others, one can attach digital symbols like tables, images and videos (except fax) (Dennis et al., 2008).

Rehearsability is low in face-to-face communication, video- and telephone conferences as the communication is happening at the same time and the speaker has no time to change or rehearse something already said. Nevertheless, it is possible for a person who sets up an e-

mail or fax to carefully craft the message and go over it again to convey the idea behind it, so rehearsability is high (Dennis et al., 2008). What's app also has a high rehearsability as it is possible to take back an already sent message to rephrase or delete it (What's App Inc., 2017). The rehearsability of a voice mail is low to medium as it is hard to take something already said back (Dennis et al. 2008).

Reprocessability is the reexamination of older messages (Dennis et al., 1999). It is really high in e-mail, What's App, voice mail and fax as it is possible to have a look at older sent messages and to process them again. While in face-to-face meetings, video- and telephone conferences it is hard to know what the topic of past discussions was without having a record (Dennis et al. 2008).

All the explained capabilities together present the degree of synchronicity of the different communication channels. For example, face-to-face communication and videoconferences are high in synchronicity, whereas a conference call and What's app have a medium degree of synchronicity. A low degree of synchronicity is seen in voice mail, fax and e-mail (Dennis et al. 2008).

Media Synchronicity is positively associated with transmission velocity, natural symbol sets, and negatively associated with parallelism, rehearsability and reprocessability (Dennis et al., 2008). Therefore, a high synchronous media is one that conveys a message fast, in which parallelism is medium, carries few to many symbol sets and in which rehearsability and reprocessability are low. According to Media Synchronicity Theory, there is no best medium for every situation. Communication performance depends on the fit between media synchronicity a given medium can support and the needs for media synchronicity in a given situation. As an example, when a professor explains a statement to the students it might be helpful to use a whiteboard as a graphic support to the verbal explanation (Dennis et al., 2008).

Table 1 shows how the different capabilities which together support or lower synchronicity in different media.

	Transmission Velocity	Parallelism	Symbol Sets	Rehearsability	Reprocessability	Synchronictiy
Face-to-face	high	medium	few-many	low	low	**high**
Video Conference	high	medium	few-medium	low	low	**high**
Telephone Conference	high	low	few	low	low	**medium**
What's App	medium-high	high	few-medium	high	high	**medium**
Voice Mail	low-medium	low	few	low-medium	high	**low**
Fax	low-medium	low	Few-medium	high	high	**low**
E-mail	low-medium	high	few-medium	high	high	**low**

Table 1 Comparison of selected media and their capabilities (Dennis et al., 2008, adapted)

2.3 Team Processes

Marks, Mathieu & Zaccaro (2001) define team processes as *"members interdependent acts that convert inputs to outcomes through cognitive, verbal, and behavioral activities directed towards organizing taskwork to achieve collective goals"* (p. 357).

Team processes act as a mediating mechanism linking input variables such as team members, team- and organizational characteristics with criteria such as performance, quantity, quality and member reactions. The processes team members use to interact with each other to accomplish the work play a crucial role in successful projects (Marks et al., 2001). Teams perform in episodes, which are temporal cycles of goal-directed activity. These episodes can be split up into two phases: The transition phase and the action phase. In the first phase, activities are planned and past activity is evaluated. Such planning processes consist of mission analysis, mission formulation and mission planning. In an iterative process, goals are specified and a strategy is formulated (Marks et al., 2001).

The action phase is dedicated to the accomplishment of previously defined goals by performing in a way, which is consistent with the formulated strategy. Tasks and progresses are measured and information about performance is constantly evaluated in order to react and adapt the action of team members. Furthermore, internal systems and resources (e.g. team resources such as personnel, equipment, etc.) and environmental conditions, which are

relevant for the effectiveness of a team are constantly monitored. And, team members are being directly assisted (e.g. feedback, etc.) in order to optimize the output within these parameters (Marks et al., 2001).

The authors highlight a third phase of team processes, the so-called interpersonal processes-phase. These processes are related to the management of interpersonal relationships, which are present during both action and transition phases. Those interpersonal processes can be divided into conflict management, motivation and confidence building and affect management (Marks et al., 2001).

When looking at the three phases of team processes it is noticeable that studies examining the transition phase processes in virtual teams are still underrepresented, while action- and interpersonal phase were studied extensively (Gilson, Maynard, Jones –Young, Vartiainen, Hakonen, 2015).

Due to this fact, the research of this thesis will focus on the processes within the transition phase. Therefore, I will focus on the transition processes and the challenges of virtual teams during this phase in the following chapter.

2.3.1 Transition Processes

During the transition phase, teams start to evaluate and plan activities to achieve a mutual goal or objective. The transition phase processes consist of mission analysis, goal specification and strategy formulation (Marks et al., 2001).

Mission analysis encompasses evaluation of the mission, identification of the primary tasks, operative environmental conditions and available team resources. The two key components of mission analysis are backward evaluation and forward visioning. Backward evaluation includes the analysis of the impact and the success of actions, performed within a past task. The general aim is to learn from previous mistakes. Forward visioning consists of planning tasks and scenarios, which are estimated to occur with a certain possibility in the related future of a project (Marks et al., 2001).

One arising challenge during the mission analysis can be that the affective commitment in virtual teams who primarily use asynchronous media, such as e-mail, is low. This may be due to the fact that team members lack social meaningful experiences and feel isolated within the team. All of this can lead to lower work performance and weaker organizational citizenship behavior, which makes it harder for the team to find a shared mission and define a common

purpose even though it is critical for the team's effectiveness (Martins, Gilson & Maynard, 2004; Johnson, Bettenhausen & Gibbons, 2009).

During **goal specification**, overall mission goals and sub-goals, which also include certain quality standards and timelines, are allocated and assigned. However, due to the inability to be prepared for all situational contingencies, goals might have to be specified and redefined throughout the action phase (Marks et al., 2001). Hereby, higher synchronous media allows a better and faster allocation of responsibilities between team members, especially because individuals can react and comment on what is given to them and immediately negotiate if they do not agree with the task (Cramton, 2001). Thus, poorly conceptualized and too general goals and sub-goals could be better defined and discussed in advance (Marks et al., 2001).

Strategy formulation and planning are focusing on developing alternative options of action to achieve a mission. The three sub-dimensions are: deliberate planning (set a principle course of action at the beginning of the episode to achieve a mission), contingency planning (prepare upfront for probable changing events) and reactive strategy (invention of a new plan during the action phase when neither deliberate nor contingency planning worked) (Marks et al., 2001). When evaluating previous information one can derive that high synchronous communication, such as face-to face communication or videoconferences, could be valuable during this process, as team members have to act and react fast (Maynard et al., 2012). In the **deliberate planning phase**, synchronous communication could be beneficial when the team members merely know each other and have never been working together before. However, also asynchronous communication such as e-mail could be effectively applicable, when the team members already worked in a similar or same team composition in the past. For instance, a catering team, which always consists out of the same people and knows the internal processes, an e-mail containing all the necessary information (events size, time, location) 3 days before every event may already sufficiently grant the team's success. On the other side, when new employees join the catering team it would be necessary to meet in person and explain and discuss everything more in detail (Marks et al., 2001).

The contingency planning phase is the phase where so called "Plan B's" are developed. In order to be prepared for all eventualities in upcoming events, e-mails may lead to misunderstandings and loss of time, whereas, during face-to-face communication ideas for a "Plan B" could be shared and discussed more effectively (Martins et al., 2004). To respond to unexpected events or errors during the action phase it is important for teams to form a **reactive strategy** as fast as possible. Here face-to-face communication, which provides the

capability of high transmission velocity, could be the best option as action can be taken at the same moment the problem was noticed (Maynard, Mathieu, Rapp & Gilson, 2012).

In conclusion, one can derive that by using lower synchronous media several challenges during the transition phase can arise. First, asynchronous communication such as e-mail can be more time consuming as either people take a long time to reply or they simply need more time to understand the matter (Maynard et al., 2012) whereas with face-to-face communication this could be avoided as the thematic could be better explained to the person and questions could be answered at the same time. Especially when people have to react fast and form a plan "B", asynchronous communication can be disadvantageous (Martins et al., 2004). Moreover, absence of social cues can bear the consequences that people do not really feel connected with the project and are not effectively committed to it. Thus their motivation can be low and team effort can head-into a wrong direction (Johnson et al., 2009). To avoid this, teams should meet face-to-face especially in the beginning were the mission is formulated (Dubé & Robey, 2008).

2.4 Conflict

Teamwork applies more and more as the norm in organizations, yet it comes up with challenges. One of these challenges is conflict, which is defined as the process emerging from the tension between team members because of real or perceived differences (De Dreu & Weingart, 2003). Researchers defined three forms of intragroup conflict. These three are relationship conflict, task conflict and process conflict (De Wit, Jehn & Greer, 2012). Relationship conflicts include interpersonal discrepancies among group members, such as interpersonal differences in opinion, norms and values and different views about, for instance, religion, politics and fashion (Jehn & Bendersky, 2003). A task conflict is a conflict about the work itself or task at hand. It exists when disagreements among team members are coming up about the content of the task being performed. Team members have different ideas, opinions and viewpoints about the way the task should be performed (Jehn & Bendersky, 2003). Process conflict can arise when group members disagree about the delegation of duties and resources. For instance, an engineer would identify potential courses of action differently than a member, whose background is in marketing or accounting (Jehn, Northcraft & Neale, 1999).

Earlier scholars focused on the negative effects of conflicts in general, as a restraint to effective group functioning (De Wit, Jehn & Greer, 2012). However, task conflict and relationship conflict have different effects on distal- and proximal group outcomes. Distal group outcomes include group performance, which focuses on outcomes such as innovation,

productivity and effectiveness. On the other hand, proximal outcomes focus on group emergent states and group viability. Group emergent states describe cognitive, motivational and affective states of teams (Marks et al, 2001), such as collective efficacy or trust. Group viability reflects group member's commitment and behavioral intentions to remain in the group (Barrick, Stewart, Neubert & Mount, 1998). The relationship between both task and relationship conflicts on proximal outcomes are consistently negative. The negative effect of task conflict on proximal outcomes can be explained with the help of self-verification theory (de Wit, Jehn & Greer, 2012). This theory states that people want others to see them as they see themselves, even if they might have a negative self-view (Swann, 2012). In the context of negative effects of task conflict on proximal outcomes such as satisfaction, team members become dissatisfied when others are criticizing their viewpoint as they interpret it as a negative assessment of their own abilities and competencies. As a result, task conflict can lead to rumination and stress among group members.

Moreover, task conflicts increase the cognitive load and this may lead to negative effects on distal group outcomes, such as group effectiveness, creativity and decision making (de Wit, Jehn & Greer, 2012). Nevertheless, recent studies stated that intragroup conflict does not always has to be negative for group outcomes, and that task conflict can also have a positive impact on distal group outcomes such as group performance. Task-related conflicts may stimulate critical thinking and avoid premature consent, which could lead to more innovativeness and more thoughtful group decision making (de Wit, Jehn & Greer, 2012). The main advantages of a task conflict can simply be the deeper understanding of the task itself. Moreover, it could help to overcome confirmatory biases in groups decision making (De Dreu &Weingart, 2003; de Wit, Jehn & Greer, 2012).

On the other hand, during relationship conflict the ability of the group to process information is limited, as group members are concentrating more on the group's task-related problems (De Dreu & Weingart, 2003). It can happen that task conflict is turning into relationship conflict when a team member misperceives constructive feedback as criticism and feels personally attacked (Jehn, 1997).

We also expect that the relationship between each type of conflict and the degree of the transition processes is influenced by the degree of communication synchronicity. As transmission velocity in synchronous communication is high, decisions can be often made faster, with less time to consider different perspectives and alternatives (Dennis et al, 2008). But, having more time to think about what other members are saying without immediately

reacting to a perceived criticism, this could lead to an increased focus on the task and will further allow more cognitive space for investing in transition processes (Warkentin et al. 1997). However, generally during synchronous communication, such as face-to-face communication and videoconferences, task conflict is likely lower than during asynchronous communication (Martinez-Moreno, Gonzalez-Navarro, Zornoza, & Ripoll, 2009).

Therefore, we deduct the first hypothesis:

H1. The positive relationship between task conflict and transition processes will be moderated by the degree of synchronicity in communication, such that the lower the synchronicity (i.e. the higher the asynchronicity), the weaker the association between task conflict and transition processes.

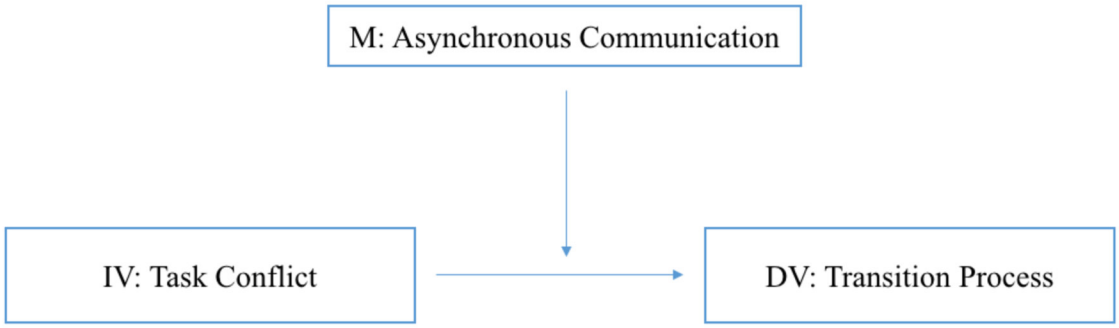

Figure 1: Hypothesis 1

As symbol sets, such as social cues, are absent during asynchronous communication (Dennis et al., 2008), teams working on a more virtual level might have a lower affective commitment to their group, which in the end may increase relationship conflict (Johnson et al., 2009). Reprocessability and rehearsability are rather high in communication with a high degree of asynchronicity. For example, one can always retrieve sent or received emails for further evaluation (Dennis et al., 2008). As a result, team members might feel transparent and controlled. Furthermore, they might loose trust to colleagues and as a consequence the potential of relationship conflict is rising (Martins et al., 2004). Thus, relationship conflict is likely to be higher during more asynchronous communication (Martinez-Moreno et al., 2009) and this could be an obstacle for focusing on evaluating past- and planning future performances, as team members are primary focusing on problem solving on a personal level.

Therefore, we hypothesize that;

H2. The negative association between relationship conflict and transition processes will be moderated by the degree of synchronicity in communication, such that the lower the asynchronicity, the stronger the negative association between relationship conflict and transition processes.

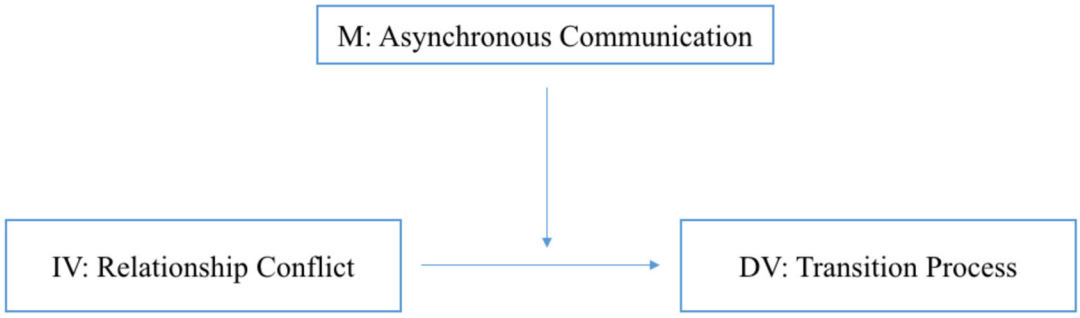

Figure 2: Hypothesis 2

3 Methodology

3.1 Participants

Six master students from the Católica-Lisbon School of Business and Economics' dissertation seminar "*Team Effectiveness"* were sending out the questionnaire and received in total 332 responses.

The questionnaire was developed as an online survey. A universal online link, which could be distributed easily and endlessly, guaranteed a simple and anonymous answering for the respondents. For the execution of this study, a total of 332 respondents answered the questionnaire. All members answered the questionnaire individually and anonymously. The survey was created in English language and afterwards translated to Portuguese. The collected data was analyzed by using the SPSS Statistics software.

The majority (59.4%) of the respondents were female. The average age was 32.05 with a Standard Deviation of 11.12. The time employees worked for the companies were ranging from approximately 2 weeks to 37 years (M: 4.6 years; SD: 6.9 years). More than half of the respondents have a university degree (52.4%), 34% are post-graduates, 11.1% have a high

school degree, 1.5% with basic education and 0.3% completed primary school. The main sectors where the respondents work are tourism, health, marketing and architecture.

3.2 Measures

Within the questionnaire raised data can be classified in following variables:

Transition processes were measured with 3 selected items from Mathieu and Marks (2006) proposal. The items reflected goal specification („We identify that everyone on our team clearly understands our goals"), mission analysis („We identify the key challenges that we expect to face"), and strategy formulation („We develop an overall strategy to guide our team activites"). Participants answered using a 7-point Likert scale (1 = *strongly disagree*; 7 = *strongly agree*), according to their level of agreement with the items. Estimated reliability was .78 (Cronbach's alpha).

Task Conflict was measured using an adaption of Jehn's (1995) Intragroup Conflict Scale (ICS). In this study we focus on task conflict and out of 4 items measuring task conflict this study was adapted to 3 items. Likert-type scales were used with the value of 1, indicating, "Strongly disagree", as the lowest level of task conflict, 7 as "strongly agree" and 4 as "Neither agree nor disagree". The items are about the extent to which members have disagreements and different opinions regarding tasks and were slightly adapted in this paper. For example, the questions "How often do people in your work unit disagree about opinions regarding the work being done?" and "How frequently are there conflicts about ideas in your work unit?" were merged to "Does a conflict of ideas exist between team members?". The question "How much conflict about the work you do is there in your work unit?" was changed to "Do team members disagree about the content of decisions?" and "To what extent are there differences of opinion in your work unit?" was rendered as "Do team members disagree about the content of decisions?". Estimated reliability was 0,84 (Cronbach's alpha), which indicates that 84% of the variability in scores represents the construct of interest and 16% REST is considered as random measured error. (Mean:3,30, St.Dev.:1,34)

Relationship Conflict was measured by using an adaptation of Jehn's (1995) Intragroup Conflict Scale (ICS). It was measured with three items instead of four. The three items were also slightly adapted and merged. Instead of the questions "How much friction is there among team members in your work unit?", "How much are personality conflicts evident in your work unit?", "How much tension is there among team members in your work unit?" and "How much emotional conflict is there among members in your work unit?" the following questions were asked: "Are there personal conflicts between team members?", "Is there

friction between team members?" and "Are personal conflicts evident?". Likert-type scales were used with the value of 1, indicating, "Strongly disagree", as the lowest level of relationship conflict, 7 as "strongly agree" and 4 as "Neither agree nor disagree". Estimated reliability was 0.88 (Cronbach's alpha).

Team Synchronicity: Items regarding the communication between team members were derived from the research paper of Dennis et al. (2008). They include "Face-to-Face", "Videoconference", "Telephone Conference", "What's App", "Voice Mail", "Fax", "E-mail" and "Other", where additional options as "Skype", "Slack" and "Facebook" were mentioned. A total sum of 100% should be distributed amongst the 9 options according to the respondent's perception of the usage of media type in his/her team. Referring to table 1, in the study a new variable was created by putting together low synchronous media. Low synchronous communication or also called asynchronous communication includes "E-mail", "Fax" and "Voice Mail".

All used scales had satisfying Cronbach's alpha values (from .78 to .88). As a control variable the time individuals have been working with the team was included in the moderation models.

Variable Scale	Number of items	Cronbach's Alpha
Transition Processes	**3**	**.78**
Task Conflict	**3**	**.84**
Relationship Conflict	**3**	**.88**

Table 2: Cronbach's Alpha for the study variables

Variable Scale	Number of items	$\bar{x}$/Usage in %	SD
Asynchronous Communication	**3**	**16.25%**	**16.62%**
- E-mail		15.92%	16.17%
- Voice Mail		.21%	1.73%
- Fax		.12%	1.70%

Table 3: Usage of different communication channel

4 Findings

4.1 Data analysis

The first and second hypotheses were tested with a moderation analysis (Hayes, 2012). All continuous independent variables were centered to reduce potential collinearity between interaction terms and their components. In hypothesis H1, one tested the effect of the moderating role of asynchronous communication between the independent variable task conflict and the dependent variable transition processes with the time individuals have been working in a team as a control variable. The same test was made for hypothesis H2 where the moderating role of asynchronous communication between the dependent variable relationship conflict and the independent variable transition processes was tested with the time individuals have been working in a team as a control variable.

4.2 Results

Table 4 shows the mean ($\bar{x}$) and standard deviation (σ) of each variable, as well as the correlations between all the variables.

	$\bar{x}$	SD	Correlations			
			1.	2.	3.	4.
1.Transition Processes	5.76	0.89	1			
2.Task Conflict	3.30	1.34	-.31**	1		
3.Relationship Conflict	2.86	1.41	-.38**	.70**	1	
4.Asynchronous Communication	16.25	16.62	-.97	-.00	.02	1

Table 4: Mean and standard deviation of each variable and correlation between all the variables. (* Correlation is significant at the 0.05 level;** Correlation is significant at the 0.01 level)

To test the moderation hypotheses, a process developed by Hayes (2012) was used with a bootstrapping number of 5000 and model 1 for moderation. The independent variables were centered before the analysis.

Regarding the first moderating model, the first hypothesis H1 could not be supported, since the interaction between the asynchronous communication and task conflict is not significant. The direct effect between task conflict and transition process was -.1882 with a lower CI of -.2597 and an upper CI of -.1167. There was no support that the higher the asynchronicity, the

weaker the association between task conflict and transition processes. The interval between the lower CI (-.0042) and the upper CI (.0053) contains the value zero.

In the second hypothesis, which predicted the effect of relationship conflict on transition processes, moderated by asynchronous communication and controlled by the time team members have been working together (RC->TP, M: asynchronous communication), the moderation was significant (interaction coeficient = .0066, BootLLCI=.0026 and BootULCI=.0106, not including zero). The direct effect between relationship conflict and transition process was -.2295 with a lower CI of -.2927 and an upper CI of -.1662.

To examine this interaction more in detail, a simple slope analysis was conducted. We have then plotted the regression lines representing the relationship between relationship conflict, asynchronous communication, and transition process (Aiken & West, 1991) at one standard deviation below and above the mean of our moderator (i.e., asynchronous communication).

Simple slope analysis indicated that for lower levels of asynchronous communication, the association between relationship conflict and transition processes was negative and significant (- 1 S.D.; b = -.3387, p < .001, BootLLCI=-.4262 and BootULCI=-.2512); and for teams with high levels of asynchronous communication, relationship conflict also influenced transition processes significantly, but less negatively (+ 1 S.D.; b = -.1185, p < .05 BootLLCI=-.2139 and BootULCI=-.0232).

The following figure shows the interaction plot regarding the model with transition processes as an outcome graphically. This plot was created with the help of an excel macro file, which was downloaded and used to plot the variables (Aiken & West, 1991):

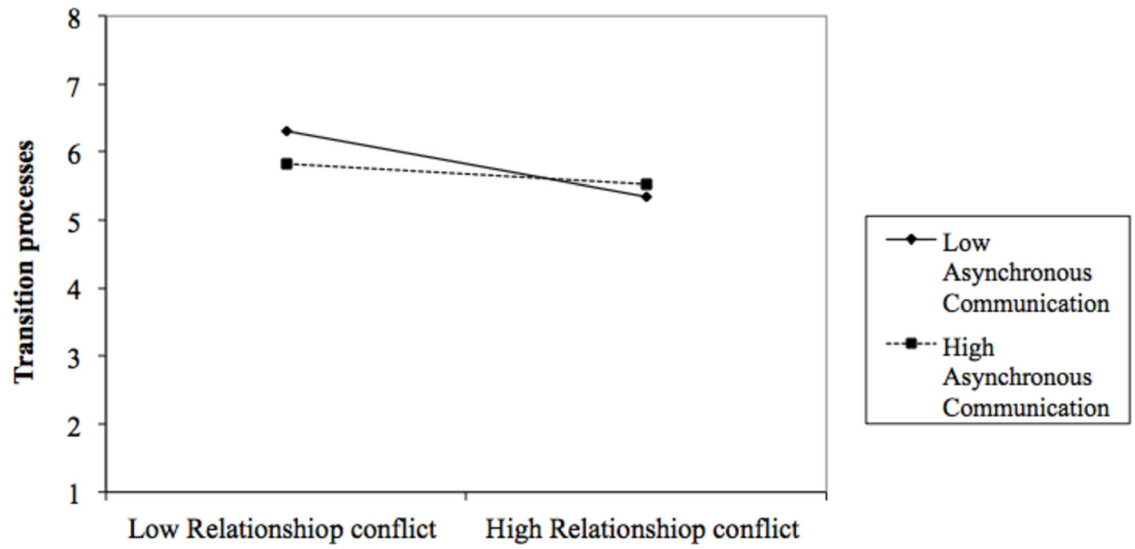

Figure 3: Interaction Plot for H2

The interaction plot for H2 shows that when both relationship conflict and asynchronous communication are low team members invest more in transition processes. Nevertheless, when relationship conflict during low asynchronous communication is rising team members engage less in transition processes. All in all, the negative effect in low asynchronous communication is stronger then the negative effect in high asynchronous communication.

5 Discussion

This research aims to contribute to understanding the role of asynchronous communication on the effect of conflicts upon transition processes. H1 stated that a positive relationship between task conflict and transition processes will be moderated by synchronicity, such that the higher the asynchronicity, the weaker the association between task conflict and transition processes. This hypothesis could not be supported, as asynchronous communication does not have a statistically significant effect on the relationship between task conflict and transition processes.

On the other hand, H2 was supported, as the variable asynchronicity moderates the negative association between relationship conflict and transition processes on a significant level. The interaction plot, displayed in Figure 5, shows that the lower the asynchronicity, the stronger the negative association between relationship conflict and transition processes. Literature supports that interpersonal processes have to be managed especially during the transition phase in order to avoid conflict (Morgeson et al., 2010). However, task conflict can sometimes be advantageous whereas relationship conflict diminishes teamwork most of the time (de Wit, Jehn & Greer, 2012). When teams spend less of their time communicating via fax, e-mail or voice mail it may be a team with a stable team composition, who worked together for various projects and who have already met before and therefore know each other well (Driskell, Radtke & Salas, 2003). As already mentioned before, it can be crucial for teams that communicate with asynchronous communication to meet face-to-face at the beginning of every new project, which can help them to build trust (Daim, Ha, Reutiman, Hughes, Pathak, Bynum & Bhatla, 2012). Teams may have more understanding about the topics and projects and are in consensus about their mission. Therefore, extensive can asynchronous communication is not necessary and relationship conflict may not have a stronger impact on transition processes. On the other hand, even when teams are used to work together it can happen, that constructive feedback is seen as criticism and one member feels unfairly treated and starts to have a personal issue with the other, criticizing team member. Even if the issues are task related they can turn into high relationship conflicts between team members (Jehn, 1997), this can be also seen in the data in which relationship conflict and task conflict are highly correlated (.70**, $p<.001$). Literature states that relationship conflict is higher when the group has a relational bond, which can explain the more negative effect of low asynchronous communication and relationship conflict on transition processes (Hinds & Bailey, 2003).

It can happen that a team, which has never worked in its composition before and whose project is only lasting for a short period of time, is spending more time in communicating with asynchronous channels such as e-mail, fax and voice-mail (Driskell et al., 2003). This may be due to the circumstance that team members do not know each other and therefore have to clarify and exchange a higher amount of information (Maynard, et al. 2012). Moreover, as social cues are missing in this process, effective commitment of team members might be lower (Martinez-Moreno et al., 2009). Therefore, there is less engagement in the transition processes of teams, as its members have to solve too many issues, and some of them socio-relational (i.e. forming the team). Furthermore, people may get desperate when progress is taking too long and a relationship conflict is arising. However, as team members are not so familiar with each other and do not interact on a too personal level, the effect of a higher relationship conflict is less negative (Hinds & Bailey, 2003).

According to the sample it is noticeable that task conflict is actually negatively related to transition processes, contrary o our predictions. The less task conflict, the more investment in transition processes happens. Literature states that task conflict can either have a positive effect or a negative effect on the team's performance (Moreno, 2009). In this sample the second effect occurs. It can take a lot of time and effort to solve a task conflict. Therefore, it can prevent members from integrating, gathering and adequately assessing valuable information (Jehn, 1995). Task conflict may also decrease team member satisfaction. Moreover, it also may lead to a relationship conflict, which can have an even more severe impact and merely negative impact on team effectiveness (Tidd, McIntyre & Friedman, 2004). Having no significant results for H1 indicates that there may be other factors, which may play a moderating role between task conflict and transition processes. A possible moderator between those variables could be the factor "trust" as it is essential for teamwork processes (Wildman, Shuffler, Lazzara, Fiore, Burke, Salas & Garven, 2012). With trust, the ability of team members to work together is rising and group processes can be more efficient and effective (Costa, Bijlsma-Frankema & de Jong, 2009). Therefore, trust can lead to an improvement in team processes and furthermore increase engagement in transition processes (McAllister, 1995). Also, trust could prevent the escalation of task conflict into a relational conflict, as individuals would less likely interpret a disagreement as an ego threat or as a personal criticism. Another possibility would be conceptualize trust as a moderator between the association of asynchronicity and transition processes. Trust can have positive effects for a virtual team's success (Gilson, 2015). It may be especially important in virtual teams who communicate most of the time asynchronously (Kanawattanachai & Yoo, 2002). Trust can

help to decrease uncertainty in the technologically based environment and can make it easier to create interpersonal relationships and therefore reduce conflicts (Jarvenpaa, Knoll & Leidner, 1998).

As mentioned before relationship and task conflict are highly correlated. Table 4 shows this correlation with the value of .70**, p<.001. Therefore, we may question whether the participants of the study did really differentiate between those two types of conflict. Nevertheless, other literature found a relation between task and relationship conflict: it is common for teams who report high levels of task conflict to also report relationship conflict (Jehn et al., 2001; Simons & Peterson, 2000). One possible explanation for task conflict turning into relationship conflict is the use of intimidation tactics and harsh language by group members. The results from poorly managed talking can lead to relationship conflict, as others feel humiliated or offended (Simons & Peterson, 2000). Another explanation according to Jehn (1997) could be the disagreement between group members on task issues. At some point people perceive an objective task conflict as criticism and feel personally attacked. Subsequently, team members start to dislike each other and a task related conflict turns into a relationship conflict.

5.1 Limitations

One limitation of this study was its execution. As the study consisted of 6 similar but isolated handled subtopics, the length of the questionnaire appeared to be a significant barrier for a fully completed survey by the respondents. In total the group reached out to around 500 respondents who actively started the survey, but a significant portion of 200 respondents just droped the survey within the first 50% of the whole process or just after a few questions. When asking for feedback, almost all questioned respondents indicated that the survey was too long and too broad in all aspects (questioned variables) so that it appeared to be too lengthy and therefore has been quit during the answering process. This may lead to a further issue in this context, that the attention of the respondents given to the surveyed questions in the latter section of the survey. As the questions were similar in terms of question type, answers may suffer from common method bias. Furthermore, survey data was collected exclusively through self reporting, hence one was reliable on the honesty of the respondents and one has to assume that honesty and dishonesty may vary significantly between the different groups of respondents, depending on the image they may want to convey via filling out the survey. What is more, the survey was conducted in a cross sectional way, containing the danger of difficulties of measuring and interpreting incidence.

5.2 Further developments & Practical Implications

Generally, one recognized in the course of the literature analysis that research on virtual teams primarily focuses on some parts of teamwork processes, such as the action phase and interpersonal processes, and therefore disregards transition processes. Furthermore, due to the novelty of the topic of virtual communication, extensive academic literature and research in this area is still rare. But, findings of this data generation show the relevance of new technologies and globalization in everyday teamwork. As a result, extensive research, similar in execution to this work, should be conducted in order to draw statistically significant conclusions based on the discussed literature in this thesis. Online surveys primarily dedicated to important variables of task and relationship conflict should be raised in a survey exclusively dedicated to this topic. Qualitative data generation might be a further useful tool to conduct before compiling a quantitative data acquisition in this area in order to receive useful input from the interviewees. One might discover different general approaches of fully virtually working teams, which can constitute a contradiction to existing literature in this field. This may be simply due to the fact that in recent years of fast innovation, people changed their habits of consuming and using virtual technologies. Therefore, this development in the society directly and indirectly affects teamwork and teams may have completely changed their approach. A circumstance, which was not considered in this survey, was that virtual teams might already know about the challenges and disadvantages of the lacking face-to-face communication and try to compensate this by making arrangement beforehand to minimize the possible disadvantages. Hence, questions for a quantitative data generation and analysis may be completely reframed. Considering this and adapting further research to these conditions may be a primary challenge for further, deeper research.

Based on the findings I would recommend every team to engage especially in transition processes, as they are the basis for successful projects. Moreover, teams should primarily try to avoid relationship conflict in more synchronous communication as well as in low synchronous communication. Nevertheless, sometimes it could be advantageous to promote task conflict up to a special level as outcomes could be more elaborated.

In conclusion, it can be said that asynchronous communication can be advantageous but often it can lead to a lot of misunderstandings. Therefore, companies should invest time and resources in valuable team building in the beginning, in order to avoid potential problems in teams, which, are working from different places, and communicating mostly virtually.

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Appendix

STUDY QUESTIONNAIRE				
Item	**Dimension**	**Description**	**Scale**	**Source**
Variable: Transition Processes				
Q1_11		We identify the key challenges that we expect to face		Mathieu & Marks, 2006
Q1_12		We ensure that everyone on our team clearly understands our goals		
Q1_13		We develop an overall strategy to guide our team activities		
Variable: Relationship Conflict				
Q6_1		Are there personal conflicts between team members?	1- Strongly disagree 2- Disagree 3- Somewhat disagree 4- Neither agree nor disagree 5- Somewhat agree 6- Agree 7- Strongly agree	Jehn, 1995
Q6_2		Is there friction between team members?		
Q6_3		Are personal conflicts evident?		
Variable: Task Conflict				
Q6_4		Is there a conflict of ideas exist between team members?		Jehn, 1995
Q6_5		Is there a confrontation of opinions about the decisions to be made?		
Q6_6		Do team members disagree about the content of decisions?		
Variable: Synchronicity Team				
Q10_1		Regarding the communication between **team members**, please state the proportions of communication channels used in your working environment. Split up a 100% on the mentioned channels. *Please note that the sum must be 100%.* 1- Face-to-Face 2- Video Conference 3- Telephone Conference 4- What's App 5- Voice Mail 6- Fax 7- E-mail 8 - Other (please mention which)	100% has to be split up on the mentioned channels	Dennis, Fuller & Valacich, 2008
Variable: Demographics				
Q11_1		Age		
Q11_2		Nationality		
Q11_3		Sex	1 – Male 2 – Female	
Q11_4		How long have you worked with this team		
Q11_5		I am the leader of this team	1 – Yes 2 – No	
Q11_6		Sector of Activity		