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The Impact of Team Work Engagement on Team Satisfaction and the Role of Psychological Safety as a Moderator

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Abstract

Title – The Impact of Team Work Engagement on Team Satisfaction and the Role of Psychological Safety as a Moderator

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The purpose of this master thesis is the study of the impact of Team Work Engagement (TWE) on Team Satisfaction in the presence or absence of Psychological Safety. Data was collected through a laboratory study and by running a survey in real world teams in organizations. It was expected from the research that TWE would have a positive effect on Team Satisfaction and that teams who experienced high levels of TWE and high levels of Psychological Safety, would be more satisfied than teams who experienced high levels of TWE but low levels of Psychological Safety. The results confirmed that TWE positively impacts Team Satisfaction. They also showed that TWE has only a small impact on Team Satisfaction when Psychological Safety is already high.

Key words: *Team Effectiveness, Team Work Engagement, Team Satisfaction, Psychological Safety*

Resumo

Título – O Impacto do Team Work Engagement na Satisfação da Equipa e o Papel da Segurança Psicológica como Moderador

Autor – Raquel Costa Gaspar

O objectivo desta tese de mestrado é o estudo do impacto do Team Work Engagement (TWE) na Satisfação da equipa na presença ou ausência de Segurança Psicológica. Os dados foram recolhidos através de um estudo de laboratório e da realização de um inquérito a equipas reais em organizações. Seria esperado que o TWE tivesse um impacto positivo na Satisfação da equipa e que equipas com elevados níveis de TWE e de Segurança Psicológica apresentassem uma maior Satisfação do que equipas com elevados níveis de TWE mas baixos níveis de Segurança Psicológica. Os resultados confirmam que o TWE influencia positivamente a Satisfação da equipa e revelam que o TWE tem apenas um ligeiro impacto na Satisfação da equipa quando a Segurança Psicológica é alta.

Palavras-chave: *Eficácia de Equipas, Team Work Engagement, Team Satisfaction, Segurança Psicológica*

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Preface

This research benefited greatly from the support and help of my master thesis coordinator Professor Patrícia Costa and the joint work of my colleagues Joana Lamarão, João Simões, Nadia Mahjoub and Pedro Quintal in the data collection and by contributing with their insights. I appreciate all the people that participated in the laboratory study and the ones that answered the survey as well as their organizations. Finally, I would like to thank my mother, my boyfriend, my family and my friends, who supported and motivated me throughout this journey.

1. Introduction

Team work engagement and psychological safety have been proposed to influence team effectiveness, including team levels of satisfaction. Also, research shows that there is a positive effect of positive emotional states on satisfaction (Barsade & O'Neil 2014; Brief & Weiss, 2002; Locke, 1976). At the same time, there is a lack of research of this impact at the team level in work teams. Understanding that team work engagement and psychological safety together enhance team satisfaction can allow managers to actively promote high levels of engagement and of psychological safety, thus enhancing teams' satisfaction levels.

Therefore, the aim of this research is to understand the impact of team work engagement on team satisfaction and to explore to what extent this relationship is moderated by psychological safety of the team, at the team level. This study proposes that the existence of team work engagement predicts team satisfaction, because this emergent state has a positive affective nature (Costa et al., 2014): teams with high levels of team work engagement are more likely to be satisfied with their teams because the nature of team work engagement and of satisfaction (a construct with an affective component) converges. In addition, because psychological safety is a belief that the members of a team are safe for speaking up and express themselves (Edmondson, 1999), this variable may foster positive emotional states, such as team work engagement. Therefore it is predicted that the interaction between psychological safety and team work engagement will result in higher levels of team satisfaction. In other words, for high levels of psychological safety, team work engagement will have a greater impact on team satisfaction than in situations where psychological safety is low.

The structure of this dissertation is as follows. Chapter 2 introduces some relevant literature on the subjects of Team Effectiveness, Team Satisfaction, Team Work Engagement and Psychological Safety, defining these constructs and explaining the relationships between them. In Chapter 3 the methodology used and data collection undertaken for this research is described. Chapter 4 includes the analysis and discussion of the results as well as some of their practical implications. In Chapter 5 the limitations of this research are presented and further research is suggested.

2. Literature Review

2.1. Team Effectiveness

Before understanding *Team Effectiveness*, it is important to define the concept of *team*, which is a "distinguishable set of two or more people who interact, dynamically, interdependently, and adaptively toward a common and valued goal /objective /mission, who have been assigned specific roles or functions to perform, and who have a limited life-span of membership" (Salas et al., 1992, p. 504). According to many authors, interaction is a central characteristic of teams (e.g. Shea & Guzzo, 1987; Campion et al., 1993) and their success is dependent on the way team members interact with each other to accomplish the work (Marks et al., 2001).

According to Kozlowski and Bell (2003), the following issues are extremely important to understand work teams: (1) task or workflow interdependence, (2) contextual creation and constraint, (3) multilevel influences, and (4) temporal dynamics. *Task or workflow interdependence* refers to the interactions among team members, which are influenced by a workflow structure. This workflow structure connects inputs, outcomes, and goals (Van de Ven et al., 1976). These interactions have a significant impact on team processes, which are essential to team effectiveness. *Contextual creation and constraint* are also a critical aspect of work teams. Team members operate in a context that they create through their attitudes, interactions and responses; and team processes, in part, create a contextual structure that constrains team processes. *Multilevel influences* on teams are also important to consider because of the fact that individual members are immersed in teams that, in turn, belong to a broader organizational context. Finally, *temporal dynamics* are an important characteristic of teams (McGrath, 1990). Teams are formed and they develop and grow over time (Morgan et al., 1993). Therefore, it is important to understand how team processes unfold over time, in order to understand team effectiveness.

Hackman (1987) defines team effectiveness as a construct composed by three criteria: performance, satisfaction, and viability. *Performance* is the outcome produced by the team and is related to whether they are able to meet or exceed the objectives stipulated for their tasks as a team. *Satisfaction* is characterized by the extent to which team members feel satisfied or frustrated in relation to their personal needs. *Viability* refers to the capability of team members to continue working together in the future. Satisfaction is the team effectiveness criteria in which this thesis is going to focus on.

Most models of team effectiveness are formulated around the Input-Process-Outcome (IPO) framework, proposed by McGrath (1964), in which inputs precede processes, and the transformation of inputs into outcomes happens through these team processes (i.e. the interaction among group members). *Inputs* include the resources available to the team and can be internal or external. Examples of internal inputs are team members' personalities and demographics, and external inputs may be, for instance, organizational climate, rewards and training. *Team Processes* involve "mechanisms that inhibit or enable the ability of team members to combine their capabilities and behavior" (Kozlowski & Bell, 2003, p. 26). Marks et al. (2001) define team processes as "members' interdependent acts that convert inputs to outcomes through cognitive, verbal, and behavioral activities directed toward organizing task work to achieve collective goals" (p. 357). *Outputs* are the end result of team processes (i.e. the quality and quantity of the work /product that results from the interaction among team members as well as the members' reactions) and the criteria that allow us to assess team effectiveness. These criteria may be internal (i.e. satisfaction and viability) or external (i.e. performance).

Team Processes

Marks et al. (2001) propose a temporarily based conceptual model of team processes, explaining how these processes work in different team performance phases and how temporal factors impact team functioning. They argue that different team processes are important at different phases of task performance. The three types of team processes more likely to happen at different periods within performance episodes are action phase, transition phase and interpersonal processes. Performance episodes are characterized by different periods of time in which task performance happens and feedback is available. Also, the completion of one episode usually represents the beginning of another. These authors first make a distinction between action phase and transition phase processes. *Action phase processes* represent the periods of time when teams are performing activities that contribute to accomplish the objectives of the task. Their process dimensions include mission analysis formulation and planning, goal specification, and strategy formulation. On the other hand, *transition phase processes* refer to the periods of time when teams evaluate their performance in the previous episode and plan for the next one, by comparing current performance levels against the objectives established for the tasks. These include the following process dimensions: monitoring progress toward goals, systems monitoring, team monitoring and backup

behavior, and coordination. They argue that some processes are more likely to occur during transition phases, whereas others are more likely during action phases. Interpersonal processes are expected to happen throughout both action and transition periods. These are processes used by teams to manage interpersonal relationships and include the following three process dimensions: conflict management, motivating and confidence building, and affect management. *Conflict management* characterizes the way through which team members proactively and reactively deal with conflict. *Motivating and confidence building* refers to the activities that develop and maintain members' motivation and confidence regarding the team achieving its goals and objectives. *Affect management* represent the interactions among team members that cultivate an emotional balance and allow for dealing and managing well frustration and stressful situations.

There is an extensive literature on team processes and there is divergence on a core set of processes. However, some recurrent processes in the literature include cognitive, affective, motivational, and coordination constructs and mechanisms (Zaccaro et al., 2001). The main *Cognitive Processes* that appear in the literature include team mental models, transactive memory, and team learning. *Team Mental Models* are "team members' shared, organized understanding and mental representation of knowledge about key elements of the team's relevant environment" (Mohammed & Dumville, 2001, p. 90). Also called "shared mental models", they imply a shared understanding of the expected collective behavior patters that will happen during team action and which are accomplished through the common experiences of team members. Research findings support that appropriate team mental models have positive impacts on both team processes and team effectiveness (Marks et al., 2000; Mathieu et al., 2000). *Transactive Memory* is a shared cognitive system that combines each member's memory system with a shared awareness of who, among the team members, knows what (Wegner, 1986). It involves conducting existing information to the right team member and having a strategy for assessing that information (Mohammed & Dumville, 2001). The advantages of an appropriate transactive memory system include reducing cognitive load of each individual, providing access to more information and expertise, and decreasing the wasted cognitive effort involved in overlapping individual knowledge (Hollingshead, 1998). *Team Learning* at the team level refers to relatively permanent alterations in the knowledge of an interdependent group of individuals associated with experience (Kozlowski & Bell, 2003). The model of team learning proposed by Edmondson (1999) implies that the psychological safety of the team contributes to team learning behaviors, such as talking about errors,

experimenting, sharing information, asking for help and seeking feedback. Moreover, Edmondson (1999) reported that these learning behaviors, in turn, had a positive effect on team performance.

Primary *Affective and Motivational Processes* worth mentioning and most recurrent in the literature are (1) group cohesion, (2) collective efficacy, (3) group emotion, and (4) conflict. *Group cohesion* is a motivational process and Festinger (1950) defined it as the result of all the forces that act on the members to remain in the group. Mullen and Copper (1994) found that task cohesion – the necessity of individuals to work together to achieve desired outcomes - had the largest impact on team performance; while Barrick et al. (1998) reported that social cohesion - intensity and number of friendships among members of the team - had a positive effect on team viability. *Collective efficacy* is also a motivational process and it represents the members' confidence that collectively they can perform a particular task or mission well. Research has found that collective efficacy influences team effectiveness. For instance, Campion and his colleagues' (1993) findings showed that collective efficacy (which they refer to as "potency") related positively with all the three criteria they used to measure team effectiveness (productivity, employee satisfaction, and manager judgments of effectiveness). The *Group emotion or group affect* refers to groups (or teams) that share an affective/ emotional tone, whether negative or positive. Barsade and Gibson (1998) characterized group affect as consisting of two different processes, a "top-down" process and a "bottom-up" process. In the "top-down" approach, the characteristics and properties of the group act upon the emotions of the individuals within it, whereas in the "bottom-up" approach the group affect is the result of the aggregate of individual team members' affective states and traits. Kelly and Barsade's (2001) model of group affect refers to both implicit and explicit affective transfer processes, which include emotional contagion, behavioral entrainment, feeling affect vicariously, and the manipulation of affect. Contrary to most of the constructs and mechanisms mentioned before, which are oriented toward forces of convergence, *conflict* is a process characterized by divergence, pushing team members apart. Task conflict, relationship conflict and process conflict often harm team performance and satisfaction; therefore, these should be properly managed (Jehn, 1997). Jehn and Bendersky (2003) characterize task conflicts as the disagreements among team members about the content and outcomes of the task being performed, while relationship conflicts relate to disagreements about interpersonal issues (i.e. personality differences, and differences in norms and values), and process conflicts involve the way the tasks are being accomplished

(i.e. delegation of tasks and responsibilities).

Finally, *coordination* is a behavioral process characterized by the activities required to manage interdependencies among the team and their work. Espinosa et al. (2004) define coordination as the effective management of dependencies among sub-tasks, resources, and people. They also propose that there are explicit and implicit coordination mechanisms. Explicit coordination mechanisms include task organization and team communication, and implicit coordination mechanisms refer to team cognition. On the other hand, Salas et al. (2005) suggest that there are three coordination mechanisms, which are different from the ones prosed by Espinosa et al. (2004). These include shared mental models, mutual trust, and closed-loop communication (i.e. the exchange of information between a sender and a receiver irrespective of the medium). Research has found that team coordination has a positive correlation with performance (Wilson et al., 2007). Therefore, it is also an important issue for the study of team effectiveness.

Emergent States

Marks et al. (2001) make a distinction between team processes and emergent states. These authors define emergent states "as properties of the team that are dynamic in nature and vary as a function of: team context, inputs, processes and outcomes" (p. 357). These authors describe cognitive, motivational and affective emergent states of teams. They propose that variables such as collective efficacy, potency and cohesion, which have often been used to characterize team processes, should be considered emergent sates instead. They argue that these types of constructs, as opposed to team processes, do not imply an interaction among team members, but instead, they characterize qualities of a team, such as member attitudes, values, cognitions and motivations. In turn, these emergent states may originate from certain team processes. Emergent states are many times related with actions undertaken by the team, but they are not the same. Instead, they are the result of team experiences (which include team processes). For example, an existing conflict within the team (a team process) may result in lower cohesion of the team and/ or lower positive group affect (emergent states). At the same time, emergent states may also be inputs to subsequent processes and outcomes. For example, teams with low negative group affect (an emergent state) may be less willing to resolve conflict among team members (a process), which can increase levels of conflict even further that will result in more negative group affect. Therefore, emergent states may be considered both team inputs and outcomes. In sum, Marks et al. (2001) highlight that emergent states are

not the same as processes because of the fact that they do not describe the nature of member interaction, but instead are properties of the team that may change as a result of the effect of other emergent states or team processes.

On the other hand, Cohen and Bailey (1997) consider affect and cohesion constructs as psychosocial traits instead of emergent states. They present a model in which psychosocial traits are predicted by inputs and processes and are predictors of subsequent processes and outcomes. However, since the concept of trait is defined as "a relatively enduring characteristic" (Kerlinger, 1986, p. 453), it is assumed in this thesis that constructs such as affect and cohesion are emergent states. The reason for this relates to the fact that emergent states are mutable qualities (i.e. they may change over time, or even in short periods of time), and they are influenced by context. For example, the positive or negative group affect of the team may be influenced by the individual mood of the team members or by specific events that the team experiences together (such as high levels of performance of the team). In other words, when team members know that they accomplished good levels of performance as a team, they will tend to experience positive group affect.

2.2. Team Satisfaction

Team satisfaction is the team-level construct equivalent to the individual-level construct of job satisfaction. There is a vast research on the concept of job satisfaction, which refers to "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experience" (Locke, 1976, p. 1300). Job satisfaction focuses on affective reactions and the need to maintain happiness (Rich et al., 2010). It can be influenced by differences in individual personality (Judge et al., 2002), but also by perceptions of job characteristics, supervisors, and coworkers (Russell et al., 2004). High levels of job satisfaction make individuals more willing to carry out behaviors associated with tasks that contribute to organizational effectiveness (Judge et al., 2001). Team satisfaction, on the other hand, characterizes the overall extent to which members are satisfied with the team and the team's outcomes (Standifer et al., 2015), such as decisions made by the team, communication among team members, and relationship climate among members of the team. It describes both a positive feeling and an evaluation of the team and its work. Therefore, the concept of team satisfaction is proposed to have both an affective component and a cognitive component.

Performance and viability variables are not enough to analyze team effectiveness, it is also relevant to analyze if the way the task is performed contributes to the satisfaction of team members (Hackman, 1987). A meta-analysis from LePine et al. (2008) revealed that team work processes have positive relationships with member satisfaction. The input-process-outcome heuristic from McGrath (1964) (mentioned in section 2.1), proposes that inputs such as characteristics of the team's members, tools, technologies and context indirectly influence team's effectiveness (i.e. the outcome), through interdependent activities among team members (i.e. team processes). In line with this rationale, LePine et al. (2008) state that teamwork processes help to cultivate perceptions of a satisfying team experience. Nonetheless, they also refer that, while team processes work as mechanisms through which inputs have an impact on outcomes, emergent states might also work as team inputs, mediators or outcomes.

Santos and Passos (2013) have highlighted the relevance of team processes, conflict and shared cognitions concerning team satisfaction. They have found that conflict limits the development of team mental models, therefore decreasing satisfaction. Their study shows that it is important that teams develop conflict management skills and know how to use conflict management strategies to avoid conflict in order to feel satisfied. Study results from Jehn (1997) also show that relationship conflict is negatively correlated with satisfaction. De Wit et al. (2012) in their meta-analysis report that task conflict has a less negative relation with satisfaction than process and relationship conflict. For instance, disagreements among team members about the content of a task or about the result of it are less relevant and have a smaller impact on team satisfaction than disagreements about who does what (i.e. delegation of tasks) or disagreements about interpersonal issues, such as team members not getting along with each other due to personality differences or attitudes from their colleagues with which they do not agree with. In fact, in some cases, task conflict may actually have a positive effect on satisfaction since its existence allows for a more critical evaluation of different points of view and well-informed decision-making. However, task conflict may also have a negative impact on team satisfaction when group members interpret their group members' different points of view as a negative assessment of their own capabilities. Therefore, in situations where conflict results in negative group emotions it might be a predictor of team dissatisfaction. In other words, if teams do not feel happy or motivated to work, for instance due to conflicts within the team, they will tend to feel less satisfied with team members, their work and decisions that they make as a team.

2.3. Team Work Engagement

Work Engagement at the individual level has been defined as an individual's drive to excel at his or her work and work passionately. Its definition is usually associated with finding one's job challenging, exciting, enjoyable and doing more than it is requested, just for the fun of it. Bakker et al. (2008, p. 187) introduced the concept of work engagement as "a positive, fulfilling, affective-motivational state of work-related well-being". They also support a three-factor structure of work engagement comprised by vigor, dedication and absorption. *Vigor* characterizes high levels of energy and resilience while working and willingness to invest effort in work in the face of difficulties. *Dedication* refers to experiencing high levels of involvement and enthusiasm, while feeling that the work being done is meaningful, significant and challenging. *Absorption* is the characteristic of being fully focused and engaged in work in a way that it feels as if time passes by very quickly. Bakker (2009) reinforced the theory of previous research from Bakker and Demerouti (2007), which proposed that job resources influenced work engagement. These studies showed that job resources such as learning opportunities, social support from colleagues and supervisors, autonomy, and proper feedback from supervisors were positively related to work engagement. For instance, if team members receive feedback on their work and on the way work is being done, they will know what they are doing well and where there is still room for improvement and therefore they may feel more engaged in their tasks.

Many studies have demonstrated that work engagement is positively related with outcomes such as employees' performance and wellbeing, which translate into more positive results for organizations. For instance, Schaufeli et al. (2008), in a study of middle managers, reported that work engagement was related to working extra hours, job satisfaction, and positive health. Engaged employees usually have higher levels of performance, which translate into, for example, more creative ideas from employees and more efficient ways to solve problems in organizations, better service quality perceived by customers, less injuries and accidents in the workplace. A meta-analysis from Harter et al. (2002) that included almost 8,000 business-units of 36 companies showed that work engagement was positively related to the levels of performance of the business-units. These levels of performance were measured, for example, in terms of profitability, turnover, customer satisfaction and loyalty and productivity.

Most of the research on work engagement has, until now, focused almost entirely on the individual level. However, work engagement has been proved to be relevant at the team

level too, as a motivational construct that comprises both affective and cognitive components (Costa et al., 2014). Building on work from Schaufeli et al. (2001) and Schaufeli and Bakker (2010), Costa et al. (2014) defined team work engagement (TWE) as "a shared, positive and fulfilling, motivational emergent state of work related well-being" (p. 418), characterized by affective and cognitive components: team vigor – "high levels of energy and an expression of willingness to invest effort in work and persistence in the face of difficulties" (p. 418) -, team dedication – "shared strong involvement in work and an expression of a sense of significance, enthusiasm, inspiration, pride and challenge while doing so" (p. 418) -, and team absorption – "shared focused attention on work, whereby team members experience and express difficulties detaching themselves from work" (p. 418).

While individual work engagement is proposed to be dependent on job resources and demands (e.g. Demerouti et al., 2001; Bakker and Demerouti, 2007; Bakker, 2009), team work engagement is proposed by Costa et al. (2014) to result on the individual actions and interactions among team members that create a common pattern of behavior. In other words, it is from the interdependent actions of team members that team work engagement is formed. Furthermore, while individual work engagement characterizes the perceptions of one individual about his or her level of engagement, TWE describes a shared perception of work engagement of the team as a whole, and it might exist due to emotional contagion (Hatfield et al., 1994) – "the tendency to mimic and synchronize facial expressions, vocalizations, postures, and movements with those of another person's and, consequently, to converge emotionally" (p. 5) - among team members. In other words, due to people's ability to mimic other people's facial, vocal and postural expressions they can also feel what others are feeling. For example, a team member that feels energized and happy while he or she is working and that expresses these feelings will "contaminate" other team members that have a tendency to "catch" other people's emotions, leading them to also feel energized and happy.

The theoretical model of TWE proposed by Costa et al. (2014) highlights the importance of affect management, motivation and confidence building and conflict management processes (Marks et al., 2001) for its emergence. These authors argue that the emergence of team work engagement is more connected to these team interpersonal processes than to individual and contextual variables, such as team members' personality traits or specific events at work. These same interpersonal processes may lead to other emergent states, such as team work engagement. For example, a team high in cohesion will tend to experience more vigor, dedication and absorption at work because they have the motivation to

remain in the group and work together to achieve some specific desired outcome. Moreover, emergent states, such as collective efficacy, cohesion and group affect may also be positively related with team work engagement. In the case of collective efficacy, for example, if the members of a team believe that collectively they can perform a task well, they will tend to work harder and for longer periods of time, therefore feeling more vigorous and dedicated to their work.

Finally, research on TWE has reported evidences of the positive effect of TWE on variables such as task and team performance, collective positive affect, efficacy beliefs and individual-level work engagement (Salanova et al., 2003; Torrente et al., 2012). For example, teams that feel happy and proud of their work and also energized and inspired while they are working, will tend to work for longer periods of time and be more focused, thus achieving higher levels of performance. Also, in teams that feel strong and vigorous while they are working, team members will tend to share positive emotional states due to emotional contagion.

2.4. Team Work Engagement and Satisfaction

According to Maslach et al. (2001), work engagement differs from satisfaction in the sense that it offers a more complex perspective on the relation between the individual and work. Job satisfaction, as an individual level construct, is the extent to which work is a source of need fulfillment and contentment, or a means of enabling employees to feel no hassles or dissatisfaction. While both constructs involve a positive state of well being, satisfaction is not composed by the three-dimension structure of vigor, dedication, and absorption proposed by Leiter and Bakker (2010) and that characterizes work engagement. Also, in contrast to engagement, which suggests activation (enthusiasm, alertness, excitement, elation), satisfaction connotes satiation (contentment, calmness, serenity, relaxation) (Schaufeli, 2012).

Research has shown that there is a positive relationship between affective/emotional states and processes on other affective/emotional states. For instance, drawing from the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2000), Fredrickson and Joiner (2002) predicted and showed that positive emotions lead to subsequent positive emotions. Also, research on group affect/emotion has shown that group emotional states have an impact on other group constructs that have an affective component (Barsade & Knight,

2015). Therefore, team work engagement, as a positive emergent state with a positive affective valence at the team level, is proposed to have an impact on other variables with a positive affective valence, such as satisfaction at the team level.

More specifically, research demonstrates that there is a positive effect of shared emotional states on satisfaction. For example, in a longitudinal field study at a large long-term care facility, Barsade and O'Neil (2014) found that a stronger culture of compassionate love among employees lead to greater employee teamwork and satisfaction, at the same time reducing employee exhaustion and absenteeism. Barsade et al. (2000) also showed that similarities in trait positive affective groups were associated with greater satisfaction. Given that some researchers have found associations between affect and satisfaction at the individual level (e.g. Brief & Weiss, 2002; Locke, 1976), researchers have also studied the relationship between these variables at the team level and found positive relationships between group affect and group satisfaction. For example, Chi et al. (2011) found that team members who shared positive affective experiences were more satisfied with their teams than members who did not share common positive experiences. Moreover, these authors found that team positive mood indirectly influenced team performance through team satisfaction. There has also been some (fewer) evidence of the impact of negative group emotion on team satisfaction. For instance, Duffy and Shaw (2000) demonstrated that mean group envy (i.e. the degree to which each group member felt envy toward other group members) had a negative impact on group cohesiveness and group potency, which in turn had a positive relationship with group member satisfaction.

There is also evidence in the literature of the relationship between work engagement and satisfaction. For instance, Salanova et al. (2011), in students working in groups, showed that work engagement increases positive group affect (i.e., comfort, enthusiasm, satisfaction). Research from Schaufeli et al. (2008) has also shown that work engagement is related to health, job resources (job control and co-worker support), and positive work outcomes, such as job satisfaction. Also Costa et al. (2016) provide evidences for the relationship between work engagement and variables such as satisfaction. For example, teams in which their members share feelings of happiness, enthusiasm, and immersion in their work will tend to share other positive emotions, which in turn will lead to feeling satisfied with their teams, with the results from their work and with the way work was performed (for instance, the strategy defined by the team).

Individual work engagement has been shown to have a positive effect on individual

satisfaction. Moreover, team satisfaction has an affective component and there is evidence in the literature of the impact of group affective states on other group level constructs with emotional components. Therefore this study proposes that team work engagement, as an affective-motivational state and a team-level construct, will have a positive effect on team satisfaction:

Hypothesis 1 – Team work engagement positively influences team satisfaction.

2.5. Psychological Safety

Psychological Safety has been defined both at the individual and the team levels. At the individual level, based on Kahn (1990), Brown and Leigh (1996) defined psychological safety as an employee's "sense of being able to show and employ one's self without fear of negative consequences to self-image, status or career" (p. 708). In other words, an employee that feels psychologically safe in his or her workplace will believe that he or she is free to make mistakes in order to learn from them and improve, to put their own ideas into practice, and share their creativity with their colleagues and leaders, and that these actions will not have a negative impact on the way he or she is perceived by others or harm in his or her career.

Team psychological safety, introduced by Edmondson (1999) is a "shared belief that the team is safe for interpersonal risk taking" (p. 354). It involves a sense of confidence that the team will not embarrass, reject, or punish someone for speaking up, and it comes from a place of mutual respect and trust among team members. In addition, psychological safety is a group-level construct, which means that it must characterize the team rather than their individual members, and team members must hold similar perceptions of it. Research undertaken by Edmondson (1999) shows that team psychological safety is a predictor of learning behavior, which in turn has an impact on team performance. Results from this research also support that context, team leader coaching, and shared beliefs shape team outcomes. For example, making part of a team where the team leader encourages his or her subordinates to feel safe to share their own ideas without being judged or working in a company with a learning culture will foster team learning behaviors, which in turn will result in higher levels of team performance and satisfaction. According to Edmondson (1999), learning behavior consists of activities undertaken by team members through which a team

obtains and processes data that allow it to adapt and improve. Through learning behaviors teams can, for example, learn about customer needs and therefore improve customer service and products offered, detect changes in competitors' strategies and in other aspects of the environment, detect previous mistakes that the team may have made and then learn from them. Learning behaviors also involve seeking feedback in order to improve their work as a team, asking for help and discussing errors, communicating more in order to share important information with other team members and experimenting.

Baer and Frese (2003) extend the construct team psychological safety referring to an organizational climate for psychological safety. According to them, a climate for psychological safety characterizes formal and informal organizational practices and procedures that guide and allow for open and trustful interactions within the work environment. Therefore a climate for psychological safety implies that there is a work environment where employees are safe to speak up without being rejected or punished. Employees working in this kind of environment would be more likely to take the risk of proposing a new idea and organizations would be encouraging learning behavior and the use of employees' creative potential. Thus, increasing levels of team effectiveness.

2.6. Team Work Engagement, Psychological Safety and Satisfaction

Has we have seen, research shows that constructs with a positive affective component tend to facilitate the development of positive group attitudes and processes, therefore leading to team satisfaction (e.g. Chi et al., 2011; Barsade and O'Neil, 2014). Working in a team where members tolerate other members' mistakes because they believe it is a way for them to learn with each other (team psychological safety) will lead to a sense of calmness and serenity within the team (team satisfaction) because team members will feel less worried about making mistakes. On the other hand, if team members tend to reject other members because they are different or have different opinions or ideas (low psychological safety), the team will be less content overall (team satisfaction), since people may feel that their opinions are not valued or that they are mistreated.

The team's belief that it is safe for one to speak up and express oneself within the team (team psychological safety) added to a sense of vigor, energy and proud toward work (team work engagement), will also tend to make the team more satisfied overall. For example, in highly engaged teams, members will feel more vigorous and with more energy; in addition

to this, if the team feels psychological safe, team members might communicate more and therefore share their enthusiasm with the rest of the team, which make team members more satisfied with the way they communicate with each other and also more satisfied with the relationship climate. On the other hand, if the team experiences low levels of psychological safety, team members might not share their energy and vigor with the other team members, thus feeling less satisfied. Thus, team work engagement and team psychological safety may interact in predicting team satisfaction.

High levels of satisfaction with the team will be found in teams with high levels of team work engagement, especially when they have high levels of psychological safety. Therefore, we hypothesize a cumulative effect of team work engagement and team psychological safety for team satisfaction.

Hypothesis 2 – Teams who experience high levels of team work engagement and of team psychological safety are more satisfied, compared to those teams who experience high levels of team work engagement, but have low psychological safety.

A representation of the two hypotheses formulated is presented in Figure 1.

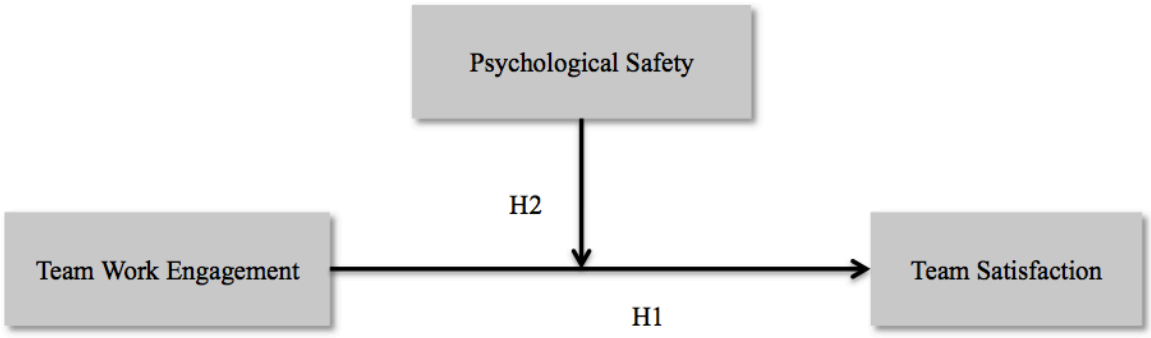

Figure 1: Schematic representation of the hypotheses.

3. Methodology and Data Collection

3.1. Participants and Procedure

Team Effectiveness was proposed as the overall theme to be studied by five students (including myself) at Catolica Lisbon School of Business and Economics, in their master thesis. We together collected data on different variables in real teams within organizations and through a laboratory study. In addition to collecting data in "real" teams we chose to run the laboratory study in order to maximize the size of the sample, considering the time available to collect the data as well as the difficulty to gather data in companies. The same questionnaire was used in the laboratory study and in the teams in the companies. The items and scales included in the questionnaire for each one of the variables in the present study – Team Work Engagement, Satisfaction and Psychological Safety – are presented in Appendix 1.

All the "real world teams" that answered the survey had already worked together in the past in any project or were working together by the time they filled out the questionnaire.

Regarding the laboratory study, we gathered groups of people between four and six members to participate as a team in a twenty-minute task. We randomly assigned one leader in each team before starting the activity and gave him or her the instructions to perform the task. Afterwards, the leader was responsible for sharing this information with his or her team members so they could perform the activity together as a team. The task consisted of a Tangram game - a puzzle-like game, where seven different shapes should be organized, without overlapping, to build figures (see Appendix 2) - and its goal was to build the maximum number of figures in the given twenty minutes with the materials the team had at their disposal. In the end, the team that had built the highest amount of figures would win a 30€ gift card. After completing the task, the participants individually answered the questionnaire, regarding their satisfaction with team and their work, their perceptions of team work engagement and their perceptions of psychological safety.

The data collected in this research amounts to 243 respondents (n=243), distributed in 51 teams. 23 of these teams are "real world teams" in companies and 28 participated in the laboratory study. Each team was composed, on average, by 4.9 members, and had a standard deviation of 0.7. A total of 106 participants were male and 135 were female (two omitted results). The average age of respondents was 32.7, with a standard deviation of 13.1. The "real world teams" had spent between 3 months and 15 years working together by the time they answered the survey.

3.2. Measures

As previously stated, the variables used in this study were Team Work Engagement, Satisfaction and Psychological Safety.

Team Work Engagement was assessed using the nine-item scale developed by Costa et al. (2014), including items such as "while we are working we feel bursting with energy" and "we get immersed in the work". This variable was measured in a Likert scale ranging from 1 (never) to 7 (every time). *Satisfaction* was assessed by 9 items and measured in a Likert scale ranging from 1 (completely dissatisfied) to 7 (completely satisfied), with items such as "team functioning" and "communication among members of the team". In order to assess the *Psychological Safety* we used 7 items, measured in a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Such items were for instance, "in my team, it is safe to take risks and take chances on new ideas" and "when working with members of my team, my competences and talents are valued and used", based on the scale developed by Edmondson (1999) to assess Psychological Safety.

The analysis of the gathered data was done using the SPSS Statistics Software and the Cronbach's alpha was calculated in order to test the reliability of each scale used. These results as well as the number of items used are presented in Table 1 below.

Variable	Number of items	Cronbach's alpha
Team Work Engagement	9	0.81
Satisfaction	9	0.94
Psychological Safety	7	0.76

Table 1: Cronbach's alpha calculated for each variable.

The mean of the team members' responses was used to calculate the scores of the three variables - team work engagement, satisfaction and psychological safety. These scores were then aggregated to the team level. We calculated the index of within-group interrater agreement, $rwg_{(j)}$, based on James et al. (1993) in order to statistically justify aggregation. We used the value of 0.70 and above as an acceptable level of agreement (Cohen et al., 2001). Since the mean value of this index for TWE, satisfaction and psychological safety was respectively 0.72, 0.75 and 0.85, it falls above the acceptable value for all three variables.

Regression and moderation analysis were used in the data gathered in this research.

Hypothesis 1 was tested using a simple regression of the dependent variable Satisfaction on the independent variable Team Work Engagement, in order to assess the impact of Team Work Engagement on Team Satisfaction. Hypothesis 2 was tested using a moderation analysis, in order to test whether the magnitude of Team Work Engagement's effect on Team Satisfaction depends on the Psychological Safety of the team. The statistical model is a linear equation in which Y is estimated as the product of X and M (XM), as in the following equation (Hayes, 2012):

$$Y = i + c_1 X + c_2 M + c_3 XM + e_Y$$

Therefore the moderation was given by the interaction of the independent variables Team Work Engagement and Psychological Safety. Then a regression of the dependent variable Satisfaction on this interaction was conducted.

4. Data Analysis

4.1. Results

The descriptive statistics and the correlations for all the variables in the study are presented in Table 2 below. All three variables were significantly correlated with each other.

	Mean	SD	TWE	Satisfaction
TWE	5.00	0.83	-	
Satisfaction	5.44	0.69	0.64**	-
Psychological Safety	5.61	0.52	0.52**	0.59**

Table 2: Descriptive statistics and correlations for all the variables in the study (Notes: N=243 individuals; N=51 teams; $^{**}p < 0.01$).

As previously mentioned, Hypothesis 1 was tested using a simple regression between the independent variable team work engagement and the dependent variable satisfaction, both at the team level. The effects of the variable team work engagement on team satisfaction were statistically significant and TWE ($\beta = 0.64$) has a positive effect on satisfaction. The variable team work engagement explains 40% of satisfaction's variance (R^2=0.40, F=33.20, p<0.01). Therefore, Hypothesis 1 is supported.

Hypothesis 2 was tested using a moderation analysis, through a multiple regression with two models. After the variables were centered, the results of the moderation were as presented in table 3.

	Predictor	**R^2**	**F**	***p***	**β**
Model 1	**TWE**	0.50	23.66	0.00	0.45**
	Psychological Safety				0.36**
Model 2	**TWE**	0.54	18.55	0.00	0.37**
	Psychological Safety				0.36**
	TWE*Psychological Safety				-0.23**

Table 3: Output of the moderation analysis (Notes: N=243 individuals; N=51 teams; $^{**}p < 0.01$).

The results show that teams who experience low levels of team work engagement, but have high levels of psychological safety, feel more satisfied than teams who experience low levels of team work engagement, and have low levels of psychological safety. However, for teams who experience high levels of team work engagement, the team level of psychological safety seems to make a just a slightly difference for team satisfaction. Furthermore, and more interestingly, teams that experience high levels of psychological safety tend to feel very satisfied with their teams regardless of whether team work engagement levels are high or low. Nonetheless, when psychological safety is low, team work engagement has an impact in the levels of satisfaction and it seems to make a much larger difference. It is as if the team work engagement is compensating for the low levels of psychological safety and their impact on team satisfaction.

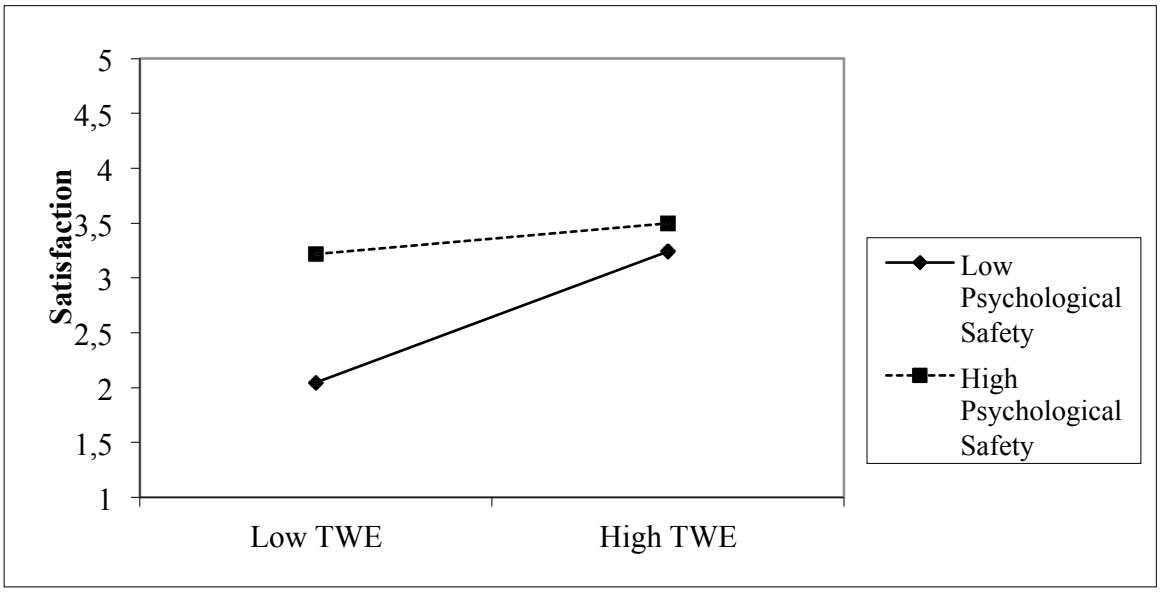

Figure 2: Interaction between team work engagement (TWE) and psychological safety predicting satisfaction. (Notes: N=243 individuals; N=51 teams).

4.2. Discussion of Results

The results of the present research support hypothesis 1, indicating that team work engagement has a positive effect on team satisfaction. Therefore, this study supports previous research on group affect that demonstrate positive relationships between shared emotional states and other constructs that have an affective component (Barsade & Knight, 2015).

Moreover, this research also adds to previous research on positive affect in teams and their impact on team satisfaction (Chi et al., 2001). The results indicate that teams that have high levels of team work engagement are more satisfied overall. This might indicate that teams that feel energetic, strong and vigorous while they are working will more likely experience other positive emotional states that will lead to feelings of satisfaction with their teams and the work performed together by their members. For example, teams that are more engaged with their work and feel happy while working might evaluate that they are satisfied with the team relationship climate. If the levels of team work engagement were fostered by the team leadership, the team might also eventually evaluate being satisfied with the team leader, which in turn could contribute to the overall satisfaction with the team. On the other hand, teams that are immersed in their work will more likely work extra hours or for longer periods of time and this will indirectly lead to higher team satisfaction because longer work hours where team members feel carried away might result in higher team performance or better results, which in turn lead to team members feeling more satisfied with their work.

The results of this study, however, were also surprising. We predicted that when teams feel energetic, proud and dedicated to their work and at the same time feel psychologically safe - team members believe they are safe for making mistakes and learning from them, taking risks, being themselves and express their own ideas and opinions because other team members tolerate them and are not going to reject them – they are more likely to feel satisfied. However, the results indicate that teams highly psychologically safe feel highly satisfied with their teams whether team work engagement is low or high. On the other hand, when teams are less psychologically safe, team work engagement tends to make a difference in how satisfied teams feel. In other words, team work engagement does not seem to make a difference in the levels of team satisfaction when psychological safety is already high; however, when psychological safety is low, team work engagement has a compensating effect, indicating that teams who feel more vigorous, energetic and dedicated to work, will more likely feel more satisfied than teams that are not engaged in their work. It seems as if promoting psychological safety is more important than promoting team work engagement to increase team satisfaction.

But why is it that in the presence of high levels of psychological safety team work engagement is less relevant? Or why is it that team work engagement becomes more relevant when psychological safety is low? It may be that in order to feel satisfied team members prefer to be able to express themselves freely and do not feel constrained to say what they think is wrong with the way work is being done than to be highly engaged in their tasks. Also,

the sense that they can ask for help to other team members without being judged criticized or feeling as if they are incompetent may contribute more to feeling satisfied than feeling immersed in or inspired by their own work. On the other hand, when the team has no sense of psychological safety it may happen that team work engagement compensates for it in terms of team satisfaction. In other words, although there is no psychological safety in the team – team members are not free to express themselves and the team does not discuss difficult issues –, the dedication the team has toward the work being done and their enthusiasm when they perform their tasks makes the team satisfied. However, their satisfaction is still lower than if they were both engaged and psychologically safe. Therefore, although it may be more important to focus on fostering psychological safety beliefs than on fostering work engagement states in order to have satisfied teams, it is still important to promote both. Ideally, organizations should promote both psychological safety beliefs and work engagement states among their teams. Nonetheless, in organizations whose cultures do not make it possible for employees to discuss difficult issues openly or they are not allowed to question authority (for example, in more hierarchical organizations) improving team work engagement should be a priority for improving team satisfaction.

4.3. Practical Implications

The results from this research have some practical implications for organizations. Some studies have demonstrated the importance of companies switching from focusing on employees' individual work and individual rewards to team work and rewards based on team performance (DeMatteo et al., 1998). Some organizational cultures and more creative types of work require employees to work in teams, therefore the study of team work is increasingly relevant. It is also important for organizations and their leaders to understand that having satisfied teams in their organizations leads to higher levels of performance, better work, and lower turnover (i.e. teams continuing working together in the future), which in turn have a positive impact on the organization's financial results and positive outcomes for their stakeholders, for instance, by creating more value for society at large. Therefore, this study contributes to the research on work teams.

This study also shows the importance of team work engagement for team satisfaction. Organizations should be more worried about having engaged employees in the workplace. This can for instance involve hiring teams that are truly happy about and dedicated to the

work they do as well as proud of this same work that is meaningful for them and has an impact on society. Other example of improving levels of engagement of teams at work might implicate teambuilding activities among members of teams to foster emotional contagion, thus highly engaged employees might influence others to feel engaged too. Or, for instance, highly engaged leaders who also know how to inspire their followers might influence the way team members are in turn inspired by the work they do together, therefore having an impact on the levels of satisfaction of their teams.

Moreover, organizations should foster environments of work engagement within their teams, especially when psychological safety is low. In line with the results from this research, in some situations, high levels of team work engagement might compensate for low levels of psychological safety, in terms of the impact on team satisfaction. This is especially relevant, for instance, in very hierarchical companies where employees are not allowed to question rules and norms stipulated by authority figures and leaders.

However, the results suggest that psychological safety may be more important in predicting team satisfaction than team work engagement, since levels of satisfaction do not improve much in the presence of high levels of team work engagement. Therefore having organizations and leaders creating psychologically safe environments within their teams seems to be more important than promoting team work engagement. Leaders may, for instance, create a culture of tolerance for employees' mistakes and different opinions to be expressed within their organizations, while encouraging debate about difficult subjects, taking risks and learning from mistakes. Leaders may, for example, encourage their subordinates to suggest new ideas to improve customer service or every time a conflict happens among employees an environment of healthy discussion should be promoted.

5. Limitations and Future Research

There is number of limitations in this study that must be addressed. First of all, ideally and in order to have more accurate results and closer to reality ones we should have used only real teams from "real world" organizations. However, due to time constraints and the difficulty of collecting data in these settings, this has not been possible. This is the reason why we also added a laboratory study to our research. Furthermore, due also to limitations in terms of time we were not able to collect a larger sample. In turn, because we had a small sample (n=243 individuals, n=51 teams) it was not possible to split and compare the data depending on the type of team ("real world" teams versus laboratory study teams), at the team level, for significant results because the number of teams was not sufficiently large. Based on these limitations, some further research could be conducted with a larger sample or only with real world teams.

Another limitation worth mentioning is related with the fact that the data was collected in a single point in time instead of being collected using a longitudinal study. Research on teams has demonstrated the importance of time and team work as a dynamic process (McGrath, 1990; Morgan et al., 1993) and emergent states (such as team work engagement) have been shown in previous research to change over time (Marks et al., 2001). Therefore further research may apply the same methodology used in this study but in several points in time in order to achieve more accurate results.

The fact that the results from this research were extrapolated from self-evaluations and self-reported observations from respondents also represents a limitation. Further research should be conducted using other methodology rather than self-report.

Moreover, further research could also explore other moderators of team work engagement and satisfaction rather than psychological safety or study mediators between those two variables, such as emotional contagion or positive group affect.

Finally, further research could be conducted on how team work engagement and the interaction between team work engagement and psychological safety impacts team viability and team objective performance.

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7. Appendix

Appendix 1. Items and Scales for Team Work Engagement, Satisfaction and Psychological Safety variables, included in the survey and in the laboratory study questionnaire.

Item	Scale
Variable: Team Work Engagement	
While we are working we feel bursting with energy.	1-Never 2-Rarely 3-Occasionally 4-Sometimes 5-Frequently 6-Usually 7-Every time
While we are working we feel strong and vigorous.	
We are enthusiastic about our work.	
Our work inspires us.	
When we arrived here, we felt like participating in this task.// **When we get up in the morning we feel like going to work.**	
We feel happy while we are working.	
We are proud of our work.	
We get immersed in the work.	
We get carried away when we are working	
Variable: Satisfaction	
Team you were in	1 – Completely dissatisfied 2 – Mostly dissatisfied 3 – Somewhat dissatisfied 4 – Neither satisfied or dissatisfied 5 – Somewhat satisfied 6 – Mostly satisfied 7 – Completely satisfied
Team functioning	
Participation in the task	
Decisions made by your team	
Communication among members of the team	
How the team leader acted	
Strategy defined by the team	
Relationship climate among members of your team	
All in all, and considering every aspect of your participation in the team you would say you are	
Variable: Psychological Safety	
My team members do not tolerate other member's mistakes. **(R)**	1- Strongly disagree 2- Disagree 3- Somewhat disagree 4- Neither agree nor disagree 5- Somewhat agree 6- Agree 7- Strongly agree
My team members are able to debate about difficult problems and subjects.	
My team members sometimes reject other members because they are different. **(R)**	
In my team, it is safe to take risks and take chances on new ideas.	
In my team, it is difficult to ask for help to another member. **(R)**	
Nobody in my team would deliberately jeopardize another member.	
When working with members of my team, my competences and talents are valued and used.	

Appendix 2. Tangram rules and materials used in the laboratory study.

TANGRAM

Tangram is a puzzle-like game that consists in 7 shapes, called *tans*, that can be organized into figures. The goal of the puzzle is to construct figures using all the 7 shapes, without overlapping them.

You have a representation of the shapes in the next page.

Your task is to ***build the maximum of figures possible, from the list provided in page 3, in 20 minutes***.

In the end of those 20 minutes, you have to decide, from the figures that you have actually build, which one will be the logo for your team and why.

In the end of the study, the team who builds the highest number of figures in less time will win the 30€ voucher.

Rules:

- Do not use the internet – you will be disclassifyed
- One team member can leave the room once during the 20 minutes, provided that he/she does not take anything with him/her
- You can use any materials you want to
- Please inform the researcher when you finish so that he/she can check if the figure is ok