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The impacts of Team Virtuality: an investigation of Team Virtuality, Team Reflexivity, and Copresence on Team Effectiveness

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Master in Human Resources Management and Organizational Consulting

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Abstract

Teams have become the standard way of working in organizations. Therefore, it is of extreme importance to understand what differentiates high performing teams from other teams. Team Virtuality is also increasingly more common. Globalization, distributed skills and competencies, and the advances on communication technology have led organizations to increasingly rely on virtual teams. In this sense, the present study investigates the impact of Team Virtuality on Team Reflexivity, a team process that highly contributes to Team Effectiveness. Despite the geographic and/or temporal distance, and the loss of some cues when communicating through virtual tools, one can still feel present in an environment and that others are present with them and collaborating. This study investigates if this sense of copresence is able to moderate the relationship between Team Virtuality and Team Reflexivity. A sample of 93 Start-up employees has been analyzed. Results showed that the extent of use of virtual tools, informational value and synchronicity have actually a positive effect on Team Reflexivity; that Team Reflexivity has, in fact, a positive influence on Team Performance and Team Viability; but, however, that Copresence has no moderation power on the relationship of Team Virtuality with Team Reflexivity. This research extends the literature, as the impact of Team Virtuality in team processes, Team Reflexivity included, hasn't received significant dedication yet. Moreover, Copresence's impacts have not been studied at all, and it needs further research. Practical and theoretical implications of the findings and potential questions for future research are discussed.

Keywords: Team Virtuality; Synchronicity; Informational Value; Team Reflexivity; Team Performance; Team Viability; Team Effectiveness; Copresence

Abstract (PT)

As equipas tornaram-se a forma de trabalho mais comum nas organizações. Por isso, é de extrema importância compreender o que diferencia as equipas de alto desempenho das outras equipas. A virtualidade na equipa é, também, cada vez mais comum. A globalização, as competências e skills distribuídas, e os avanços na tecnologia de comunicação levaram as organizações a recorrer, cada vez mais, a equipas virtuais. Neste sentido, o presente estudo investiga o impacto da Virtualidade das equipas na Reflexividade das mesmas, um processo de equipa que contribui altamente para a Eficácia das equipas. Apesar da distância geográfica e/ou temporal e da perda de algumas pistas quando a comunicação é feita através de ferramentas virtuais, é possível, ainda, sentir que se está presente num determinado interface e que os outros estão, também, presentes connosco e a colaborar. Este estudo investiga se este sentimento de copresença é capaz de moderar a relação entre a Virtualidade da equipa e a Reflexividade da equipa. Foi analisada uma amostra de 93 empregados de Start-ups. Os resultados mostraram que a quantidade de ferramentas virtuais utilizadas, o valor informacional e a sincronia das mesmas têm, na realidade, um efeito positivo na Reflexividade da equipa; que a Reflexividade da equipa tem, de facto, um impacto positivo no Desempenho e na Viabilidade da Equipa; mas, no entanto, que a Copresença não tem poder de moderação na relação entre a Virtualidade da equipa com a Reflexividade da equipa. Implicações práticas e teóricas dos resultados e potenciais questões para investigação futura são discutidas.

Palavras-chave: Virtualidade da Equipa; Sincronia; Valor informacional; Reflexividade da equipa; Desempenho da equipa; Viabilidade da equipa; Eficácia da equipa; Co-presença

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Introduction

The market and business environment we live in is increasingly more complex and competitive due to globalization, technical complexity and rapid evolution (Schaubroeck & Yu, 2017). In this sense, it also demands increasingly more creativity and innovation, in order for companies to distinguish themselves from others, so they can prosper. Work teams can usually provide organizations with creativity and innovation (Cohen & Bailey, 1997; West, 2004; Widmer, Schippers & West, 2009). Therefore, organizations have relied more and more on teams to accomplish work (Schaubroeck & Yu, 2017). In addition, globalization, distributed skills and competencies, and the need to rapidly develop innovative products, along with improved information and collaboration technologies, have pressured and allowed organizations to rely on Virtuality to accomplish work, therefore creating Virtual Teams (Dulebohn & Hoch, 2017).

As organizations rely on teams to accomplish work, they face the pressure to guarantee that those teams work effectively, and groups actually face several obstacles when they try to coordinate actions and integrate ideas (Tjosvold, Tang & West, 2004; Hackman, 1990). Team Reflexivity has been proved to highly contribute to Team Effectiveness (Carter & West, 1998; De Dreu, 2002; De Dreu, 2007; Hoegl & Parboteeah, 2006; Schippers, 2003; Tjosvold et al., 2003; and others) by reducing the impact of some of those obstacles. Moreover, Team Reflexivity was found to contribute to creativity and innovation, as well (Schippers, West, & Dawson, 2015; De Dreu, 2002; West & Anderson, 1996; Schippers, West, & Dawson, 2015).

As Team Virtuality is increasingly more common (Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Kozlowski & Bell, 2003; Mathieu, Maynard, Rapp, & Gibson, 2008; Gilson, Maynard, Jones Young, Vartiainen, & Hakonen, 2015), it is of extreme importance to understand its' impacts on team processes. Given the relevance of Team Reflexivity to Team Effectiveness, creativity and innovation and, therefore, to the prosperity of organizations, this study aims to understand the impact of Team Virtuality in that team process.

Virtual tools allow team members to communicate even when separated by time and space, increasing the teams' flexibility to coordinate actions (Townsend, DeMarie, & Hendrickson, 2000; Boudreau, Loch, Robey, & Straud, 1998; Chuboba, Wynn, Lu, & Watson-Manheim, 2005), demanded by the complex and fast changing work environment (Boudreau, Loch, Robey, & Straud, 1998; Chuboba, Wynn, Lu, & Watson-Manheim, 2005). However, communication through virtual tools doesn't provide all five senses, as does face to face interaction (Schroeder, 2002). Therefore, there is a loss of media richness when communicating trough technologic solutions. Moreover, social cues are also lost in the process, also leading to

poorer communication (Schroeder, 2002). However, it is still possible to feel that one is present in such medium and that others are present with them and collaborating (Baldassar, 2008; Casanueva & Blake, 2001). This is called the sense of copresence and its' impacts on team processes are still unknown. According to some authors (Yang & Chen; 2008), this feeling can be the background for the development of spontaneous interactions that support information and knowledge sharing, crucial for Team Reflexivity. Therefore, the present study aims to understand if Copresence can moderate the relationship between Team Virtuality and Team Reflexivity.

The sample of this study is composed by Start-Up employees. A start-up is a business entity: "which did not exist before during a given time period (new), which starts hiring at least one paid employee during the given time period (active), and which is neither a subsidiary nor a branch of an existing firm (independent)." (Luger & Koo, 2005). Start-ups are known for their focus on growth and innovation. Therefore, Team Reflexivity should be a prime concern for them, as it highly promotes innovation (Schippers, West, & Dawson, 2015; De Dreu, 2002; West & Anderson, 1996; Schippers, West, & Dawson, 2015). Moreover, when at an early stage of group formation, more strategic decisions have to be made, such as goal setting, process designing, and norms and values' definition (Kirkman et al., 2005). All these processes are part of Team Reflexivity (Schippers et al., 2007). New-born and young companies should also be concerned about implementing norms that enhance reflexivity very early on a team's life because teams usually engage in comfort-enhancing routines (Gersick & Hackman, 1990). Finally, start-ups emerge in a digital world and are known to be highly virtual, so it was expected that a significant amount of Team Virtuality would be found, which was necessary to really understand its' impact on Team Reflexivity.

In this sense, although the goal of this study is extremely relevant for any company, because Team Virtuality is nowadays present in almost every existing company and Team Reflexivity provides benefits also to any organization, it may be of even greater importance to Start-ups.

Literature Review

1.1. Team Virtuality

Globalization, technical complexity and competitiveness have pressured team leaders to assure that their talent is leveraged and well used. In this sense, organizations increasingly rely on teams to respond to the demands of this rapid changing environment (Schaubroeck & Yu, 2017). Work teams are "defined as groups of individuals with mutual accountability that work interdependently to solve problems or carry out work" (Guzzo & Dickson, 1996 in Kirkman & Mathieu, 2005). This reliance on teams is based on the assumption that groups of employees with diversified backgrounds and expertise make better decisions than one employee alone (Griffith & Neale, 2001). This is due to the fact that, even if an employee has access to the same information and knowledge than the whole team, his perspective will always be more limited (Jackson, 1992). Moreover, organizations may understand that no employee has access to the full range of information and knowledge that a group of employees may have, which is necessary for some complex tasks (Hackman, 1990).

More recently, globalization, distributed skills and competencies, organizations' need for fast product development and innovation due to higher competitiveness and rapid evolution, and improved information and collaboration technologies (Dulebohn & Hoch, 2017) have led organizations to increasingly rely on virtual teams (Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Kozlowski & Bell, 2003; Mathieu, Maynard, Rapp, & Gibson, 2008; Gilson, Maynard, Jones Young, Vartiainen, & Hakonen, 2015). Virtual teams allow for organizations to leverage from the best talent, even when individuals with the necessary expertise to cope with a given task are separate by time and space (Townsend, DeMarie, & Hendrickson, 2000); information and telecommunication technologies allow for the best talent to communicate and coordinate their effort to achieve common goals (Schaubroeck & Yu, 2017; Bell & Kozlowski, 2002). Information and communication technologies are, then, considered facilitators of virtuality, as they allow to overcome barriers to collaboration and increase flexibility, demanded by the complex and fast changing work environment (Boudreau, Loch, Robey, & Straud, 1998; Chuboba, Wynn, Lu, & Watson-Manheim, 2005). Therefore, virtual teams have been an explosive trend, expected to continue in the future (Dulebohn and Hoch, 2017).

Virtual Teams have been defined as teams whose members interact and communicate with each other through technology mediums to work on interdependent tasks, crossing multiple boundaries, such as geographic, temporal, organizational and cultural (Dulebohn &

Hoch, 2017; Bell & Kozlowski, 2002; Gibson & Cohen, 2003; Martins, Gilson, & Maynard, 2004). According to Townsend, DeMarie and Hendrickson (2000, p.18), virtual teams are "groups of geographically and/or organizationally dispersed co-workers that are assembled using a combination of telecommunications and information technologies to accomplish a variety of critical tasks". These definitions both include geographic dispersion as a requisite for a team to be virtual. However, recently, this condition has been removed by some authors, as they believe (Kirkman & Mathieu, 2005; Cohen & Gibson, 2003; Girffith & Neale, 2001; Griffith, Sawyer, & Neale, 2003; Martins et al., 2004) that co-located teams (teams whose members interact physically face-to-face) can also be highly virtual. The removal of this condition has enhanced the theoretical and practical understanding of virtual teams (Kirkman & Mathieu, 2005). In this sense, the distinction between purely virtual teams and co-located teams is artificial, as all teams can be situated in a continuum of virtuality. Geographic dispersed teams are, indeed, more likely to use virtual tools to coordinate actions, however, co-located teams may engage in communication through virtual means as well. Co-location does not impede members from interacting virtually, team members may choose to use virtual means for several reasons, even if they are physically proximal, especially in today's workplace (Schaubroeck & Yu, 2017). Today, it is difficult to even imagine a team that doesn't communicate virtually at all (email, videoconferencing, instant messaging, shared calendars...). Almost all teams tend to use at least one type of virtual medium when coordinating their actions to carry out work (Dulebohn & Hoch, 2017). Co-located teams can, then, be highly virtual (Kirkman & Mathieu, 2005).

In this sense, it can be stated that team virtuality is a continuum which refers to "the extent of utilizing technology as a medium for accomplishing work in teams" (Shaubroeck & Yu, 2017, p. 636) or, in more detail, "the extent to which team members use virtual tools to coordinate and execute team processes, the amount of informational value provided by such tools, and the synchronicity of team member virtual interaction" (Kirkman & Mathieu, 2005, p. 702). According to this last definition, there are three dimensions of team virtuality. Relatively to (a) the extent of use of virtual tools, today it is natural that every team employs at least some virtual means to communicate. Many teams that have been considered face-to-face before, now incorporate technology to coordinate some of their actions and many teams considered virtual meet face-to-face sometimes (Kirkman & Mathieu, 2005). Most teams are located, then, between the extremes of the continuum of virtuality (exclusively face-to-face/exclusively virtually). As for (b) informational value, it is the "the extent to which the combination of virtual tools being used conveys communication *and* data that are important for

the team to be effective" (Kirkman & Mathieu, 2005). Kirkman and Mathieu (2005) defend that employing technologies that carry rich and valuable information is less virtual than using technologies that convey less valuable information – the lower the informational value of virtual tools, the higher the level of virtuality. This is due to the fact that their concept of informational value recognizes that virtual tools are used to much more than communicating. Concerning (c) synchronicity, the third dimension of team virtuality, it is the extent to which the virtual medium allows for a synchronous collaboration (Martins et al., 2004; Kirkman & Mathieu, 2005). Synchronous mediums allow for real time exchanges, while asynchronous mediums involve a time lag on communication exchanges (Goel, Sharda, & Taniar, 2003; Pinelle, Dyck, & Gutwin, 2003; Kirman & Mathieu, 2005). Asynchronous exchanges are considered more virtual than synchronous ones, as the first are not able to provide concurrent exchanges with other members, which is what happens in face-to-face interactions, instant messaging or videoconferencing. E-mail, on the other hand, is lower in this dimension. However, it allows for a wider spread of the message (Martins et al., 2004). Some authors believe that asynchronous mediums weaken communication quality, negatively affecting coordination (Warkentin, Sayeed, & Hightower 1997). However, others defend that it allows team members to take time to reflect on the message and their response or even consult other resources (Kirkman & Mathieu, 2005). Moreover, it minimizes the constraints of members working in different time zones (Kirkman & Mathieu, 2005; Martins et al., 2004). As communication channels vary in terms of informational value and synchronicity, team members should choose which type of medium to use depending on which medium is more conducive to effectiveness, according to their context and task (Kirkman & Mathieu, 2005; Martins et al., 2004).

According to Kirkman and Mathieu (2005), a team's extent of virtuality varies depending on three antecedents: contextual features, task-media-member compatibility, and temporal dynamics.

"Contextual features refer to the larger system within which teams are embedded", including "work arrangements and forms such as networks, alliances, partnerships, cellular designs, virtual arrangements" (Kirkman & Mathieu, 2005, p.706). Some work arrangements may lead team members to rely on more or less virtual means of coordination. Contextual features include, for example, the number of boundaries crossed: working across different organizations, countries/cultures, time zones, will necessitate a higher use of virtual means than face-to-face contact (Straus & Olivera, 2000). Teams who work across different time zones, for example, are likely to employ more asynchronous and with less informational value means (e.g. e-mail), thus employing highly virtual tools. Teams with less co-located members are also more

likely to employ more virtual tools for coordination, as at least some of the co-located members usually rely more on face-to-face contact than those who are geographically dispersed (Kirkman & Mathieu, 2005). Team size also affects the reliance on virtual tools, as it is more difficult for a larger team to assemble face-to-face meetings, thus forcing those to use more virtual means. Moreover, it is proved that team size negatively affects the quality of team interactions (Hare, 1981) and positively affects absenteeism rates (Markham, Dansereau, & Alutto, 1982).

Given the present conjecture, due to COVID-19, it is clear that also a Pandemic can be a contextual feature that positively influences the use of virtual tools in organizational teams.

As for task-media-member compatibility, it considers the nature of the task, available technology and team members' competencies. The extent of use of virtual tools depends, then, on how much the task allows virtual means of coordination, how much technology is needed and available and how much members are capable and willing to use such technology. If this synergy is compatible, then, most probably, team members will choose to work more virtually (Kirkman & Mathieu, 2005). Some tasks allow for a higher reliance on virtual tools than others. Tasks with intensive interdependence, for example, where team members have to work with each other on real time, always maintaining situation awareness and monitoring each other, require high informational value and synchronous technology in order to optimize actions, which minimizes virtuality. In this sense, according to Kirkman and Mathieu, the higher the level of task complexity, the lower team virtuality (Kirkman & Mathieu, 2005). Naturally, in terms of members competencies, the more members possess virtuality related KSAOs, team virtuality likely increases. Finally, if more technology is available, team virtuality likely increases.

Time also influences the amount of technology team members choose to employ. First of all, sometimes actions can be coordinated faster through virtual tools, sometimes not. Therefore, team virtuality like increases the more the virtual tools enable the team to complete tasks more quickly and efficiently (Kirkman & Mathieu, 2005). Second of all, teams live life cycles, in which different phases or stages of maturity, different forms of interactions are best employed. During early stages of team development, for example, it is best that actions are coordinated by synchronous, with high informational value tools, such as videoconferencing (Kiesler, Zugrow, Moses, & Geller, 1985). When trust has finally been developed and processes for coordination are settled, team members will be increasingly more effective employing asynchronous and with less informational value tools (Alge, Wiethoff, and Klein, 2003; Townsend et al., 2000). In sum, when team members are still organizing themselves and formulating strategies, "forming and storming" activities, virtuality is likely lower than when

teams are on the latter stages of their life cycle, which are "norming and performing stages" (Tuckman, 1965). Finally, different team phases call for different processes. Transition phases, for example, include actions such as mission analysis, goal specification, and strategy formulation, which call for less virtual means and more face-to-face contact. On the contrary, action phases, when teams are more focused on accomplishing tasks, call for more virtual means of coordination. In this sense, more or less virtuality will be employed, depending on the nature of the task (Kirkman & Mathieu, 2005). Marks, Mathieu & Zaccaro (2001) classified team processes into planning, action and interpersonal processes. Planning processes are, such as transition phases, a time for goal setting, mission analysis, strategy formulation and other actions aiming to focus the group's efforts. Action processes are related to the action phases, actions that occur during the performance of the task, for example, communication, coordination, monitoring and participation. Interpersonal processes encompass the relationships between team members, such as affect, trust, conflict, and social integration (Martins et al., 2004).

Martins et al. (2004) and Griffith and Neal (2001) agree that the extent of virtuality employed by a team depends on the nature of the task, technological resources, and members' skills and capabilities.

Some authors defend that, as virtuality lifts some barriers to collaboration, crossing boundaries such as physical location, time zones, national culture, professional culture, and organizational affiliation, it possibly causes a loss of cohesion in the work environment (Chudoba et al., 2005). Watson-Manheim, Chudoba, & Crowston (2002) call these boundaries/barriers of discontinuities and defend that they contribute to a lack of cohesion between workers in a collective situation. Martins et al. (2004) define three dimensions in which these boundaries can be organized: locational boundaries, temporal boundaries and relational boundaries. Locational boundaries refer to a physical dispersion between team members: different geographic locations or different buildings in the same geographic location, for example. The temporal boundary refers to synchronicity. This is, if team members are able to interact in real time or not. The relational boundary refers to all the relational differences between team members, for example, their connections with other teams, departments, other groups within the organization, such as cultural sub-groups, or even with other organizations. According to Gilson et al. (2015), geographic dispersion can positively influence the creation of subgroups because sometimes subgroups are based on cultural similarities, time zones, or language.

Naturally, virtuality carries positive and negative effects on teams and teams' processes. Dulebohn and Hoch (2017, p. 569) refer some advantages of virtual teams: "the ability to assemble teams that maximize functional expertise by including professionals who are geographically dispersed, enabling continuous 24/7 productivity by using different time zones to their advantage, lowering costs by reducing travel, relocation and overhead, and sharing knowledge across geographic boundaries and organizational units and sites". Chudoba et al. (2005) also refer to the advantage of broadening access to relevant knowledge when using information and communication technology, as it allows team members to communicate with non-collocated or close-knit networks, thus broadening their circle. Griffith and Neal (2001) defend that team members from the same social networks tend to have redundant knowledge and perspectives, which dampens the teams' potential problem-solving effectiveness. To avoid homogeneous groups, organizations try to design cross-functional teams and virtuality allows a broader pool of candidates, which is an advantage of virtual teams. Skill differentiation is essential to create cross-functional teams. It is the extent to which team members have specialized knowledge, skills, and capabilities that make it more or less difficult to substitute them (Hollenbeck et al., 2012). However, it has also been shown that differences in knowledge bases, educational backgrounds, or work experiences positively influence task conflict (Schaubroeck & Yu, 2017; Jehn, Northcraft, & Neale, 1999). Also, team members may suffer from difficulties in communication and coordination, thus impeding from leveraging from the knowledge each member can provide (Gibson & Gibbs; 2006; Scott & Wildman, 2015). Other advantage of virtual teams is that virtuality has been proved to facilitate creativity, as it allows group members to participate with ideas and suggestions more freely, as they have usually less fear of looking foolish or suffer repercussions than in face-to-face interactions (Gilson et al., 2015). Also the fact that some technologies allow team members to "speak all at once", without interrupting any other member (which can block productivity) (Griffith & Neale, 2001), positively influences the act of brainstorming, resulting in a larger number of ideas generated per period of time (Griffith & Neale, 2001). Martins et al. (2004) also state that virtual teams outperform co-located teams in brainstorming and generating ideas, for the same reason. Griffith and Neale (2001) also believe that information and communication technologies allow team members that are motivated to share, to easily share information with other group members, which is an important advantage of virtual teams as well. Some media channels, such as e-mail, allow individuals to distribute information to a broader audience, extending the reach of socialization with other colleagues (Martins et al., 2004; Feldman, 1987).

As for disadvantages, Dulebohn and Hoch (2017, p. 569) state: “communication and collaboration difficulties, low levels of media richness compared to co-located teams, potentially lower team engagement by team members, difficulties in creating trust and shared responsibility among team members, isolation, high levels of social distance between members, and challenges in monitoring and managing virtual teams”. Shaubroeck and Yu (2016) also alert to their belief that when work is coordinated through virtual means, due to the lack of nonverbal and paraverbal cues, there is a loss of communication richness in comparison with face-to-face interactions. Related to some of these disadvantages, other authors defend that virtual teams can possibly find it harder to promote team identification (Schaubroeck & Yu, 2017; Fiol & O'Conner, 2005; Wiesenfeld, Raghuram, & Garud, 2001), to manage diversity across boundaries (Schaubroeck & Yu, 2017; Gibson & Gibbs, 2006; Scott & Wildman, 2015), and to determine how to best lead the team (Schaubroeck & Yu, 2017; Bell & Kozlowski, 2002; Hoch & Kozlowski, 2014). Armstrong and Cole (2002) defend that distance, which is a common feature of virtual teams, may make it more difficult to develop a shared understanding among team members; Jarvenpaa et al. (1998) agree with Dulebohn and Hoch about the difficulty of creating and maintaining trust; Davenport and Pearlsson (1998) refer the difficulty to transfer the organizations’ culture to employees, and Cramton and Orvis (2003) affirm that it may be harder for virtual teams to foster knowledge and information sharing across group members. One important advantage of virtual teams is, though, the possibility of exchanging knowledge with a broader pool of colleagues, so an effort should be done in order to foster knowledge sharing. Other disadvantage mentioned by Schaubroeck and Yu (2017) is that, when teams have considerable skill differentiation between members and asynchronous media channels are used, members usually don’t spend time extending the discussion in order to resolve ambiguity, proceeding, instead, based on an uncertain understanding. Andres (2012) affirms that communication through virtual tools more often suffers from lags in information exchange, misunderstandings, and incoherent messages. However, this is not consensual. Some argue that it is even favorable in some circumstances, for example, when challenges are associated to increased team size.

In spite of all the advantages and disadvantages, what really has to be considered when deciding whether to use or not virtual tools and which is the best one to use in what circumstances is, as stated before, the contextual features, task-media-member compatibility and temporal dynamics (Kirkman & Mathieu, 2005).

1.2. Team Reflexivity

Organizations have increasingly relied on teams to accomplish work. In the fast-changing environment of today's marketplace, teams can usually respond quickly and effectively (Widmer, Schippers & West, 2009). Moreover, they promote creativity and innovation (Cohen & Bailey, 1997; West, 2004; Widmer, Schippers & West, 2009), which are crucial for every organization to distinguish itself from others and prosper.

However, to develop effective teams is not always an easy task (Tjosvold, Tang & West, 2004; Hackman, 1990). Groups face obstacles when they try to coordinate actions and integrate ideas (Tjosvold, Tang & West, 2004; Hackman, 1990).

Teams are information-processing systems and, therefore, face threats such as the "failure to search for and share relevant information, failure to elaborate on information, or failure to alter shared conclusions, maintaining or even reinforcing existing team behaviors" (Schippers, Edmondson, & West, 2014, p.737). Even individuals alone process information in ways that generate systematic errors (Schippers, Edmondson & West, 2014; Heath, Larrick, & Klayman, 1998). These failures can be mitigated with team reflexivity - "the extent to which group members overtly reflect upon, and communicate about the group's objectives, strategies (e.g., decision making) and processes (e.g., communication), and adapt them to current or anticipated circumstances" (West, 2000, p. 296).

Regarding the failure to search for and share relevant information, it is based on the fact that sometimes unique information is not shared because (1) team members don't recognize its importance for the issue being discussed, (2) individuals assume that others have that information too, or (3) members don't want to interrupt the discussion (Schippers, Edmondson, & West, 2014). By engaging in team reflexivity, the team will most probably be able to identify and use useful information (Schippers, Edmondson, & West, 2014; Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hardt, 2007; Schulz-Hardt, Brodbeck, Mojzisch, Kerschreiter, & Frey, 2006).

As for the failure to elaborate on information, it is based on the fact that even if relevant information is shared, team members might still fail to elaborate on that information correctly. "Elaboration refers to working out in detail, and revealing intricacy, through a careful and painstaking process to understand or explain in detail the information relevant to a team's decision-making process." (Schippers, Edmondson, & West, 2014, p. 740). Team reflexivity can help reduce this failure through explicit information processing (Lubatkin, Simsek, Ling, & Veiga, 2006; Wei & Wu, 2013; Schippers, Edmondson, & West, 2014), which is based on

grounded data, involves disconformable statements, and balances advocacy and inquiry (Schippers, Edmondson, & West, 2014). Teams should then be encouraged to carefully reflect on information before emerging on an implemental mind-set (Schippers, Edmondson, & West, 2014).

Teams can also incur in the failure to alter shared conclusions, maintaining or even reinforcing existing team behaviors. After searching and sharing relevant information and elaborating on such information, it is naturally necessary to revise and update prior conclusions, considering alternative interpretations and appropriate approaches to a given problem (Schippers, Edmondson, & West, 2014). However, sometimes teams tend to persist in old routines, social rhythms and beliefs (Schippers, Edmondson, & West, 2014; Staw, 1981; Jonas, Schulz-Hardt, Frey, & Thelen, 2001). Team reflexivity, by encouraging careful attention on the team's decision-making processes, helps to mitigate this failure (Schippers, Edmondson, & West, 2014).

Reflexivity is also very important for the reduction of representational gaps. Sometimes, team members may have different representations of a given problem, ones that can even not be integrated (Cronin & Weingart, 2007). These gaps compose important process losses in teams, which hamper the integration of information and impede the development of a shared understanding, resulting in considerable coordination losses (Schippers, Edmonson, West, 2014; van Ginkel, Tindale, & van Knippenberg, 2009; Steiner, 1972).

The process of discussing ideas about the task, task goals and strategies is part of reflexivity, which is crucial to find common ground and to align task representations. By reflecting on their task together, team members should become aware of their task representations, as well as others', and identify the differences between them. When discussing such differences and trying to align them, more shared and appropriate task representations should be developed. Moreover, when team members reflect on the task, it is more likely that they develop task representations that emphasize the need to exchange and integrate information, making better use of distributed information and therefore enabling higher quality decisions and higher effectiveness (van Ginkel, Tindale, & van Knippenberg, 2009).

In addition, when team members are conscious that task representations are shared in the group, usually their psychological safety increases, as they are sure they can act on those representations (van Ginkel & van Knippenberg, 2008; van Ginkel, Tindale, & van Knippenberg, 2009).

Reflexivity is of major importance when a team is characterized by information asymmetry or/and when the task is complex (Gurtner et al., 2007). Team members may hold

different, but crucial information. Therefore, it is very important that they share it with one another. When team members reflect on the task and on the information they possess, they should more likely understand the importance of sharing it (van Ginkel, Tindale, & van Knippenberg, 2009). However, when in front of a complex task, team members should not only share the information, but also develop and implement good strategies based on that information (Gurtner, Tschan, Semmer, & Nägele, 2007; Hackman, 2002; Marks, Mathieu, & Zaccaro, 2001; Salas, Sims, & Burke, 2005). To do so, group members must reflect on the task and information as well, effectively elaborating on it. Evaluating and reflecting on methods is of greater importance in complex jobs, as the task is non-routine and the environment uncertain (West, 1996; Schippers, Den Hartog, Koopman, & Wienk, 2003).

Team reflexivity can be done before task, during task and after task. Before task, team members would reflect on team goals, strategies and processes. During task execution, it should be considered whether the team is still on the right path, or if the right problem is being approached and things are done correctly. As for reflection after task execution, team members should evaluate their achievements and the way they got there (Schippers, Hartog, & Koopman, 2007). In sum, before task team members should reflect on what they are trying to achieve (goals); during team task, they should reflect on how they are going about it (processes); and after task execution, group members should think about how effective or successful they were (outcomes) (Schippers, Edmondson, & West, 2014).

Reflexivity may also vary in depth (Swift & West, 1998; Schippers, Hartog, & Koopman, 2007). Shallow reflection is the first stage of awareness and it involves reflecting on matters closely related to the task, such as the division of a task between team members. Moderate reflection - the second stage of reflection – is a more critical thinking towards tasks, strategies, goals, and processes. As for deep reflection, it should approach the norms, values and culture of the team or the organization as a whole and their impact on team and organizational functioning (Schippers, Hartog, & Koopman, 2007). Deep reflection is usually less often carried out than shallow and moderate reflection (Allen, 1996).

Besides reflecting on any team matters, it is necessary to act on those reflections, as reflection alone does not lead to changes (Schippers, Hartog, & Koopman, 2007; Widmer, Schippers, & West, 2009). Therefore, team reflexivity is thought of as a process which contains three components: reflection, planning and action/adaptation (Widmer, Schippers, & West, 2009; Schippers, Hartog, & Koopman, 2007). These components are highly interrelated. According to West (2000), reflection includes behaviors such as questioning, careful consideration of work-related issues, analysis, reviewing past events with self-awareness, or

learning at a meta-level. In this sense, reflection as such does not lead to changes, adjustments or improvements (Schippers, Hartog, & Koopman, 2007; Widmer, Schippers, & West, 2009), consisting in only the starting point of the whole reflexivity process (Schippers, Hartog, & Koopman, 2007). Ways of operating have to be adapted when obsolete (Widmer, Schippers, & West, 2009). Planning is, then, the bridge between reflection and adaptation (Miller, Galanter, & Pribram, 1960; West, 1996; Widmer, Schippers, & West, 2009). At this stage, goals should be settled based on the previous reflection and ways to achieve those goals should be planned (Widmer, Schippers, & West, 2009). After, goal-directed behaviors should be pursued in the action/adaptation phase, with the purpose of achieving the desired changes identified during reflection (West, 2000). Even though adaptation is not guaranteed to come after reflection, the chances of making relevant improvements in the team are increased by this activity (Schippers, Edmondson, & West, 2014; Ellis, Carette, Anseel, & Lievens, 2014; Marks, Zaccaro, & Mathieu, 2000). Schippers, Hartog, & Koopman (2007, p.192) see adaptation as "the extent to which teams live up to agreements". The changes resulting from the action phase generate new information, which should then lead to reflection again, and therefore to planning and adaptation, which makes the process ongoing and interactive (West, 2000; Widmer, Schippers, & West, 2009).

In order to encourage reflexivity in teams it is possible to adopt several strategies.

It is important to guarantee a non-harming climate, which should be based on trust, psychological safety and cooperation (Kramer & Tyler, 1996; De Jong, & Elfring, 2010). This is crucial for reflexivity as team members, when sharing feelings and thoughts on team processes, make themselves vulnerable (Cunliffe & Easterby-Smith, 2004). Therefore, team members are only able to take the risk involved in reflexive behavior if there is psychological safety and trust among them: members who trust each other will be able to speak freely and have no fear of doing so (Widmer, Schippers, & West, 2009). Psychological safety encourages, then, reflexivity and debate (West & Ritchter, 2008).

Creating a shared vision can also enhance reflexivity, as it constitutes a higher goal, an idea of a valued outcome, creating commitment and a common identity among team members (West, 1990; Widmer, Schippers, & West, 2009). Moreover, it fosters risk taking (Widmer, Schippers, & West, 2009).

Diversity can also have a positive influence on reflexivity. Group members with different knowledge, skills, and abilities, usually have different opinions and perspectives,

resulting in further communication, discussion and, in turn, reflective behavior (Widmer, Schippers, & West, 2009).

Teams characterized by outcome interdependence are usually more reflective (Widmer, Schippers, & West, 2009). Therefore, having a common goal may positively influence reflexivity, or even making use of rewards based on team performance (Schippers, Hartog, Koopman, & Wienk, 2003).

Leaders have also a prime role in enhancing reflexivity, as they can encourage members to reflect and stimulate communication (Widmer, Schippers, & West, 2009).

Cooperation is also an important factor for reflection, as it usually requires constructive controversy (Tjosvold, Wong, Nibler, & Pounder, 2002, Tjosvold, Tang, & West, 2004).

Team feedback is also capable of encouraging reflexivity, as it promotes awareness of information gaps (Johnson et al., 2013).

According to Okhuysen (2001), simple interventions can also enhance reflexivity, such as a formal command to "stop and think".

Guided reflexivity may also be a way to increase team reflexivity. It consists in briefing, debriefing or after event reviews (Ellis et al., 2014).

As teams usually engage in comfort-enhancing routines (Gersick & Hackman, 1990), it is important to implement a norm that encourages reflexivity very early on a team's life.

Associated to information processing failures, it is also very useful to make sure team members are aware of the existing biases and errors. If they do so, they will probably value and engage more on team reflexivity (Schippers, Edmondson, & West, 2014). The awareness of what is team reflexivity and its' benefits is powerful in enhancing reflection and can be included in team training (Schippers, Hartog, Koopman, & Wienk, 2003).

Team virtuality adds complexity to team interactions (Lipnack & Stamps, 2000) and, consequently, may affect Team Reflexivity. A non-harming climate, which should be based on trust and cooperation (Kramer & Tyler, 1996; De Jong, & Elfring, 2010), for example, is crucial to enable team reflexivity. However, Dulebohn & Hoch (2017) alert for the communication, collaboration and creation and maintenance of trust (Jarvenpaa et al.,1998) difficulties virtuality may entail. Moreover, teams characterized by outcome interdependence are usually more reflective (Widmer, Schippers, & West, 2009) and virtuality may make it more difficult to create trust and shared responsibility among team members (Dulebohn & Hoch, 2017). Creating a shared vision can also enhance reflexivity, as it creates commitment and a common identity among team members (West, 1990; Widmer, Schippers, & West, 2009). However, virtual teams

can possibly find it harder to promote team identification (Schaubroeck & Yu, 2017; Fiol & O'Conner, 2005; Wiesenfeld, Raghuram, & Garud, 2001) and transfer the organizations' culture to employees (Davenport & Pearlsson, 1998). Finally, Cramton and Orvis (2003) affirm that it may be harder for virtual teams to foster knowledge and information sharing across group members, which is crucial for reflexivity. Teams with more virtuality are, then, at a disadvantage in knowledge sharing effectiveness compared to less virtual teams (Griffith, Sawyer, and Neale, 2003; Chen, Carpenter, and Su, 2020). This argument is based on the media richness theory which states that face-to-face communication is best, as it allows immediate feedback and nonverbal cues (Chen, Carpenter, and Su, 2020). Cramton (2001) reported that the greater the use of virtual tools for communication (e-mail, instant messaging...), the greater the negative impact on both explicit and tacit knowledge transfer effectiveness, which is essential for team reflexivity.

Therefore, it is hypothesized that Team Virtuality has a negative impact on Team Reflexivity. As Team Virtuality is measured in three dimensions (extent of use of virtual tools; informational value; and synchronicity):

H1a: The extent of use of virtual tools has a negative impact on Team Reflexivity.
H1b: Informational value has a positive impact on Team Reflexivity.
H1c: Synchronicity has a positive impact on Team Reflexivity.

Reflexivity has been identified as a key factor in the effectiveness of work teams (Schippers, Hartog, & Koopman, 2007). According to Guzzo and Dickson (1996), Hackman (1987) and Sundstrom, De Meuse, and Futrell (1990), effectiveness in groups is indicated by the outputs produced by the team, in terms of quantity, quality, speed, customer satisfaction, and so on; the consequences a group has for its members; or the enhancement of a teams' capability to perform effectively in the future. This is, performance, satisfaction and viability, respectfully. In this study, we focus on the first and the latter, which provide a more task focused evaluation of team effectiveness and a more relational one.

Reflecting on work processes helps teams to be more effective by promoting the generation of new ideas that improve their ways of working (Schippers, Edmonson; & West, 2014). Non-reflexive teams are much less aware of the team goals and strategies, and the environment they work in, resulting in a reactive rather than proactive group, which hampers team effectiveness (Schippers, Hartog, & Koopman, 2007; Widmer, Schippers, & West, 2009). On the contrary, reflexive teams present more elaborated and accurate planning, pay more

attention to long-term consequences, and have a more extensive inventory of environmental cues to which they react to (West et al., 1997; Schippers, Hartog, & Koopman, 2007). Not reflecting and discussing on alternatives can lead to poor decision making and, therefore, to decreased team effectiveness (Schippers, Homan, & Knippenberg, 2013).

Regarding TIP (team information processing) failures, Schippers, Edmonson & West (2014), argue that using team reflexivity to reduce information-processing failures can facilitate innovation and team effectiveness.

Relatively to task representations, van Ginkel, Tindale, & Knippenberg (2009) state that team reflection fosters performance and effectiveness by promoting the development of task-appropriate representations. In addition, reflection positively influences similarity between team members' task representations (Van Ginkel & Van Knippenberg, 2009). As already mentioned, the realization of this similarity increases psychological safety, which enhances group processes (Edmondson, 1999; Ellis et al., 2014) and therefore effectiveness.

The linkage between reflexivity and effectiveness has been shown by several other authors (Carter & West, 1998; De Dreu, 2002; De Dreu, 2007; Hoegl & Parboteeah, 2006; Schippers, 2003; Tjosvold et al., 2003; and others). As reflexivity positively influences effectiveness, its' impact will be as stronger to the degree that prior performance is poorer (Schippers, Homan, & Knippenberg, 2013), as teams will have less need to change their course of action when they are successfully effective. In this sense, it is hypothesized that Team Reflexivity positively influences Team Effectiveness.

H2a: Team Reflexivity positively influences Team Performance.

H2b: Team Reflexivity positively influences Team Viability.

Reflexivity is also key to innovation (Schippers, West, & Dawson, 2015). As todays' marketplace is increasingly competitive, challenging and demanding, it is increasingly necessary to organizations to be innovative in order to maintain or increase effectiveness (Schippers, West, & Dawson, 2015; De Dreu, 2002; West & Anderson, 1996). Reflection helps team members to recognize how their methods, processes and ideas may have become obsolete because of environmental changes (Tjosvold, 1991; Schippers, Hartog, & Koopman, 2007). Reflexivity enables innovation by promoting awareness of the goals, strategies, and processes of teams. By being aware, groups may more likely identify discrepancies between current and ideal factors in their domain, facilitating the development and implementation of actions to reduce those gaps, such as innovation (Schippers, West, & Dawson, 2015).

In spite of all the benefits reflexivity might have, it consumes time and energy of group members. Therefore, teams should only engage in such process when the benefits outweigh the costs (Schippers et al., 2013). However, there is evidence that these benefits can quickly be achieved (Schippers, Edmondson, & West, 2014).

In conclusion, the goal of team reflexivity is to appraise past performance, learn from failures and successes, and adapt action intentions to enhance future functioning (Schippers, Edmondson, & West, 2014).

1.3. Co-presence

Given the increasingly global nature of businesses and allowed by the improvements in communication technologies, distanced collaboration is more and more common (Kraut, Gergle, & Fussell, 2002). The increasing availability, advancements and reduction of costs in technology (Nowak, 2001; Baldassar, 2008) allow, then, for a growth on distributed work (Beaulieu, 2010). An example of such evolution is the *webvolution*, something that started focused on "access and find" progressed to "share, participate, and collaborate" and is now more like an "immersive collaboration and co-creation" (Kapp & O'Driscoll, 2010, p.7). In fact, most networked communication has the purpose of providing a satisfying and productive access to others, to their thoughts and emotions, to feel their presence (Biocca, Harms, & Burgoon, 2003). Therefore, they can be used to provide a sense of social presence as an end in itself or to accomplish tasks involving several peoples' inputs (Biocca, Harms, & Burgoon, 2003). It is also true that communication systems have been increasingly designed in order to improve communication for collaborative work and, therefore, teams have increasingly relied more on networked communication – "a person using a medium to be with another" (Biocca, Harms, & Burgoon, 2003, p. 456).

Technology has the power to extend the normal human sense perceptions through electronic mediation (telephone, e-mail, text message, videoconferencing...) (Zhao, 2003). However, of the five senses, smell, taste and touch are left out, which contributes to a lack of media richness, an absence of social cues in the interpersonal interaction and, therefore, to a poorer communication (Schroeder, 2002). Virtual communication is most commonly constructed by the sense of hearing, either directly by verbal interactions on the telephone, or by webcam, which adds the sense of sight, or indirectly when reading messages in the form of written words by email or SMS (Baldassar, 2008). However, it is still possible, through

electronic mediation, to provide a sense of closeness, despite geographical distance (Baldassar, 2008). It is, in fact, crucial for collaborative virtual environments to be usable and successful to provide individuals with a high sense of presence and copresence, convincing them that they are present in such environment, together with other real people and collaborating with them (Casanueva & Blake, 2001).

In a mediated environment, presence refers to the sense of being of an individual in a particular interface (Sheridan, 1992). It is a subjective and psychological state that includes the sense of being there and the individuals' consideration that what is "there" is real and present (Slater, 1999). Therefore, presence is a subjective, psychological experience of being in an environment when physically being situated in another (Witmer & Singer, 1998).

Social presence has been defined as "the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships" (Short, Williams, & Christie, 1976, p. 65). However, Daft and Lengel (1986) have then extended the concept for a less subjective construct: "medium's capacity for immediate feedback, the number of cues and senses involved, personalization, and language variety" (p. 560), a concept derived from media richness and related to the mediums' characteristics.

The term co-presence was first defined by Goffman (1963) as a sense of being together in a virtual environment where individuals are "accessible, available, and subject to one another" (p.22). According to Nowak (2001), it is the sense of being together and a psychological connection of minds. Moreover, one should feel like being part of a group (Goffman, 1963; Bulu, 2012; Slater, Sadagic, Usoh, & Schroeder, 2000). In this sense, co-presence includes not only the sense of being together in a certain place, but also a mutual awareness between individuals (Bulu, 2012; Biocca, Harms, & Burgoon, 2003). One should feel and perceive others and feel that those others actively perceive him back (Goffman, 1963; Biocca, Harms, & Burgoon, 2003). According to Heeter (1992), the awareness of the existence of the other is enabled by the other's reactions to the user: the reactions of the other to the user validate that they are there and aware. Therefore, co-presence is an interactive achievement by users (Beaulieu, 2010). When talking on the phone, for example, individuals rely on routines such as answering and interrupting, to make sure that they are together with the mediated other on that interface (Beaulieu, 2010). Some authors (Biocca, Harms, & Burgoon, 2003; Short, Williams, & Christie, 1976) defend that the mediated other is not either present or not present but is present to a greater or lesser degree along a co-presence continuum.

According to some authors (Bulu, 2012; Nowak, 2001; Schroeder, 2002; Daft & Lengel, 1986, for example), co-presence is, then, distinct of social presence. Social presence is related

to the quality of the medium and co-presence addresses the psychological interaction of the participants. Zhao (2003), however, defends that co-presence has also been called of social presence and refers to the sense of being together with others in a mediated environment. He argues that co-presence consists on both the (1) physical conditions in which participants interact (what was previously described as social presence) – what he calls mode of co-presence - and (2) the perceptions individuals have of one another and sense of being together (what was previously described as co-presence) – what he calls sense of co-presence. To Zhao (2003), the mode of copresence is a form of human colocation, a set of spatio-temporal conditions in which participants may have instant interactions. In sum, "whereas mode of copresence refers to an individual's actual spatiotemporal colocation with other people, sense of copresence involves an individual's perceptions and feelings of being with others" (Zhao, 2003, p. 450).

The most common form of co-presence in virtual teams is the corporeal telecopresence, in which individuals are present in each of their local sites, but located in each other's electronic proximity (Zhao, 2003). This means that even though participants are not able to reach each other through their naked senses, they are within prompt reach through an electronic communication interface (Zhao, 2003), for example, via telephone, phone, instant messaging, or videoconferencing.

Zhao (2003) also advances that the mode of copresence influences the sense of copresence. In a telephone call, for example, technological factors such as the possibility of automated responses, transmission mode, or the quality of the connection influence the establishment of co-presence (Beaulieu, 2010). The use of a webcam, which allows the sense of sight along with hearing, also facilitates the development of co-presence, rather than by phone call (Baldassar, 2008). If the medium includes avatars, it is also known that some individuals require highly realistic avatars in order to develop and maintain a sense of copresence (Casanueva & Blake, 2001). Schroeder (2002) states that a more immersive virtual system can create a better sense of copresence. Moreover, he advocates that the sense of being together with a mediated other highly depends on what the medium allows them to do together (Schroeder, 2002). Goffman (1963) alerts to the point that copresence implies the reception of body cues, as it is a key medium of communication. In this sense, an interface that allows embodied messages is better for the development of copresence. Generally speaking, the higher the levels of embodiment and media richness, the higher the chance of a great co-presence (Daft & Lengel, 1986; Zhao, 2003).

Moreover, the interfaces of communication determine the way participants come to contact with each other, the process of communication and, therefore, should also impact the outcome of such communication (Zhao, 2003; Nowak, 2001).

In this sense, clearly technology, the medium's characteristics, the mode of copresence, has an important effect on copresence (Nowak, 2001) and on the interaction itself and communication (Zhao, 2003). Thus, it has a decisive impact on collaboration and performance (Schroeder, 2002). To strengthen this point, copresence itself can also influence the communication and its' outcome, because if an individual feels connected with another mind, he should also feel that they are able to fulfill communication goals (Nowak, 2001). An interface that doesn't provide this sense of access to the mediated other may be less able to achieve communication goals (Nowak, 2001).

The goal of mediums should be, then, to "provide interactants with a sense that they have shared an experience, had access to another mind, or experienced a face engagement" (Nowak, 2001, p. 5), as this all determines the ability of the medium to achieve communication goals.

As interactions' goals are not always the same and there are increasingly more medium options to resort to, the medium should be chosen in accordance with the needs of the interaction itself. Interfaces are more and more personalized and targeted for specific needs (Nowak, 2001).

There are several factors that can positively influence copresence. Ciolek (1982), for example, mentioned the importance of attention and responsiveness to others for the sense of copresence. Schroeder (2002) refers to the immersion of the virtual system: the more immersive, the greater copresence. Zhao (2003) agrees, as he believes that higher levels of embodiment or media richness enhance the users' copresence, which should culminate in a fully immersive virtual environment. Schroeder (2002) hypothesizes that the more involved in the task, the more copresence; the richer and more complex the virtual environment, the more copresence; and the more realistic the virtual environment, the more copresence. Schroeder (2002), such as Ciolek (1982), Nowak (2001), and Biocca et al. (2003) also mentions the common focus of attention and mutual awareness. He adds that a collaborative task performance is more likely to lead to a greater co-presence than a competitive one (Schroeder, 2002). Finally, the author states that co-presence depends on what participants are able to do together in the interface, how used people are to the virtual environment, and how many participants there are (Schroeder, 2002). Biocca et al. (2003) agrees with Goffman (1959) that also the presence of obstructions or even the temperature of the air can influence copresence. When communicating through text messages, Zhao (2003) refers to paratext, such as

punctuation marks, emoticons or intentional alterations on spelling, as a factor that contributes for the sense of co-presence, for example: “Hope you come to Italy soooon!!!”. Finally, Zhao (2003, p.451) states that “psychological states, such as mood, alertness, and prior experiences, will affect an individual’s sense of copresence” and “environmental factors such as temperature, light, sound and smell, may also influence an individual’s sense of being with others”.

Yang and Chen (2008) state that co-presence, in technologically mediated environments, is the background for the development of spontaneous interactions that support information and knowledge sharing, crucial for team reflexivity. In this sense, it is hypothesized that co-presence moderates the relationship of team virtuality and reflexivity, as it can probably diminish the negative impact of the first in the latter. As Team Virtuality is measured through three dimensions (extent of use of virtual tools, informational value, and synchronicity):

H3a: Co-presence decreases the negative relationship of the Extent of use of Virtual tools with Team Reflexivity.

H3b: Co-presence increases the positive relationship of Informational Value with Team Reflexivity.

H3c: Co-presence increases the positive relationship of Synchronicity with Team Reflexivity.

1.4. Model

Considering the hypotheses mentioned, the following research model was proposed and tested- Figure 1.

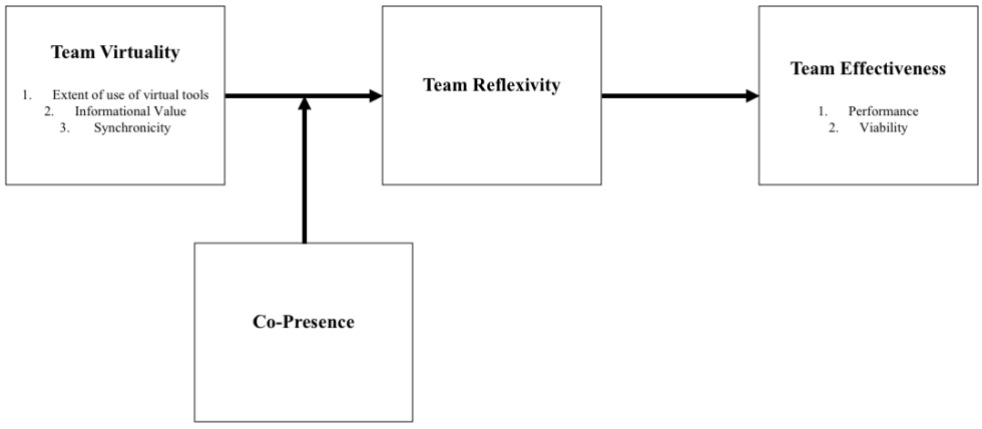

Figure 1- Research Model

Method

Participants

The sample of this study consists in Start-Up employees. A start-up can be defined as a business entity: "which did not exist before during a given time period (new),which starts hiring at least one paid employee during the given time period (active), and which is neither a subsidiary nor a branch of an existing firm (independent)." (Luger & Koo, 2005). However, the time period mentioned is not clear: a start-up can be considered a start-up even if it has over 7 years old, for example. The maximum number of employees, or revenues, for a company to be considered a start-up is also not clear.

Some start-up founders defend that a startup is a culture that cannot be measured by simple metrics. Usually, a startup claims freshness and focuses on growth. Being a new-born company or even a young company focused on growth and freshness, it is crucial for a start-up to invest in reflexivity, as it highly promotes innovation (Schippers, West, & Dawson, 2015). Moreover, naturally, during an early stage of group formation, more strategic decisions have to be made, goals have to be set, processes have to be designed, norms and values have to be accorded (Kirkman et al., 2005). These processes are included in a deep level of reflexivity (Schippers et al., 2007). Finally, teams usually engage in comfort-enhancing routines (Gersick & Hackman, 1990) and, therefore, it is important to implement norms that enhance reflexivity very early on a team's life. This should be a concern of new-born and young companies. Therefore, it was decided that the study would focus on start-ups that, emerging in a digital world and known as highly virtual, should also highly invest in Team Reflexivity.

The sample studied is a convenience sample, as the research group approached most of the teams through their personal and professional networks. However, also the snowball technique was applied, because direct contacts were asked to share the questionnaire with their colleagues, therefore increasing the sample.

As Team Virtuality, Team Reflexivity, and Team Effectiveness are all team variables, it was originally thought that a minimum of 3 individuals from the same team and, therefore, same Start-up, should answer to the questionnaire. Participants were asked to decide and fill a code name equal to all team members, so it could be possible to arrange individual responses in teams. If so, it would be possible to collect the teams' overall result in Team Virtuality, Reflexivity and Effectiveness. However, it was not possible to collect so many answers per team, as a lot of individuals reached out didn't answer to the questionnaire on time. Therefore,

individual perceptions on Team Virtuality, Team Reflexivity, Team Effectiveness and Co-Presence are reported.

A total of 93 individuals, from 41 different Start-Ups participated in the study. The most common areas of action of these Start-Ups are all related to Technology, such as technology itself (10,8%), software development (9,8%), and gamification (6,5%). Recruitment, some of them connected to technology for recruitment (9,8%), Retail (6,5%) and Hospitality (5,5%) were also very common among participants. The most common Start-Up age was more than 5 years (35,5%), followed by from 1 to 2 years old (16,1%) and 4 to 5 years old (15,1%). Most of the participants (45,2%) stated that the Start-Up they worked at was at an Early Growth stage, a stage where the business establishes itself through strong positive growth with a commercially feasible product and/or marketing approach. The average number of employees of the Start-Ups that participated in the study is 112 (SD=243,6), with a minimum of 1 and maximum of 1000. The teams in which participants were embedded ranged from 1 to 50 employees, with an average of 8 (SD=8,4).

Most of the participants of the study were men (57%; n = 53). 36,6% (n = 34) of the sample was female and 5,4% (n = 5) preferred not to answer about their sex. The average age of the inquired group was of 28 years old (SD = 9), the most common ranging from 23 to 26. However, 20 participants preferred not to answer about their age. As for the level of education, the most common was the Masters' Degree (47,3%; n =44), followed by the Bachelors' Degree (41,9%; n=39).

Procedure

To collect data to the study, a questionnaire was developed and shared online through Qualtrics. It was sent to friends, friends of friends and published in a channel of a collaboration hub, called Slack, where a lot of Start-Up workers are connected. Moreover, direct contacts were asked to share the questionnaire with their colleagues, therefore increasing the sample (snowball effect).

The survey was of individual and self-response. It was conducted in English. Therefore, the first question of the survey guaranteed that only individuals comfortable in answering in English could continue with the questionnaire. This way, it was ensured that the results were not biased due to language difficulties.

The survey took approximately 12 minutes to be completed.

After a short introduction about the study, the goals of the research and a declaration of confidentiality and anonymity, participants were asked to answer questions about Team Virtuality, Team Reflexivity, Team Effectiveness, and Co-Presence.

Instruments

After a short introduction to the questionnaire, participants were asked to answer about the name of the start-up they worked at, the number of employees working in the company, and number of employees working in the same team as the participant.

Following these introductory questions, a block consisting of the scales referring to the variables under study was conducted. In this study, four variables were under consideration: Team Virtuality, composed by the sub-scales of the Extent of Use of Virtual tools, Synchronicity and Informational value; Reflexivity; Effectiveness, evaluated through the scales on Performance or Viability; and Co-Presence.

In the last part of the survey, some demographic data was requested: industry of the start-up; start-up stage; start-up age; age, sex, and level of education of the participant.

1. Team Virtuality

Team virtuality was measured by a scale based on Kirkman and Mathieu (2005). According to these authors, team virtuality is defined through three dimensions: "(a) the extent to which team members use virtual tools to coordinate and execute team processes, (b) the amount of informational value provided by such tools, and (c) the synchronicity of team member virtual interaction." (p.702). It was decided that all these three dimensions should be measured and analyzed separately, as each one of them may have different impacts on the other studied variables.

1.1. Extent of use of virtual tools

The extent of use of virtual tools was measured by 10 items where participants were asked to think on how much their team uses virtual tools to complete several tasks. A Likert scale from 1 ("not at all") to 5 ("to a very great extent") was used. The items all started with "To what extent does our team use virtual tools (e.g. email, video conferencing and work tools such as Google docs, Trello, calendar, etc), to:" and were followed by, for example, "Develop an overall strategy to guide our team activities", "Monitor important aspects of our work environment

(e.g., inventories, equipment and process operations, information flows)", or "Assist each other when help is needed". These aspects were included as they are the team processes defined by Mathieu, Luciano & D'Innocenzo (2020).

The analysis for internal consistency yielded a Cronbach's α of .86 which suggests good reliability.

1.2. Informational Value

Informational value was analyzed based on 7 items, developed based on Daft & Lengel (1984/1986) and Ferry, Kydd & Sawyer 2001. A Likert scale from 1 ("not at all") to 5 ("to a very great extent") was used. In this case, the participant should think on how often the chosen virtual tools allowed the transmission of different types and amounts of information. The statements all started with "When our team uses virtual tools to interact, how often does the chosen virtual tool allow for:" and ended up with, for example, "Understanding others through voice inflection, intonation, body language and/or facial and non-verbal expressions", "Conveying data that is important for team efficiency (e.g. expressing agreement is faster with a nod than with typing "I agree with you")", or "Knowing immediately what others think about expressed ideas".

The Cronbach's α of these 7 items was of .83, revealing a good reliability.

1.3. Synchronicity

As for synchronicity, it was measured with 10 items based on Dennis et al. (2008) that evaluated how often the chosen virtual tools allowed for a synchronous or asynchronous communication. A Likert scale from 1 ("not at all") to 5 ("to a very great extent") was used. Examples of such items are "When our team uses virtual tools to interact, how often does the chosen virtual tool allow for: A fast response to the message/ Carefully crafting a message before transmission to ensure that its meaning is expressed precisely/ The revisiting of prior messages". The scale showed a good reliability (α = .91).

2. Reflexivity

To measure reflexivity, a scale developed by Swift and West (1998) was used. Initially, the scale of Schippers, Hartog, and Koopman (2007) was considered. However, it included the 9 items from Swift and West plus 24 items, which made the questionnaire too long. A Likert scale from 1 (strongly disagree) to 5 (strongly agree) was used. Examples of such items are: "The

methods used by the team to get the job done are often discussed.", "In this team we modify our objectives in the light of changing circumstances.", or "We often discuss how well we communicate information.". Two items of this scale had to be reversed, in order to be in line with the other seven. The scale showed good reliability (α = .72).

3. Team Effectiveness

According to Guzzo and Dickson (1996), Hackman (1987) and Sundstrom, De Meuse, and Futrell (1990), effectiveness in groups is indicated by the outputs produced by the team, in terms of quantity, quality, speed, customer satisfaction, and so on (team performance); the consequences a group has for its members (their satisfaction); or the enhancement of a teams' capability to perform effectively in the future (viability). In this study, it was chosen to measure team effectiveness based on the individual perception of the participant about the teams' performance and viability.

3.1. Team Performance

To measure Team Performance, three items were developed, evaluated based on a Likert scale from 1, "Very Poor", to 10, "Superb". The questions ought to understand if the productive outcome of the teams met or exceeded the performance standards of those who received or reviewed the outputs. Therefore, it was asked to participants to evaluate "The amount of work the team produces.", "The quality of work the team produces.", and "Your overall evaluation of the team's effectiveness.". The scale revealed a Cronbach's α of .86, which shows good reliability.

3.2. Team Viability

To measure Team Viability, a scale developed by Standifer, Halbesleben and Kramer's (2009, unpublished data) was used. It had 4 items, measured on a Likert scale from 1, "Strongly disagree", to 7, "Strongly agree". Examples of such items are: "If it was possible, I would have changed teams.", or "This team could work really well in future projects.". Two items of this scale had to be inverted, in order to be in line with the other two. A Cronbach's α of .75 was revealed, showing good reliability.

4. Co-Presence

To measure Co-Presence, a scale from Bailenson, Swinth, Hoyt, Persky, Dimov, and Blascovich (2005), based on three items, was utilized. However, as their study was focused on the presence of embodied agents in virtual rooms, the items had to be adapted. “Even when the “other” was present, I still felt alone in the virtual room.” was adapted to “I still feel alone, even when my colleagues are present through electronic communication devices.”; “I felt like there was someone else in the room with me.” was changed to “I feel like my colleagues are with me.”; and, finally, “I felt like the “other” was aware of my presence in the room.” was changed to “I feel like my colleagues feel that I am present with them.”. The first item had to be inverted, in order to be in line with the other two.

A Cronbach’s α of .77 was revealed, showing good reliability.

Results

Once collected, the data was exported to the IBM SPSS Statistics 26 software, with which the statistical analyses were performed.

As it wasn't possible to collect at least three answers per team, data was treated as the perceptions of participants about Team Virtuality, Reflexivity, Effectiveness, and Co-presence in their teams. In this sense, answers were not aggregated to a team level (Costa et al., 2013).

The Macro PROCESS of Preacher and Hayes (2012) was also used to test the indirect effects in the relation between Team Virtuality, Team Reflexivity and Team Effectiveness (model 4), as well as the moderation of Co-Presence in the relation of the first two variables (model 1). PROCESS calculates the coefficients of a model, estimates direct and indirect effects of simple and multiple mediator models, and tests interactions in moderation models, using ordinary least square methods for all continuous outcomes. Then, it applies bootstrap methods that estimate sampling distribution of statistic tests based on repeated sampling of the data up to 5000 resamples. This tool allows to combine moderation and mediation models in a single and easy to use interface, does not require normal distributed samples, reduces the possibility of Type l errors, and, most importantly to this study, exceeds other tools when the sample is small (Preacher & Hayes, 2012).

In this sense, PROCESS was chosen as the most appropriate method of analysis. It was possible to use Model 8, that combines mediation and moderation in the same analysis. However, as the sample used is small, it was decided to test mediation and moderation in two separate models (model 4 and model 1) in order to get a better understanding of the relations.

Descriptive Statistics and Correlations

Table 1 - Correlations

	M	SD	1	2	3	4	5	6
1. VT_Ext	3.9	.62						
2. VT_InfV	3.7	.66	**.65****					
3. VT_Sync	4.0	.66	**.59****	**.64****				
4. RE	3.8	.53	**.59****	**.47****	**.39****			

5.	PERF	7.7	1.2	**.34****	**.36****	**.27***	**.37****		
6.	VIAB	5.9	1.0	**.30****	**.36****	**.24***	**.39****	**.38****	
7.	COP	3.6	0.8	**.31****	**.31****	.19	**.37****	**.22***	**.24***

**. Correlation is significant at the 0.01 level; *. Correlation is significant at the 0.05 level

Table 1 shows the means, standard deviations and correlations of the studied variables. As it can be observed, all variables are positively correlated, except for Co-Presence and Synchronicity.

The highest correlations are, naturally, the ones between the three dimensions of Team Virtuality. The three of them are positively correlated with each other. The Extent of use of virtual tools (VT_Ext) is correlated with Informational Value (VT_Inf) on 0.66 ($p < .01$) and with Synchronicity (VT_Sync) on .59 ($p < .01$). Synchronicity (VT_Sync) is correlated with Informational Value (VT_InfV) on .64 ($p < .01$). This is, when one dimension of team virtuality increases, the other two increase as well. Relatively to Team Virtuality, it is also interesting to mention that, in a Likert scale from 1(not at all) to 5 (to a very great extent), the averages of the three dimensions were 3.9, 3.7 and 4.0, indicating that participants perceive a considerable Team Virtuality in the teams they work in.

As for perceived Team Reflexivity, measured based on a Likert Scale from 1 (strongly disagree) to 5 (strongly agree), the observed average is of 3.8. Perceived Team Reflexivity appears to be positively correlated with the three dimensions of Team Virtuality: VT_Ext ($r = .59$; $p < .01$), VT_InfV ($r = .47$; $p < .01$), and VT_Sync ($r = .39$; $p < .01$). The positive correlation between the Extent of use of virtual tools and perceived Team Reflexivity was contrary to expectations. Perceived Team Reflexivity is also positively correlated with perceived Team Performance ($r = .37$; $p < .01$), perceived Team Viability ($r = .39$; $p < .01$) and Co-Presence ($r = .37$; $p < .01$).

Perceived Team Performance and perceived Team Viability, the dimensions used to measure Team Effectiveness, are positively correlated with one another ($r = .38$; $p < .01$). Moreover, both of them are positively correlated with Co-Presence (PERF and COP: $r = .22$; $p < .05$; VIAB and COP: $r = .24$; $p < .05$).

All three dimensions of perceived Team Virtuality are positively correlated with perceived Team Performance, perceived Team Viability and Co-Presence except for Synchronicity with Co-Presence, which is also contrary to expectations.

Hypothesis Testing

Results of the Mediation Analysis (Hypotheses 1 and 2)

Table 2

	b	*SE*	*t(df)*	*p*	LL 95% CI	UL 95% CI
Team Performance regressed on VT_Ext (c path)	.42	.23	1.82(88)	.072	-.04	.87
Team Reflexivity regressed on VT_Ext (a path)	**.50**	.07	6.85(89)	.000	**.36**	**.65**
Team Performance regressed on RE (b path)	**.54**	.27	2.03(88)	.046	**.01**	**1.07**
	Unstand. value	*SE*	LL 95% CI	UL 95% CI		
Boostrap results for indirect effect	.27	.16	**-.01**	**.60**		

LL = lower limit; CI = confidence interval; UL = upper limit. All predictor variables were mean-centered.

Table 2 shows the results that test hypothesis 1a and hypothesis 2a, therefore testing if the Extent of use of virtual tools affects Team Performance, through the mediation of Team Reflexivity.

Hypothesis 1a refers to the a path (b = .50; p = .000; 95%CI: .36; .65). In fact, a relationship can be observed between the Extent of use of virtual tools and Team Reflexivity. However, a positive relationship was found, and not a negative one as was hypothesized. In this sense, there is no support for Hypothesis 1a.

Hypothesis 2a refers to the b path (b = .54; p = .046; 95%CI: .01; 1.07). A positive relationship can be observed between Team Reflexivity and Team Performance. Hypothesis 2a was supported by results.

A direct effect of the Extent of use of virtual tools on Team Performance was not found (b = .42; p = .072; 95%CI: -.04; .87).

As for the indirect effect of the Extent of use of virtual tools on Team Performance through Team Reflexivity (95%CI: -.01; .60), results show no mediation.

Table 3

	b	*SE*	*t(df)*	*p*	LL 95% CI	UL 95% CI

Team Viability regressed on VT_Ext (c path)	.18	.20	.89(88)	.378	-.22	.57
Team Reflexivity regressed on VT_Ext (a path)	.50	.07	6.85(89)	.000	.36	.65
Team Viability regressed on RE (b path)	**.61**	.23	2.64(88)	.010	**.15**	**1.07**
	Unstand. value	*SE*	LL 95% CI	UL 95% CI		
Boostrap results for indirect effect	.31	.12	**.08**	**0.57**		

LL = lower limit; CI = confidence interval; UL = upper limit. All predictor variables were mean-centered.

According to the b path (b = .61; p = .010; 95%CI: .15; 1.07), Team Reflexivity has a positive impact on Team Viability, supporting hypothesis 2b.

As for the indirect effect of the Extent of use of virtual tools on Team Viability through Team Reflexivity (95%CI: .08; .57), it was supported by results. In this case, there is an indirect effect.

A direct effect of the Extent of use of virtual tools on Team Viability was, however, not found (*b* = .18; *p* = .378; 95%CI: -.22; .57). In this sense, the Extent of use of virtual tools doesn't impact Team Viability directly, but by means of Team Reflexivity.

Table 4

	b	*SE*	*t(df)*	*p*	LL 95% CI	UL 95% CI
Team Performance regressed on VT_InfV (c path)	.50	.19	2.54(88)	.013	.11	.88
Team Reflexivity regressed on VT_InfV (a path)	**.37**	.08	4.90(89)	.000	**.22**	**.53**
Team Performance regressed on RE (b path)	.53	.24	2.21(88)	.030	.05	1.01
	Unstand. value	*SE*	LL 95% CI	UL 95% CI		
Boostrap results for indirect effect	.20	.10	**.02**	**.42**		

LL = lower limit; CI = confidence interval; UL = upper limit. All predictor variables were mean-centered.

The extent of use of virtual tools is not the only dimension of Team Virtuality. The other two dimensions were also tested. Considering Informational Value, its' impact on Team Reflexivity was supported (*b* = .37; *p* = .000; 95%CI: .22; .53). It can be stated, then, that Informational Value has a positive impact on Team Reflexivity (H1b).

The indirect effect of Informational Value on Team Performance through Team Reflexivity (95%CI: .02; .42) was supported by the results. A direct effect of Informational Value on Team Performance was also found (*b* = .50; *p* = .013; 95%CI: .11; .88).

Table 5

	b	*SE*	*t(df)*	*p*	LL 95% CI	UL 95% CI
Team Viability regressed on VT_InfV (c path)	.36	.17	2.14(88)	.035	.03	.69
Team Reflexivity regressed on VT_InfV (a path)	.37	.08	4.90(89)	.000	.22	.53
Team Viability regressed on RE (b path)	.52	.21	2.53(88)	.013	.11	.93
	Unstand. value	*SE*	LL 95% CI	UL 95% CI		
Boostrap results for indirect effect	.20	.085	**.05**	**.38**		

LL = lower limit; CI = confidence interval; UL = upper limit. All predictor variables were mean-centered.

As for the relationship between Informational Value and Team Viability, a direct (*b* = .36; *p* = .035; 95%CI: .03; .69) and indirect effect (95%CI: .05; .38) were found.

Table 6

	b	*SE*	*t(df)*	*p*	LL 95% CI	UL 95% CI
Team Performance regressed on VT_Sync (c path)	.30	.19	1.58(89)	.118	-.08	.67
Team Reflexivity regressed on VT_Sync (a path)	**.31**	.08	4.04(90)	.000	**.16**	**.47**
Team Performance regressed on RE (b path)	.67	.23	2.86	.005	.21	1.14

	Unstand. value	*SE*	LL 95% CI	UL 95% CI
Boostrap results for indirect effect	.21	.10	**.05**	**.42**

LL = lower limit; CI = confidence interval; UL = upper limit. All predictor variables were mean-centered.

The third and last dimension of Team Virtuality is Synchronicity. Its' impact on Reflexivity was supported (*b* = .31; *p* = .000; 95%CI: .16; .47), supporting that Synchronicity has a positive impact on Team Reflexivity (H1c).

The mediation by Team Reflexivity on the relationship between Synchronicity and Team Performance (95%CI: .05; .42) was also supported by results. A direct effect of Synchronicity on Team performance, however, was not found (*b* = .30; *p* = .118; 95%CI: -.08; .67), suggesting that Synchronicity only impacts Team Performance by means of Team Reflexivity.

Table 7

	b	*SE*	*t(df)*	*p*	LL 95% CI	UL 95% CI
Team Viability regressed on VT_Sync (c path)	.16	.16	.98(89)	.332	-.16	.48
Team Reflexivity regressed on VT_Sync (a path)	.31	.08	4.04(90)	.000	.16	.47
Team Viability regressed on RE (b path)	.66	.20	3.26(89)	.002	.26	1.06
	Unstand. value	*SE*	LL 95% CI	UL 95% CI		
Boostrap results for indirect effect	.21	.08	**.07**	**.37**		

LL = lower limit; CI = confidence interval; UL = upper limit. All predictor variables were mean-centered.

An indirect effect of Synchronicity on Team Viability through Team Reflexivity (95%CI: .07; .37) was supported by results. However, a direct effect was not found (*b* = .16; *p* = .332; 95%CI: -.16; .48), which means that Synchronicity impacts Team Viability, but by means of Team Reflexivity.

Results of the Moderation Analysis (Hypothesis 3)

Table 8

Predictor Variable	*b*	*SE*	*t(df)*	*p*	LL 95% CI	UL 95% CI
VT_Ext	.65	.36	1.80(87)	.075	-.07	1.36
COP	.37	.40	.93(87)	.354	-.42	1.16
Interaction	-.05	.10	-.56(87)	.575	**-.25**	**.14**

LL = lower limit; CI = confidence interval; UL = upper limit. All predictor variables were mean-centered.

It was hypothesized that Co-Presence would moderate the relationship of Team Virtuality and Team Reflexivity.

According to the results on Table 8 (95%CI: -.25; .14), however, the moderation by Co-Presence on the relationship of the Extent of use of virtual tools and Reflexivity was not supported (H3a).

Table 9

Predictor Variable	*b*	*SE*	*t(df)*	*p*	LL 95% CI	UL 95% CI
VT_InfV	.60	.37	1.60(87)	.114	-.15	1.34
COP	.47	.38	1.23(87)	.223	-.29	1.23
Interaction	-.08	.10	-.78(87)	.439	**-.27**	**.12**

LL = lower limit; CI = confidence interval; UL = upper limit. All predictor variables were mean-centered.

Regarding the moderation by Co-Presence on the relationship between Informational Value and Team Reflexivity (95%CI: -.27; .12), it can't be stated that Co-presence increases the positive relationship of Informational Value with Team Reflexivity. Hypothesis H3b was not supported by results.

Table 10

Predictor Variable	*b*	*SE*	*t(df)*	*p*	LL 95% CI	UL 95% CI
VT_Sync	.38	.34	1.12(88)	.267	-.29	1.05
COP	.35	.39	.88(88)	.382	-.44	1.13
Interaction	-.03	.09	-.33(88)	.741	**-.22**	**.15**

LL = lower limit; CI = confidence interval; UL = upper limit. All predictor variables were mean-centered.

Finally, the last hypothesis testing to be reported is about H3b: Co-presence increases the positive relationship of Synchronicity with Team Reflexivity. As it can be observed on Table 10 (95%CI: -.22; .15), the hypothesis was not supported.

Table 11

Summary of Hypotheses Testing

Hypothesis	**Supported/ Not**
H1a - The extent of use of virtual tools has a negative impact on Team Reflexivity.	**Not supported**
H1b: Informational value has a positive impact on Team Reflexivity.	**Supported**
H1c: Synchronicity has a positive impact on Team Reflexivity.	**Supported**
H2a: Team Reflexivity positively influences Team Performance.	**Supported**
H2b: Team Reflexivity positively influences Team Viability.	**Supported**
H3a: Co-presence decreases the negative relationship of the Extent of use of Virtual tools with Team Reflexivity	**Not supported**
H3b: Co-presence increases the positive relationship of Informational Value with Team Reflexivity.	**Not supported**
H3c: Co-presence increases the positive relationship of Synchronicity with Team Reflexivity.	**Not supported**

Table 12

Summary of Direct and Indirect Effects

Effects	**Supported/ Not**
Direct effect: The **Extent of use of virtual tools** has a negative impact on **Team Performance**.	**Not supported**
Indirect effect: The relation between the **Extent of use of virtual tools** and **Team Performance** is mediated by **Team Reflexivity**.	**Not supported**
Direct effect: The **Extent of use of virtual tools** has a negative impact on **Team Viability**.	**Not supported**
Indirect effect: The relation between the **Extent of use of virtual tools** and **Team Viability** is mediated by **Team Reflexivity**. **Note:** (although **there is a mediation**, it is **contrary** to what was expected)	**Not supported**
Direct effect: **Informational value** has a positive impact on **Team Performance**.	**Supported**
Indirect effect: The relation between **Informational Value** and **Team Performance** is mediated by **Team Reflexivity**.	**Supported**
Direct effect: **Informational Value** has a positive impact on **Team Viability**.	**Supported**
Indirect effect: The relation between **Informational Value** and **Team Viability** is mediated by **Team Reflexivity**.	**Supported**
Direct effect: **Synchronicity** has a positive impact on **Team Performance**.	**Not supported**
Indirect effect: The relation between **Synchronicity** and **Team Performance** is mediated by **Team Reflexivity**.	**Supported**
Direct effect: **Synchronicity** has a positive impact on **Team Viability**.	**Not supported**
Indirect effect: The relation between **Synchronicity** and **Team Viability** is mediated by **Team Reflexivity**.	**Supported**

Discussion

The goal of the current study was to understand the implications of Team Virtuality on Team Effectiveness, thinking about the mediating role of Team Reflexivity. Moreover, the study ought to find out whether Co-Presence has a role in moderating the relationship between Team Virtuality and Team Reflexivity. This is of major importance because teams are increasingly more virtual (Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Kozlowski & Bell, 2003; Mathieu, Maynard, Rapp, & Gibson, 2008; Gilson, Maynard, Jones Young, Vartiainen, & Hakonen, 2015). Moreover, globalization, technical complexity and competitiveness have pressured team leaders to guarantee that their teams work effectively and innovate, in which Team Reflexivity plays a crucial role (Schippers, Edmonson; & West, 2014; Carter & West, 1998; De Dreu, 2002; De Dreu, 2007; Hoegl & Parboteeah, 2006; Schippers, 2003; Tjosvold et al., 2003; and others). This research aims at contributing to the literature in a new way, as the effects of the 3 dimensions of Team Virtuality considered on Team Reflexivity haven't been studied so far. Moreover, Co-presence has rarely been studied as a moderator of Team Virtuality with other variables, which could be very interesting, as there are several factors that can be used to enhance co-presence (Ciolek, 1982; Schroeder, 2002; Zhao, 2003), if positive relationships with such variables were found.

Even though the analysis didn't provide support for all hypotheses settled, there are some important findings that can be discussed.

First of all, the positive impact of Team Reflexivity in Team Performance and Team Viability, both dimensions of Team Effectiveness, was supported by results (H2a, H2b). It was highly expected, as much literature had already proven this relationship (Carter & West, 1998; De Dreu, 2002; De Dreu, 2007; Hoegl & Parboteeah, 2006; Schippers, 2003; Tjosvold et al., 2003; and others).

As for the impact of Team Virtuality in Team Reflexivity, the positive relation of the Extent of use of virtual tools and Team Reflexivity was contrary to what was expected (H1a). It was hypothesized that, the greater the Extent of virtual tools, and therefore, Team Virtuality, the less Team Reflexivity. According to the literature, the factors and team characteristics that enhanced Team Reflexivity, such as trust, shared responsibility and interdependence, shared vision, or knowledge transfer, were dampened by Team Virtuality (Kramer & Tyler, 1996; De Jong, & Elfring, 2010; Dulebohn & Hoch, 2017; Jarvenpaa et al.,1998; Widmer, Schippers, & West, 2009; West, 1990; Schaubroeck & Yu, 2017; Fiol & O'Conner, 2005; Wiesenfeld, Raghuram, & Garud, 2001, and others). However, the results of the present study show the

opposite: the greater the Extent of Virtual tools, the greater Team Reflexivity. A possible reason of this finding is the scale used to measure the Extent of use of Virtual tools (developed based on Kirkman & Mathieu, 2005). The scale includes 10 items where participants were asked to think on how much their team uses virtual tools to complete several team processes defined by Mathieu, Luciano & D'Innocenzo (2020). Some of those processes are part of Team Reflexivity or enhance it, such as "Identify the key challenges we expect to face", "Develop an overall strategy to guide our team activities", or "Seek timely feedback from stakeholders (e.g., customers, top management, other organizational units) about how well we are meeting our goals". In this sense, it can be confusing to participants to separate how much they actually *engage* on those processes and how much they *use virtual tools* to do so. Moreover, it is natural that the more teams engage in such processes, the higher the number of opportunities to use virtual tools to do so. It can be concluded that what really matters is whether these processes take place, and not if they do so through virtual tools or not: virtuality itself may not make so much of a difference on Team Reflexivity, as long as those processes are present. For future research, it may be useful to separate the scale in Transition phase processes, which include actions such as mission analysis, goal specification, and strategy formulation, and Action phase processes, which include actions that occur during the performance of the task, for example, communication, coordination, monitoring and participation (Mathieu et al., 2020), as different processes may have different impacts. In this case, Transition phase processes are very close to Team Reflexivity and that may have had an impact on results.

As for the influence of Informational Value and Synchronicity on Team Reflexivity, it was expected to be positive because the greater Informational Value and Synchronicity the less Team Virtuality (Kirkman & Mathieu, 2005). These hypothesis (H1b, H1c) were supported. If we admit that the Extent of use of Virtual tools has a positive impact on Team Reflexivity, but so does Informational Value and Synchronicity, it can be inferred that the way virtual tools are used has a greater impact than merely if they are used or not. This is in line with some authors opinion that it is important to go beyond the extent to which members use virtual tools, but also consider that different technologies offer different advantages and disadvantages and, if employed right, can enhance team processes (Bell & Kozlowski, 2002; Cohen & Gibson, 2003; Griffith & Neale, 2001; Griffith et al., 2003; and Kirkman & Mathieu, 2005).

A very interesting finding is that only Informational Value has a direct impact on Team Performance and Team Viability. The Extent of use of virtual tools has no direct or indirect impact on Team Performance, suggesting, again, that the amount of virtual tools used by team members may not have such a great impact, nor directly, nor by means of Team Reflexivity, on

Team Performance. This dimension of virtuality has, however, an indirect impact on Team Viability, through Team Reflexivity. This means that the Extent of use of virtual tools may influence the willingness of a team to continue to work together in the future (Guzzo & Dickson, 1996), by means of Team Reflexivity. Synchronicity has an indirect influence on both Team Performance and Viability, through Team Reflexivity. Synchronicity's impact on Team Reflexivity is visible on the impact Team Reflexivity has on Team Performance and Viability. Informational Value stands out, though, as it has a direct and indirect impact on both Team Performance and Team Viability. The results show that the Extent of use of virtual tools is less powerful than Synchronicity, and Synchronicity less powerful than Informational value. In this sense, it can be concluded that the manner matters less than the matter. It makes a smaller difference to work on a synchronous manner than to choose the appropriate virtual tool for the task, capable of conveying meaningful data and information; and the extent of virtual tools team members choose to employ makes an even smaller difference. All these results reinforce the idea that it is not so much about the amount of virtual tools used, but about the choice of the right tools for the task (Bell & Kozlowski, 2002; Cohen & Gibson, 2003; Griffith & Neale, 2001; Griffith et al., 2003; and Kirkman & Mathieu, 2005).

Regarding Copresence, its' moderator effect on the relationship between Team Virtuality and Team Reflexivity was not supported by results (H3a, H3b, H3c). However, it is positively correlated with two of the three dimensions of Team Virtuality – the Extent of use of virtual tools and Informational Value -, Team Reflexivity, and the two dimensions of Team Effectiveness. Its' correlations with the dimensions of Team Virtuality may be confusing. It could be expected that the correlation of Copresence with the Extent of use of virtual tools would be negative, as face-to-face interaction generates the most vivid sense of copresence (Cooley, 1956; Goffman, 1963; Zhao, 2003). In this sense, the less virtual tools used, the more Copresence. However, if it is true that participants have answered to the items on the Extent of use of Virtual tools thinking on how much their teams engaged on the team processes mentioned, and not so much on the extent of virtual tools used to do so, then this result can be understood. In this sense, the more team processes take place, the more copresence, because they require collaboration and, therefore, enable copresence (Schroeder, 2002; Ciolek, 1982; Nowak, 2001; and Biocca et al., 2003).

Relatively to the positive correlation of Copresence and Informational Value, the mode of copresence (physical conditions in which participants interact) affects the sense of copresence (the perceptions individuals have of one another and sense of being together) (Zhao, 2003) and, therefore, it is natural that virtual tools that enable the exchange of meaningful

information and data provide higher senses of copresence. It is odd, though, that there is no correlation between Copresence and Synchronicity – the extent to which the virtual medium allows for real time collaboration. According to Ciolek (1982), attention and responsiveness, highly provided by synchronous mediums, highly provide copresence. Moreover, the sense of hearing and sight, provided only by synchronous forms of communication, also enhance copresence (Baldassar, 2008). In this sense, future research is needed to better understand the relationship between Copresence and Synchronicity. The positive correlation between Copresence and Team Reflexivity is in line with the literature. Yang and Chen (2008) defend that, in technologically mediated environments, copresence is the background for the development of spontaneous interactions that support information and knowledge sharing, which is crucial for team reflexivity. For the same reason, the positive correlations with Team Performance and Viability are not surprising. Although it is very strange that correlations were found, but not a moderation effect, it may be explained with statistical reasons. All participants have reported almost the same values of Co-Presence (M=3.6; SD=0.8). Without variability, it may be difficult to infer a moderation.

Practical Implications

Globalization, technical complexity, competitiveness and rapid evolution are pressuring organizations to leverage their talent the best they can (Dulebohn & Hoch, 2017; Schaubroeck & Yu, 2017). In this sense, team virtuality is increasingly more common, as it allows team members to coordinate effort even when separated by time and space, increasing the flexibility demanded by the complex and fast changing work envirnonment (Townsend, DeMarie, & Hendrickson, 2000; Boudreau, Loch, Robey, & Straud, 1998; Chuboba, Wynn, Lu, & Watson-Manheim, 2005). However, in order for organizations to leverage from their talent and virtuality itself, they need to know Virtuality and how to best manage it. Communication channels vary in terms of informational value and synchronicity. Therefore, it is important to choose the best medium to the context and task (Kirkman & Mathieu, 2005; Martins et al., 2004). To do so, organizations may evaluate the contextual features, task-media-member compatibility, and temporal dynamics (Kirkman & Mathieu, 2005).

Contextual features are the larger system where the team is embedded and include, for example, alliances, networks, partnerships, number of boundaries crossed, or team size. Some work arrangements lead to higher or lesser reliance on virtual tools (Kirkman & Mathieu, 2005). Task-media-member compatibility should also be considered when the communication medium

is chosen. Some tasks allow for a higher reliance on virtual tools than others. More interdependent or focused on actions such as mission analysis, strategy formulation and goal setting require less virtual tools. Regarding members' capabilities, the more members possess virtually related skills and competencies, the easier it is to employ virtual tools. Finally, organizations should consider the technology available. The medium that enables the task to be completed more quickly and efficiently should be chosen (Kirkman & Mathieu, 2005).

The present study's results support the idea that the extent of use of virtual tools may not have a negative impact on Team Effectiveness. What should really be the concern of team members, then, is to employ the right medium to the context and task. This is line with the idea of Kirkman and Mathieu (2005) that organizations shouldn't face virtuality as a necessary evil, but leverage from it to enhance effectiveness, even with co-located members. Results also show that Informational Value is the dimension of Team Virtuality to which organizations should pay more attention to, as it has a direct impact on Team Performance and Team Viability. When considering the available tools for the task, the ability of the tool to convey important communication and data should, then, be one of the first concerns. As for synchronicity, results show it doesn't have a direct impact on Team Performance and Viability. It can though, impact those through other variables. In this case, it does through Team Reflexivity. Therefore, it should also be a concern when appraising available tools.

In order to cope with the demands of a fast-changing work environment, teams should be effective in coordinating their actions and integrating ideas (Tjosvold, Tang & West, 2004; Hackman, 1990). Moreover, knowledge as an intangible asset of an organization is crucial for a company to differentiate its products and services from competition (Lewis, 2003). However, these intangible knowledge assets have to be leveraged and Team Reflexivity has a great impact in doing so by encouraging team members to share and elaborate on information (Schippers, Edmondson, & West, 2014).

The present study's results support that Team Reflexivity impacts Team Performance and Viability, which is in line with Schippers, Hartog, & Koopman (2007), Schippers, Edmonson, and West (2014), and other authors. Therefore, the present study should encourage team leaders to promote Team Reflexivity. It can help organizations understand what Team Reflexivity is, what benefits it has and how to enhance it.

Team leaders and members should be aware of information processing failures and that Team Reflexivity can encounter them (Schippers, Edmondson, & West, 2014). Moreover, it can reduce task representation differences (van Ginkel, Tindale, & van Knippenberg, 2009), to which organizations should also pay attention to, as these gaps compose important process

losses in teams, which hamper the integration of information and impede the development of a shared understanding, resulting in considerable coordination losses (Schippers, Edmonson, West, 2014; van Ginkel, Tindale, & van Knippenberg, 2009; Steiner, 1972). This study also warns about the necessity of Adaptation after Team Reflexivity (Schippers, Hartog, & Koopman, 2007; Widmer, Schippers, & West, 2009).

In order to encourage Team Reflexivity, team leaders can rely on many strategies. It is important to guarantee a non-harming climate, which should be based on trust, psychological safety and cooperation (Kramer & Tyler, 1996; De Jong, & Elfring, 2010). Creating a shared vision, constituting a higher goal, creating commitment and common ground, can also enhance reflection (West, 1990; Widmer, Schippers, & West, 2009). Putting together diverse teams, with different backgrounds, competencies and ideas can encourage debate and, therefore, Team Reflexivity (Widmer, Schippers, & West, 2009). Leaders have a prime role in enhancing reflexivity, as they can encourage members to reflect and stimulate communication (Widmer, Schippers, & West, 2009), and implement simple interventions such as a formal command to "stop and think" (Okhuysen, 2001). As teams usually engage in comfort-enhancing routines (Gersick & Hackman, 1990), it is important to implement a norm that encourages reflexivity very early on a team's life. Finally, the awareness of what is team reflexivity and its' benefits can be very powerful in enhancing it and can be included in team training (Schippers, Hartog, Koopman, & Wienk, 2003).

Although the moderation effect of Copresence in the relationship of Team Virtuality with Team Reflexivity wasn't supported, correlations of Copresence with several variables were found. Its' positive correlations with Team Reflexivity, Team Performance and Team Viability show that it is important to have Copresence into account and enhance it. There are several factors that can enhance Copresence. Team members can enhance their sense of copresence and of the other participants by getting involved in the task and by guaranteeing a common focus of attention, responsiveness and a mutual awareness (Schroeder, 2002; Ciolek, 1982; Nowak, 2001; Biocca et al., 2003). Copresence also depends on what participants are able to do together in the virtual environment (Schroeder, 2002). Therefore, if team members choose the right medium for the task, one that allows them to do what they need to complete that task, they will probably sense copresence. Some authors believe that the more immersive and realistic the virtual environment, the greater copresence (Schroeder, 2002; Zhao, 2003). In this sense, team members can opt for this type of mediums if they want to enhance their sense of copresence. When communicating through text messages, paratext can enhance copresence

(Zhao, 2003). Avoiding obstructions and guaranteeing an adequate environment also positively influences copresence (Zhao, 2003).

In conclusion, the present study shows that virtuality should be used by organizations without fear. However, team members should be careful in choosing the right medium for the task. Moreover, the study proves the relationship of Team Reflexivity with Team Performance and Viability and offers a review of how to enhance it. Finally, although it didn't support the moderation effect of Copresence, it showed its' positive correlations with Team Reflexivity and the dimensions of Team Effectiveness, which pinpoint its' importance, and offers a review of how to enhance it. All this information is valuable to team members, team leaders and, therefore, to organizations themselves.

Theoretical Implications

The present study offers a review of what is Team Virtuality, its' antecedents and set of factors that may increase it. Moreover, while previous research concentrated more on definitions, antecedents and its' direct effect on team effectiveness (Kikman & Mathieu, 2005; Schaubroeck & Yu, 2017; Chudoba et al., 2005), this study provides an analysis of mediating (Team Reflexivity) and moderating (Copresence) variables. The inclusion of such variables has been suggested by Martins, Gilson and Maynard in 2004. They affirmed that such extensions to the literature would provide a richer understanding of the dynamics in Virtual Teams.

Although Team Virtuality has been studied in relation with information processing and knowledge in teams (Griffith & Neale, 2001; Griffith, Sawyer, & Neale, 2003), it had never been studied in relation with Team Reflexivity before, considering its three dimensions (informational value, extent of use of virtual tools to work and synchronicity). The impact of Team Reflexivity on Team Effectiveness has previously been supported by several authors (Carter & West, 1998; De Dreu, 2002; De Dreu, 2007; Hoegl & Parboteeah, 2006; Schippers, 2003; Tjosvold et al., 2003; and others). Therefore, it has been of major importance to analyze the effect of Team Virtuality, which is more and more common, in Team Reflexivity. Besides the analysis of the effect of Team Virtuality in Team Reflexivity, the present study contributes with a review on Team Reflexivity and on factors that may enhance it.

Regarding Copresence, past literature has focused almost exclusively in its' definition. Antecedents of Copresence have also been present in several studies. However, the impact of Copresence on other variables has been neglected by theorists. The present study aims to change that.

Limitations and Future Research

Despite all practical and theoretical contributions, this study is not without limitations that should be acknowledged and can point towards future research directions.

The aim of this study is to analyze the effect of Team Virtuality on Team Reflexivity and Team Effectiveness. Moreover, it pretends to understand if Copresence has a moderation effect on the first relationship mentioned. All these variables, except for Copresence, are Team Variables and should, therefore, be appraised at a team level. However, it was not possible to collect sufficient valid answers from each Start-up to aggregate individual perceptions and develop team level results. In this sense, results are based on individual perceptions about Team Virtuality, Team Reflexivity and Team Effectiveness. This is considered a limitation of the study.

The studied sample was reduced to a small niche: Start-ups. These companies are very peculiar and have a very peculiar positioning that, although very appropriate to this study, may have produced results that cannot be generalized to every type of organization. Future Research could, if possible, study wider samples.

Regarding the scale used to measure the Extent of use of virtual tools, as it can be confusing for participants to separate how much their teams engage in the given team processes or how much their teams use virtual tools to do so, future research may benefit from the separation of the scale in transition phase processes and action phase processes. The use of virtual tools in different processes may have different outcomes and therefore results may be more accurate if the scale is separated that way. In the present study, transition phase processes are very similar to Team Reflexivity processes and this may, therefore, have had an impact on results, reducing their reliability. Moreover, Gilson, Maynard et al. (2005) have mentioned the importance of Team Virtuality's literature to consider transition processes more extensively. They believe that action and interpersonal processes have extensively been considered by Team Virtuality research and, on the contrary, transition processes have been ignored. The authors suggest that the relationships of the various dimensions of virtuality with transition processes should be studied and defend that it may help to clear some of the mixed performance results evidenced in studies of Virtual Teams. The present study didn't focus on Transition phase processes. However, Team Reflexivity includes most of those processes. Therefore, this study may be helpful for such research.

Other limitation that should be mentioned is about the scale used to measure Team Reflexivity. Although the literature states that Reflection should be followed by Adaptation

(Schippers, Hartog, & Koopman, 2007; Widmer, Schippers, & West, 2009), the scale didn't include items about it. The scale developed by Schippers, Hartog, and Koopman (2007), that measures Team Reflexivity including Adaptation was considered. However, it was very long. It was decided, then, to use Swift and West's (1998) scale, which items are also included in the scale from Schippers et al., so participants wouldn't quit answering the questionnaire and could invest their attention properly. However, in future research, adaptation should be considered every time it is possible to.

The moderation effect of Copresence in the relationship between Team Virtuality and Team Reflexivity hasn't been supported by results. However, positive correlations of Copresence with Team Reflexivity, Team Performance and Team Viability were found. In this sense, further research is needed to understand if Copresence has an impact on such variables. Moreover, correlations were found between the Extent of use of virtual tools and Informational Value with Copresence. However, results didn't show a correlation between the latter and Synchronicity. Future research is needed to understand the relationship of the dimensions of Team Virtuality with Copresence. In addition, there is no research about the effects of Copresence in any variable, process or outcome. It could be interesting to understand its' possible impacts.

Finally, the fact that the research design of the present study is cross-sectional can be a limitation. All data was based on the self-reports of the participants, and no other source, collected on a single moment in time.

Conclusion

This research aimed at further shedding light to the impact of Team Virtuality on Team Reflexivity and, therefore, on Team Effectiveness. Moreover, it aimed to provide a better understanding of Copresence and to investigate its' effect on the relationship between Team Virtuality and Team Reflexivity.

Globalization, technical complexity and competitiveness, aligned with the evolution of information and collaboration technologies, has enabled the increase of Virtuality in organizations (Dulebohn & Hoch, 2017; Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Kozlowski & Bell, 2003; Mathieu, Maynard, Rapp, & Gibson, 2008; Gilson, Maynard, Jones Young, Vartiainen, & Hakonen, 2015). Virtual teams allow for organizations to leverage from the best talent, even when individuals with the necessary expertise to cope with a given task are separate by time and space (Townsend, DeMarie, & Hendrickson, 2000). As Team Virtuality becomes more common, it is necessary to understand its' impact on team processes, such as Team Reflexivity.

In the fast-changing environment of todays' marketplace, increasingly more competitive and demanding of creativity and innovation (Cohen & Bailey, 1997; West, 2004; Widmer, Schippers & West, 2009), Team Reflexivity appears to be central to Team Effectiveness (Carter & West, 1998; De Dreu, 2002; De Dreu, 2007; Hoegl & Parboteeah, 2006; Schippers, 2003; Tjosvold et al., 2003; and others). It prevents information processing failures (Schippers, Edmonson & West, 2014), reduces representational gaps (Ginkel, Tindale, & Knippenberg; 2009), and promotes the generation of new ideas that improve ways of working (Schippers, Edmonson; & West, 2014), for example. It is also key to innovation (Schippers, West, & Dawson, 2015), necessary to maintain or increase effectiveness.

Communication through virtual tools implicates the loss of media richness, as smell, taste and touch, at least, are left out, which can lead to poorer communication (Schroeder, 2002). However, one can still feel that is present and that others are present with them and collaborating with them in a virtual environment (Baldassar, 2008). This is, to sense copresence. The possibility that the sense of Copresence may have an impact on team processes and on Team Reflexivity itself was tested in the present study.

It was confirmed that Team Reflexivity does have a positive impact on Team Effectiveness. However, Team Virtuality, according to the results of the study, does not have a negative impact on Team Reflexivity. The Extent of Use of Virtual tools doesn't have a negative influence on Team Reflexivity. However, Informational Value and Synchronicity do have a

positive impact on that same process. This leads to the belief that the extent of use of virtual tools itself doesn't harm Team Reflexivity. Virtual tools can be used freely, as long as the right tools for the task are chosen. Most importantly, the mediums should be able to convey the information and data needed for team members to perform effectively. Informational Value has not only a positive impact on Team Reflexivity, but also a direct positive influence on Team Performance and Team Viability. Synchronicity should also be a concern, depending on the nature of the task at hand. It influences Team Performance and Team Viability by means of Team Reflexivity. Regarding Copresence, the results didn't support its' moderating effect on the relationship between Team Virtuality and Team Reflexivity. However, positive correlations were found between it and Team Reflexivity, Team Performance and Team Viability. Future Research is needed to understand if it can have an impact on team processes and outcomes as, if it does, it can have great practical and theoretical implications. Moreover, future research is needed to understand its relationship with the dimensions of Team Virtuality.

In conclusion, very relevant findings were achieved regarding the impact of Team Virtuality on Team Reflexivity, both increasingly more important to organizations. Copresence needs further research to be better understood.

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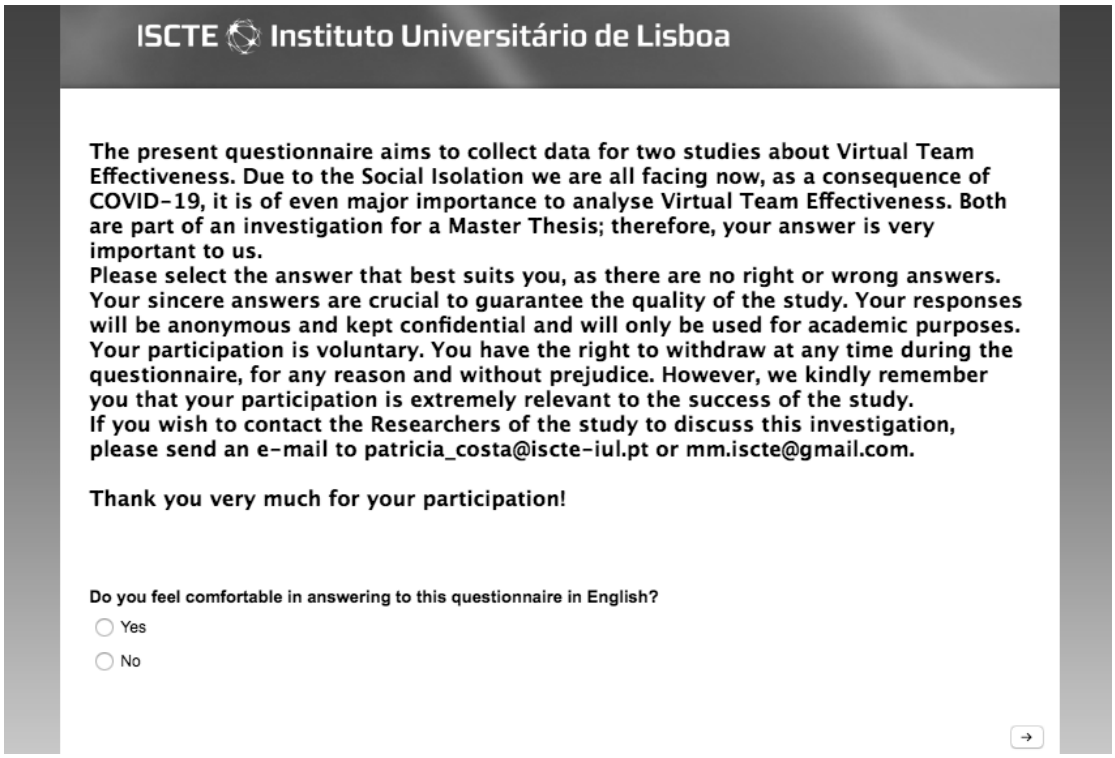
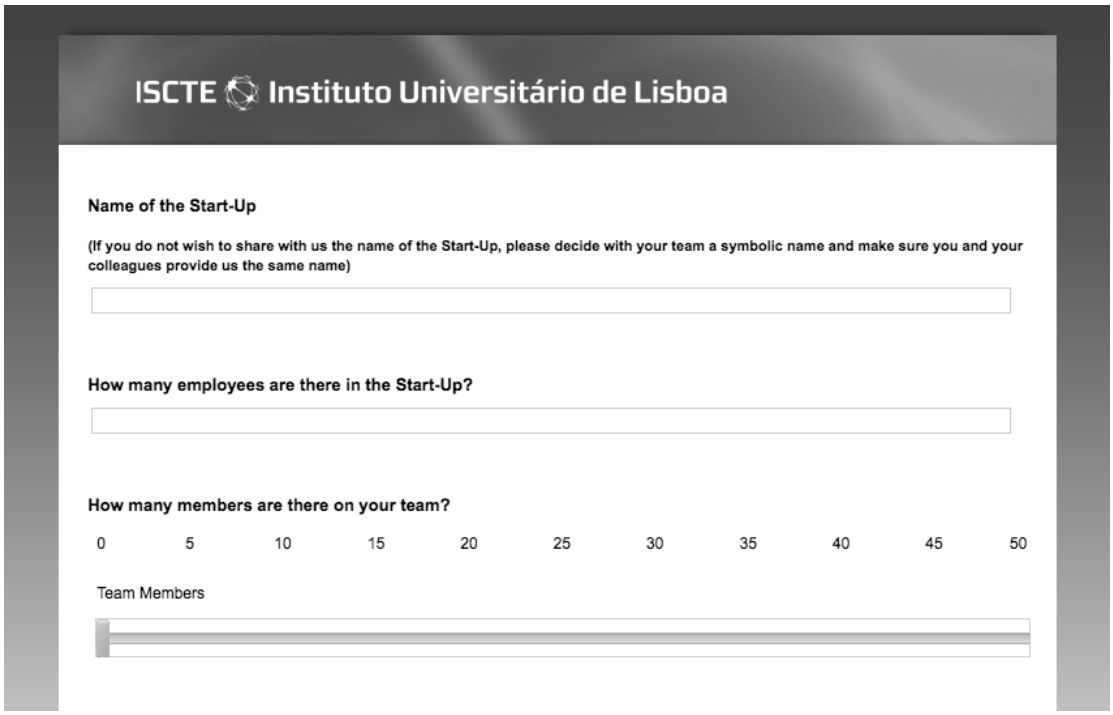
Appendix

Appendix A – Questionnaire





At the moment, how many members of your team work in the same space/building from you?

0 5 10 15 20 25 30 35 40 45 50

Not Co-Located Team Members

At the moment, how many members of your team work in a different space/building from you?

0 5 10 15 20 25 30 35 40 45 50

Co-Located Team Members

PART I

This part of the questionnaire aims to analyze the extent to which you and your team members use virtual tools to coordinate and execute team processes. Please answer honestly and spontaneously and select only one option.

a) To what extent does our team use virtual tools (e.g. email, videoconferencing and work tools such as Google docs, Trello, calendar, etc), to:

	1 - not at all	2 - very little	3 - to some extent	4 - to a great extent	5 - to a very great extent
1. Identify the key challenges we expect to face	○	○	○	○	○
2. Ensure that everyone on our team clearly understands our goals	○	○	○	○	○
3. Develop an overall strategy to guide our team activities	○	○	○	○	○
4. Seek timely feedback from stakeholders (e.g., customers, top management, other organizational units) about how well we are meeting our goals	○	○	○	○	○
5. Monitor important aspects of our work environment (e.g., inventories, equipment and process operations, information flows)	○	○	○	○	○
6. Assist each other when help is needed	○	○	○	○	○
7. Coordinate our activities with one another	○	○	○	○	○
8. Deal with personal conflicts in fair and equitable ways	○	○	○	○	○
9. Encourage each other to perform our very best	○	○	○	○	○
10. Keep a good emotional balance in the team	○	○	○	○	○

b) When our team uses virtual tools to interact, how often does the chosen virtual tool allow for:

	1 - not at all	2 - very little	3 - to some extent	4 - to a great extent	5 - to a very great extent
11. Understanding others through voice inflection, intonation, body language and/or facial and non-verbal expressions	○	○	○	○	○
12. Knowing immediately what others think about expressed ideas	○	○	○	○	○
13. Using physical, verbal and visual symbols for communicating (e.g. nodding, a touch in the shoulder, vocal tone, a smile)	○	○	○	○	○
14. Using written or typed symbols for communicating	○	○	○	○	○
15. Conveying data that is important for team effectiveness	○	○	○	○	○
16. Conveying data that is important for team efficiency (e.g. expressing agreement is faster with a nod than with typing "I agree with you")	○	○	○	○	○
17. An efficient transmission of the message, because the tool matches the needs of the message (ex. showing a picture is more efficient than verbally describing a painting)	○	○	○	○	○

c) When our team uses virtual tools to interact, how often does the chosen virtual tool allow for:

	1 - not at all	2 - very little	3 - to some extent	4 - to a great extent	5 - to a very great extent
18. The message to reach recipients as soon as it is sent	○	○	○	○	○
19. A fast response to the message	○	○	○	○	○
20. Quick feedback	○	○	○	○	○
21. The transmission of messages from multiple individuals simultaneously	○	○	○	○	○
22. The sender to rehearse or fine tune a message before sending	○	○	○	○	○
23. Carefully crafting a message before transmission to ensure that its meaning is expressed precisely	○	○	○	○	○
24. The sender to consider possible interpretations of the message beforehand	○	○	○	○	○
25. The revisiting of prior messages	○	○	○	○	○
26. Reexamining and consider previously sent content	○	○	○	○	○
27. Revisiting a discussion for developing understanding	○	○	○	○	○

PART II

This part of the questionnaire aims to analyze the extent to which your team reflects upon and modifies its' functioning. Please answer honestly and spontaneously and select only one option.

	1 - strongly disagree	2	3	4	5 - strongly agree
1. The team often reviews its objectives.	○	○	○	○	○
2. The methods used by the team to get the job done are often discussed.	○	○	○	○	○
3. We regularly discuss whether the team is working effectively.	○	○	○	○	○
4. The team often reviews whether it's getting the job done.	○	○	○	○	○
5. In this team we modify our objectives in the light of changing circumstances.	○	○	○	○	○
6. The way decisions are made in this team is rarely altered.	○	○	○	○	○
7. Team strategies are rarely changed.	○	○	○	○	○
8. We often discuss how well we communicate information.	○	○	○	○	○
9. This team is prepared to challenge organisational practices and policies.	○	○	○	○	○

PART III

This part of the questionnaire aims to analyze the extent to which the productive output of a team meets or exceeds the performance standards of those who review and/ or receive the output.

	1 - very poor	2	3	4	5	6	7	8	9	10 - superb
1. The amount of work the team produces.	○	○	○	○	○	○	○	○	○	○
2. The quality of work the team produces.	○	○	○	○	○	○	○	○	○	○
3. Your overall evaluation of the team's effectiveness.	○	○	○	○	○	○	○	○	○	○

Please consider the next scale for the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
4. I wouldn't hesitate to continue working with this team.	○	○	○	○	○	○	○
5. If it was possible, I would have changed teams.	○	○	○	○	○	○	○
6. If I had the opportunity, I would rather work with another team instead of this one.	○	○	○	○	○	○	○
7. This team could work really well in future projects.	○	○	○	○	○	○	○

PART V

"One's colleagues can be situated in close pshysical proximity yet seem quite distant. Conversely, one's colleagues can be quite far away in objective terms yet seem quite close." (Wilson et al., 2008). This part of the questionnaire aims to understand the extent to which you feel your colleagues are close to you.

When my team communicates through virtual tools...

	1 - not at all	2- very little	3 - to some extent	4 - to a great extent	5 - to a very great extent
1. I still feel alone, even when my colleagues are present through electronic communication devices.	○	○	○	○	○
2. I feel like my colleagues are with me.	○	○	○	○	○
3. I feel like my colleagues feel that I am present with them.	○	○	○	○	○

Please provide us with this demographic information:

Industry

Start-Up Stage

- ○ Stage 1: Formation - This stage can be characterized as turning a venture or idea into a business entity, getting the organization going, and building support in terms of financial backing to bolster products and business concepts.
- ○ Stage 2: Early Growth - In this stage, the business establishes itself through strong positive growth with a commercially feasible product and/or marketing approach.
- ○ Stage 3: Later Growth - In this stage, growth begins to slow.
- ○ Stage 4: Stability - A small business at this stage is stable and operates much as a small bureaucracy.
- ○ No information

Start-Up Age

- ○ < 6 months
- ○ [6 months – 1 year[
- ○ [1 year – 2 years[
- ○ [2 years - 3 years[
- ○ [3 years - 4 years[
- ○ [4 years - 5 years[
- ○ > 5 years
- ○ No information

Age (your age)

Sex

- ○ Male
- ○ Female
- ○ Prefer not to answer

Level of Education

- ○ High School
- ○ Bachelor's Degree
- ○ Master's Degree
- ○ PhD
- ○ Other