

Autonomous versus controlled forms of regulation: a cross-cultural analysis from Thai, Indian, Brazilian and German cultural contexts.

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A thesis submitted to the University of Gloucestershire in accordance with the requirements of the degree of PhD in the School of Business, Strategy, Enterprise and Management

January 2024

Abstract

The study provides empirical evidence on how different cultural contexts react to autonomous versus controlled forms of regulation when dealing with employee motivation in the automotive industry. Its research framework has been designed to provide additional evidence to the Basic Psychological Needs Theory (BPNT) and its cross-cultural universality claim and answer the call for further research on how forms of regulation can be culturally variable. Across two studies, the mediating effect autonomous and controlled forms of regulation have in the relationship between basic psychological needs and work engagement has been hypothesised and tested. In Study 1 (case study, n=625), a praxis-oriented scenario is analysed to provide the first indications that a cultural variation exists in how employees respond to autonomous versus controlled forms of regulation. Study 2 (main study, n=817) uses two statistical methods (Structural Equation Modeling – Multi Group Analysis and ANOVA) to provide concrete evidence to corroborate the initial indication and test the posed hypotheses in four cultural contexts. For both studies, data has been collected across an international production network within the automotive industry, including samples from Thailand, India, Brazil, and Germany.

Consistent with the theorisation, results show that, even though the support to basic psychological needs defined by Self-Determination Theory universally improves work engagement, different cultures might optimally achieve this need support through different forms of regulation, displaying more autonomous or controlling reasons for pursuing needsatisfying activities depending on the cultural context. Results also provide the practitioner with additional insights, guidance and actionable points regarding the future implementation of motivational programs in the automotive industry. By providing a fresh view on a recurrent question, the study advances the border where cross-cultural motivational research has collected the data to support the claims. It expands the sampling into heterogeneous cultural contexts and yet in another branch of the industry, attempting to move away from the limitations and Western bias often tainting social sciences research.

Keywords: self-determination theory, basic psychological needs theory, forms of regulation and cross-cultural research.

Declaration of Original Content

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other educational institution in the United Kingdom or overseas.

Any views expressed in the thesis are those of the author and in no way represent those of the University.

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Signed:		
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Date: 21/01/2024

DOI: 10.46289/9NV4R8X3

The successful conclusion of this research project is an exciting milestone. My gratitude goes to several people who supported me throughout this challenging doctorate journey.

First and foremost, my appreciation to my supervisors, without whom this project would be much too short to be called research. Thank you for firmly stepping on the break and even strongly pushing me forward whenever necessary. Dr Francisca Veale: thank you, Francisca, for jumping on board this journey with me; you have often been the only light during the heavy lifting in the first couple of years. Dr Saqib Shamim: Saqib, thanks for taking up the challenge mid-journey; you have provided concrete methodological guidance and consistent feedback to put my post-positivist mind at ease. For both of your guidance, I am genuinely grateful.

To the Gloucestershire University administration team for providing the necessary structure and resources to conduct this research even in challenging pandemic times. My sincere thanks to the doctoral program course leader, Dr Douglas Yourston. Dougie, between professor, advisor, and, let's be honest, part-time supervision over the years, you have challenged and taught me how to find my way between the *darlings* and *rabbit holes* continuously troubling first-time researchers; the timely accomplishment of this doctorate is due to your continuous and prompt support throughout the program.

A special thank you to my employer for supporting the research and approving the necessary resources and guidelines for a successful undertaking. Delphine, thank you for supporting the implementation of our training program and, most importantly, encouraging me to engage in this doctoral journey; I am very thankful for your mentorship. To my colleagues and project leaders in Thailand, India, Brazil and Germany, allowing, supporting and facilitating the research and, more importantly, acting as trustworthy gatekeepers throughout the process, this project is also your success.

My appreciation goes to my friends' comprehensive understanding and support whenever I had to leave early, cancel our encounters, and work on holidays. Even if our

schedule was tight, I still have the feeling that we met last time yesterday at every new encounter; thanks for being there for me during the project.

My heartfelt thanks to my family. To my wife Oanh, to whom a couple of sentences will never be enough to thank. Thank you for enduring and patiently waiting during the uncountable weekends, late nights and holidays missed. I share this project's success with you because, more often than not, you were the safe harbour enabling the venture; it could not have been accomplished without your unconditional support. And to my son Ben, even though you cannot understand it yet, thank you for the easy start; only by you being who you are could I conciliate this undertaking.

Last but by no means least, my profound appreciation goes to my parents and what they have done for me. All seized opportunities have been feasible because you prepared me for the challenge. This project is no different. Thanks for never measuring efforts to prepare your kids for the world; you clearly did a great job.

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Abbreviations

- AVE Average Variance Extracted
- **BPN** Basic Psychological Need
- **BPNT Basic Psychological Need Theory**
- CET Cognitive Evaluation Theory
- CFA Confirmatory Factor Analysis
- CSDT Center for Self-Determination Theory
- EFA Exploratory Factor Analysis
- GLOBE Global Leadership and Organizational Behaviour Effectiveness
- H Hypothesis
- HBM Hypothesis Basic Needs \rightarrow Motivation (HBM).
- HBW Hypothesis Basic Needs \rightarrow Work Behaviour (HBW).
- HTMT Heterotrait-Monotrait Ratio
- Hx_0 Research Framework Null Hypothesis
- Hx_r Alternative Hypothesis
- MGA Multigroup Analysis
- PAF Project Approval Form
- PLOC Perceived Locus of Causality
- REC Research Ethics Committee
- RO Research Objective
- RQ Research Question
- SEM Structural Equation Modeling

- SRMR Standardized Root Mean Squared Residual
- SRQ Self-Regulation Questionnaire
- SRQ-A Academic Self-Regulation Questionnaire
- SRQ-E Exercise Self-Regulation Questionnaire
- SRQ-L Learning Self-Regulation Questionnaire
- SRQ-T&D Training and Development Self-Regulation Questionnaire
- SRQ-T&D Case Training and Development Self-Regulation Questionnaire for the Case Study
- STC Search Terms Combination
- STD Self-Determination Theory
- STDEV Standard Deviation
- UQC Ultimate Quality Championship
- UWES Work & Well-being Survey

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1 Introduction

The introduction Chapter sets the scene for the current study of cross-cultural employee motivation. It starts with how the research topic came to be, detailing the context and background where it has been conducted. It shows how this research topic evolved into the study presented here, discussing the researcher's motivation and the reasoning behind the call for further academic support. More importantly, the Chapter defines the research questions, the aim of the study and the respective contributions to knowledge and practice to be expected at the end. This introductory Section ends with a detailed description of this thesis structure before moving into the literature review.

Before deep diving into the issue the study addresses, a brief description of the environmental context where the call for further research has been identified is deemed adequate. The praxis-oriented background where the problem was first seen is used as reasoning for the questions raised and the consequential aim set for the current study. Thus, the subsequent paragraphs present the introductory remarks to ease into the cross-cultural employee topic of motivation and respective issues to be addressed while providing the initial framework for the current study.

The topic was first brought to the forefront in 2016 when the researcher was dealing with the training and development of assembly line associates from a Brazilian production site within the automotive industry. The issue faced was using a local trainer to provide refreshment training to the company associates without conveying the message of undermining them concerning their job skills. Even though most of the skill refreshment training at the company is given in regular intervals and obligatory to attend, the question has been raised if a motivational approach to engage participants in such training could positively reflect on the knowledge and skill acquisition provided by them. In other words, find a way to motivate people to participate in refreshment training courses based on sheer self-interest and not a hierarchical obligation.

At the time, the researcher had been challenged to solve this problem by developing a new training concept built upon the mechanics of gamification and sport to engage employees towards participating in training and development. This new training concept

was successfully implemented in the Brazilian production site, with employees positively reacting to the motivational triggers applied and consistently increasing the self-motivated participation in the refreshment training provided. The positive results from this practical experiment triggered the intriguing question regarding how assembly line employees can be motivated and if this concept was deemed extendable to an international production network. It was clear that the motivational concept had successfully engaged associates towards training and development, but the theoretical reasons behind the success were not explicit.

Previous research undertaken by the author has shown that the Brazilian cultural context reacted positively to the motivational triggers provided by the new training concept (Nauiack, 2018). The practical experimentation was first restricted to the above-described boundaries and has been documented in an MBA final thesis (Nauiack, 2018). The work was methodologically still very short of being called research; however, it was the first academic substantiation applied to explain the training program's success. It was deemed to provide some scholarly background regarding assembly line employees' motivational triggers. It was also used to indicate possible further practical applications if repeated or expanded into the international production network of the automotive industry.

The outcome of this program within the company's production division was substantial, with numerous requests for the project's recurrence and expansion. With the management's consent in the automotive group's central division, a second run of the training concept took place in 2020. It did not only repeat the concept in Brazil but expanded it to three additional international production sites of the group: Thailand, India and Germany. With the expansion, the need for planned and rigorous research became more concrete. Can this training concept, successfully applied in a Brazilian cultural background, be successfully implemented in a culture on the other side of the globe? Does it need to be adapted to better fit the expectations and apply the correct motivational triggers for those cultural backgrounds? Are motivational triggers cultural variables or universal concepts? These questions could no longer be answered with only a practitioner's insight, cementing the call for further academic research.

A practical challenge in the daily business of the automotive industry sparked it; however, it is sustained by the interest in how to keep employees' motivational flame alive. The motivation behind the study that follows comes precisely from this interest in motivating assembly line associates across the international production network. A practitioner's experience indicates that the company's long-term success goals depend on the people and their motivation (Nauiack, 2018). The dependency of the project's success on the answers to these above-posed questions has, since then, been the driving motivator in conducting the current study. The knowledge to answer these questions can only be granted by precisely applying methodological tools framed by a meaningful ontological and epistemological paradigm through academic research.

This thesis consolidates the results and analysis conducted after implementing the training concept expansion in the international production network of the automotive group. It consists of a *case study* used to generate data directly related to motivational triggers applied during the concept's implementation and a *main study* to provide an academic-based, statistically robust answer to the research question posed in the following introductory Sections. Thus, the study is focused on a specific contribution to knowledge and practice on *engaging assembly line associates* from an *international production network* regarding skills improvement in a monotonous task such as an assembly for a vehicle. The following Sections open the academic discussion regarding the research background and framework before posing the research questions and defining its aim.

1.1 Research Background – Cross-cultural Research

Universal solutions for management issues in the form of *one size fits all* are unsuitable for multinational organizations (Gu, Horng Li Tan, Amin, Md Imtiaz, & Yeoh, 2022; S. H. Kim, Wagstaff, & Laffranchini, 2021; Magnusson, Peterson, & Westjohn, 2014). Over time, it would be expected that organizations have become specialists in adapting corporate values and management practices to fit the local cultures where they operate (Kulkarni et al., 2010); however, cross-cultural studies show this is not the case (Magnusson et al., 2014; Muduli, 2011). Western theories have often overlooked cultural factors and their potential effects on motivation (Gelfand, Erez, & Aycan, 2006). People from different cultures are

more likely to use distinct cultural values to interpret the same situational factors, meaning that, for instance, what is seen as a motivator in some cultures may be perceived as a demotivator in others (Kanfer, Chen, & Pritchard, 2008). It seems that providing an overarching motivational theory without considering the influence of the culture presents a substantial challenge.

Most available motivational theories have attempted to present a single overarching approach to explain human behaviour. For example, research in fundamental motivational theories, including the seminal writer Maslow, proposed different general human motivation levels compiled into one sequentially hierarchical system (Maslow, 1943). A general concept for human motivation was later presented by Herzberg (1987) when defining the motivation-hygiene theory to explain the employee's motivation in completing a task (Herzberg, 1987). Some behaviourist theories also try to accommodate the human response and behaviour under one theory (Schneider & Morris, 1987), inferring that any condition or event that could affect behaviour should be considered (Skinner, 1953). For example, these authors searched for a grand theory of human motivation and its universalisation, often without in-depth acknowledgement of possible cross-cultural facets.

According to more recent literature and scholars, different cultural constructs will directly influence any motivational theory's applicability, demanding consistent empirical validation to ensure its reliability in any cross-cultural domain (Engelen, Weinekötter, Saeed, & Enke, 2018a; Muduli, 2011; Snelgar, Renard, & Venter, 2013). For instance, investigation in the field of achievement motivation has shown that people from different cultures attach different meanings to achievement and are motivated to succeed in different ways (Salili & Hoosain, 2007). Additionally, even in cultures as geographically close as Sweden and Finland, it has been shown that cultural differences can directly influence the employees' motivation outcome (Helou & Viitala, 2007). These statements appear to deny the generalisability quality defended by the fundamental theories, clearly supporting cross-cultural variability.

This claim is further supported by stating that the generalisation of cross-cultural research results can often be limited by the context where it is being presented (Magnusson et al., 2014; Valverde-Moreno, Torres-Jimenez, & Lucia-Casademunt, 2021). This dilemma has recently been well documented in several motivational studies, including:

- job characteristics and job satisfaction (Gu et al., 2022; S. H. Kim et al., 2021);
- performance appraisal and rewards (Farndale & Murrer, 2015; Magnusson et al., 2014; Muduli, 2011; Newman & Sheikh, 2012; Snelgar et al., 2013);
- achievement motivation and goals (De Castella, Byrne, & Covington, 2013; Fornerino, Jolibert, Sanchez, & Zhang, 2011; King, 2016)
- game-based simulation (Madni, 2013)
- intrinsic and extrinsic motivation (Hennessey, Moran, Altringer, & Amabile, 2014);
- need satisfaction (Slocum Jr., Topichak, & Kuhn, 1971).

The above-stated cross-cultural reliability inquiry is evident in the study of Crede et al. (2019), where over thirty different cultures were compared regarding transformational leadership. In Muduli's (2011) study, cultural differences within one country were analysed regarding performance-based rewards. Even with evidence of cross-cultural reliability issues when universalising management theories, some studies in the field continue to take a universalist approach, for instance, self-determination theory (Deci & Ryan, 2000; Gagné et al., 2015; Landry & Whillans, 2018; Vansteenkiste, Ryan, & Soenens, 2020), achievement motivation (Duda & Allison, 1989) and action-trait (Bernard, 2016). The latter motivational studies base themselves on theories considered universal to all individuals, often framing cultural variability according to its precepts.

The importance of differentiating between cultural contexts and classifying behaviours in specific predefined cultural dimensions has been consistently supported by literature for many decades (Hall, 1960; Hofstede, 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004). Independent if focussed on the communication process (Hall, 1990), based on value-beliefs (Hofstede, 2001) or cultural forces (House et al., 2004), the seminal scholars in the field agree that their work is not concluded and explicitly call for further research. The increasing complexity of cultural studies is evident when comparing the latest Global Leadership and Organizational Behaviour Effectiveness (GLOBE) study (House et al., 2004), presenting a total of nine dimensions with the seminal Hofstede's study, which consisted initially of four and later five dimensions (Hofstede, 2001). The studies and scholars mentioned above show no tendency for unification and universalisation but reinforce the

relevance of adapting the management theories according to the cultural context where applied, further underlining the importance of cross-cultural research.

Managing cross-cultural frameworks is inherent to a business's sustainable success (Lifintsev & Canavilhas, 2017; Monnot, 2018; Valverde-Moreno et al., 2021). In addition to specific cross-cultural frameworks, a strengthened set of shared values and beliefs across the globe has also emerged (Harrell, 2016), further deepening the interconnections within and between cultures. With national borders slowly vanishing, grey areas in cultural research continue to grow (Menard, Warkentin, & Lowry, 2018). The complexity increase from crosscultural constructs is evident, consistently demanding reliable research to validate management theories throughout international organizations.

1.2 Theoretical Gap and Delimitation of Framework

The self-determination theory (SDT) presented by Deci and Ryan (2000) provided an appropriate fit for the intended study by focusing on psychological needs and their fulfilment. With its background in cognitive evaluation theory, SDT defines three primary psychological needs to be satisfied to achieve a healthy mind: autonomy, competence and relatedness (Deci & Ryan, 2000; Gagné & Deci, 2005; Vansteenkiste et al., 2020). The psychological needs described above do not vary between cultures, meaning those needs are universal and relevant to all individuals (Gagné et al., 2015; Martela, Lehmus-Sun, Parker, Pessi, & Ryan, 2022; Monnot, 2018; R. M. Ryan & Deci, 2020). The scholars defend the universality of psychological needs and their positive correlation to well-being independent of cultural background. They also suggest that what might differ between the cultures are the motives and how individuals are led to fulfil any particular psychological need. It is precisely the claim of psychological needs being universally valid to all individuals and motives being a cultural variable that this study has aimed to support with empirical evidence.

Apart from the psychological needs described above, cultural variability regarding motives and motivational triggers has been extensively discussed in the literature. SDT defines the premise that motivation varies along a self-regulation continuum, including *amotivation, extrinsic motivation* and *intrinsic motivation* (Grant, Nurmohamed, Ashford, &

Dekas, 2011), which has been further detailed in Sub-Section 2.2.2. This self-regulation *minitheory* within SDT was used in this study to understand the *autonomous* and *controlled forms of regulation* and their impact on employee motivation across different cultures. Limiting the explanation as introductory, *motives* can be more *autonomous* due to value or interest or more *controlled* due to external pressure or rewards, leading to different behavioural results (R. M. Ryan & Deci, 2019b). Scholars propose that *autonomous* forms of regulation for engaging in behaviour are volitional, while *controlled* forms of regulation are responses to internal or external pressure (Howard, Gagné, Morin, & Forest, 2016); this topic has been further detailed in the following Chapters.

SDT literature broadly converges regarding the positive impact *autonomous forms of regulation* have on work performance (Gagné et al., 2015; Gillet, Lafrenière, Huyghebaert, & Fouquereau, 2015; Wang & Gagné, 2013). However, the same universalisation of results is not evident in *controlled forms of regulation*. Some studies by Gagné and Deci (2005) and Hennessey et al. (2014) found that *external regulation* and reward mechanisms draw a neutral to a negative impact on employee performance, while others, such as Bauer et al. (2016) and Gagné et al. (2015), contend that more work in this field is required before a conclusion can be drawn. Ferndale and Murrer's (2015) studies and King et al. (2017) further argued that individuals in collectivist cultures might not react similarly to those in individualist cultures when under *controlled forms of regulation*.

It is based on the above-presented divergence from basic needs being universal and motives presenting cultural variability that the study's framework has been delimited. More precisely, it inquires whether the motivational triggers that activate employees towards positive work engagement vary between cultural contexts. For instance, based on the author's experience (Nauiack, 2018) and later further supported by the *case study* presented in Chapter 5, an award-based competition can generally motivate employees to complete a specific task. However, in each cultural context, an award's specific benefit and the employee's perception of this benefit may differ. Thus, besides adopting the right triggers and applying the correct *form of regulation*, understanding these potential differences appears crucial to achieving an exceptional motivational performance level in a crosscultural environment.

The discrepancy between *one-size-fits-all* solutions being culturally independent and the necessity of cultural adjustment is often seen in any international company's daily business. In the automotive industry, where this study takes place, the issue leads to additional questions: How do we motivate an associate who conducts a repetitive motor task, such as those in the vehicle assembly process? What motivational triggers improve the associate's drive for self-improvement, training and development, and how do they vary based on their cultural background? What mechanisms must be applied to increase the attractiveness of vehicle manufacturing assembly training?

This study intends to understand the *self-determination theory's autonomous* versus *controlled forms of regulation* in different cultural contexts to achieve an exceptional employee motivational performance level in a cross-cultural environment. For this study, the *autonomous* and *controlled forms of regulation* have been applied in four cultural contexts: Brazil, Thailand, India and Germany. The details of exploring those triggers and their impact on improving employee engagement underline the cross-cultural universalisation issue regarding forms of regulation described so far.

The primary academic materials and scholars indicate that there is indeed a baseline guiding all human motivation: basic psychological needs. Based on examples from well-known seminal authors, the motivational theories presented over the last century have tried to define one general concept to accommodate all human behaviour (Herzberg, 1987; Maslow, 1943; Schneider & Morris, 1987; Skinner, 1953). It seems to be the case for psychological need fulfilment, with consistent empirical evidence in the field of SDT showing that those needs do not vary with different cultural backgrounds (Chen et al., 2014; Chirkov, Ryan, Kim, & Kaplan, 2003; Deci et al., 2001; Kaplan & Madjar, 2017; Landry & Whillans, 2018). On the other hand, some papers (Markus & Kitayama, 2003; Oishi & Diener, 2001; Oishi, Diener, Lucas, & Suh, 2009) claim that cultural context plays a definitive role in the motivation and providing additional branches, more complex and culturally dependent. To summarize, research on psychological need fulfilment has provided evidence to be *culturally independent* (Chen et al., 2014; Chirkov et al., 2003; Deci et al., 2001; Kaplan & Madjar, 2017; Kaplan & Madjar, 2017; Landry & Whillans, 2017; Landry & Whillans, Madjar, 2017; Landry & Whillans, 2018), while motives on the other hand, are presented to be

culturally variable (De Castella et al., 2013; King et al., 2017; Monnot, 2018; R. M. Ryan & Deci, 2019b).

As advocated until this point, the literature consistently supports the universality claim regarding basic psychological needs (Gagné et al., 2015; Monnot, 2018; R. Ryan et al., 2023) but still calls for further research regarding motives and how they might present culturally dependent components (De Castella et al., 2013; King et al., 2017; Monnot, 2018; R. M. Ryan & Deci, 2019b). The study aims to provide concrete evidence of how forms of regulation might play a different role depending on the cultural context regarding how employees can be triggered and, therefore, their specific motives to engage in a specific behaviour might vary as well. Besides testing for cultural variability regarding forms of regulation, the *research framework*, detailed in Chapter 3, has been designed to provide reliable cross-cultural evidence of the *basic psychological needs* universality claim. Thus, in total, the study shall provide empirical evidence for the abovementioned gap, adding to the existing knowledge whether:

- the response to self-regulation triggers varies depending on the cultural contexts by testing *autonomous* versus *controlled forms of regulation* in four different cultural contexts and how they positively or negatively affect associates' work behaviour;
- the existing universality claim that SDT's basic psychological needs of autonomy, relatedness and competence are equally essential and culturally independent;

Besides the contributions to knowledge for the theoretical gap, the study also aims to provide a concrete, evidence-based answer to the research question of whether and how the motivational triggers from assembly line associates in Thailand, India, Brazil and Germany differ. Its response further supports practitioners providing insight into whether:

> Assembly line employee motivational programs and the respective triggers applied to achieve exceptional motivational results must be adapted depending on the cultural context where they are to be implemented. In other words, whether employees from different cultural

contexts react differently to *autonomous* versus *controlled forms of regulation*.

Based on the discussed theoretical limitations and gaps, the intended study has focused on understanding the motivational triggers by testing the SDT validity and reliability across different cultural contexts. It additionally aims to answer the practical question of whether a single training motivational program can be applied to the international production network independent of cultural context. In addressing this question, this study provides new and unique academic and practitioner insight into whether there are differences between cultural contexts on how employees are motivated and whether a unified cross-cultural motivational program can be developed and applied. Based on the above-defined theoretical gap, the research question, aim and objectives have been defined in the following sub-section.

1.3 Research Question, Aim and Objectives

When defining a broader research query, the overarching question investigates how the cultural context influences how employees' motivation is regulated. This question has been posed within the SDT framework of human and employee motivation in the work domain. The focus on the SDT's mini-theory of self-regulation further supports the investigation of whether significant differences exist in how different cultural contexts react to *autonomous* versus *controlled forms of regulation*.

Therefore, the research aim is defined as follows:

<u>AIM</u>: To investigate, using self-determination theory, the response difference of assembly line associates working in Thailand, India, Brazil and Germany regarding *autonomous* versus *controlled forms of regulation*.

Three subsequential steps have been defined to achieve the above-defined aim and provide the expected contributions to knowledge and practice. These have been labelled as research objectives (RO) and, when achieved, provide the necessary research evidence to fulfil the aim and answer the research question. Therefore, the aim has been further divided into the following research objectives: To identify, theoretically:

<u>RO1</u>: the model describing how *forms of regulations, autonomous* versus *controlled,* relate to employee engagement in the workplace domain in Thailand, India, Brazil and Germany;

Then, using self-determination theory, to analyse and evaluate empirically whether:

- <u>RO2</u>: autonomous and controlled forms of regulation will present the same expected positive or negative effect on assembly line associates' behaviour in Thailand, India, Brazil and Germany;
- <u>RO3</u>: there are differences between cultures on how employees are motivated, and confirm if a unified motivational program can be developed and applied for production plants in Thailand, India, Brazil and Germany.

Each of the research objectives described above intends to answer one specific question. The broader research query is clarified by answering all three research questions, and, as a consequence, the overall aim is achieved. The table below associates each of the research objectives with the respective formulated research question:

Autonomous versus controlled forms of regulation: a cross-cultural analysis from Thai, Indian, Brazilian and German cultural contexts.				
Overall Reseach Query			Reseach Aim	
How does the cultural context influence how employees' motivation is regulated?			vestigate, using self-determination theory, the onse difference of assembly line associates working ailand, India, Brazil and Germany regarding nomous versus controlled forms of regulation.	
Research Questions (RQ)			Research Objectives (RO)	
RQ1	Which are the existing theoretical models describing the relationship between <i>forms of regulation</i> to motivate employees and <i>work engagement</i> ?		To identify, theoretically, the model describing how forms of regulations, autonomous versus controlled, relate to employee engagement in the workplace domain in Thailand, India, Brazil and Germany.	
Based on self-determination theory:			self-determination theory, to analyse and evaluate ically whether:	
RQ2	to what extent do Thai, Indian, Brazilian and German employees differ in how they react to <i>autonomous</i> versus <i>controlled</i> forms of regulation?		<i>autonomous</i> and <i>controlled</i> forms of regulation will present the same expected positive or negative effect on assembly line associates' behaviour in Thailand, India, Brazil and Germany.	
RQ3 does cultural context influence how employees' motivations are regulated and, if so, must cultural motivation programs be adapted to account for those differences?		RO3	there are differences between cultures on how employees are motivated, and confirm if a unified motivational program can be developed and applied for production plants in Thailand, India, Brazil and Germany.	

Figure 1. Research Questions and Objectives (own work).

By achieving the above-defined aim and objectives and answering the posed research questions, the current study provides substantial knowledge contribution to the theoretical field of cross-cultural employee motivation. Besides the theoretical contribution, the study's outcomes provide new insight and guidance for practitioners when implementing future cross-cultural motivational programs within the company.

1.4 Structure of the Thesis

Before moving on to the next Chapter, a general explanation of this thesis' structure is provided. The following Sub-Section guides the reader regarding what and where to expect each content within this study. The thesis is structured into a total of 8 Chapters. It follows a linear research strategy, starting with defining the aim and objectives, as seen in the introductory Chapter. After that, in Chapter 2, the literature review was conducted, ending with the definition of this study's conceptual framework and respective research hypotheses in Chapter 3. Chapter 4 provides a quick overview of the philosophical debate within the social sciences regarding research paradigms before presenting the arguments for the ontological and epistemological standpoints for the current study. Chapter 4 still deals with the methods for the *case* and *main study*, later presented in Chapters 5 and 6.

Up to Chapter 4, the reporting of the study conducted is linear; however, Chapters 5 and 6 demand an additional explanation to facilitate the understanding of the thesis structure, with both Chapters presenting one independent study. The first one, defined here as study 1, or *case study*, describes the practical solution implemented in the automotive industry to motivate assembly line employees towards training and development. For this first study, only the participants of the training concept have been considered regarding data collection and analysis. It has two primary objectives: first, it supports - with concrete evidence - the call for future research found in the field leading to the research question and aim, as well as detailing the environment where practitioners can apply the final results of the current study; second, the *case study's* data presents an initial indication of possible cross-cultural variability even if limited by its sample and short measurement instrument. The *case study* is further defined and detailed regarding its 1st implementation in Brazil and 2nd implementation concerning the training concepts' expansion in the production network. The details have been described in the figure below.



Figure 2. Case Study Structure and Steps – Chapter 5, Focus on the Case Study (own work).

The second study outlined in Chapter 6, defined here as study 2, or the *main study*, describes the data collection process and analysis regarding the theoretical research framework. Unlike the abovementioned *case study*, it has been designed to verify the research hypotheses through robust and valid research methods, using a comprehensive data collection process and reliable statistical analysis. For this second study, the samples have not been restricted to participants of the training concept but focus on a broader group to ensure that a wide-ranging cross-cultural analysis can be conducted. Its primary objective is to present, through concrete evidence, a valid and reliable answer to the research question posed in the introductory Chapter. The *main study* is also further defined and detailed regarding its *pilot study* data collection and analysis and its *main study* data collection and analysis. The details have been described in the figure below.



Figure 3. Main Study Structure and Steps – Chapter 6, Focus on the Main Study (own work).

The *case study* poses the practical question for this research, indicating possible cross-cultural variance; the *main study* answers the question using robust methods based on the literature-supported theoretical framework. Though contrasting in content, the *case study* and the *main study* present similar reporting structures in the thesis. They start by presenting introductory comments and delimiting the framework, collecting the data and presenting the results of the data analysis. Both studies end with a short conclusion before moving on to the discussion and triangulation of findings conducted in Chapter 7.

As expected, the thesis ends with Chapters 7 and 8 discussing findings, their implications and respective thesis conclusions. Chapter 7 presents a deep dive into the case and the main study's results to test the research hypotheses. It discusses the research contributions to knowledge and practice before examining the study's limitations and providing suggestions for future research. The thesis ends with Chapter 8, drawing the conclusions of the thesis and presenting a closing note regarding the research journey. The following figure facilitates understanding the thesis' structure, describing each Chapter's content.

Autonomous versus controlled extrinsic motivation triggers: a cross-cultural analysis from Thai, Indian, Brazilian and German Cultural contexts.				
Chapter 1	Introduction	 → Research backgorund and delimitation of framework; → Research aim, questions and objectives. 		
Chapter 2	Literature	Motivation	 → Needs, motives and values; → The current field of Self-Determination Theory. 	
	Review	Culture	 → Culture definition and implications; → Generalisation across cultures and the western bias. 	
Chapter 3	Framework and Hypothesis	→ Variables definition; → Conceptual framework and hypothesis.		
	Research	$ \begin{array}{c} \rightarrow \text{Reseach parad} \\ \rightarrow \text{Reasoning for} \end{array} $	ligm and design; the chosen methodology.	
Chapter 4	Paradigm, Design and Methods	Methods – Case and Main Study	 → Self-completion questionnaires and data collection; → Sampling, measurement instrument/scale and ethics; → Reliability and Validity. 	
	Study 1 (Case Study)	Introduction	\rightarrow Introduction and delimitation of Study 1 (Case Study).	
Chapter 5		Data Collection and Analysis	 → Data generation process; → Data analysis. 	
		Preliminary Discussions	 → Preliminary discussions; → Call for further research. 	
	Study 2 (Main Study)	Introduction	\rightarrow Introduction and delimitation of Study 2 (Main Study).	
Chapter 6		Pilot Study Data Collection and Analysis	 → Questionnaire validation and testing; → Reliability analysis and exploratory factor analysis. 	
		Main Study Data Collection and Analysis	 → Descriptive statistics and exploratory factor analysis; → Structural equation modeling, confirmatory factor analysis and cross-cultural comparisons; 	
		Preliminary Discussions	→ Preliminary discussions.	
Chapter 7	Discussion	 → Hypothesis verification and link to the literature; → Contribution to knowledge and implication in the field; → Contribution to practice; → Limitations and future research. 		
Chapter 8	Conclusion	\rightarrow Reflection and closing note.		

Figure 4. Thesis Structure (own work).

As delineated above, the thesis presents mainly a linear structure, moving from a literature review into the research framework, data collection, discussion of findings and conclusion. The *case study* and *main study* discussed in Chapters 5 and 6 provide additional depth to this linearity, deep diving into the practical issue posing the question and the

theoretical framework used to provide concrete evidence for the answer. The figure below illustrates this journey throughout the Chapters.



Figure 5. Thesis structure – Including Details for Study 1 (Case Study) and Study 2 (Main Study) (own work).

The structure presented here has been constantly revisited throughout the thesis and at the start of specific Chapters to facilitate navigation and seemingly separate the steps, particularly when dealing with the above-mentioned *case study* presented in Chapter 5 and the *main study* presented in Chapter 6 later. At each Chapter's beginning, its content and structure have been similarly presented to facilitate navigation. Besides easing into each Chapter with introductory remarks, a conclusion can be found at the end, drawing the essence before advancing into the following Chapter.

2 Literature Review

The literature review Chapter deals with the analysis, synthesis and critique of the current body of knowledge in the field of cross-cultural employee motivation. Besides the indepth analysis of the systematically selected articles, publications, seminal scholars and methodological literature, this Chapter aims to support the positioning of the current study within the field, further distinctly outlining the expected contribution to knowledge. The Chapter has been divided into two parts. The first, Section 2.1, presents the methodology applied during the systematic literature review. It further details how the search terms and database have been defined, the inclusion and exclusion criteria have been applied, and how the relevant publications have been later processed.

The second part of the Chapter presents the systematic literature review results, fundamentally discussing the two main relevant topics for this research: *motivation* and *culture*. First, in Sections 2.2 until 2.4, SDT, *needs*, and *motives* are analysed, stating the claims existing in the literature and respective evidence to support them and the discrepancies and disagreements between scholars, further positioning the current study within the field. Second, in Sections 2.5 until 2.7, the Chapter focuses on culture and cross-cultural research, analysing how culture is defined and the research impact caused by its definition. Besides defining cultural contexts and their consequences, the subsequent Sections deal with cross-cultural generalisations and Western bias in research. The two relevant topics, *motivation* and *culture*, provide the theoretical background needed to position the current study within its field, define the theoretical framework and outline its contribution to knowledge and practice. A summary of the literature review, consolidating the gaps and debates and providing the key takeaways for the conceptual framework, is presented in Section 2.8 before concluding the Chapter.

2.1 Systematic Literature Review Methodology

The following literature review has been conducted using a systematic literature review approach. The systematic literature review is recommended when the research question and design are supported by a deductive positivist methodology based on available evidence and pre-existing theories (Tranfield, Denyer, & Smart, 2003). Furthermore, and in comparison with the narrative review, scholars advocate that this kind of review supports decision-making in business and management when consensus on a subject has not been achieved (Bryman & Bell, 2011). Consistent with the aim of the study and its ontological and epistemological position, later discussed in Section 4.1, the systematic literature review approach provides the correct methodological guidelines to ensure a robust deductive answer to the posed question.

The literature review applied a modern systematic approach to business and management research. As advocated above as the most fitting method for the current study, it provides a robust and reliable base for analysing the body of knowledge, minimising possible bias during the process (Tranfield et al., 2003). This introductory Section describes the methodology used for the systematic literature review, defining the respective steps, sources, and inclusion and exclusion criteria applied. Denyer and Tranfield (2009) presented a series of steps to be followed when providing an evidence-based systematic literature review. The steps presented by them and applied for this study's systematic literature review have been presented in the figure below:

Systematic Literature Review			
Step 1	Define the research question.	Chapter 1	Section 1.3
Step 2	Define sources and locate the studies.	Chapter 2	Sub-Section 2.1.1
Step 3	Define criteria for inclusion/exclusion of studies.	Chapter 2	Sub-Section 2.1.2
Step 4	Analyse and compile the literature.	Chapter 2	Section 2.2-2.8
Step 5	Report and discuss the results.	Chapter 2	Section 2.2-2.8, 2.9

Figure 6. Systematic literature review steps (own work).

The systematic literature review ensures that the latest discussions between scholars and calls for further research have been considered before positioning the current study within the field of cross-cultural employee motivation, providing the necessary methodological robust evidence-based starting point (Denyer & Tranfield, 2009; Tranfield et al., 2003). Its first step has been concluded in the introductory chapter of this thesis, Section 1.3, where the research aim and objectives have been stated. Steps 2 and 3 have been consolidated in the following two Sub-Sections, detailing where the literature review studies have been found and which inclusion and exclusion criteria have been used to select the relevant articles. The literature review results, specifically steps 4 and 5, have been later consolidated in Section 2.2 through Section 2.8 of this Chapter. The last step described in the figure above, the review results, can be found throughout the Chapter in each Section and Sub-Section, including this Chapter's conclusion, and embodied in the research design Chapter's conceptual framework, Chapter 3.

2.1.1 Search Terms and DataBase

Based on the research question formulated in the introductory Chapter, an initial mind map has been created to assess the depth of each keyword linked to *cross-cultural employee motivation*, defining the initial frame of the search terms. It aimed to consolidate some of the main terms found in the literature and was later used to set the filters applied in each source for relevant articles and publications. The terms have been gathered, and the map generated based on a scoping review methodology, which can be conducted as a rapid review of available literature before diving deep into a full systematic review (Arksey & O'Malley, 2005).

An initial scoping of the subject area is methodologically recommended to define the delimitations, size and relevance of the systematic literature review framework (Tranfield et al., 2003) and position the review within the body of knowledge (Denyer & Tranfield, 2009) and thus applied as the initial step. To further support the results of the initial scoping review, some meta-analysis studies from the field (Bauer et al., 2016; R. Ryan et al., 2023; Slemp, Kern, Patrick, & Ryan, 2018) have been used to cross-check the frequency and validity of the terminology ensuring its inclusion. Based on the scoping review and the meta-
analyse studies evaluated, the gathered terms and expanded mind map have been consolidated below:



Figure 7. Mind map representation of the main terms and keyword concepts in the field of cross-cultural employee motivation – Results of the Scoping Review (own work).

The results of the scoping review and the abovementioned mind map have been directly translated into search terms to delimit further and precisely the search field. As suggested by the systematic literature review process steps, the search terms have been consolidated in search clusters and applied to specific search term combinations (Denyer & Tranfield, 2009; Tranfield et al., 2003). The following table compiles the search terms and the combinations used for the process:

Terms	CROSS-CULTURAL	EMPLOYEE	MOTIVATION
Cluster	А	В	С
Search Terms and Synonyms Used	"Cross-Cultural" OR "Cross Cultural" OR "Inter-Cultural" OR	"Employee" OR "Associate" OR "Worker" OR "Operator"	"Motivation" OR "Motive" OR "Incentive" OR
	"Inter Cultural" OR "Ethnic"	OR "Labour" OR "Labor"	"Reward" OR "Self Determination Theory" OR "SDT"
Search Terms Combinations (STC)*	STC1 = A+B+C STC2 = A+C STC3 = B+C *Legend: the operator "+" represer	its the Boolean term "AND" i	n this combination

Table 1. Search Terms, Search Terms Combination Table.

As the table above shows, only two Boolean operators have been used for the search terms combination: *OR* and *AND*. The search term combinations (STC) 1-3 were then used as input for the advanced search in the online databases to provide the most current publications related to the topic. The following online databases have been used:

- ABI/INFORM Global: <u>https://search-proquest-</u> com.glos.idm.oclc.org/abiglobal/index
- Business Source Complete: <u>https://web-a-ebscohost-</u> com.glos.idm.oclc.org/ehost/search/advanced?vid=0&sid=b189d87f-acaf-48cd-828e-29e5bd2a0329%40sdc-v-sessmgr03
- Web of Science: http://apps.webofknowledge.com.glos.idm.oclc.org/UA_GeneralSearch_input.do
 ?product=UA&search_mode=GeneralSearch&SID=C6OSQY6mso3T6TGzpzU&pref <a href="mailto:erencesSaved="mailto:erencesSaved="mailto:erencesSaved="mailto:erencessaved="mailt

ProQuest: <u>https://www.proquest.com/</u>

Some restrictions have been applied as filters to the database search to narrow down the results; they aim to improve the results' precision, reliability and quality, ensuring that the latest updates in the field have been included in the review. The following limiters have been applied in the advanced search filters of each source to provide a list of the latest evidence and the corresponding claims presented by SDT and cross-cultural scholars:

- 1. Language: English;
- 2. Published Date: 20090101-20191231;
- 3. Scholarly (Peer Reviewed) Journals;
- 4. Document Type: Article.

There are two main arguments to endorse using the above-noted English language filter. First, the body of knowledge from the Self-Determination Theory is based on the work of the two seminal English-speaking authors conducting and reporting their research in the English Language. Secondly, building upon the first argument, it has been deemed critically essential for any study embedded in the Self-Determination Theory, supporting or disproving it or parts of it, to present publications or abstracts in the English language for peer review challenges. If the articles or abstracts are not available in English, it would be prudent to question the motives behind the absence; why would the author or the content not be presented internationally using the English language for peer review and scrutiny? The possible answers to this question have been deemed essential to ensure the quality of the reviewed articles and thus support the filter.

For the sake of the argument of filtering based on the English Language, a search has also been conducted for publications not in English in the ABI/INFORM Global. The total number of English publications on the topic since 1937 reached 90,631 results, with 1,681 results being from articles in any other language with at least an English abstract, meaning less than 2% of the studies could have been impacted by the filter. The filter for the publications in the English Language is further supported by the seminal authors from the Self-Determination Theory, who used it to publish a meta-review consolidating the findings

from 60 meta-analyses (R. Ryan et al., 2023). The scholars also applied the English filter over the four decades of research in Self-Determination Theory to extract the relevant articles (R. Ryan et al., 2023), further validating this filter as relevant for the field and, thus, for the current study.

The second limitation applied refers to papers published in a 10-year period. This limitation has been deemed adequate once an exponential trend has been evidenced regarding publications on cross-cultural employee motivation, from 14,732 between 2000 and 2009 to 40,708 between 2010 and 2019. The growth is even more pronounced when further restricted to self-determination theory, going from 2,475 between 2000 and 2009 to 6,551 between 2009 and 2019. This filter is also supported by the most recent literature regarding Self-Determination Theory meta-review analysis. Ryan et al. (2023) confirm that over 75% of the studies have been published in the last ten years, further suggesting that a critical mass for meta-analytical analysis has been achieved (R. Ryan et al., 2023). Olafsen et al. (2021) further advocate that SDT research in the work domain has gained increased attention in the last ten to fifteen years. Thus, the initial 10-year period plus the subsequent literature review update before the thesis submission, including more than three additional years, is considered adequate for the current study's systematic literature review.

The third and fourth limitations have been set to ensure that every result has been published as a peer-reviewed journal article, supporting the reliability and quality of the search results. All described filters have been applied for the initial search on the four sources stated above; based on the information extracted from this database, additional publications have been included and reviewed based on the references found in the analysed papers to ensure the conclusions are built on validated theories prior to the date limit set for the systematic literature review. The temporal limit filter has not been set when dealing with the CSDT (Center for Self-Determination Theory) database to ensure the whole theory, including all data validating it, has been analysed in depth before providing the framework and measurement instruments applied to the current study.

Despite the abovementioned limitations, the source *ABI/INFORM Global* presented numerous results, totalling 43,366 publications. Therefore, before applying the inclusion and

exclusion criteria and undergoing a detailed evaluation of this literature, some additional limiters have been applied to narrow down the results of this specific database:

 Databases: ABI/INFORM Global; Limited by: Peer-reviewed; Date: Last ten years; Source type: Dissertations & Theses, Scholarly Journals; Document type: Article, Literature Review; Language: English; Narrowed by: Peer-reviewed: Peerreviewed.

To filter this body of knowledge regarding its content and relevance for cross-cultural employee motivational research, inclusion and exclusion criteria have been defined and applied as suggested by Denyer and Tranfield (2009). After applying the limitations described above in the advanced search engine of each of the four mentioned sources, results have been gathered using the pre-defined search term combinations. The outcome was then compiled, with duplicates removed from the database. This process has been further detailed in the following Sub-Section.

Before concluding the written work of the thesis, the most recent publications have been checked to ensure the study is up to date with the field. As noted above, the search history was first conducted limited to the 31st of December 2019, where the articles were extracted to prepare the systematic literature review. The new search has been conducted using the same search terms, combinations, and advanced filters described above to include all articles published until the 30th of May, 2023. The additional work was sorted through the inclusion and exclusion criteria in the following sub-section.

Besides the four sources discussed so far, one other databank has been considered an essential source of publication for the current field of self-determination theory and thus included in the process:

CSDT (Center for Self-Determination Theory):
 <u>https://selfdeterminationtheory.org/</u>

The papers and scholars in the CSDT have been chosen as additional sources for the systematic literature review for two main reasons. First, the institute was founded by Prof. Richard Ryan and Prof. Edward Deci, the two most prominent and internationally recognized scholars in the field of SDT. They were also the ones to draw, develop and publish the first

SDT hypothesis and thesis as early as 1989 (Deci, Connell, & Ryan, 1989; R. M. Ryan & Connell, 1989), being considered experts until today by the leading scholars in the field. Second, the Center for Self-Determination Theory supports all research conducted in the field by providing all relevant articles, books and validated methods and metrics for future research. The total amount of relevant studies, classified by thematical Sub-Section, have been consolidated in the table below:

Main Source	Source	Page	Number of Studies	τοται
(incl. page)	Sub-Section	Sub-Section	and Publications*	TUTAL
	Theoretical Overview and Research Reviews	https://selfdeterminationtheory.org/research/theor etical-overviews-and-research-reviews/	31	
CSDT (Center for Self- Determination Theory)	Basic Psychological Needs	https://selfdeterminationtheory.org/research/basic -psychological-needs/	114	352
https://selfdeterminationthe ory.org/	Internalization and Self-regulatory Styles	https://selfdeterminationtheory.org/research/inter nalization-and-self-regulatory-styles/	142	
	Motivation and SDT Across Cultures	https://selfdeterminationtheory.org/application- cultural/	65	

 Table 2. CSDT (Center for Self-Determination Theory) Source, including the number of publications.

*Initial search, results found until 31st of December, 2019.

It is essential to note that even though the publications found in the CSDT are internationally recognized and published in some of the leading journals in the field of psychology, the use of this source alone for the most relevant contributions could present a limited, biased view on the topic. This statement is not tentative to reduce its significance or challenge the validity of any of its publications but to reinforce the necessary awareness and ensure further transparency for the following review. It solely implies that additional caution must be taken when analysing the articles posted by this specific source, mainly because it would be expected that a centre currently regulating research on the area might present more supporting than contradicting evidence to the theory it advocates. Thus, this statement is not drawn as a conviction but rather as a caution to ensure the conducted literature review goes beyond these publications, challenging and supporting its predictions with additional external evidence before basing the study on its premises.

2.1.2 Inclusion and Exclusion Criteria

As briefly discussed above, inclusion and exclusion criteria have been defined and applied to reduce unnecessary complexity further and ensure the analysed evidence's overall quality (Denyer & Tranfield, 2009). These criteria have been used to include or exclude studies focusing on cross-cultural employee motivation and avoiding expansion into other fields that are irrelevant to this study's framework. The following inclusion criteria have been defined and applied to the search results.

Inclusion criteria:

- Business-related, application in company or industry;
- All cross-cultural studies in the field of motivation;
- All rewards/incentive studies in the field of motivation;
- Quantitative studies precede further classification; qualitative studies to be evaluated separately and explicitly mentioned during the literature review.

The search has shown that cross-cultural studies have presented a growing focus for numerous publications in various fields. Exclusion criteria have been defined and applied as a filter when dealing with the cross-cultural employee motivation search results, further delineating this topic's boundaries. The aim was to ensure studies focused on presenting some correlation or causality between *culture variability* and *motivation in the workplace* without narrowing the evaluations to gender restrictions or creating too much diversification into different fields. Thus, the following exclusion criteria have been used:

- Not: migration, expatriates, health care, discrimination, human rights;
- No male/female specific studies;
- No buyer/seller, marketing, or consumer studies;
- No leadership and transformational leadership-focused studies;
- No expatriate studies regarding cultural adaptation.

The search results have been filtered using the above-defined inclusion and exclusion criteria, and duplicates have been removed. The total number of remaining papers has been consolidated in the table below:

Source	Initial Results	Add. Filter	Incl./Excl., Criteria	Duplicates Removed	TOTAL
Business Source Complete (EBSCOhost)	279	NA*	22	19	
ABI/INFORM Global	43,366	1,590	29	27	107
Web of Science (Core Collection)	796	NA*	21	19	
Center for Self-Determination Theory	352	NA*	42	42	

Table 3. Search results STC1 = A+B+C. Initial search results, until 31st of December 2019.

*NA: not applicable. No additional filters have been applied for this specific source.

Table 4. Search results STC1 = A+B+C. Results from 31^{st} of December 2019 to 30^{th} of May 2023.

Source	Initial Results	Add. Filter	Incl./Excl., Criteria	Duplicates Removed	TOTAL
Business Source Complete (EBSCOhost)	75	NA*	5	5	
ABI/INFORM Global	27,015	107	3	1	14
ProQuest	58	NA*	2	1	
Center for Self-Determination Theory	32	NA*	8	7	

*NA: not applicable. No additional filters have been applied for this specific source.

As defined by the methodology and expected from a systematic literature review, a detailed evaluation of the 107 papers was conducted and later cross-checked and updated with the latest 14 papers found up until the 30th of May, 2023. The evaluation process of the relevant literature has been described in the following Sub-Section, and its respective review can be seen in Sections 2.2 until 2.8.

2.1.3 Processing the Relevant Articles and Publications

All relevant information extracted from the evaluated papers has been tabulated into an Excel spreadsheet to facilitate direct comparisons regarding supporting and diverging evidence and claims. This comparison process allows for consistent cross-checking between methodologies used, methods and analysis applied, and results presented in each article. An example of this information extraction and categorization process can be seen below.

1	, Pr	rir,	Reference	Author	Date 🚽	Title	Journal 🚽	Line of Thought 🞽	Data Type 🚽	Method
	84 ****	-	Howard, J. L., e	Howard, Joshua L. Gagné, Marylène Morin, Alexandre J. S. Forest, Jacques	2.016	Using Bifactor Expl	Journal of Manager	Post-positivist	1 - Quantitative	archival data collected between 2008 and 2012 that have been previously used to validate the MWMS (Gagné et al., 2015). The current sample includes 1,124 fulltime Canadian employees from a range of organizations and industries. Content of the surveys varied within data sets in terms of covariates and demographics, but all participants completed the same 10 items forming the MWMS. Employees completed confidential surveys voluntarily on an online platform or in paper format on their work premises.

Figure 8. Information extraction and categorization process in an Excel spreadsheet for systematical comparison (own work).

The following categories, defined by the columns in the Excel spreadsheet, have been defined for compiling the literature review data on *cross-cultural employee motivation*:

Systematic Literature Review								
	Reference Details	Author/Date	Title	Journal	Paradigm Data type			
Study Summary	Methodology	Method Data Analysis	Scale/ Instrument	Hypothesis	Countries and samples			
	Results	Findings and results	Conclusions Limitations and future research		Additional references			
	Frameworks	Hofstede	Kluckhohn and Strodtbeck	Hall Trompenaar	Triandis and Gelfand			
Cultural Emphasis	Culture	Definition	Interst in cross- cultural framew.	Organizational vs. national				
	Bias	Generalisation across cultures	Western bias in research	Limitations and future research	Additional references			
	Motivation	Maslow/Needs	Perform. based reward/Rewards	Learning / Goal Theory				
Motivation	Self-Determination	SDT (General)	SDT – Psyc. Needs	SDT - Regulation	SDT - Regulation (Autonomous)			
Emphasis	Theory	SDT - Regulation (Controlled)	SDT - Intrinsic	SDT - Extrinsic	SDT-Amotivation			
	Others	Expectancy Theory	Expectancy- value	Action-Trait Theory				

Figure 9. Categories used to classify the article's information - Cross-cultural motivation (own work).

The evidence found and the scholar's statements and claims were compared within each category. The interpretation of these results has been summarized in the following Sections of this literature review Chapter. A similar tabulation and analysis procedure has been conducted for the literature review regarding the research paradigm, design and methods discussed in Chapter 4. Analogously, the following categories have been defined for these topics when categorizing the evidence and claims in the spreadsheet:

	Research Paradigm and Design								
Reference Summary	Reference Details	Book/Article Title	Publisher	Paradigm (if applicable)					
	Reality and Knowledge	Ontology	Epistemology	Axiology	Methodology and methods				
Basic Knowledge / Definitions	Reasoning Deduction		Induction	Abduction					
	Others	Paradigm definition	Ethics						
	Paradigms	Research Philosophy	Phil. Debate in social sciences	Values/Bias	Objectivism / Realism				
	Dealism	Positivism Philosophy	Critique on Positivism	Positivism Research Design	Positivism Methods				
Philosophical Paradigms	Redistri	Roles and skills	Critical Realism						
	Constructivism	Interpretivism/ Constructivist	Critique on Interpretivism	Interpretivism Research Design	Interpretivism Methods				
	Constructivism	Action Reseach	Critique in Action Research	Roles and skills					

Figure 10. Categories used to classify the article's information – Research paradigm and design (own work).

Methodology and Methods								
	Quantitative/ Qualitative Qualitative		Self-Completion Questionnaire	Structured Interview	lssues			
Methodology	Desie Kneudedee	Causality	Generalization and Replication	Reliability	Validity			
	Basic Nilo wiedge	Hyposthesis Testing	Types of Variables	Missing Data				
	Sampling	Sample Sizes	Probability Samples	Non-probability Samples	Sampling Error / Bias			
	Data callection	Creating a Questionnaire	Scales	Survey Error				
Methods	Data collection	Piloting and Translation	Measures/ Instruments					
	Doto Analysis	ANOVA and MANOVA	Confirmatory Factoral Analysis	Struct. Equation Modeling (SEM)	Statistical Signifcance			
		Correlation	T-Test Chi-Square Test	Correlation	Confidence Interval			

Figure 11. Categories used to classify the article's information – Research methodology and methods (own work).

As stated before, the systematic literature review results regarding cross-cultural employee motivation can be seen in the following Sub-Section of this Chapter. The systematic literature review results regarding the research's philosophical paradigm, design and methods are presented in Chapter 4 of the thesis.

2.2 The Current Field of the Self-Determination Theory

This Section presents the opening statements extracted from the literature review regarding *cross-cultural employee motivation*. It starts the guidance until ultimately positioning the current study within the field of self-determination theory. Based on the review conducted, scholars and their statements have been organized, compared, challenged, and presented to support the need for this study's framework. The available evidence has been juxtaposed to allow an overview of the available theoretical background before presenting and justifying the conceptual framework. Until the end of the Chapter, the standpoint of this study's two main theoretical pillars have been analysed in-depth: *employee motivation* and *cultural frameworks*. The discussion starts with motivational

research in the chosen field of the self-determination theory, followed by the definition of culture and the current bias and opportunities available in cross-cultural research.

Over the last two decades, research in the organizational field has often turned to the self-determination theory to increase employees' motivation and engagement (Deci, Olafsen, & Ryan, 2017; R. M. Ryan & Deci, 2019b). Ryan and Deci (2019b) advocate that the increase seen in the use of SDT is due to the thorough theoretical background provided, which has been strongly supported with empirical evidence (R. Ryan et al., 2023). According to Slemp et al. (2018), not many theories have received as much attention from scholars as the SDT's motivation framework. According to scholars, SDT provides a theoretical foundation to understand the mechanisms behind human motivation and the psychological needs to be satisfied to achieve well-being, growth and self-actualization.

As briefly described in the introduction Chapter, self-determination theory (SDT) advocated by Deci and Ryan (2000) provided an appropriate fit for the intended study by focusing specifically on psychological needs and their fulfilment and was thus chosen as the theoretical cornerstone for the current study. The theory claims that psychological needs do not vary between cultures, meaning those *needs* are universal and relevant to all individuals (Gagné & Deci, 2005; Martela et al., 2022; Monnot, 2018). The seminal scholars defend the universality of psychological needs and their positive correlation to well-being independent of cultural background. They also suggest that what might differ between the cultures are the *motives* and how individuals are led to fulfil any particular psychological need. It is precisely the claim of *psychological needs* being universally valid to all individuals and *motives* being a cultural variable that the current study aims to support with empirical evidence. The theoretical background to support the claim for such evidence has been described in the following Sub-Sections.

2.2.1 SDT – Basic Psychological Needs Theory – *Needs*

One of the main *mini-theories* within self-determination theory is the Basic Psychological Need Theory (BPNT). The BPNT postulates that the needs of *autonomy*, *competence* and *relatedness* are fundamental psychological needs and, when satisfied, promote the individual's psychological well-being, psychological growth and consistent

performance improvement (Chen, Van Assche, Vansteenkiste, Soenens, & Beyers, 2015; Deci et al., 2017). According to the SDT's view on the BPNT, the needs for *autonomy, competence* and *relatedness* are inherent to all individuals, being part of the natural human development process and, therefore, universal (Chen et al., 2015; Vansteenkiste et al., 2020). The positive relation between need fulfilment and well-being has been extensively tested in the last decades, with several studies providing empirical evidence to support the universalization claim even in different cross-cultural domains (Chen et al., 2014; Chirkov et al., 2003; Deci et al., 2001; Kaplan & Madjar, 2017; Landry & Whillans, 2018).

The universality claim of the three basic psychological needs has been mainly focused on in recent decades. Most scholars, including the seminal authors, advocate that these three fundamental needs satisfaction promotes well-being independent of the cultural background, age group or population (Martela et al., 2022; R. Ryan et al., 2023). Initially postulated by the seminal scholars Deci and Ryan, this claim has been extensively tested with several samples across many different cultural contexts. Substantial evidence has been seen across various studies and is detailed in the following paragraphs.

Deci et al. (2001) provided the first evidence as early as 2001 when testing employees from companies in Bulgaria and the USA regarding need fulfilment and wellbeing. Chirkov et al. (2003) provided evidence by testing samples across South Korea, Russia, Turkey and the USA in a different construct. Furthermore, consistent with the results from Chirkov, Chen et al. (2014) found evidence to underscore the universality claim when testing the satisfaction of the basic psychological needs in teenagers from Belgium, China, the USA and Peru. The BPNT universality claim has even been confirmed in Australian indigenous populations (Magson et al., 2022). Furthermore, a meta-analytical review by Slemp et al. (2018) supported the above research after analysing 754 correlations across 72 studies. Seemingly, consistently across the literature, the three basic psychological needs' universality claim is supported by empirical evidence.

On an important note, according to some scholars, additional attention must be given to one specific psychological need before moving forward with the universality claim argument. Divergency within the field appears to exist mainly on a specific basic psychological need: the need for *autonomy*. According to cultural relativist scholars,

autonomy would be strongly linked to individualist societies but limited to collectivist ones (Markus & Kitayama, 2003; Oishi & Diener, 2001). This claim is based on the understanding that autonomy relates to the individual's capacity to decide independently (Rudy, Sheldon, Awong, & Tan, 2007). This definition of autonomy would reasonably frame this particular psychological need as a standard for individualist cultures.

The statement proposes that individualist and collectivist cultural contexts would moderate correlations between autonomy's need fulfilment and well-being. Oishi et al. (2009) advocated that autonomy is a stronger predictor of well-being for individualist cultures than for collectivist ones. In his work, Oishi et al. (2009), autonomy is understood as taking independent action or following individualist decisions. It means that the moderation provided by individualist values facilitates the need for fulfilment towards autonomy. However, SDT argues that this definition is inaccurate, strongly diverging from this understanding and standing by the theory's universality.

According to SDT scholars, autonomy is not defined by the individual's ability to act independently but to decide and choose according to one's own volition. It implies that even if someone decides to follow a millenary tradition in a collectivist society but conducts this choice based on their resolution, this autonomy would also positively affect psychological well-being and human growth (R. M. Ryan & Deci, 2019a). This understanding of autonomy allows individuals from collectivist cultures to choose, consciously supporting their need for autonomy. This claim has been consistently supported by evidence from the literature (Chen et al., 2014; Chirkov et al., 2003; Kaplan & Madjar, 2017). Conclusively, independent of the values rooted in any culture, the fundamental psychological need for autonomy is inherent to human nature, and, therefore, its satisfaction is essential for healthy psychological development.

Despite the different understandings of autonomy described above and enough evidence supporting the universality claim towards need fulfilment, additional care must be taken before concluding the issue. Universality and generalisation statements can be hard to support once even one negative evidence result can change any theory's universality claim (Popper, 2014). Even meta-analysis results supporting the SDT's universality claim, as presented by Slemp et al. (2018), demand additional caution regarding generalization across

every cultural background. The scholars confirm that yet using samples from countries defined by Hofstede (2001) as individualists and collectivists, the samples contained mixed ethnic groups and suggest that additional work is needed to confirm their findings in different cultural contexts. Understanding how one can generalize theories across cultures is crucial for the current study and must be investigated in depth. Thus, further discussion is presented in the literature review Section 2.6., helping to position the study between the absolutist and relativist stances presented above.

To summarize, the SDT's BPNT has been extensively tested in the cross-cultural domain, and consistently across the analysed papers, the universality claim has been supported with empirical evidence. Although coherent and substantial evidence is presented, the literature review does not seem to close the discussion between the scholars permanently. Chirkov et al. (2003) commented at the end of their study that even after confirming the universality hypothesis, they had done so in samples from only four cultures. They further argue that this result does not begin to cover all cultural forms and calls for additional study in other parts of the world. The difficulty of finding a decisive argument is presumably the same as in any theory searching for definitive empirical confirmation; one single negative result could decisively disprove the universality claim. This theoretical understanding goes back to Popper (2014) and his work about Conjectures and Refutations in the mid-'60s; one contrary result in the BPNT universalisation claim may completely change the understanding of its universalisation.

Regarding the basic psychological needs, several arguments favour the limitations inherent to the analysed studies' design: samples might not represent a given culture, student samples cannot be extended to working-class populations, results from one sample cannot be extended to a whole culture, and so on. The variety of cultural backgrounds is enormous. With the physical borders slowly vanishing in the current global scenario, the constantly changing environment further demands research to validate any theory (Menard et al., 2018). Meta-analysis could also profit from additional empirical evidence in various cultural contexts and samples not yet tested. This discussion opens up space for continuous research in the field, serving as essential understanding regarding the knowledge contribution provided by the current study.

2.2.2 SDT – Behaviour Regulation and the Self-Determination Continuum – *Motives*

Besides the above-presented discussion within the SDT's mini-theory of BPNT and the knowledge contribution opportunity discussed above, additional research on *motives* and *regulation* also appears necessary. According to the literature, even when scholars openly disagree regarding the importance and definition of *basic psychological needs* (Locke & Schattke, 2019; R. M. Ryan & Deci, 2019b), they collectively acknowledge that additional research on *intrinsic* versus *extrinsic* motivation is needed. The issue is clearly stated in Ryan and Deci's (2019b) brief reply to Locke and Schattke. In this response letter, a *call to action* is presented by the scholars, encouraging researchers to provide additional evidence concerning *intrinsic* and *extrinsic* motivation. Following this call and based on the systematically chosen literature, the theoretical framework regarding the *type of motivation* and the respective *behaviour regulation* has been further detailed below.

As stated, this Sub-Section moves away from the *basic psychologic needs* fulfilment and into the *motives* triggering individuals towards a specific behaviour. In other words, the aim is to analyse how people might have different *reasons* to accomplish a specific task or goal. These *reasons* or *motives* can be more *autonomous* due to value or interest or more *controlled* due to external pressure or gratification, leading to different behavioural results (R. M. Ryan & Deci, 2019b). SDT proposes that *autonomous* reasons for engaging in behaviour are volitional, while *controlled* reasons are responses to internal or external pressure (Howard et al., 2016). The central discussion point of this Sub-Section and the study conducted is the regulation process and the degree to which each regulation is internalized, *autonomous* vs *controlled*. Self-determination theory defines *autonomous* and *controlled* as the degree of regulation to which individuals respond and engage in a particular behaviour.

The *autonomous* and *controlled* degree of internalization differs in terms of the perceived locus of causality (PLOC) relative to the person or variables giving the impulse to the behaviour (R. M. Ryan & Connell, 1989). The PLOC distinguishes if the behavioural impulse is *external* or *internal*, a crucial distinction to understanding intrinsic and extrinsic motivation and the perceived autonomy when engaging in a specific behaviour. The following figure has been adapted to facilitate the understanding and the differences between *behaviour*, *types of motivation*, *form of regulation* and the *degree of internalization*:

	The Self-Determination Continuum								
Behaviour	Nonself-determin	Ionself-determined Self-determined							
Type of Motivation	Amotivation		Extrinsic Motivation						
Form of Regulation	Non-regulation	External Regulation	Introjected Regulation	Identified Regulation	Integrated Regulation	Intrinsic Regulation			
Degree of Internalization		External	Slightly Internalized	Somewhat Internalized	Internalized	Internalized			
(Locus of Causality)		•	More Controlled	More Autonomou	JS	•			

Figure 12. The Self-Determination Continuum, adapted from Deci and Ryan (2000, p. 237) and Slemp et al. (2018, p. 3).

The figure presented illustrates the so-called self-determination continuum. According to the literature, the constructs analysed in internalization theories follow a predefined legitimate order, which can be placed over a self-determination continuum (Black & Deci, 2000; Chirkov et al., 2003; Howard et al., 2016; R. M. Ryan & Connell, 1989). The continuum moves from non-self-determined, externally regulated behaviours to selfdetermined, internalized, autonomous behaviour. The current study bases its analyses on the blocks forming the above-presented continuum; thus, a short definition is deemed adequate before discussing the proposed *theoretical research framework*.

Types of Motivation:

- Amotivation: Amotivation is defined as the complete lack of interest and intention to complete an activity (Gagné et al., 2015; Howard et al., 2016; Slemp et al., 2018; Wang & Gagné, 2013). The knowledge of why this activity is essential and why it should be conducted is not present; no direct reward and punishment, either tangible or intangible, are related to it (Deci & Ryan, 2000; Gagné & Deci, 2005);
- Extrinsic Motivation: Extrinsic motivation is the motivation to complete a task to avoid a specific consequence or to receive a benefit (Black & Deci, 2000; Deci et al., 2017; Gagné et al., 2015; Anja H. Olafsen, Halvari, Forest, & Deci, 2015). The constraints and rewards received are classified as tangible, such as salary, prize, financial benefit, or intangible, such as feedback, time limit,

competition, and goals (Hennessey et al., 2014; Machado, Cabral, & Vaccaro, 2018; Newman & Sheikh, 2012);

Intrinsic Motivation: Intrinsic motivation refers to the engagement of an individual with a task due to the sheer pleasure provided by it (Bauer et al., 2016; Gagné et al., 2015; Sheldon & Elliot, 1998). The activity is conducted not due to external force or reward but for his own sake and enjoyment (Deci et al., 2017; Hennessey et al., 2014; King, 2016). In recent decades, research has consistently demonstrated that intrinsic motivation is positively related to enhancing an individual's contribution, higher satisfaction and optimal performance (Guillen-Royo & Kasser, 2014; Landry & Whillans, 2018; Monnot, 2018).

Forms of Regulation:

- Non-Regulation: It refers to the complete lack of any form of regulation directly linked to amotivation and complete lack of engagement in a specific task;
- External Regulation: External Regulation is the classical extrinsic motive to regulate behaviour (Chirkov et al., 2003). That means that the individual acts to avoid unwanted punishment or to receive a benefit (Gagné & Deci, 2005; Rudy et al., 2007);
- Introjected Regulation: Introjected Regulation is defined as controlling the behaviour through self-imposed constraints internal to the individual, such as fear, shame, ego or self-pride pressures (Chirkov et al., 2003; Gagné et al., 2015; Rudy et al., 2007);
- Identified Regulation: Identified Regulation points out to the execution of a task due to the individual's identification of its goals, values or significance (Chirkov et al., 2003; Gagné et al., 2015; Rudy et al., 2007);
- Integrated Regulation: Integrated Regulation is the only extrinsic trigger considered fully autonomous, sharing many intrinsic behaviour characteristics

(Chirkov et al., 2003). In this regulation process, the individual identifies himself with the activity and is part of who he is; it can be expanded outside his work environment and into his daily life, altering his behaviour. The task becomes an essential instrument for his objectives (Gagné & Deci, 2005).

 Intrinsic Regulation: Intrinsic Regulation refers to engaging in a particular activity out of pure enjoyment and interest, the highest autonomous form of regulation directly linked to the intrinsic type of motivation (Chirkov et al., 2003).

Degree of Internalization (Locus of Causality):

- Controlled (external or slightly internalized): The internalization process is considered *controlled* when the behaviour has an *external perceived locus of causality* (Black & Deci, 2000). It is the case when the individual is externally triggered by punishment avoidance and reward orientation or through introjected enforcement to avoid the feeling of guilt or fear or to seek recognition and improve self-esteem (Deci et al., 2017; Howard et al., 2016; Slemp et al., 2018). It is the case referring to the following forms of regulation: *external* regulation and *introjected* regulation;
- Autonomous (somewhat internalized or internalized): The internalization
 process is considered *autonomous* when the behaviour has an *internal
 perceived locus of causality* (Black & Deci, 2000). It means the motive to
 engage in a particular task is volitional (R. M. Ryan & Connell, 1989). The task
 is seen as personal identification and importance or based on sheer interest
 and enjoyment (Gagné & Forest, 2008; Grant et al., 2011; Kaplan & Madjar,
 2017). It refers to the following forms of regulation: *identified, integrated* and *intrinsic* regulation.

According to Deci et al. (2017), many European and Asian studies have successfully applied SDT to understand employee engagement better across different cultures and industries. The scholars further advocate that it is crucial to differentiate the *type of motivation*, *controlled* vs *autonomous*, and the sub-type *forms of regulation* to better

anticipate employee behaviour and engagement in the workplace (Deci et al., 2017). Furthermore, the literature indicates that even though the satisfaction of basic psychological needs is essential for intrinsic motivation across all cultural contexts, the response to extrinsic rewards depends on cultural variability (Monnot, 2018).

The literature further supports the *call to action* mentioned at the beginning of this Sub-Section to present evidence of cultural variability in the field of extrinsic motivational triggers. De Castella et al. (De Castella et al., 2013) advocate notable differences in achievement motivation and self-regulation when analysing a cross-cultural context. King et al. (2017) found that even though extrinsic goals are relevant for all students across different cultural contexts, they might predict better learning in one culture if compared to another. The scholar found evidence of cross-cultural similarities and differences in performance and social and extrinsic goals when studying responses to mastery motivation. Guillen-Royo and Kasser (2014) argue that samples from economically developing nations are often underrepresented. They also state that college students do not represent working-class or slum residents when studying the universalisation of psychological needs and motivational triggers. In the same line of thought, Jugert et al. (2014) advocate that systematical investigation in motivation requires consistent sampling from various cultural contexts to measure culture-related similarities and variations.

According to the literature mentioned above, further research seems necessary to better understand the differences and similarities in *types of motivation* and *forms of regulation* between cultural contexts. The *theoretical framework* for the current study is being framed precisely by this request. The following Chapter details this *theoretical framework*, defining the expected relationship between the variable and providing the hypothesis tested in the study across the four different cultural contexts. The study's pivotal question, aim and objectives directly relate to understanding *extrinsic motivational triggers* and their forms of regulation, comparing *autonomous* vs *controlled*. The study is expected to find the most significant differences between the analysed cultures on employee motivation in this theoretical framework. The following figure illustrates how the *theoretical research framework* regarding extrinsic motivational triggers fits into the self-determination continuum described:

Behaviour Nonself-determined Self-det	ermined
Time of	
Amotivation Extrinsic Motivation Motivation	insic vation
Form of RegulationNon-regulationExternal RegulationIntrojected RegulationIdentified 	insic lation
Degree of Internalization External Slightly Internalized Somewhat Internalized Internalized	nalized
(Locus of More Controlled More Autonomous	

Figure 13. The Theoretical Research Framework is based on the Self-Determination Continuum, adapted from Deci and Ryan (2000, p. 237) and Slemp et al. (2018, p. 3).

In addition to the above-described *theoretical framework*, the study cannot ignore the cross-cultural validity divergencies in the BPNT discussed in the last Sub-Section. As stated before, need fulfilment is considered the predecessor and overarching intrinsic motivation process. Thus, it must be tested in the same cultural contexts to ensure that cultural divergencies from the need theory do not taint ext*rinsic types of motivation* tested by the *research framework*. It is imperative to test *need satisfaction* across cultures to ensure the reliability of the results provided by the current when comparing *autonomous* vs *controlled* forms of regulation. This BPNT theoretical field is included in the study's *research framework*, with Chapter 3 further detailing the relationships and hypotheses to be tested.

2.3 Needs, Motives and Values

The previous two Sub-Sections have presented the different literature stances regarding *basic psychological need satisfaction* and *motives*, including its *forms of regulation*. Besides *needs* and *motives* and the relationship between the two, the current Section addresses the issue of *values* and their role in how culture is defined and how individuals are motivated. The degree of expected cultural variability for these three components helps to shape the theoretical framework and later hypotheses for the variables and their relationships. The following paragraphs analyse these three components concerning their degree of expected cultural variability across different contexts.

The first component to be analysed regarding expected cultural variability is the *needs*. As presented during the literature review on SDT basic psychological needs theory, it seems that the three fundamental psychological needs promote well-being independently of the cultural context (Chen et al., 2014; Chirkov et al., 2003; Deci et al., 2001; Kaplan & Madjar, 2017; Landry & Whillans, 2018). With several studies providing substantial empirical evidence to support this claim, scholars consistently agree that what might be cultural relative is how individuals express and fulfil their needs and the degree of relevance they might have within a culture (Chirkov et al., 2003). It means that *needs* are not expected to be culturally variable, but how needs are fulfilled can have some degree of cultural variability.

The second component is the *motives* that lead an individual to engage in a particular task. The last Sub-Section has made clear that scholars expect motivational triggers and their *forms of regulation* to be influenced by cultural context, with different cultures leading people differently towards a specific behaviour (De Castella et al., 2013; King et al., 2017; Monnot, 2018). It indicates that *motives* are expected to present more significant cultural variability than *needs*. According to the literature, cultural variability should be even more pronounced when dealing with extrinsic motivational triggers (King et al., 2017). Thus, this cultural variability is also expected to be more accentuated when dealing with *extrinsic motivation* and *controlled forms of regulation* than with *intrinsic* and *autonomous forms of regulation*.

The third component to be analysed regarding cultural variability is the *values*, being the most influential component when dealing with cross-cultural contexts. Per definition, culture consists of all values, beliefs, attitudes, practices and behaviours conducted by a society or group of people (Bolino & Turnley, 2008; Farndale & Murrer, 2015; C. Kim, 1999; Magnusson et al., 2014; McCarthy, 2019; Newman & Sheikh, 2012). Hofstede (2001) defined culture as a collective mindset programmed and shared by a group of people, differentiating societies and nations. Therefore, per definition, the collective programmed mindset from a pre-defined set of values must vary depending on the cultural context (Menard et al., 2018); otherwise, only one culture would exist. This set of values shared between individuals will vary depending on the cultural context; therefore, the highest cultural variability is expected to exist. This oversimplified definition of culture will be used to position the relationship between *needs, motives* and *values* in this Section; for now, it is enough to present the point

regarding the degree of variability depending on cultural context. A more refined and indepth analysis of how culture should be characterized is presented in Section 2.5.

To summarize, *needs*, *motives* and *values* are expected to vary in the degree to which they are considered cultural variables. As argued above, even though *basic psychological needs* are universal, different cultural contexts might lead to different forms of relevance, expressions and fulfilment of a particular basic psychological need. Therefore, the *needs* themselves would present the lowest possible cultural variability. On the other hand, *motives* and reasons to engage in a specific behaviour would present a more substantial cultural variability, while *values*, per definition, are expected to differ depending on the cultural context. The picture below further illustrates the essence of this discussion:

	Needs, Motives a	and Values
Cultural Variability	High Cultural Variability	Low Cultural Variability
Theoretical Framework	Values Motives	Needs

Figure 14. Needs, Motives and Values (High vs Low Cultural Variability) (own work).

The figure above must be interpreted carefully. The picture does not imply that the three overlapping concepts represent the complete universe of motivation, nor has the intent to oversimplify the context of cultural variability for the three described components. It aims to limit the study's framework, correctly framing the needed variable to answer the research question. It indicates that *values* are the most cultural variable characteristic in a cross-cultural context, followed by *motives* and why individuals engage in behaviour, with *needs* being practically culturally invariant. When applying this concept to the *research framework* discussed in the last Section, the following construct can be observed:

Needs, Motives and Values							
Cultural Variability	High Cultural Var	Cultural Variability Low C					
Theoretical	Values					Needs	
Framework		Motives				Needs	
Type of Motivation	N 4	Extrinsic N	Motivation Triggers	(Autonomous vs C	ontrolled)	Intrinsic Motivation	
Form of Regulation	N.A.	External Regulation	Introjected Regulation	Identified Regulation	Integrated Regulation	Intrinsic Regulation	
Degree of Internalization		•	More Controlled	More Autonomou	ıs		
	Cultural Variable (per definition)	Expe	ected Cross-cultura	l Variability	Low Cross-	ultural Variability	

Figure 15. Needs, Motives and Values and the Expected Cross-cultural Variability (own work).

Analogous to what has been stated before, additional caution is advised when interpreting the figure. The presented perspective is a schematical simplification applied to facilitate an understanding of how the study has been framed, using squared boxes that are sequentially organized and distinctively separated. The concepts presented above are not closed boxes sequentially organized but overlapping constructs that can be placed into a continuum form, from *external* to *intrinsic* regulated, from *high* to *low* cultural variability. The construct does intend to imply that *need satisfaction* only affects *intrinsic motivation*, or that *extrinsic motivational triggers* are the only *motives* to engage individuals in specific behaviours. The key message is that the further the observation moves into intrinsic motivation, the more the fulfilment of basic psychological needs seems to play a definitive role in motivation, and less cultural variability is expected to be identified. Based on the literature discussed in the last Sub-Sections, according to SDT, needs are inherent to human nature and, therefore, culturally universal (Chen et al., 2015; R. M. Ryan & Deci, 2000).

The figure also indicates that motives with a more *controlled* degree of internalization would be more susceptible to cultural variability than *autonomous* ones. The more *autonomous* the form of regulation is, the more *intrinsic* the type of motivation is, and the more convergency to *basic psychological need* fulfilment is expected to be seen. On the other hand, the more *controlled* the trigger is, the greater the cultural variability is expected to exist. This interpretation is merely an expectation drawn from the previous review, not a

factual statement. This study aims to test the variability of motivational triggers across different cultural contexts to support these claims.

For instance, it could be hypothesised that an externally regulated extrinsic motive could support the fulfilment of a lower hierarchical need and, therefore, be more appropriate for cultural contexts where this basic need is not fulfilled. For example, in a culture where *financial safety* is not fulfilled, an extrinsic external regulation such as a monetary or material award would be more effective as a motivational trigger for behavioural change than in a context where financial safety is a need already fulfilled. On the other hand, the same motivational trigger might not present the same benefit toward well-being if applied in a cultural context where the basic needs are already fulfilled, and the psychological needs assume higher hierarchical priority. In that case, the autonomous triggers of identified and integrated regulation would be a better fit to cause a behaviour change.

Further examples have been found in the literature hypothesizing similar cultural variability. For example, as Chen (2014) advocated, the emphasis on specific basic psychological needs may vary across cultures. He also argued that while the need fulfilment benefits are universal, the path taken to satisfy the need may be directly influenced by cultural context (Benita, Benish-Weisman, Matos, & Torres, 2019; Chen et al., 2014). In his example, individuals from collectivist cultures might feel autonomy by following the directions of someone important. In contrast, someone from an individualist culture might satisfy the need for autonomy by making their own decision (Chen et al., 2014). On a similar note, Kornadt (2002) has said that understanding social motives has often been neglected in terms of culture-specific domains, being the challenge of cross-cultural research to understand how social motives are activated and developed in different cultural contexts.

The arguments presented in this Section support the need for further research, showing signs that people from different cultures should be managed differently (Wang & Gagné, 2013). Moreover, it would be naïve to assume that there are just one-way and *onesize-fits-all* solutions for any management theory in cross-cultural contexts (Gould-Williams & Mohamed, 2010), including in the field of employee motivation. Multinational organizations can improve their competitive position and financial performance by adapting

the managerial approach to how employees in different cultures are motivated (Snelgar et al., 2013). Based on the discussion above, culture plays a definitive role and ignoring this call could affect the expected results when dealing with cross-cultural employee motivation.

2.4 Self-Determination Theory Model for the Workplace

The motivation constructs and components discussed in the literature review so far can be further classified regarding the type of variable they represent and the respective relationship expected to exist between them. Deci et al. (2017) presented a *basic selfdetermination model for the workplace* to illustrate and facilitate this construct's relationship analysis. The authors consolidated the variables in their proposed model, and the relationship between them is often found in recent SDT studies. They advocate that studies have frequently defined two primary independent variables: *social context* and *individual differences*. The model further describes the dependent variables as typically one of two kinds: *work behaviour* or *health and wellness*. The diagram below illustrates the relationship between the described variables:



Figure 16. Basic SDT Model in the Workplace (Deci et al., 2017, p. 23).

Besides the independent and dependent variables, it is noticeable that the workplace's basic SDT model defines the *basic psychological needs* and *motivations* as

mediators. Studies have often used the mediators as either a set of motivation variables, a set of need satisfaction ones or both (Deci et al., 2017), usually being placed as mediating factors between independent and dependent variables. The scholars argue that many studies have also chosen a sub-set of the above-presented variables, using the mediators as independent variables to predict outcomes (Deci et al., 2017). This explanation allows the current study to analyse the cross-cultural differences in *needs* and *motives* when predicting a *work behaviour* outcome to precisely answer the research question. The following figure illustrates the study's framework within the basic SDT model in the workplace:



Figure 17. Basic SDT Model in the Workplace: Delimitation of the Research Framework. Adapted from Deci et al. (2017, p. 23).

The proposed *research framework* uses *motivation* not as a mediator but as an independent variable predicting *work behaviour* outcomes. The relationship between *basic psychological needs* and satisfaction has been added to the equation, posing as the independent variable and hypothesizing about the expected relationship with *motivation* and *work behaviour* outcomes.

These proposed frameworks, including variables and expected relationships, are further supported by the meta-analysis study conducted by Slemp et al. (2018). Similarly to Deci et al. (2017), Slemp et al. (2018) presented an overarching diagram, proposing the hypothesised association between variables found to exist in recent SDT studies. The figure below has been extracted from their publication and further illustrates the discussion:



Figure 18. Path Diagram of the Hypothesized Associations Amongst Variables: LAS, Needs, Motives, Behaviour (Slemp et al., 2018, p. 6).

Noticeable is the relationship between the *basic psychological needs* of autonomy, competence and relatedness and *autonomous* vs *controlled forms of regulation*. It further characterizes the interaction between the three variables evaluated by the current study's research framework: *needs, motives* and *work behaviour*. Analogously to the basic SDT model for the workplace from Deci et al. (2017) and based on the work presented by Slemp et al. (2018), the research framework would incorporate the following relationships:



Figure 19. Path Diagram of the Hypothesized Associations Amongst Variables: Delimitation of the Research Framework. Adapted from Slemp et al. (2018, p. 6).

As presented in both models, the independent variable chosen for the current study is directly related to *work engagement* and *positive work behaviour*. Even though it would be exciting and relevant for the field of cross-cultural employee motivation to analyse general well-being and ill-being, those concepts are not part of the study's scope. The current study is focused on a specific contribution to knowledge and on answering a pre-defined practical question on *how to engage* assembly line associates towards skills improvement in a monotonous task such as vehicle assembly. Therefore, measuring work engagement and positive work behaviour towards skills improvement from a monotonous task must be defined as essential dependent variables to be measured.

Additionally, each dependent variable presented above has one or more measurement instruments, validated *questionnaires*, that could be applied. Measuring them simultaneously with a single research design and approach is deemed impractical. It is crucial to note that both diagrams above are meta-analytical constructs based on several studies in the SDT's field of workplace and employee motivation. It would be naïve to assume that one study can single-handedly provide reliable evidence from all the variable relationships presented in this Sub-Section. Thus, the current study further focuses on the relationship between the three pre-defined variables: *needs, motives* and *work engagement*. The in-depth analysis of these variables by testing their relationships using robust statistical methods provides this study's contributions to knowledge.

2.5 Culture: Definition and Implications

Before cross-cultural research is conducted, defining a cultural context's essential characteristics, including its manifestation and expected boundaries, is crucial. As briefly described before, per definition, culture consists of all values, beliefs, attitudes, practices and behaviours conducted by a society or group of people (Bolino & Turnley, 2008; Farndale & Murrer, 2015; C. Kim, 1999; Magnusson et al., 2014; McCarthy, 2019; Newman & Sheikh, 2012). Hofstede (2001) defined culture as a programmed collective mindset shared by people, differentiating societies and nations. Thus, per definition, the set of collective

mindsets and values shared between individuals varies depending on their cultural context (Menard et al., 2018); otherwise, only one culture would exist.

Values described here are outlined by the classic definition presented by Schwartz (1992). This simplified definition states that culture is a set of values shared between a group of people, which is the most common interpretation in recent cross-cultural research. The scholar characterizes values as beliefs that transcend the individual's actions and behaviours and provide a standard for decision and motive (Schwartz, 1992). Consequently, values can underline the individual's motivation, guide human behaviour, and regulate what is deemed desirable behavioural results (Fornerino et al., 2011; Schwartz, 1994). This definition is, therefore, intertwined with the discussion conducted in Section 2.3. regarding *needs*, *motives* and *values*.

Similarly to the *needs*, even though the essence of *values* can be the same for all individuals, the meaning and importance of each can vary across different contexts (Castro, Neto, Ferreira, & Gomes, 2016). Individuals from the same cultural group tend to share values-relevant experiences and accept a shared standard set of values (Fornerino et al., 2011). Thus, understanding how each group associates a different meaning to the same value becomes fundamental to analysing behaviour across cultures. Remarkably, most of the research reviewed has referred back to the same concepts presented above, possibly because its definition facilitates clear delimitation of cultural constructs and allows for generalisations within the pre-defined cultural boundaries.

A precise and clear delimitation of cultural borders facilitates direct comparison between samples regarding differences and similarities when applying cross-sectional research designs. Even if the fact that nation and culture are not the same is briefly ignored for argument, adopting a pre-defined set of values bounding a culture together when defining the study's cross-cultural framework appears to facilitate the process. Adopting cultural concept boundaries at the national level, such as those provided by Hofstede (2001), simplifies cultural contexts, providing measurable variables and facilitating comparisons between them (Knoll et al., 2021). Interestingly enough, recent literature has been found to critique the idea of pre-defined boundary conditions for cultural constructs by suggesting abandoning the term *culture* altogether.

According to Poortinga (2015), finding a consensus on how culture should be defined is impossible. Even if a particular group of scholars agreed on a common definition, the concept would probably be widely rejected by others (Poortinga, 2015). The scholar argues that even though a precise meaning to culture supports clear scientific communication, its concept might be superfluous for cross-cultural psychology studies (Poortinga, 2015). He suggests that studies should move away from propositional designs and null hypotheses, where coincidence is hardly distinctive from causality, focusing on why a particular population has been included in the study and how the population is defined (Poortinga, 2015). The suggestion to abandon the boundary conditions for culture might sound extreme, but it further justifies the attention needed when analysing different cultural contexts in cross-cultural research.

The truth is presumably in between the two above-presented stances. While completely abandoning the concept of culture appears to be impracticable when comparing populations across different cultural contexts, limiting culture to a national level is a dangerous over-simplification. The definition of culture cannot be bound to geographical borders once it ignores significant within-country heterogeneity and across-border similarities (Knoll et al., 2021; Nelson, 2014; Newman & Sheikh, 2012). Thus, to define and differentiate cultural context, social commonalities, religion and beliefs, proximity between groups should be used to determine where a specific culture starts and the other ends (Monnot, 2018). It presents culture as a non-stationary, fluid concept, likely to adapt to the current political, religious and economic societal changes (Wang & Gagné, 2013). The fluidity allows for continuous adaptation, further deepening the interconnections within and between cultures. With national borders slowly vanishing (Menard et al., 2018) and a strengthened set of shared values and beliefs emerging across the modernised world (Harrell, 2016), grey areas in cultural research continue to grow, consistently demanding reliable research to validate management theories throughout the international organizations.

Based on the arguments presented above, defining culture by oversimplifying it to its geographical boundaries at a national level has been avoided for the current study. However, it is deemed unnecessary to compare single individuals in cross-cultural research once, as supported by extensive literature, common sets of shared values within groups

exist; thus, the proximity between groups regarding this set of common values can be used to determine where a specific culture starts and the other ends. For the current study, cultural constructs sharing these commonalities have been referred to as *cultural contexts*. The definition of specific *cultural context* means that a regional set of similarities allows for a boundary condition to outline a particular group, ensuring a comparison between groups can be made.

By using the above-stated definition of *cultural contexts*, the generalisations of results for the sample are limited, making it impractical to infer that this study's results can be generalised to the whole nation or even to a whole geographical region. At best, the study provides an indication of what to expect when extrapolating the data outside of the analysed *cultural context*. This indication may guide future researchers and practitioners conducting research in similar *cultural contexts*. However, it cannot be set as a ground rule, requiring consistent testing before any extrapolation is deemed valid for similar *cultural contexts* or for a whole nation.

Understanding how *cultural contexts* are outlined does not weaken the importance of cross-cultural research but instead increases its need. For the current study, this interpretation further ratifies the need for a *research framework* including the universalisation claim towards the *basic psychological need* theory. The harder it is to extrapolate sample results to the national level, the more studies are needed to test the same hypothesis in various *cultural contexts* before providing universalised solutions. Although several studies have consistently supported the *basic psychological needs theory* universalisation claims, no studies collecting evidence in the industry and *cultural contexts* analysed by the current study have been found. Therefore, this study presents a concrete contribution to the meta-analytical plane of the field of cross-cultural employee motivation.

2.6 Generalisation Across Cultures

The following Sub-Section addresses a critical topic when conducting cross-cultural research. According to the evidence presented in the following paragraphs, generalising motivational constructs across different cultural contexts must be done cautiously or avoided altogether. It is supported by the growing extensive criticism towards research

designs in cross-cultural contexts (Poortinga, 2015). The criticism focuses on studies generating procedures that reject the null hypothesis using a limited, pre-defined string of variables applied over just a few cultural contexts. According to Poortinga (2015), the experimental design should rely on the random allocation of samples and a strictly controlled environment. He further advocates that studies often aim for convergency instead of discriminant validity, limiting the universality claim's reliability of any particular study.

De Castella et al. (2013) state that few theories can sustain their universalisation claim. The studies are often limited to a specific gender or student sample (De Castella et al., 2013). His claim can be confirmed by the literature reviewed when scholars attempt to infer that a concept is generalisable by *stretching* the study's limitation—for instance, defining Bulgaria as a collectivist country (Deci et al., 2001) or using university students from Peru (Benita et al., 2019) as samples to represent the culture. Bulgaria might be more collectivist than the USA, according to Hofstede (Hofstede, 2001), but it does not compare with the collectivist-centred cultures found in Asia. Additionally, even though it is understandable why one might use university students to research once they are easier to reach, they are not to be considered representative of the population (Guillen-Royo & Kasser, 2014), especially in a country like Peru, where most of the population does not have access to the higher education system.

Several studies proved that relationships studied in the social sciences vary with cultural contexts. Engelen et al. (2018a) have concluded that the relationship between corporate support programs and employee behaviour is moderated by national culture and, therefore, not universal. Gu et al. (2022) advocate that companies should place additional care in adapting and shaping their compensation packages to fit the needs of their culturally diverse workforce. Crede et al. (2019) found similar transformational leadership results when analysing its relationship to performance across different cultures. Ferndale and Murrer (2015) found a positive relationship between engagement, financial rewards, team climate and participation in decision-making across different cultures, but the strength of these relationships differed significantly.

The point is that inferences and generalisations of a theory must be made with extreme caution, providing data to support each claim and avoiding inferences beyond the available evidence. Poortinga (2015) criticizes this tendency of *over-generalisation* when analysing research in cross-cultural psychology. The scholar advocates that these broad generalisation tendencies in the field should be avoided, not letting the data derive from the researcher's interests and limiting any *interpretation* without supporting evidence. It seems that taking an *absolutist* stance regarding a motivation theory might be superficial, if not limited. This position is further detailed in the following paragraphs.

In the literature, two stances are evident when addressing reliability and generalisability across nations and cultures. One stance defends that strong cross-cultural reliability claims must be made cautiously and that cultural differences must be accounted for. This position is well noted in many recent motivational studies, such as those concerning job characteristics and job satisfaction (Gu et al., 2022; S. H. Kim et al., 2021), performance appraisal and rewards (Farndale & Murrer, 2015; Magnusson et al., 2014; Muduli, 2011; Newman & Sheikh, 2012; Snelgar et al., 2013), achievement motivation and goals (De Castella et al., 2013; Fornerino et al., 2011; King, 2016), game-based simulation (Madni, 2013) as well as intrinsic and extrinsic motivation (Hennessey et al., 2014; Monnot, 2018). In contrast to these examples, some studies present an opposing stance and claim to be reliable in a cross-cultural environment, such as the self-determination theory (Deci & Ryan, 2000; Gagné & Deci, 2005; Gagné et al., 2015; Landry & Whillans, 2018), action-trait (Bernard, 2016) and achievement motivation (Duda & Allison, 1989).

The two described positions are seen across the literature, with studies providing empirical evidence to support both claims. One side focuses on proving generalisability and reliability across all cultures. The other one paces any generalisation, searching for evidence of differences across nations and cultural contexts. According to King et al. (2017), this dichotomy is expressed through researchers assuming an *absolutist* or *relativist* stance regarding motivation theories. An *absolutist* position would claim that all psychological needs are seen as generalisable across all human beings and, therefore, universal; almost no space for cross-cultural impact is left.

Conversely, the *relativist* position postulates that any generalisation is risky, and each culture's role should be considered when conducting research (King et al., 2017). In between those two positions, King et al. (2017) present a third one: the *universalist* approach. The *universalist* perspective allows the researcher to look for differences and similarities when testing a theory in different cultural contexts. It balances the hard ends defended by the *absolutists* and *relativists*, being proposed as the best path to push scientific research forward (King et al., 2017).

Based on this understanding of the three stances described, the SDT's scholars appear to be adopting an *absolutist* position regarding fulfilling *basic psychological needs*. Analogously, concerning motivational triggers and their *forms of regulation*, the approach seems relativist. Nevertheless, the current study has adopted a *universalist* stance, looking for differences and similarities between different cultural contexts without categorically defining any given theory as valid or invalid in every cultural context. This further in-depth analysis of different cultural contexts with the proposed *universalist* approach is deemed appropriate to push research forward in the field of cross-cultural employee motivation.

As described in the last Sub-Section, various values and beliefs are expected across different cultural contexts. Therefore, no theory is expected to be equally reliable in every organisational environment (Magnusson et al., 2014). Using a management approach in different cultural contexts without proper adaptation is considered risky and could undermine its effectiveness (Engelen, Weinekötter, Saeed, & Enke, 2018b; Muduli, 2011; Snelgar et al., 2013). The universalisation of a motivational theory without considering the influence of the cultural contexts could impose a substantial challenge or at least present itself as superficial. In this regard, instead of a hard absolutist position, a universalist approach could offer a more exciting position when studying motivation in a cross-cultural environment and has been therefore applied for the current study.

2.7 Western Bias in Motivational Research

For centuries, social sciences theories have been primarily developed and applied in Western economies (C. Kim, 1999; King et al., 2017). This Western bias in research is seen in many different fields, from general human resources practices and management research

(Farndale & Murrer, 2015; Fey, 2005; Gould-Williams & Mohamed, 2010) to leadership (Crede et al., 2019; Wang & Gagné, 2013), as well as cognition constructs (McCarthy, 2019), power relations (Datu, 2014) and game-theory (Madni, 2013).

The trend identified above is also strongly recognisable in the motivation branch within the social sciences (Fey, 2005). For instance, affected by this tendency are the theories of achievement goal (King, 2016; King et al., 2017), employee work motivation (Muduli, 2011), achievement motivation (De Castella et al., 2013; Duda & Allison, 1989), and equity theory (Bolino & Turnley, 2008). According to Aydinli-Karakulak and Bender (2015), studies should avoid Western bias and go beyond the contrast definition from East versus West by including other samples from different countries. Even within the SDT field, most data has been collected within the United States (Rudy et al., 2007). Deci et al. (2001) agree with the statement, affirming that theories used to understand the motivation processes are often based on Western ideology's goals and needs.

Without proper adaptation, directly applying any Western-biased theory in a non-Western cultural context presents a substantial risk to the workplace and the business (Farndale & Murrer, 2015). It has become essential that any research conducted inside or outside of the Western developed countries needs to acknowledge the cultural differences and avoid the blinders derived from Western theories. As Hofstede (2001) very well states:

> "If we maintain the naive assumption that because they look like us they also think like us, our efforts will not get very far. If we begin to realize that our own ideas are culturally limited, from that moment we need the others: We can never be self-sufficient again" (Hofstede, 2001)

Research in the last century has presented substantial Western bias when defining reliable theories regarding motivation, with a slight change in its course only noticeable in the past decades. More and more cross-cultural research designs have tried to *prove* or *disprove* each theory's applicability in a multinational organisational environment, one cultural context at a time. The need for this kind of cross-cultural approach is evident to ensure the reliability of motivational studies in the future. The current study aims to contribute to this call by providing additional empirical evidence to yet another industry and
four cultural contexts, consistently opposing the Western bias tendency in contemporary research.

2.8 Literature Review Summary

To facilitate interpretation and bridge the results into the conceptual framework, an extract of the main findings and significant insights from the systematic literature review conducted is presented in this Section. Results have been presented in a tabular form, with the last column providing the main takeaway and, most importantly, the literature gap found to exist based on the divergencies and opposing perspectives from various scholars. This summary does not deal with key terms definition; instead, it focuses only on the takeaways from diverging perspectives to provide suggestions on how to deal with the current stances and address the current study's issues.

	Core element (Themes)	Leading scholars	Summary of findings and significant insights (opposing perspectives found in the literature)	Literature gap and key takeaways for the conceptual framework		
Motivation	SDT Basic Psychological Needs Theory	(Chen et al., 2014) (Chirkov et al., 2003) (Deci et al., 2001)	The positive relation between need fulfilment and well-being has been extensively tested in the last decades, with several studies providing empirical evidence to support the universalisation claim.			
		(Martela et al., 2022) (R. Ryan et al., 2023)	Advocate that the three fundamental needs satisfaction promotes well-being independent of the cultural background, age group or population.			
		(Slemp et al., 2018)	Consistently across the literature, the three basic psychological needs' universality claim is supported by empirical evidence (meta-analytical review, 754 correlations across 72 studies).	Several arguments favour the limitations inherent to the analysed studies' design: samples might not represent a		
			Meta-analysis results supporting the SDT's universality claim also demand additional caution regarding generalisation across cultural contexts.	given culture, student samples cannot be extended to working- class populations, results from		
		(Oishi et al., 2009)	Cultural relativist scholars defend that autonomy would be strongly linked to individualist societies but limited to collectivist ones, proposing that individualist and collectivist cultural contexts moderate correlations between autonomy's need fulfilment and well-being.	one sample cannot be extended to a whole culture, and so on. Meta-analysis can profit from <i>additional empirical evidence</i> in various <i>cultural contexts</i> and samples not yet tested, opening spaces for continuous research in the field.		
		(R. M. Ryan & Deci, 2019a)	Autonomy is not defined by the individual's ability to act independently but to decide and choose according to one's own volition. This understanding of autonomy allows individuals from collectivist cultures to choose, consciously supporting their need for autonomy.			
		(Chirkov et al., 2003)	The universality hypothesis has been confirmed in samples from only four cultures, further arguing that the result does not begin to cover all cultural forms, calling for additional cross-cultural studies.			
	SDT Behaviour Regulation and	(Locke & Schattke, 2019)	Scholars collectively acknowledge the need for more research on intrinsic/ extrinsic motivation.	Further research is necessary to		

Table 5. Literature Review Summary: Literature gap and key takeaways for the conceptual framework.

	the Self-		Call to action to provide additional evidence	understand better the	
ŀ	Determination Continuum	D M Buop & Doci	concerning intrinsic and extrinsic motivation.	differences and similarities in	
		(K. W. Ryan & Deci, 2019b)		types of motivation and former	
	(part 1/2)	20150	Reasons/ motives can be more <i>autonomous</i> or	types of motivation and forms	
			controlled, leading to unierent behavioural results.	of regulation between cultural	
			It is crucial to differentiate the type of motivation,	contexts - autonomous vs	
		(Deci et al., 2017)	controlled vs autonomous, and the sub-type forms	controlled forms of regulation.	
			behaviour and engagement		
		(Mannat 2019)	Satisfaction of BPN is essential for intrinsic	Need fulfilment is considered	
		(101011101, 2018)	response to extrinsic rewards is culturally variable	overarching intrinsic motivation	
			response to extrinsic rewards is culturally variable.	process. Thus, it must be tested	
		(De Castella et al.,	Notable differences in achievement motivation	in the same cultural contexts to	
	SDT Behaviour Regulation and	2013)	and self-regulation when analysing a cross-cultural	ensure that cultural divergencies from the need theory do not taint the forms of	
			context.		
	the Self-		Even though extrinsic goals are relevant for all		
	Determination	(King et al., 2017)	students across different cultural contexts, they	regulation tested by the	
	Continuum		might predict better learning in one culture if	research framework. It is	
	(part 2/2)		compared to another.	imperative to test need	
		(Guillen-Royo and	Samples from economically developing nations are	satisfaction across cultures to	
		Kasser, 2014)	often under-represented.	ensure the reliability of the	
			Systematical investigation requires consistent	results provided by the study	
		(Jugert et al., 2014)	sampling from various cultural contexts to	when comparing autonomous vs	
			measure culture-related similarities and variations.	controlled forms of regulation.	
		(Chap at al. 2014)	The three fundamental psychological needs (SDT		
		(Chen et al., 2014) (Doci et al., 2001)	BPNT) promote well-being independently of the	The closer regulation is to	
		(Deci et al., 2001)	cultural context.	intrinsic motivation, the more	
			Scholars consistently agree that what might be	the fulfilment of BPN seems to	
		(Chickey et al. 2002)	cultural relative is how individuals express and	play a role, and less cultural variability is expected to exist.	
		(Chirkov et al., 2003)	fulfil their needs and the degree of relevance those		
			needs might have within a culture.		
		(De Castella et al., 2013) (Manpot 2018)	Scholars expect motivational triggers and their	Motives with a more controlled	
	Needs.		forms of regulation to be influenced by cultural	degree of internalization would	
			context, with different cultures leading people	be more susceptible to cultural	
			differently towards a specific behaviour. It	variability than <i>autonomous</i>	
		(10011101, 2018)	indicates that motives are expected to present	ones.	
	Motives and		more significant cultural variability than needs.		
	Values	(Ving of al. 2017)	Cultural variability should be more pronounced	The more <i>autonomous</i> the form	
		(King et al., 2017)	when dealing with extrinsic triggers.	of regulation is, the more	
			Values: the collective programmed mindset from a	intrinsic the type of motivation	
		(Manard et al. 2019)	pre-defined set of values must vary depending on	is and the more convergency to	
		(Mellalu et al., 2016)	the cultural context; otherwise, only one culture	hasic psychological pood	
			would exist.	fulfilment is available to be	
			The emphasis on specific BPN may vary across	runnment is expected to be	
		(Chen et al. 2014)	cultures; while the need fulfilment benefits are	seen.	
		(chen et al., 2014)	universal, the path taken to satisfy the need may	The many controlled the trigger	
			be directly influenced by cultural context.	is the greater the cultural	
		(Wang & Gagnó 2012)	People from different cultures should be managed	variability is expected to exist.	
		(Walle & daglic, 2010)	differently \rightarrow Need for further research.		
			Present a basic self-determination model for the	Choosing a subset of the	
			workplace, consolidating the variables and the	presented variables is possible	
			relationship between them often found in recent	using the mediators as	
			SDT studies with two primary independent	independent variables to predict	
		(Deci et al., 2017)	variables, social context and individual differences	outcomes. It allows the current	
			and dependent variables as typically one of two	study to analyse the cross-	
			kinds: work behaviour or bealth and wellness	cultural differences in needs and	
	CDT Madal C		kinds, work behaviour of fleat(frank weilitess.	motives when prodicting a work	
	the Workslass		Many studies have chosen a sub-set of the	holouious cutores to	
	the workplace		presented variables, using the mediators as	the research support	
			independent variables to predict outcomes.	the research question.	
			Eurther support for the proposed framework	The te death as 1 is ful	
			runner support for the proposed framework	ine in-depth analysis of the	
			model for the workplace, presenting an	three variables (needs, motives	
		(Slemp et al., 2018)	overarching diagram, proposing the hypothesised	and work engagement) and	
			association between variables found to exist in	their relationship using robust	
			recent SDT studies. Noticeable is the relationship	statistical mothods provides this	

	between the basic psychological needs of	study's contributions to
	autonomy, competence and relatedness and	knowledge.
	autonomous vs controlled forms of regulation,	
	characterizing the interaction between the three	
	variables evaluated by the current study's research	
	framework: needs, motives and work behaviour.	

	Core element (Themes)	Leading scholars	Summary of findings and significant insights (opposing perspectives found in the literature)	Literature gap and key takeaways for the conceptual model	
	Culture Definition	(Knoll et al., 2021)	Adopting cultural concept boundaries at the national level simplifies cultural contexts, providing measurable variables and facilitating comparisons between them.	Defining culture by oversimplifying it to its geographical boundaries at a national should be avoided.	
		(Knoll et al., 2021) (Nelson, 2014) (Newman & Sheikh, 2012)	The definition of culture cannot be bound to geographical borders once it ignores significant within-country heterogeneity and across-border similarities.	However, common sets of shared values exist, and cultural constructs sharing these	
		(Wang & Gagné, 2013)	Culture is a non-stationary, fluid concept, likely to adapt to the current political, religious and economic societal changes. The fluidity allows for continuous adaptation, further deepening the interconnections within and between cultures.	commonalities have been referred to as <i>cultural contexts</i> , meaning that a regional set of similarities allows for a boundary condition to outline a	
		(Poortinga, 2015)	Finding a consensus on how culture should be defined is impossible. Others would probably reject the concept even if a particular group of scholars agreed on a standard definition. Even though a precise meaning of culture supports clear scientific communication, its concept might be superfluous for cross-cultural psychology studies.	particular group, ensuring a comparison between groups can be made. <i>Risk</i> : results generalisations for the sample are limited to the defined <i>cultural context</i> .	
	Generalisation Across Cultures	(De Castella et al., 2013)	Few theories can sustain their universalisation claim; studies are often limited to a specific gender or student sample.		
Culture		(Poortinga, 2015)	Critique on the over-generalisation tendency when analysing research in cross-cultural psychology. Broad generalisation tendencies in the field should be avoided, not letting the data derive from the researcher's interests and limiting any interpretation without supporting evidence.	The <i>universalist</i> perspective provides a balance from the hard ends defended by the abcolutists and relativists	
		(Deci & Ryan, 2000) (Bernard, 2016) (Duda & Allison, 1989)	Some studies claim reliability in a cross-cultural environment, such as the self-determination theory, action trait and achievement motivation.	allowing the researcher to look for differences and similarities when applying them to different	
		(King et al., 2017)	Absolutist perspective: claim that all psychological needs are seen as generalisable across all human beings and, therefore, universal; almost no space for cross-cultural impact is left.	cultural backgrounds and being therefore advocated to be the most fitting to push research forward in the field of cross- cultural employee motivation.	
		(King et al., 2017)	Relativist perspective: postulates that any generalisation is risky, and each culture's role should be considered when conducting research.		
		(King et al., 2017)	Universalist perspective: allows the researcher to look for differences and similarities when testing a theory in different cultural contexts.		
	Western Bias in Motivational Research	(C. Kim, 1999)	Social sciences theories have been primarily developed/applied in Western economies for centuries.	There is an evident need for a	
		(Fey, 2005)	The trend is strongly recognisable in the motivation branch within the social sciences.	ensure the reliability of	
		in Motivational Research (Rudy et al., 2007 (Deci et al., 2001)	(Rudy et al., 2007) (Deci et al., 2001)	Most data within the SDT field has been collected within the United States. Theories used to understand the motivation processes are often based on Western ideology's goals and needs.	motivational studies in the future. The current study aims to contribute by providing additional empirical evidence to yet another industry and four
		(Farndale & Murrer, 2015)	Without adaptation, directly applying Western- biased theory in a non-Western cultural context	cultural contexts.	

The consolidated results from the above-presented extract have been used to define the conceptual framework in Chapter 3. Furthermore, the opposing perspectives support the call for further research in the cross-cultural employee motivation domain and, consequently, the posed research question. They explicitly focus on the expected cultural variability regarding how different cultural contexts react to *autonomous* vs *controlled* forms of regulation, which is precisely what the current study aims to address.

2.9 Chapter Conclusion

The literature review Chapter dealt with the current disagreement within the field regarding SDT's mini-theory of BPNT. Even though substantial evidence has been provided to support the *basic psychological needs* universality claim, the literature has encouraged additional research to ensure its validity across every cultural context. Once the validity of the basic psychological needs has not yet been tested in the automotive industry in Thailand, India, Brazil and Germany, the current study further contributes to this theoretical framework. Furthermore, testing the universality claim with the *research framework* ensures that the results presented regarding motivational triggers and their forms of regulation are not tainted by disagreement, increasing its overall reliability.

The Chapter further detailed the expected relationship between the *needs*, *motives*, and *work engagement* variables using meta-analytical theoretical frameworks. The relationships between variables and their expected degree of cultural variability have also been discussed. According to the literature reviewed, *motives* are expected to present more significant variability than *needs*. Therefore, when searching for cross-cultural differences and similarities, motives and their forms of regulations have been the focus of the *research framework* for the current study. The precise expected relationship between the *needs*, *motives* and *work engagement* is hypothesised in the following Chapter.

The review also dealt with the definition and characterization of culture and the impact this definition has on the study's ability to generalise its results. Regarding generalisation across cultural contexts, it has been proposed that the study follows a *universalist* stance on cross-cultural research instead of the extremist *relativist* or *absolutist* perspective. It provides a better balance from the hard-end stances defended by the

absolutists and relativists. It is proposed as the best path to push scientific research forward and is considered a more exciting position when studying cross-cultural employee motivation. The Chapter ended by addressing the issue of Western bias in motivational research, where the current study contributes with results from dispersed samples from cultural contexts not limited to Western societies.

The provided review regarding cross-cultural employee motivation has further addressed the issue: do employees from different cultures respond to the same motivational triggers differently? The answer is still not clear. Controversial results from the last decades show variability across cultural constructs, often contradicting seminal authors regarding the theory's cross-cultural reliability. Substantial empirical evidence in every cultural context is needed to establish the universalisation claim. This study's suggested framework adds to the available results regarding self-determination theory and its applicability across different cultural contexts. The specific results from the automotive industry support future research in the field of motivation and the reliability of SDT across cultural contexts and nations.

The literature review showed that independent of whether the behaviour is based on human needs, extrinsic triggers, expected results or goals, most motivation constructs' effectiveness seems to vary depending on the cultural context where they are applied. Confronting the reliability across cultures, not only is empirical evidence often missing, but consistently throughout the articles, similar limitations between the studies have been described. The studies were often limited to the field where they took place (Crede et al., 2019; Thanetsunthorn & Wuthisatian, 2018) or to the nations and socioeconomic status of the samples where they were conducted (Busque-Carrier, Ratelle, & Le Corff, 2021; Farndale & Murrer, 2015; Kulkarni et al., 2010); sometimes not even being considered reliable across a whole nation (Crede et al., 2019; Muduli, 2011). Additional limitations were consistently related to the sample size (Muduli, 2011), cross-sectional constructs (Farndale & Murrer, 2015; Gagné et al., 2015) or insufficient dimensions being evaluated simultaneously (Bolino & Turnley, 2008; Kulkarni et al., 2010), further supporting the call for further research.

Managing cross-cultural frameworks is inherent to any modern business's sustainable success, as we know (Harrell, 2016; Lifintsev & Canavilhas, 2017; Monnot, 2018). Strengthened shared values and beliefs worldwide have also emerged (Harrell, 2016),

further deepening the interconnections between cultures. With national borders slowly vanishing, grey areas in cultural research continue to grow (Menard et al., 2018). As mentioned before, the complexity increase from cross-cultural constructs is evident, consistently demanding reliable research to validate management theories throughout international organizations (Gu et al., 2022). This study aims to contribute to this call with additional reliable evidence regarding employee motivation in cross-cultural contexts. The following Chapter presents the conceptual framework used to achieve this contribution.

3 Conceptual Framework and Hypothesis

3.1 Variables

As presented during the Self-Determination Theory (SDT) literature review, it is expected that *controlled forms of regulation* regarding extrinsic motivation should be negative or unrelated to significant improvement in terms of employee motivation. (Gagné & Deci, 2005; Kuvaas, Buch, Weibel, Dysvik, & Nerstad, 2017). However, Gagné and Deci (2005) also mentioned that depending on the context and task, some level of *controlled regulation* could eventually be beneficial and positively related to improvement in work engagement. More specifically, if dealing with unappealing and so-called *mundane* tasks, where intrinsic motivation is not present, the *controlled forms of regulation* play a more critical role than if applied to complex and more challenging tasks (Deci & Ryan, 2000; Gagné & Deci, 2005; Kuvaas et al., 2017).

When dealing with performance in the workplace, Cerasoli et al. (2016) further argue that the above-described distinction should be made by defining tasks as *quality-type* and *quantity-type*, with the first being characterized by high intellectual involvement, attention and careful craftsmanship, while the second by being repetitive and requesting basic skills with limited personal involvement (Cerasoli et al., 2016). The scholars' meta-analysis shows a difference regarding the strength of the correlation between need satisfaction and performance when comparing *quality-type* and *quantity-type* tasks (Cerasoli et al., 2016), further supporting the need for careful observation of how need satisfaction and incentives might present a joint function on how employees are motivated.

Based on the above principles, a positive result is expected when dealing with repetitive and monotonous activities. Therefore, the same result can be reproducible in a dull and repetitive task within the manufacturing industry. In other words, extrinsic factors based on *controlled* and *autonomous* forms of regulation would be expected to generate positive behaviour changes in the work performed by an assembly line associate in the automotive industry. The conceptual framework presented in this Chapter further explores the extrinsic motivation factors and their *forms of regulation* when applied to the assembly line work environment in the automotive industry.

The initial relationship between variables can be drawn from the statements before; the study aims to understand if and how *autonomous* and *controlled forms of regulation* from intrinsic and extrinsic motivation can engage assembly line associates towards positive work behaviour in different cultural contexts. Therefore, motives or motivation and their respective *forms of regulation* have been defined as the independent variables. The expected change in behaviour towards work engagement results from this interaction and, thus, the dependent variable.



Figure 20. Research Framework: Primary Independent and Dependent Variables (own work).

The relationship presented above is defined as the variable interactions for the *research framework*. In this case, the study evaluates how *motivational triggers* and respective *forms of regulation* cause a change in *work behaviour*, defining *motivation* as the independent variable for the study's *research framework*. This independent variable is defined categorically at the nominal level (Bryman & Bell, 2011; Evans, 2017; Weinstein, 2010). The independent variable is expected to be the condition necessary to achieve the result (Field, 2018; Neuman, 2014). As described above, the following *forms of regulation* have been compared as causes for behavioural change: *autonomous* versus *controlled*.

Besides the above-proposed research's *framework* with a focus on the *controlled* vs *autonomous* forms of regulation, it has been stated during the literature review that controversial evidence is available regarding the universalization claim of the BPNT. An expansion of the *research framework* has been suggested to ensure the above-proposed results are not tainted by the dispute regarding the basic psychological needs' universality claim. The complete *research framework* is expected to confirm the universality claim advocated by SDT's seminal scholars. Its generated data contributes to knowledge by supporting the universality claim in another industry and four additional cultural contexts. Thus, the complete *research framework* ensures that cultural differences are seen only in *motivation* and their *forms of regulation* rather than *basic psychological needs*, their fulfilment and their relationship to work engagement.

The complete *research framework* needs further discussion regarding how the variables are defined. According to the available BPNT literature, *basic psychological needs* are typically studied as the independent variables causing the change in behaviour or promoting well-being (Chen et al., 2014; Chirkov et al., 2003; Kaplan & Madjar, 2017), with the resulting working behaviour as its dependent variable. This relationship is presented in the figure below:



Figure 21. Research Framework: Secondary Independent and Dependent Variables (own work).

When combining the primary and secondary sets of variables for the *research framework, work engagement* is set to be the overarching dependent variable. When defining an underlying model and hypothesizing the association between *psychological needs* and *motivation*, the literature provides the following relationship between the variables:





The relationship presented above is supported by the literature as detailed in Sub-Section 2.4, *Self-Determination Theory Model for the Workplace*, of the literature review Chapter. Deci et al. (2017) presented the *basic self-determination theory model in the workplace*, indicating the expected relationships between variables when applying the core elements of SDT in the work domain. Consistently, the variable relationships established above were based on this model. The current study's *research framework* can also be described with the same Basic *SDT Model in the Workplace*. The picture below has been adapted from Deci et al. (2017, p. 23) to better illustrate the model, variables and respective relationships.





Some critical notes must be taken when interpreting the figure above. The model presented is a meta-analytical tentative from scholars to define possible relationships

between elements within the SDT field of motivation in one single model. This overarching model presents the *basic psychological needs* as mediators between *workplace context* and *work behaviour*. It would have been the case if, for instance, studying the impact of a leadership style has in *need supporting* or *need thwarting*, where the *basic psychological needs* and *motivations* would then be presented as mediators for the proposed relationship. However, the current study does not intend to evaluate the *workplace context* but rather how different cultural contexts might respond differently depending on the *form of regulation* applied.

The current study focuses on how *basic psychological needs* and *motivation* relate to *work behaviour* in different cultural contexts. Therefore, the spotlight is placed on the interactions between those two components of the model and their relation to *workplace behaviour's* dependent variable. This specific demarcation suggested by the *research framework* is allowed and supported by the same literature that presented the model, as stated by Deci et al. (2017):

"Typically, researchers have used either the set of need satisfaction variables or the motivation variables, although a few studies have used both, in which case they have tended to predict the motivation variables from the need satisfaction variables, typically as mediating variables between independent variables and dependent variables (De Cooman et al. 2013).... Many studies have selected a subset of variables, such that, for example, what are shown in the figure as mediators might be used as independent variables predicting outcomes. Other studies have examined the relations of some of the SDT variables to variables from other perspectives in the organizational literature. For example, studies have examined transformational leadership, which bears some relation to need-supportive management, as that leadership relates to basic need satisfaction, autonomous motivation, or both." (Deci et al., 2017, p. 24)

Slempt et al. (2018) have used a similar approach when hypothesizing the association between *needs, motives* and *work behaviour* in the meta-analysis review regarding leader autonomy. A similar model to the one presented above is drawn to explain the relationships

(R. Ryan et al., 2023; Slemp et al., 2018). The figure below is an adaptation from the one in Slempt et al. (2018, p. 6):





Besides providing a clear relationship between the variables, detailing how the expected outcome can be measured is also essential (Hancock, Stapleton, & Mueller, 2019). The study's dependent variable of *work behaviour* is defined as an ordinal variable. The independent variable of *basic psychological needs* and the moderation of *motivation* are also ordinal. All results are measured through a 7-point Likert scale, with the ordinal ranking going from *not at all true* or *never* to *very true* or *always* (Neuman, 2014). The research methods Section in Chapter 4 presents additional details regarding scale. The independent and dependent variables must be discrete with a pre-defined set of attributes. Based on the variables and relationships described above the study's conceptual framework and hypotheses can be stated in the following Sub-Section.

3.2 Conceptual Framework and Hypothesis

SDT has been used as the cornerstone for understanding how *autonomous* versus *controlled forms of regulations* relate to employee engagement in the work environment. The described problem is underlined by comparing different cultural contexts regarding employee motivation, the respective *forms of regulation*, and how they might differently

relate to *work engagement*. The research has been conducted in four different cultural contexts: Thailand, India, Brazil and Germany. Consistently supported by literature, these four cultural contexts present clear, distinguished patterns when analysing behaviours based on specific predefined cultural dimensions (Hofstede, 2001; House et al., 2004). Based on the same literature, the four contrasting cultural contexts in Asia, South America, and Europe allow the evaluation of possible cross-cultural differences and similarities regarding employee motivation and checking if universalisation across cultural contexts can be inferred. As stated before, the current study focuses on testing SDT claims in cross-cultural contexts; thus, the abovementioned cultural dimensions have not been used as moderation but rather *forms of regulation* to see if the cultural contexts react differently to *autonomous* when compared to *controlled*. The diagram below further describes the issue investigated:



Figure 25. Research Conceptual Framework for Single Cultural Context – Example Thailand (a) (own work).

As described by the *research conceptual framework* presented above and discussed during the literature review, two forms of *controlled* and *autonomous* regulation have been analysed for this study. The figure describes the variable, expected relationship and hypothesis using the cultural context of Thailand as an example. The same framework is valid for the variables tested in the other three cultural contexts: India, Brazil and Germany. Each cultural context has been attributed with a letter to facilitate its reference. The following letters have been addressed to the respective cultural contexts: (a) Thailand, (b) India, (c) Brazil, and (d) Germany. Thus, the following hypotheses have been determined:

- H1_{a,b,c,d}: Autonomous forms of regulation are positively related to work engagement in Thailand (a), India (b), Brazil (c) and Germany (d);
- H2_{a,b,c,d}: Controlled forms of regulation are neutral or negatively related to work engagement in Thailand (a), India (b), Brazil (c) and Germany (d);

The results from $H1_{a,b,c,d}$ and $H2_{a,b,c,d}$ should confirm the relations presented in the literature. Once the positive relationship *autonomous forms of regulation* have in improving work behaviour does not depend on the culture (Gagné et al., 2015; Kuvaas et al., 2017), $H1_a$ should present the same positive association as $H1_b$, $H1_c$ and $H1_d$. Analogously, the $H2_a$ should present the same slightly negative or neutral relation as $H2_b$, $H2_c$ and $H2_d$, as *controlled forms of regulation* would be expected to be similarly related to *work engagement*. If all that is correct, the problem in question converges to the research question to be evaluated and, thus, the aim of this study: Are there any differences in how *autonomous* and *controlled* forms of regulation relate to *work engagement* when applied over different cultural contexts? In other words, do Hx_a , Hx_b , Hx_c and Hx_d present a statistically significant difference between the cultures in the degree to which they are associated? The *research framework* respective alternative hypothesis (Hx_r) can be defined, for both cases, as follow:

• $H1,2_r$: some $H1,2_i \neq$ some $H1,2_i$

If the alternative research hypothesis is rejected for both cases, the results corroborate the universality claim, and the generalisability of *controlled* and *autonomous* forms of regulation is ensured across cultural contexts. If $H1_r$ or $H2_r$ is confirmed, the effect of forms of regulation on work engagement varies depending on the culture, precisely answering the research question. The table below consolidates the hypotheses described above.

Relationship Analysed	#	# Textual		Mathematical
(Variables)		Description	Context	Notation
	Ш1	Autonomous forms of regulation are positively related	Thailand	_
	11 1 a	to work engagement in Thailand	indiana	
Autonomous Forms of	<i>H</i> 1,	Autonomous forms of regulation are positively related	India	-
Regulation →	11 10	to work engagement in India		-
Work Engagement	<i>H</i> 1	Autonomous forms of regulation are positively related	Brazil	-
	11 I _C	to work engagement in Brazil	Bruzh	
	H1 _d	Autonomous forms of regulation are positively related	Germany	_
		to work engagement in Germany		
	บา	Controlled forms of regulation are neutral or	Thailand	-
	11 2 a	negatively related to work engagement in Thailand	manana	-
Controlled Forms of	Н2.	Controlled forms of regulation are neutral or	India	_
	1126	negatively related to work engagement in India	it in India	
Work Engagement	บว	Controlled forms of regulation are neutral or	Brazil	-
	11 2 _C	negatively related to work engagement in Brazil	Bruzh	
	н2	Controlled forms of regulation are neutral or	Germany	-
	$m \mathbf{z}_d$	negatively related to work engagement in Germany	acimany	-
Cross-cultural alternative	H1 _r	There is a statistically significant difference in how		
hypothesis (Autonomous)		autonomous forms of regulation relate to work	All	$H1_r$: some $H1_i \neq some H1_j$
		engagement across cultures		
Cross-cultural alternative		There is a statistically significant difference in how		•
hypothesis (Controlled)	H2 _r	controlled forms of regulation relate to work	All	$H2_r$: some $H2_i \neq some H2_j$
		engagement across cultures		

Table 6. Research Framework (Focus: Autonomous vs Controlled forms of Regulation) – 1st Set of Hypotheses.

Besides the core analysis described by the *research framework* above, additional hypotheses are required to test the results' reliability within the field of employee motivation. The literature review discusses that *basic psychological needs* are essential in motivation. Consistent evidence has been presented in the past couple of decades to support the universal claim of the positive role *basic psychological needs* play independent of the cultural context (Chen et al., 2014; Chirkov et al., 2003; Kaplan & Madjar, 2017). On the other hand, some cultural relativist scholars do not support the universality claim, especially regarding the need for *autonomy* (Markus & Kitayama, 2003; Oishi & Diener, 2001; Oishi et al., 2009). Thus, the *research framework* has also been expanded to evaluate the basic psychological needs' role in the four analysed cultural contexts to ensure this discussion does not taint the results regarding *forms of regulation*. The figure below

illustrates the interfaces for the complete *research framework*, including the expected relationship between variables and hypothesis:





The diagram above presents two supplementary relationships between the variables, identified by the acronyms HBM and HBW. Firstly, the relationships between *basic psychological needs* and *motives* are tested, identified as Hypothesis *Basic Needs* \rightarrow *Motivation* (HBM). Secondly, the direct relationships between *basic psychological needs* and *improved work engagement* are tested, above identified as Hypothesis *Basic Needs* \rightarrow *Work Engagement* (HBW). The following hypotheses are therefore formulated based on the expected relationships presented above. For the *research framework's* second set of hypotheses, HBM, the relationships are expected to follow the same logic as those previously defined in the *research framework*. It means *autonomous motivation* should positively relate to *basic psychological needs*. On the other hand, *controlled motivation* should present a neutral or negative relationship with *basic psychological needs*. Thus, the following HBM hypotheses are defined.

 HBM1_{a,b,c,d}: BPN are positively related to autonomous forms of regulation in Thailand (a), India (b), Brazil (c) and Germany (d); HBM2_{a,b,c,d}: BPN are neutral or negatively related to controlled forms of regulation in Thailand (a), India (b), Brazil (c) and Germany (d);

The results from $HBM1_{a,b,c,d}$ and $HBM2_{a,b,c,d}$ should confirm the relations presented in the literature. Once the positive relationship basic psychological needs have towards autonomous triggers does not depend on the culture (Gagné et al., 2015; Kuvaas et al., 2017; Vansteenkiste et al., 2020), $HBM1_a$ should present the same positive association as $HBM1_b$, $HBM1_c$ and $HBM1_d$. Analogously, the $HBM2_a$ should present the same slightly negative or neutral relation as $HBM2_b$, $HBM2_c$ and $HBM2_d$. If all that is correct, the basic psychological needs universality claim can be tested by comparing the results between samples. In other words, do $HBMx_a$, $HBMx_b$, $HBMx_c$ and $HBMx_d$ present a statistically significant difference between the cultures in the degree to which they are associated? The *research framework's* research hypothesis for *Hypothesis Basic Needs* \rightarrow *Motivation* (*HBMx_r*) can be defined as follow:

• $HBM1,2_r$: some $HBM1,2_i \neq$ some $HBM1,2_i$

If the research hypothesis is rejected for both cases, the results corroborate the *basic psychological needs* universality claim. Thus, the role played by *controlled* and *autonomous* motivation is also ensured across cultures. On the other hand, if $HBM1_r$ or $HBM2_r$ are confirmed, the effect *basic psychological needs* have on *controlled* and *autonomous forms of regulation* varies depending on the culture, refuting the universality claim. The table below consolidates the hypotheses described above.

Relationship Analysed	#	Textual	Cultural	Mathematical
(Variables)		Description	Context	Notation
	HBM1 _a	BPN are positively related to autonomous forms of regulation in Thailand	Thailand	-
BPN → Autonomous Forms of	HBM1 _b	BPN are positively related to autonomous forms of regulation in India	India	-
Regulation	HBM1 _c	BPN are positively related to autonomous forms of regulation in Brazil	Brazil	
	HBM1 _d	BPN are positively related to autonomous forms of regulation in Germany	Germany	-
	HBM2 _a	BPN are neutral or negatively related to controlled forms of regulation in Thailand	Thailand	-
BPN \rightarrow	HBM2 _b	BPN are neutral or negatively related to controlled forms of regulation in India	India	-
Regulation	HBM2 _c	BPN are neutral or negatively related to controlled forms of regulation in Brazil	Brazil	-
	HBM2 _d	BPN are neutral or negatively related to controlled forms of regulation in Germany	Germany	-
Alternative hypothesis (Autonomous)	HBM1 _r	There is a statistically significant difference in how autonomous forms of regulation relate to work engagement across cultures	All	$HBM1_r$: some $HBM1_i \neq some HBM1_j$
Alternative hypothesis (Controlled)	HBM2 _r	There is a statistically significant difference in how controlled forms of regulation relate to work engagement across cultures	All	$HBM2_r$: some $HBM2_i \neq$ some $HBM2_j$

Table 7. Research Framework – 2^{nd} Set of Hypotheses (BPN \rightarrow Autonomous Motivation).

A similar logic is applied when analysing the relationships between *basic psychological needs* fulfilment and improved *work behaviour*, here defined as Hypothesis *Basic Needs* → *Work Behaviour* (HBW). For this *research framework's* third set of hypotheses, HBW, it is expected that *basic psychological needs* fulfilment should have a positive relationship with improved *work behaviour* independent of the cultural context. Thus, the following HBW hypotheses are defined.

> *HBW*1_{*a,b,c,d*}: BPN are positively related to work engagement in Thailand (a), India (b), Brazil (c) and Germany (d);

The results from $HBW1_{a,b,c,d}$ should confirm the relations presented in the literature. Once the positive relationship *basic psychological needs* have towards *work*

engagement does not depend on the culture (Gagné et al., 2015; Kuvaas et al., 2017), $HBW1_a$ should present the same positive association as $HBW1_b$, $HBW1_c$ and $HBM1_d$. If that is correct, the basic psychological needs universality claim can be tested by comparing the results between samples. In other words, do $HBMx_a$, $HBMx_b$, $HBMx_c$ and $HBMx_d$ present a statistically significant difference between the cultures in the degree to which they are associated? The Hypothesis Basic Needs \rightarrow Work Behaviour research hypothesis (HBWx_r) can be defined, as follow:

• $HBW1_r$: some $HBW1_i \neq$ some $HBW1_i$

If the research hypothesis is rejected, the results corroborate the *basic psychological needs* universality claim and, thus, the role played by *basic psychological needs* is also ensured across cultures. On the other hand, if $HBW1_r$ is confirmed, the effect *basic psychological needs* have on *work behaviour* varies depending on the culture, refuting the universality claim. The tables below consolidate the set of hypotheses presented above.

Relationship Analysed	#	Textual	Cultural	Mathematical
(Variables)		Description	Context	Notation
	HBW1 _a	BPN are positively related to work engagement in Thailand	Thailand	-
$\text{BPN} \rightarrow$	HBW1 _b	BPN are positively related to work engagement in India	India	-
Work Engagement	HBW1 _c	BPN are positively related to work engagement in Brazil	Brazil	-
	HBW1 _d	BPN are positively related to work engagement in Germany	Germany	-
Cross-cultural alternative hypothesis	HBW1 _r	There is a statistically significant difference in how BPN relates to work engagement across cultures	All	$HBW1_r$: some $HBW1_i \neq$ some $HBW1_j$

Table 8. Research Framework – 3^{rd} Set of Hypotheses (Autonomous Motivation \rightarrow Work Engagement).

The three sets of hypotheses presented above further clarify the issue of crosscultural employee motivation and provide evidence to support or refute the universality claim regarding *basic psychological needs, forms of regulation* and *work behaviour*. Specific instruments must be applied to measure each variable and test the abovementioned relationships and hypotheses. The methodological procedure, including its methods and measurement instruments used to test the hypotheses, are further discussed and justified in Chapter 4 for the *case* and *main study*.

Before closing the discussion on the conceptual framework and correspondent hypothesis, additional notes regarding the cross-cultural aspect within the delimitation are deemed reasonable. The conceptual framework focuses on *autonomous* vs *controlled* forms of regulation to answer how different cultural contexts might react differently to those triggers. The framework has also been expanded to test the basic psychological needs and their role within the same defined cultural context, establishing further reliability and validity to the response on this matter.

It would be exciting and certainly provide further contributions to knowledge if additional hypotheses regarding cultural variability were considered. For instance, one could argue that the issue could be seen through the lenses of cultural dimensions (Hall, 1960; Hofstede, 2001; House et al., 2004) to explain why cultures might react differently based on different forms of regulation. Alternatively, a perspective regarding individualist vs collective cultural contexts could provide evidence to support or refute the discussion regarding the basic psychological need for autonomy, as its universalisation theory has been frequently debated in various studies (Markus & Kitayama, 2003; Oishi & Diener, 2001; R. M. Ryan & Deci, 2019a). With studies and scholars showing no tendency for unification and universalisation across topics, the relevance and importance of cross-cultural research is underlined, with many open fronts in adapting the management theories according to the cultural context.

The delimitation of the study provided by the conceptual framework presented in this chapter ensures that the research question is answered precisely and that the data collection is focused on ensuring reliability and validity. The defined scope tests 25 hypotheses to cover all variable relationships across the four cultural contexts analysed to provide the similarities and differences between each of them. To provide robust evidence, these hypotheses are tested using 3 measurement instruments with a total of 62 loadings or questions. The described in-depth analysis is necessary to avoid overgeneralisation, taking a universalist stand on the issue at hand, precisely what has been extensively debated in the literature review and presented as the main takeaways for the conceptual framework.

For example, additional hypotheses and analyses regarding cultural dimensions could unnecessarily and exponentially increase the study's complexity and are advocated to be out-of-scope for the current study. The research question has been precisely posed towards expanding motivational programs for associates across an international production network in the automotive branch; thus, the focus is on providing concrete evidence to corroborate the need and pathway for adjustment. The delineated conceptual framework thoroughly covers the research question; additional cultural facets, even if exciting, could undermine the study's effectiveness and have been consciously removed from further consideration. These facets are later addressed in Section 7.5 regarding suggestions for future research designs and scopes.

3.3 Achievement of the 1st Research Objective

Based on the revised literature, Chapter 3 provided the theoretical model describing how *autonomous* and *controlled forms of regulation* relate to *basic psychological needs* and *work engagement*. For this purpose, the SDT Model for the Workplace (Deci et al., 2017; R. Ryan et al., 2023; Slemp et al., 2018) has been identified as an appropriate fit to describe the variables and relationships presented by the *research framework*. This theoretical model provides the structure for the study conducted and, together with the delineated research framework, the response to the 1st Research Objective (RO1):

To identify, theoretically:

<u>RO1</u>: the model describing how *forms of regulation, autonomous* versus *controlled*, relate to employee engagement in the workplace domain in Thailand, India, Brazil and Germany;

The identified theoretical model, its variables, relationships, and research framework have been used to provide the cross-cultural hypotheses to be tested by the main study, concluding the first research objective.

3.4 Chapter Conclusion

The current Chapter has described the variables and expected relationships as the initial structure for the framework and hypotheses. After that, based on the existing contemporary discussion in the SDT field, the framework has been defined for the study. Firstly, the *research framework* has been outlined to describe and hypothesise the relationship between *forms of regulation* and *work engagement* to answer the question regarding cultural variability. Secondly, the *research framework* has been expanded to test the SDT universality claim between the *basic psychological needs* and *work engagement* variables, and the mediation effects *forms of regulation* have on this relationship.

Three sets of hypotheses have been defined to test the cross-cultural universality claim, testing the relationships between *forms of regulation* and *work engagement, basic psychological needs* and *forms of regulation*, and lastly, *basic psychological needs* and *work engagement* being mediated by *forms of regulation*. The results from the hypotheses testing have been discussed at the beginning of Chapter 7, discussion of findings and implications.

4 Research Paradigm, Design and Methods

Before moving into the *case* and *main study* to test the framework and hypotheses defined in the last Chapter, a discussion of the study's paradigm characteristics, design and methods is deemed adequate. As discussed in the introductory Chapter, the study aims to analyse whether the response to *controlled* and *autonomous* forms of regulation is influenced by the cultural context where applied to motivate employees. Thus, the study intends to determine whether *forms of regulation* have a different non-random correlating relationship depending on the employee's location and cultural context. It supports a realist ontological perspective by defining its framework with external elements bound to concrete measurement instruments. Grounded on a post-positivist understanding of knowledge creation, the proposed research has applied a cross-sectional design to compare four cultural contexts in Thailand, India, Brazil and Germany regarding employees' *autonomous* versus *controlled* preferred response to forms of regulation.

The current Chapter details the ontological and epistemological underpinnings of the research framework and consequential design and methods chosen for the study. It begins by acknowledging the existing philosophical discussion within the social sciences regarding the different research paradigms and the consequences of each stance. A clear distinction and required comprehension of the different approaches is deemed essential better support knowledge creation, precisely defining the materials and methods used for data collection and in-depth analysis. After supporting the choice of the research paradigm, the Chapter moves on with the justification regarding the quantitative methods used for the data collection, more precisely, the self-completion questionnaires. The last section of the Chapter is then used to define the methods applied for the *case* and *main* study concerning data collection and analysis.

4.1 Research Paradigm

4.1.1 The Philosophical Debate within the Social Sciences

According to the literature, conducting any social sciences and business research study is impossible without addressing social ontology (Bryman & Bell, 2007; Easterby-Smith, Thorpe, Jackson, & Jaspersen, 2018; Saunders, Lewis, Thornhill, & Bristow, 2019). By defining philosophy as the science of ontology (Bhaskar, 1975), the philosophical underpinning of how reality comes to be is fundamental for conducting social science. Based on its general definition, ontology refers to understanding the nature of reality, how it comes to be, and what constitutes it (Easterby-Smith et al., 2018; Neuman, 2014; Van de Ven, 2007). Therefore, a social ontology analysis defines the social systems' nature, entities, and interactions (Bryman & Bell, 2007). This ontological discussion is considered the origin of the philosophical controversy and debate presented below.

Different forms of designations and definitions are found in the literature regarding many particular ontological positions. This interpretation takes different shapes depending on which study is used as a base for the discussion. The interpretation and often the nomenclature also vary between the sources when classifying the same ontological position, generating grey areas and creating additional contradictions. For the sake of argument and the discussion that follows, the playing field has been oversimplified to explore only two

ontological positions for the current study: the realist and the constructivist. This oversimplification shows that these two positions are presented as discrete observation points in a continuum of possible ontological interpretations (McNeill & Chapman, 2005; Saunders et al., 2019; Van de Ven, 2007). It is essential to notice that the work presented here does not intend to validate nor refute any philosophical paradigm. The aim is to evaluate each ontological position's implications for this study's proposed research design.

Social researchers differ in how reality is perceived and knowledge is created and acquired, with the two above presented opposite ontological stances providing the background of this philosophical discussion. In addition to diverging understanding of the nature of reality, the epistemological position also impacts research design (Bryman & Bell, 2007; Van de Ven, 2007). The epistemological discussion concerns validating what constitutes and legitimates knowledge and how knowledge can be transferred to others (Easterby-Smith et al., 2018; McNiff, 2013; Saunders et al., 2019). Similarly to the oversimplification applied to the ontological debate, the analysis has been restricted to two contrasting epistemological understandings: post-positivist and interpretivist perspectives. The nomenclature and characteristics of these epistemological standpoints may vary slightly within the literature but have been predefined here to facilitate the discussion and allow the precise evaluation of the research design's consequences. Those positions are also not the only existing ones but suffice to evaluate the impacts of the methodology and methods that could be applied in the study.

The philosophical debate presented above has been carried out over centuries and is still part of social research today (Neuman, 2014). In the past two decades, conclusive evidence through consistent reasoning has been provided for applying different research methods in the social sciences (McNeill & Chapman, 2005). Additional perspectives regarding the nature of reality and how knowledge is extracted from it have consistently added approaches to social research. It only further justifies the plurality of what constitutes *science* and *how to do science* today (Neuman, 2014). The implications of this discussion for the research's conceptual framework are the aim of the following Sub-Sections.

4.1.2 Chosen Research Paradigm

The two ontological and epistemological positions, defined as discrete stances in a continuum, underline the current debate within the social sciences, laying the foundation for why it is necessary to position the study within the research paradigm. According to the evaluation, the constructivist inductive stance appears unable to provide a single reliable answer to the problem of cross-cultural employee motivation. Suppose the study would be positioned within the constructivist paradigm, independently of interpretivist, interventionist or any other epistemological perspective; in the end, only an indication of the differences between the motivational triggers can be provided, but not a definitive answer. The question raised for the study is clearly defined: how do the motivational triggers from assembly line associates in Thailand, India, Brazil and Germany differ? With the literature providing evidence in both directions, a reliable *yes* or *no* would clarify the issue and support the practitioner in daily business. A straightforward statement can support future decisions regarding cross-cultural motivational programs within the company. In order to achieve the expected outcome, the proposed study can only follow one philosophical path: a postpositivist epistemology built upon a realist ontology.

Based on the Self-Determination Theory, the chosen realist stance supports the question's answer by confirming or rejecting elements and claims across different cultural contexts. By testing SDT in different cultural contexts, the study approaches the issue closely to Popper's (2014) interpretation of theory refutability, where the best validation test for a theory is the tentative to refute it (Popper, 2014). A concrete answer to the SDT BPNT universality claim and this study's relativist claim towards *forms of regulation* can only be provided using a realist understanding of the nature of reality. This understanding is consistent with the study's expectations regarding the hypothesis; different cultural contexts are expected to react differently to autonomous and controlled *forms of regulation*. This study's results may support the theory by its tentative to disprove it or partially refute some of its claims. Independent of the outcome, it provides a simple answer to the question raised. If results are significantly divergent, cultures react differently to forms of regulation; therefore, motivation programs must be adapted before implementation. On the other hand, if SDT's claim is supported, generalisability in a cross-cultural environment is

established, and the same motivational programs can be applied equally across the analysed cultures.

Regarding the skill set needed for the study, affinity to mathematical problem-solving and statistical data is undoubtedly advantageous when conducting post-positivist research. Even though the researcher's skills can impact how easily the methods can be applied, they should not be used as a definitive argument for a decision. Choosing a specific approach to bypass a specific method may not deliver the best-expected research outcome and should be avoided (Lee & Lings, 2008). Values have a similar consideration; conducting research based solely on the researcher's values would likely grant a biased subjectivity to the study. Its results cannot be considered valid or reliable; therefore, the choice must be based on the research question and desired outcomes (Bryman & Bell, 2007; Easterby-Smith, Thorpe, & Jackson, 2012). This study's questions and outcomes are underpinned by a realist understanding of reality and a post-positivist approach to knowledge creation. In this case, a conscious choice is made, not inherited, conclusively providing the best fit for this study's design (Van de Ven, 2007).

The consequential methodological boundaries provide consistency to the study, supporting its results interpretation, the analysis regarding contributions to knowledge and practice, and its limitations. By positioning the study within the realist paradigm, the correspondent methodological boundaries must be adapted to define the approach accordingly, from the theories and hypothesis formulation to the methods used for the data collection and analysis. Thus, the research design and methodology described in the following Sub-Sections guide the study until the last Chapter.

4.2 Quantitative Methods of Obtaining Data

The data collection technique derives deductively from the theory to produce precise numerical results (Neuman, 2014). According to the literature, social surveys or structured questionnaires are the most widely applied data-gathering techniques within the chosen research paradigm (McNeill & Chapman, 2005; Weinstein, 2010). Questionnaires are usually applied through face-to-face interviews, telephone or internet calls, or using self-completion written questionnaires. Its primary purpose is to gather a large amount of pre-structured data and facilitate subsequent statistical analysis through an objective perspective, providing a valid, reliable and generalisable result. Based on mathematical and statistical analysis, traditional scientific researchers often advocate quantitative methods to ensure an objective and value-free research design (McNeill & Chapman, 2005), allowing extensive data gathering and broad comparisons between groups and populations.

Within the quantitative approaches for data gathering, the literature consistently endorses two primary survey methods of data collection: *structured interviews* and *selfcompletion questionnaires* (Easterby-Smith et al., 2012; Hancock et al., 2019; Rugg & Petre, 2007). With *self-completion questionnaires* being chosen as the appropriate method for this study, the reasoning for the choice is detailed in the following sub-sections by covering the following steps:

- 1. Self-completion questionnaires Reasoning for choice as a research method
 - a. Overall method description;
 - b. Important characteristics;
 - c. Particular benefits and issues to be addressed.
- Structured interviews Disqualification as a suitable method for the current study.

4.2.1 Self-completion questionnaires - Reasoning for choice as a research method.

Even though self-completion questionnaires are similar to structured interviews in how questions and answers are organized, they vary regarding administration methods. Instead of having the interviewer's presence, reading questions and recording answers, the respondent personally completes the questionnaire (Bryman & Bell, 2011). However, similar to face-to-face interviews, the questions are close-ended and usually presented with predefined answers, as expected from a post-positivist methodology using quantitative data gathering to be statistically analysed. The self-completion questionnaire may be administered by mail, electronically or even by requesting respondents to deliver written questionnaires in one specific box or location (Bryman & Bell, 2011; McNeill & Chapman,

2005). These administration methods facilitate anonymity and can, therefore, reduce *social desirability* bias (Neuman, 2014). The administration method should be chosen based on the topic, target population, anonymity, duration, and costs (Hancock et al., 2019).

For this method, some concerns must be addressed as the unaccompanied respondent answers the questionnaire without trained supervision. Self-completion questionnaires do not allow respondents to clarify doubts or ask for support regarding the meaning of words or sentences (Neuman, 2014). Therefore, clear instructions and easy-to-follow questions are needed to avoid misunderstandings and misinterpretation (Bryman & Bell, 2011). Long and complicated answers must also be avoided for the same reason and to ensure a higher response rate (Bryman & Bell, 2011). Because no one is present to ensure all questions have been answered accurately, incomplete answers or questionnaires may be an issue (Neuman, 2014), generally providing lower response rates than face-to-face interviews (Neuman, 2014; Rugg & Petre, 2007). To consistently increase the response rate, executing a compulsory questionnaire approach is possible. However, the obligatory requirement may influence answers since the respondents would no longer be volunteers (Rugg & Petre, 2007) and therefore has not been applied for the current study's self-completion questionnaires.

In addition to lower response rates, other issues must be noted when gathering data through self-completion questionnaires. Since the respondent can read the whole questionnaire in advance, the expected effect of following a pre-defined answering sequence may be reduced, potentially biasing answers from previous questions (Bryman & Bell, 2011). Face-to-face interviews could potentially provide better results when dealing with sensitive topics if the interviewer can create a trust bond and a positive environment with the respondent (Hancock et al., 2019). However, the impact has been deemed limited, and the issue is less concerning than those discussed in the following Sub-Section disqualifying structure interviews.

The main identified benefit of self-completion questionnaires is the absence of the interviewer, with self-completion questionnaires reducing unwanted interviewer variability (Bryman & Bell, 2011). An interviewer figure may affect the answers given by respondents and is one of the main reasons for disqualifying structured interviews in the following Sub-

Section. The social desirability effect is also reduced because the respondents no longer have to answer directly to someone recording their answers (Bryman & Bell, 2011; McNeill & Chapman, 2005). With the self-completion questionnaire method, the anonymity of the individual can be ensured, independent of the administration method. Self-completion questionnaires are also very convenient for the respondents once they can complete them in their own time and control their pace of response (Bryman & Bell, 2011). Compared to face-to-face interviews, they are more efficient to administer (Bryman & Bell, 2011). It is particularly well suited for studies where the samples are widely geographically dispersed (Neuman, 2014). In summary, its practical application allows a single study to cover larger samples in harder-to-reach populations (Bryman & Bell, 2011; Hancock et al., 2019; Neuman, 2014), being evaluated as the most suitable method for a current study.

4.2.2 Structured interviews – Disqualification as a suitable method for the study

Structured interviews have not been deemed inappropriate to provide the necessary evidence for the current study. If compared to self-completion questionnaires, structured interviews present some notable efficiency disadvantages. A significant number of written questionnaires can be distributed simultaneously, while face-to-face interviews request higher costs and effort for travel, supervision and re-calls (Neuman, 2014). For the current study, it would mean subsequential trips to each location in Thailand, India, Brazil and Germany until the number of pre-defined interview rounds has been completed and the needed sample size for further statistical analysis has been interviewed. Compared to written questionnaires, the bias in face-to-face interviews is also expected to be higher (Bryman & Bell, 2011; McNeill & Chapman, 2005; Neuman, 2014; Rugg & Petre, 2007), an issue that could be magnified by the necessary translation during the interview process. According to scholars, even the tone used to ask the question or the interviewer's appearance may influence the respondent's answers.

Respondents are expected to be anonymised (University of Gloucestershire, 2020), and their answers are treated so that it is impossible to trace them back to the individual. In the case of face-to-face interviews, the interviewer would personally record the participant's answer, meaning the anonymization process would happen after data collection. Even

though the answers might be anonymised for the data analysis at a later stage, the interviewer would have had direct contact with each individual and each individual's answer. This process may also intensify the *social desirability* effect, where the respondent overreports information or answers that are considered desirable from a social perspective (Bryman & Bell, 2011; McNeill & Chapman, 2005; Neuman, 2014). Instead of being frank about his opinion or motive, the respondent's answers may be distorted to fit expected social norms (Easterby-Smith et al., 2012; Neuman, 2014). This issue is potentialized with an interviewer's presence; the fact that some power relation disparity might exist or be inferred by the respondents when a researcher from Germany is placing the questions could potentialize this effect, generating additional biases.

Additional issues can be foreseen if the data collection method of structured interviews had been chosen for the current study. Finding and correctly training the necessary interviewers is expected to be substantially more complicated when different cultures and distant locations are involved. For the study, it would mean that training would have to be conducted in four different languages with a translator's presence, considerably increasing the complexity. The different cultural backgrounds must also be considered when standardising tone, environment and interviewer behaviour. Chances for the re-calls, together with personal supervision probing, would have been minimised. The absence of supervision can cause a divergence between the cultural contexts on how the interview is conducted, potentially increasing the bias and directly influencing the study's overall reliability and the results' internal validity. Travel restrictions during the COVID-19 pandemic have also been considered, limiting the transit precisely when the interviews would have been conducted, generating similar concerns and further disqualifying structured interviews as an appropriate method for the study.

4.3 Research Design and Chosen Quantitative Method

As discussed so far, the study evaluates cultural contexts' role in employee motivation from different plants across the international production network within the same automotive group. The production plants to be evaluated are geographically dispersed, including samples from Thailand, India, Brazil and Germany. A cross-sectional

design has been deemed appropriate to compare different plants within the same production network once it answers the research question without needing a longitudinal approach. It is essential to note that even though the cross-sectional design is the most used in management research, it cannot present decisive conclusions regarding the cause-effect relationship of the variables analysed (Easterby-Smith et al., 2012). Caution is advised before providing causality conclusions from the data gathered, as results may be limited by the context where it has been conducted and, more importantly, by the cross-sectional design. It has been considered when describing the correlations between the variables and stating the hypothesis and addressed in Chapter 7 regarding this study's limitations and suggestions for future research.

The last Sub-Section evaluated structured interviews and self-completion questionnaires as potential candidates for data collection methods, assessing practicality, benefits and potential issues. The rationale for choosing self-completion questionnaires as the most suitable quantitative data collection method has also been discussed. According to Hancock et al. (2019), once there is no overall suitable method for every study, the administration method should depend on the target population, the content area of the survey, the anonymity requirements, the length, and the time and effort available. Thus, the self-completion questionnaire has been chosen as the most appropriate for the study, with the following three main reasons pointed out as primary guidelines for the decision:

- First, challenging access to the population and sample due to its geographically dispersed placement. If samples are hard to approach, selfcompletion questionnaires are more suitable than in-depth interviews.
- Secondly, the process of successfully choosing and training interviewers is complicated by language and geographical barriers, potentially undermining the study's feasibility and reliability. Language barriers are easier to manage in a better-controlled environment, such as when applying a self-completion questionnaire administration method. Any attitude or information from an unsupervised interviewer figure cannot influence questionnaires translated in advance and later self-completed.

 Thirdly, the social desirability effect and any inferred power relation are minimized when no interviewer directly records the answers and the researcher is not directly involved, increasing the study's reliability and internal validity.

Following the above reasoning, the study has gathered its data using the quantitative method of a self-completion questionnaire. Further methodological specifics for the *case* and *main study* have been further detailed in the following Sub-Sections.

4.4 Research Methods for the Case and Main Study

This Section describes and discusses the research methods applied to the *case* and *main study*. It systematically defines and advocates using the three measurement instruments forming the study's questionnaire: Basic Psychological Need Satisfaction at Work Scale, Training and Development SRQ and Work & Well-being Survey. Later, the questionnaire development process is described, demonstrating how the existing and validated questionnaires have been integrated with the new SRQ-T&D to provide the measurement instrument for the *case* and *main study*. The population, sampling process, data generation, and analysis procedures have also been comprehensively detailed. The Section ends by addressing the study's ethical stance and the issues of reliability and validity for both studies.

4.4.1 Measurement Instrument and Scale

Three questionnaires have been selected as measurement instruments, one to measure each of the research framework's variables: *needs*, *motives*, and *work engagement*. Two questionnaires have been found to exist in the literature precisely in the configuration and level of detail needed for the main study. These two available questionnaires have already been tested and validated in various cultural contexts and translated into several languages to measure the *basic psychological need satisfaction at work* (Deci & Ryan, 2000; Deci et al., 2001; Ilardi, Leone, Kasser, & Ryan, 1993; Kasser, Davey, & Ryan, 1992) and *work engagement* (Schaufeli & Bakker, 2004) variables. Both were also available in English and presented a correct fit to the study without needing supplementary adaptation.

For the third variable, a measurement instrument for the *autonomous* and *controlled* forms of regulation was also found; however, the questionnaire was never applied in the work domain for employee motivation towards training and development. Thus, the Self-Regulation Questionnaire (SRQ) available and validated in the literature (Black & Deci, 2000; R. M. Ryan & Connell, 1989) has been adapted to fit the expectations of the current study. The figure below illustrates the assignment of each measurement instrument to the respective research framework's variables:



Figure 27. Measurement Instruments for Research Framework (own work).

As presented in the diagram above, for the *basic psychological need* variable, the Basic Psychological Need Satisfaction (BPNS) at Work Scale (Deci & Ryan, 2000; Deci et al., 2001; Ilardi et al., 1993; Kasser et al., 1992) has been applied as the measurement instrument. It is built over a 21-item scale addressing need satisfaction at the work level. The original questionnaire regarding need support and frustration has been widely tested (Center for Self-Determination Theory, 2021a; Anja Hagen Olafsen et al., 2021), and the work domain need support questionnaire validated in several studies and translated into various languages in different cultural contexts (Benita et al., 2019; Chen et al., 2015; Chen et al., 2014).

The dependent variable of work behaviour has been measured using the Work & Well-being Survey (UWES) provided by Schaufeli and Bakker (Schaufeli & Bakker, 2004). It consists of a 17-item scale addressing the issue of employee engagement towards work, providing a perfect fit for the current study. Regarding positive work behaviour, task engagement is the expected outcome of fulfilling *basic psychological needs* and regulating the motives with *autonomous* and *controlled forms*, being the accurate dependent variable to be measured with this instrument.

A third instrument has been used to measure the mediating variable of *motives* and their *forms of regulation*. For this case, an adaptation of the Self-Regulation Questionnaire (SRQ) (Center for Self-Determination Theory, 2021d), introduced by Ryan and Connel (1989), has been used for the quantitative data generation process. The adapted questionnaire is based on the combination of the Learning Self-Regulation Questionnaire (SRQ-L) (Black & Deci, 2000), the Academic Self-Regulation Questionnaire (SRQ-A) (R. M. Ryan & Connell, 1989), and the Exercise Self-Regulation Questionnaire (SRQ-E) (Center for Self-Determination Theory, 2021d). The combined questions did not require significant adaptations once the three SRQs already had a background in learning and development. Moreover, all three base questionnaires have already been adapted, tested in various studies and translated into several languages within the field of Self-Determination Theory, providing additional reliability in a cross-cultural context. The following Sub-Sections further detail the adaptation, translation and validation processes.

As expected in quantitative research design using self-completion questionnaires, all three measurement instruments are constructed using a set of close-ended questions. Responses are recorded using a pre-defined set of close-ended answers based on a 7-point Likert Scale already provided by the validated measurement instruments (Deci & Ryan, 2000; R. M. Ryan & Connell, 1989; Schaufeli & Bakker, 2004). BPNS at Work and the SRQ-T&D questionnaires have a 7-point Likert going from *Not at all true* to *Very true*. The figure below exemplifies the scale used for both instruments:



Figure 28. 7-point Likert Scale used for BPNS at Work Scale and SRQ-T&D (own work).

With a slightly different approach regarding its scale, the UWES questionnaire also recorded the responses using a set of pre-defined closed-ended answers based on a 7-point Likert scale (Schaufeli & Bakker, 2004). The main difference for this measurement instrument is that the scale measures the individual's frequency towards distinct forms of work engagement. Therefore, the pre-defined answers are defined by frequency and not agreement level: *never*, *almost never*, *rarely*, *sometimes*, *often*, *very often* and *always*. The figure below exemplifies the scale used for this instrument:



Figure 29. 7-point Likert Scale used for UWES (own work).

The scales applied in the study were validated in the literature; no adaptation from the above-presented scales was deemed necessary. Even though the three questionnaires do not present the same discrete pre-defined set of attributes, all three scales present 7 points, further facilitating the data analysis.

4.4.2 Case Study Questionnaire Development, Testing and Validation

According to the literature reviewed in Chapter 2, *motives* or *reasons* to engage in a particular activity can be more *autonomous* due to value or interest or more *controlled* due to external pressure or rewards, leading to different behavioural results (R. M. Ryan & Deci, 2019b). Scholars propose that *autonomous* reasons for engaging in behaviour are volitional, while *controlled* reasons are responses to internal or external pressure (Howard et al., 2016).

There is also significant differentiation between *autonomous* and *controlled* regarding the degree of regulation to which individuals respond and engage in a particular behaviour. An adapted version of the Self-Regulation Questionnaire (SRQ) (Black & Deci, 2000; R. M. Ryan & Connell, 1989) has been used to measure the forms of regulation seen in the training program; being available and validated in the literature, it presented a reliable source for the closed questions used for quantitative data collection and analysis.

For the case study, three versions of the SRQ have been used to create the final measurement instrument: Learning Self-Regulation Questionnaire (SRQ-L) (Black & Deci, 2000), Academic Self-Regulation Questionnaire (SRQ-A) (R. M. Ryan & Connell, 1989), and Exercise Self-Regulation Questionnaire (SRQ-E) (Center for Self-Determination Theory, 2021d). These versions have been previously applied to test individual responses to these *controlled* and *autonomous* triggers in the respective fields of *learning, academics* and *exercise*, providing the proper combination for theoretical and practical training and development. The following diagram illustrates how the questionnaires have been combined.



Figure 30. Questionnaire Development Process for the Case Study: SRQ-T&D (Case) based on SRQ-L, SRQ-A and SRQ-E (own work).

The final questionnaire had a total of 10 questions, with special care being taken to balance the number of questions testing *controlled* and *autonomous forms of regulation*: *external, introjected, identified* and *intrinsic*. Only minor wording adjustments towards training and development were necessary with the portfolio of validated questions from the three available questionnaires. The Training and Development Self-Regulation Questionnaire Case (SRQ-T&D Case) quantitative closed questions adapted from the existing questionnaires can be seen below:

- Why did I (would I) participate in the UQC training platform?
 - Because that's what I'm supposed to do.
 - So my boss will think I'm good in what I do.
 - Because I enjoy doing the trainings (practical/theoretical).
 - Because I will get the championship trophy if I succeed.
 - Because improving my skills is an important value for me.
 - Because it's important to me to try to do well.
 - Because I will feel really proud of myself if I do well.
 - Because I would get a reward if I do well (trip/driving experience)
 - Because the UQC is fun.
 - Because my family/friends would be really proud if I do well.

Additional control variables have been added to the questionnaire to support further detailed statistical analysis after the data generation. The following questions have been defined as control variables for the study:

- My age is represented within the following range:
 - o Under 20 20-30 31-40 41-50 51-60 Over 60
- My area:
 - \circ Office Production
- Years of work at the company:

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 more than
15
- My gender is / I identify myself best with the following gender:
 - Male Female Other:
- My country of Birth is:
 - o Thailand India Brazil Germany Other: _____
- Country I lived most of my life in:
 - Thailand India Brazil Germany Other: ______

Even though scholars support using surveys for exploratory research (Neuman, 2014), self-completion closed questions have the condition that they cannot collect additional data and may limit themselves to the pre-established parameters (Bryman & Bell, 2011). To further reinforce the case study's exploratory character towards refining the research question and supporting the hypotheses, two open questions have been added to the questionnaire to allow additional branches and nuances to come through the investigation if they exist. The qualitative open questions used to expand the collection regarding existing *forms of regulation* and further supporting the *case study*'s exploratory character can be seen below:

- Do you have any additional suggestions/complaints regarding the UQC? Feel free to comment.
- Is there a different reason why you participate/engage in THEORETICAL/PRACTICAL training? Feel free to comment.

The final measurement instrument, translated into the four languages, can be seen in Appendix 2 through Appendix 5, more precisely in Part B, sections B2 through B4 of each translated questionnaire. These final versions have been used for the data collection in the Thai, Indian, Brazilian and German cultural contexts accordingly.

4.4.3 Case Study Data Analysis

Statistical tests have been used to analyse the quantitative data collected. After descriptive statistics were used to provide information regarding participation and answers tested regarding normal distribution, a one-way analysis of variance (ANOVA) was conducted to compare results between cultural backgrounds. The ANOVA tests whether a

statistically significant difference exists between the groups regarding how they react to the different motivational triggers (Evans, 2017; Hancock et al., 2019; Weinstein, 2010). The results of the quantitative data analysis for the *case study* have been presented in Chapter 5 accordingly.

A content analysis was used to interpret the results for the qualitative data. Initial coding has been used to compile and organize the data into categories (Neuman, 2014). Due to the short responses, providing no more than one or two sentences per participant, and the relatively large sample size for a qualitative study, a first coding system based on verbatim analysis has been deemed adequate. Based on the literature, the following steps have been followed for the complete data analysis:

- Verbatim analysis: analyse the word, phrase or expression without interpretation or substitution by equivalent. It usually provides many results without frequent repetitions (Rugg & Petre, 2007).
- 2. Gist analysis: the first step of clustering the words and expressions found, using synonymous where possible by the interpretation to create the second layer with fewer fields and more repetitions per field (Rugg & Petre, 2007).
- 3. Superordinate categories: the results are then clustered based on interpreted relations, even if words are not synonyms (Rugg & Petre, 2007).

The results presented by the superordinate categories were then compared with the pre-defined forms of regulation for the *autonomous* and *controlled* motivational triggers tested by the Self-Regulation Questionnaire (SRQ) from Black and Deci (2000) and Ryan and Connell (1989) during the quantitative analysis. The comparison has been used to present additional themes not covered by the pre-defined literature and re-validate the questionnaire if it exists. The results of the qualitative data analysis and the subsequent comparison have been presented in Section 5.3.

4.4.4 Main Study Questionnaire Development, Testing and Validation

As discussed so far, three measurement instruments have been used to generate quantitative data on the three analysed variables: *needs, motives* and *work engagement*.

Two validated questionnaires have been extracted from the literature without adapting them for the main study to measure *needs* and *work engagement*. However, the third measurement instrument has been adapted from the one used by Ryan and Connel (1989). The authors developed a Self-Regulation Questionnaire (SRQ) to determine an individual's tendency to engage in specific behaviour due to a more *controlled* or *autonomous* reason (Black & Deci, 2000).

Similarly to the process conducted before for the *case study*, three versions of the SRQ have been used to create the final measurement instrument for the *main study*: Learning Self-Regulation Questionnaire (SRQ-L) (Black & Deci, 2000), Academic Self-Regulation Questionnaire (SRQ-A) (R. M. Ryan & Connell, 1989), and Exercise Self-Regulation Questionnaire (SRQ-E) (Center for Self-Determination Theory, 2021d). In the literature, these versions were applied to test individual responses to these *controlled* and *autonomous forms of regulation* in the respective fields of *learning*, *academics* and *exercise*. These fields provided the proper combination for training and development in the automotive industry, involving intellectual challenges through learning and academic and practical training through the exercise questionnaire. The following diagram illustrates how the questionnaires have been combined.



Figure 31. Questionnaire Development Process SRQ-T&D based on SRQ-L, SRQ-A and SRQ-E (own work).

As presented above, validated questions were extracted from the three available questionnaires to create the new *training and development* SRQ questionnaire (SRQ-T&D). Only minor wording adjustments towards *training* and *development* were necessary with the portfolio of validated questions from the three available measurement instruments. Special care was taken to balance the number of questions testing the analysed *controlled* and *autonomous forms of regulation: external, introjected, identified* and *intrinsic*. The draft questionnaire for training and development consolidated 34 relevant questions. The draft questionnaire was then optimized to 24 questions by removing unnecessary duplicate questions. Even with the reduced version, six questions for each *regulation* were cared for, ensuring a robust set of loadings per analysed factor, allowing consistency check for responses and supporting its internal validity.

Additional control variables have been added to the questionnaire to support further detailed statistical analysis after the data generation. The following questions have been defined as control variables for the study and can be found in the final translated questionnaires in Appendix 2 through Appendix 5:

• My age is represented within the following range:

o Under 20 20-30 31-40 41-50 51-60 Over 60

- My area:
 - Office Production

• Years of work at the company:

0
 1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15

- My gender is / I identify myself best with the following gender:
 - Male Female Other: _____

• My country of Birth is:

o Thailand India Brazil Germany Other: ______

- Country I lived most of my life in:
 - Thailand India Brazil Germany Other: ______

The *main study*'s final questionnaire combined all three measurement instruments and the control variables into one final piece consisting of the following items: a 21-item scale addressing need satisfaction at work, a 24-item scale addressing the type of regulation implicit in motives, a 17-item scale addressing the engagement towards work and 6-item for the control variables. The illustration below illustrates the process.



Figure 32. Questionnaire Development Process: all Three Measurement Instruments, including Control Variables (own work).

Two pilots were conducted using the initial English version before moving into the questionnaire translation to the respective languages required. The initial pilots were done with fluent English speaker employees in the central department in Germany, with *five* and *ten* people, respectively. The two pilots were used to gather feedback from the questionnaire in terms of the following:

- Initial instructions and opening statement clarity, simplicity and understanding;
- Questions intelligibility;
- Scale comprehensibility;
- Overall structure;

• Grammatical structure.

The feedback loop described above has been applied consistently throughout the questionnaire development process, between each pilot study and after translations when needed. The feedback gathered by the first two small pilots has been analysed, and the necessary correction has been made to the initial English questionnaire. The translation process started after the final English version was completed and tested. The translation process consisted of two simultaneous independent translators who translated the English version to the local spoken language without direct contact with each other. After both translations were completed, a meeting was set to compare the two versions. The translators have been challenged regarding divergencies found to exist and the meaning behind the different translations.

A final questionnaire in the local language was then consolidated, and subsequential pilots were conducted to test the measurement instruments and the research design as a whole (Bryman & Bell, 2011). The objective and results of the final pilot have been presented in Section 6.2 – *Pilot Study Data Collection and Analysis*. An iterative feedback loop was applied between each pilot and each step of the translation process. The final version of the translated questionnaire was then translated back into English to test meaning congruency. If the meaning was maintained, the questionnaire was complete, and the final version was ready for final data generation. The following diagram illustrates the piloting and translation process described:





As detailed above, at the end of the process, four questionnaires were available as measuring instruments for the current study, one in each language: English, Thai, Portuguese and German. The participants in India received the English version of the questionnaire once all associates in the plant were English speakers. The final questionnaires were then applied to the respective samples to collect the data. This process is described in the following Sub-Section.

4.4.5 Main Study Data Analysis

The stated hypothesis in Section 3.2 further detailed the study's objective of answering the cross-cultural issue of employee motivation. Do associates from different

cultures respond differently to the same *forms of regulation*? A series of statistical tests have been conducted to finally compare the results between each analysed group of employees to test the hypotheses and answer the research question. The steps conducted for the pilot study, testing the questionnaire with 106 valid responses, and the main study, broad data collection with 817 valid responses, have been described below and illustrated below.

	Data Analysis – Pilot Study (n=106)						
	IBM SPSS	Descriptive Statistics					
		Skewness & Kurtosis					
		Reliability (Cronbach's Alpha)					
		Exploratory Factor Analysis (EFA)					

Figure 34. Statistical Data Analysis Steps for the Pilot Study (own work).

The data analysis process from the pilot study had two main focuses. Firstly, to test the instrument's ability to measure the variables and, secondly, to explore the model described by the theoretical framework. The data gathered by the pilot has been cleaned to remove missing and unengaged responses and imported into IBM SPSS Statistics 27 for initial descriptive statistics. Cronbach's Alpha reliability analysis has been conducted using the same software to test the measurement instrument's results against the ones validated in the literature. Finally, exploratory factor analysis has been conducted to evaluate the theoretical model, including all factors and loadings. Results from the *pilot study*'s data analysis have been consolidated in Section 6.2.

The data analysis for the *main study* initially follows a similar procedure regarding preparing the data before moving further into the structural equation modelling to test the cross-cultural variability hypotheses. The figure below shows the sub-sequential steps.

Data Analysis – Main Study (n=817)						
	Descriptive Statistics					
	Skewness & Kurtosis					
IBM SPSS	Reliability (Cronbach's Alpha)					
	Exploratory Factor Analysis (EFA)	 EFA for Basic Psychological Needs EFA for Forms of Regulation EFA for Work Engagement 				
SmartPLS	Structural Equation Modeling (SEM)	 Path Analysis & Confirmatory Factor Analysis (CFA) 1st Iteration 2nd Iteration 3rd Iteration 				
		- Mediation Analysis				
		- Multi-Group Analysis (MGA)				
IBM SPSS	One-way ANOVA					

Figure 35. Statistical Data Analysis Steps for the Main Study (own work).

Analougouly to the *pilot study* and using the same IBM SPSS Statistics 27 software, descriptive statistics were applied, summarising the data generated by the *main study* samples. Each question or factor loading has been tested regarding normal distribution using skewness and kurtosis analysis. After confirming its distribution, the reliability of each measurement instrument and respective factor has been tested using Cronbach's Alpha. This reliability test has allowed results to be directly compared to the literature, which uses the same test for the existing validated versions of the instruments. For the main study, a series of exploratory factor analyses have been conducted, firstly including all variables and later systematically applied to each variable to test expected cross-loading between the subcomponents of each variable. The results of the EFAs have been used to generate the theoretical model as input for modelling the expected relationships.

The clean data and respective theoretical models were then imported and modelled into the SmartPLS 3 software for further statistical analysis. The software has been chosen due to its user-friendly interface for structural equation modelling and respective multigroup analysis needed to answer the research question. The modelling process followed the theoretical model described by the study's *research framework* and supported by the EFAs. Path analysis has been applied to test the model's discriminant validity, construct's reliability and validity, overall model fit and statistical significance. Discriminant validity has been

evaluated using Fornell-Lacker Criterion and the Heterotrait-Monotrait Ratio (HTMT), the construct's reliability with Cronbach's Alpha, the construct's validity with Average Variance Extracted (AVE), the model fit using Standardized Root Mean Squared Residual (SRMR) and statistical significance using bootstrap analysis with 1000 samples. Results have been consolidated in Sub-Section 6.3.3.

After achieving the defined model metrics, the *autonomous* and *controlled forms of regulation* have been tested regarding their mediation relationships before moving on to the cross-cultural tests. Multigroup Analysis (MGA) has been used in SmartPLS to finally test the cross-cultural hypothesis and respective *forms of regulation* cultural variability claim. To cross-check the comparison between groups from the SmartPLS SEM MGA results, an ANOVA in IBM SPSS has been conducted. The two cross-cultural test results have been presented in Sub-Sections 6.3.3 and 6.3.4. These results were later used to test the hypotheses and answer the research question in Chapter 7 – Discussion of Findings and Implications.

4.4.6 Data Collection Process

As discussed during the questionnaire development and translation process, a *pilot study* has been conducted to test version 2.0 of the English, Thai, Portuguese and German questionnaires. For this purpose, the data has been collected by testing the questionnaire on native speakers of each language. The focus was to test the questions and scale's intelligibility and the questionnaire's overall structure, evaluate if the measurement instrument's reliability met the validated literature expectations, and provide initial indications regarding the theoretical model. The data collection for the pilot study used a printed version of the questionnaires for all cultural contexts, with self-completed questionnaires being physically collected in a sealed box and stored in a high-security server, with approval and controlled access before transcription and analysis.

After the measurement instruments had been adapted, translated and finally piloted, the *main study*'s data collection process was conducted using the final 3.0 version of the questionnaires. Depending on the sample, different administration methods have been used for the questionnaires to ensure the highest response rate per sample. After closing the

piloting process and conducting several discussions with the local management and gatekeepers in each production site, it was evident that the ability and interest of the respondents in answering the questionnaire would vary based on the administration method for each cultural context. Therefore, for each of the affected samples, a slight adaptation of the data collection process was necessary as follows:

- Thailand: the data was generated by providing a digital flyer to the participants where they were able to scan the QR-Code with their mobile phones and answer the questionnaire. An example of this digital flyer can be seen in *Figure 36*. The QR-Code led to the digital version of the Thai questionnaire, provided using an online platform. A pre-planned production stoppage has been used to provide the appropriate time for the questionnaire completion. The highest number of responses from analysed cultural contexts for the *main study*, totalling 503, has been achieved in Thailand, primarily by providing the respondent with this necessary time within the daily working schedule;
- India: the data was generated through a digital version of the English questionnaire adapted to the local survey platform available on the production site. This platform has been chosen due to its compliance with local regulations regarding data safety. The gatekeeper and his support team have provided the necessary time and access to the participants through a shared company computer in the production or individual computers in the office area. This method generated a total of 136 responses for the *main study*;
- Brazil: the collection has been split into two categories to maximize responses. Due to easy access to computers and e-mail, the office participants digitally responded to the Portuguese version of the questionnaire using an online platform. The production employees have no access to a company's computer and restricted access to the latest mobile and internet technology to answer through a QR-Code system. Therefore, the printed version of the questionnaire has been chosen as the optimal data collection method for this

sample. Both methods combined generated a total of 168 responses for the *main study*;

 Germany: the data was generated in the office, where every participant had direct access to the company's computer and e-mail. Thus, the participants have been provided access to the German version of the questionnaire by email. The digital version of the German questionnaire has been offered through the company's own survey platform, which is work council approved and European data safety conforms. This method generated a total of 129 responses for the *main study*.

As mentioned above, adaptation was necessary to ensure maximal response rates according to the available access and agreements with the respective management teams. An example of the different communication methods and necessary language adaptations can be seen in the figure below to illustrate the issue further.



Figure 36. Data Collection Digital Flyer Example for Each Sample (own work).

Communication with the respondents has been standardised even when using different channels and languages. The aim was to avoid bias during the local administration and ensure all participants were equally informed regarding participation. The following

introduction sentence about the study and the necessary fulfilment instruction have been equally presented to every participant:

 Dear colleague, you are being invited to participate in the research conducted by the University of Gloucestershire (UK) regarding self-regulated motivational triggers and their influence on skills training and development in the automotive industry. Your participation is highly appreciated; it will only take around 10-15 min of your time. Upon completion, it will be collected in a sealed box and stored in a high-security server with restricted access. This questionnaire, including all answers, will be kept anonymous and used for research purposes only. No questionnaire and/or answers can be traced back to any participant. Please answer the questions reflecting your honest opinion. You may refrain from answering any question you are not comfortable with.

The non-formal approach using personal pronouns in the second person has been chosen as the standard for communication even in a more formal language such as German. It has been applied intentionally and consistently to avoid the participants' potential hierarchical or power bias issues. An example in the German language can be found below:

> Liebe Kolleg*in, Du bist herzlich eingeladen, an der Umfrage der University of Gloucestershire (UK) zu selbst regulierten Motivationsauslösern und deren Einfluss auf das Training von Fähigkeiten und Weiterbildung in der Automobilindustrie teilzunehmen. Deine Teilnahme schätzen wir sehr. Die Umfrage wird ca. 10-15 Minuten in Anspruch nehmen. Nach dem Ausfüllen wird der Fragebogen in einer versiegelten Box gesammelt und auf einem Hochsicherheitsserver mit eingeschränktem Zugang gespeichert. Der Fragebogen sowie Deine Antworten werden anonym bleiben und nur für wissenschaftliche Zwecke verwendet. Kein Fragebogen und/oder keine der Antworten können zu einem Teilnehmenden zurückverfolgt werden. Bitte beantworte die Fragen ehrlich mit Deiner eigenen Meinung. Fragen, bei denen Du Dich unwohl fühlst, kannst Du selbstverständlich auslassen.

Local gatekeepers and the plant's nominated project team supported the questionnaire administration and facilitated access to the sample (McNeill & Chapman,

2005). This approach minimised the existing power gap between the central project lead in Germany and local project leads in the affected plants. As discussed in Section 4.2, it facilitated the communication process while potentially reducing social desirability bias that would have been expected if an external international entity independently conducted the research in each production plant. After completing the questionnaires, the online version has been digitally stored, facilitating future data analysis. Upon completion, the printed questionnaires were removed from the closed sealed box and scanned before being transcripted and consolidated for the data analysis.



Figure 37. Data Generation Process Across all Samples (own work).

The picture above shows that the data generation process provided 936 responses for the *main study* before data cleaning, validation and analysis. The *case* and *main study* data analysis are presented in Sections 5.3 and 6.3 accordingly.

4.4.7 Population and Sampling

The *case* and *main study*'s population comprised associates from the Thai, Brazilian, Indian and German production plants. As discussed in the introductory remarks and further detailed in Section 7.5 – *Limitations and Future Research* – by defining these specific population boundaries, results from the *main study* can only infer that similar outcomes might be expected in different branches within the analysed industry or generalise results for the broader cultural contexts. A representative and precise sample has been defined based on the above-described population (Easterby-Smith et al., 2012). In order to minimise the interference of external factors and avoid sampling bias, a simple random sample has been used (Bryman & Bell, 2011). The random sampling process ensured higher representativeness of the population and minimised the sampling error (Easterby-Smith et al., 2012; Neuman, 2014), being the correct fit for the current study.

The sample size and character directly influenced which data analysis methods can be used (Bryman & Bell, 2011). It is usual to think that the bigger the sample, the better the result (Rugg & Petre, 2007), but it is much more related to the sample's representativeness and precision. By correctly proportioning the sample size, the sample's precision and credibility are increased (Easterby-Smith et al., 2012). Thus, the sample size varies depending on the population size of each production plant analysed. Krejcie and Morgan (1970) presented an efficient method to determine the needed sample size for any given population. Based on their formulation, the following table has been extracted for the *main study*:

Table 9. Table for Determining Sample Size from a Given Population adapted from Krejcie and Morgan (1970) – Standard Error = .05.

Ν	S	Ν	S
300	169	950	274
320	175	1000	278
340	181	1100	285
360	186	1200	291
380	191	1300	297
400	196	1400	302
420	201	1500	306
440	205	1600	310
460	210	1700	313
480	214	1800	317
500	217	1900	320
550	226	2000	322
600	234	2200	327
650	242	2400	331
700	248	2600	335
750	254	2800	338
800	260	3000	341
850	265	3500	346
900	269	4000	351

The sample size for each production plant has been calculated based on each plant's population at the time of the data collection. Therefore, for the current study, the sample size varies from 196 for the smallest 397-associates population in plant India to 322 for the largest 2,000-associates population in plant Munich (Krejcie & Morgan, 1970). The table below presents the consolidated data regarding the population and expected sample size for each production plant:

Production Plant	Population Size	Theoretical Sample Size
Thailand	954	274
India	397	196
Brazil	546	226
Germany (Munich)	2000	322

 Table 10. Population and Theoretical Sample Size for each Analysed Production Plant.

As the study has the organisation's support, a local gatekeeper in each production plant has been used, not only as an attempt to generate a relatively high response rate but also to enable the researcher to access the site and remain detached from the study being conducted (Neuman, 2014). The gatekeeper has also been instructed to ensure that the sample is not coerced to participate, informing the participants of anonymity and that the data generated is used for research purposes only. Further details regarding this role are discussed under ethical considerations in Sub-Section 4.4.8.

4.4.8 Ethical Consideration

Regarding its ethical posture, the study has strictly followed the University of Gloucestershire Handbook of Research Ethics and the GDPR protocols to ensure the project is conducted ethically (University of Gloucestershire, 2020). Additionally, during the Project Approval Form process (PAF) and its later execution, the research project has been consistently evaluated regarding ethical conduct. Conclusively, supported by the University's research supervision, the research project did not require special approval from the Research Ethics Committee (REC) in any of its research phases.

The study has been conducted with permission and full support from the company where it takes place, with questionnaires and methodology being agreed upon with local

management, overall data protection department, respective work council and compliance departments before the data collection. The data protection department has agreed with the methodology and confirmed that it is permissible if the research guarantees the following:

- The survey serves exclusively for the stated purpose: Autonomous versus controlled forms of regulation: a cross-cultural analysis from Thai, Indian, Brazilian and German cultural contexts;
- 2. Participation in the survey is voluntary;
- 3. Personal responses are anonymised and presented by statistical evaluations;
- Evaluations refer to a respective scope of at least seven people (is achieved by aggregation of functional units, if necessary);
- The interviewees are to be informed of the survey results in a suitable manner;
- 6. There should be no functional obligation to answer the individual questions,i.e. participants can click their way to the next question without answering it;
- The survey follows the process agreed upon with the work council thoroughly;
- The raw data must be deleted immediately after the survey. Statistical data can, however, be stored as long as needed, for instance, for future longitudinal studies;
- 9. A response check and a follow-up action do not take place;
- 10. The department conducting the study bears responsibility for the survey;
- 11. The survey cannot measure performance and employee conduct.

The study has strictly followed the recommendations above. They mostly overlapped with the University of Gloucestershire Handbook of Research Ethics and the GDPR protocols for ethical research. They had already been considered when choosing the adequate methodology so that no significant changes were necessary. Furthermore, the regulations presented above have been agreed upon with the central work council department in Germany and the respective work council responsible for the production sites in Thailand, India and Brazil where it has been conducted. The additional request to present the results to all involved parties, including the work council, will be conducted as soon as the thesis defence concludes. Finally, the compliance department within the production division has also confirmed that by following those guidelines, no additional compliance risks are foreseen.

During the data collection process, the central management functions and local plant managers have been consistently and systematically informed of every research step. All participants have been given the appropriate time to answer the questionnaire upon management agreement. All collected data has been stored in a high-security server for strictly confidential documentation, with approval and controlled access provided by the company where the study occurred. The research's objective has been clearly stated to every participant, ensuring that the research is voluntary and that results have been used only for research purposes.

A local gatekeeper has been nominated to minimise the potential researcher's bias and involvement and provide additional participant protection. The researcher has had no direct contact with the respondents during data collection, being impracticable to trace responses back to participants. The local gatekeeper has also ensured the study has not been tainted by the researcher's possible disparity in power relation with the local associates and minimised international travel. The responses have been anonymised from the collection process onwards. Self-completed questionnaires have been digitally collected without traceability or physically collected in a sealed box and stored securely before transcription and analysis. The results were stored in a high-security server with controlled access during the data analysis.

4.4.9 Reliability and Validity

Before concluding the *case* and *main study*'s methods Section, it is essential to address the topics of reliability and validity for the current study. Reliability is the study's ability to be replicated and deliver the same results under similar conditions (Bryman & Bell, 2011; Field, 2018). It is referred to as stability reliability when the study can repeat results if applied to the same setting at a different period (Neuman, 2014). Additionally, reliability is expected when applying the same method across different groups or samples, presenting a consistent outcome (Evans, 2017; McNeill & Chapman, 2005). Therefore, specific care has

been taken in the current study to ensure a reliable design construct and coherent results across the analysed samples.

Two measures have been applied to increase the reliability of the proposed study. First, multiple indicators to measure the construct have been used, improving *equivalence reliability* (Neuman, 2014). It means that, when developing the questionnaire, slightly different questions with the exact core measurement have been provided to cross-check responses and ensure consistency between answers. For instance, the newly developed SRQ-T&D presents six loadings for each *form of regulation* being measured, consistently increasing the reliability of the generated data. The sequence of questions has been randomized to ensure the respondent sees no evident pattern in the cross-checking process.

Second, the questionnaire has been tested through consistent piloting in each cultural context, supporting the *stability and reliability* of this particular study (Neuman, 2014). Each questionnaire has been tested locally with a restricted number of mothertongue speakers respondents. Responses have been used to conduct a first review of the questionnaire before and after the translation process. After the two-way translation process, the updated measurement instrument was piloted before being applied to the *main study*'s sample in each cultural context. With increasing sample size between each iteration, with samples of 5, 10 and then 106 participants, results were used to cross-check responses, ensuring the measurement instrument's data reliability and consistency.

The reliability of the results has been checked according to the following parameters:

- Construct reliability: Similar to the descriptive statistics, the reliability results per factor have been checked. Results for Cronbach's alpha >.700 have been deemed acceptable (Cortina, 1993; Taber, 2018).
- Overall model fit: the model has been checked regarding its overall fit. The Standardized Root Mean Squared Residual (SRMR) has been used as the metric for this test. Results for SRMR <.080 have been deemed acceptable (Hu & Bentler, 1999; Ringle, 2020).
- Bootstrap analysis with 1000 samples: the paths have been checked for statistical significance. For the bootstrap analysis, the T-Test with acceptable limits >1.96

and P-Values with acceptable limits <.050 have been used to verify the result's significance (Barrow, 2017; Newbold, Carlson, & Thorne, 2013).

Besides reliability, the study has addressed potential validity issues accordingly. Validity deals with how the data collected truthfully represents the measured reality (Bryman & Bell, 2011; Evans, 2017; Field, 2018; McNeill & Chapman, 2005; Neuman, 2014). A social survey design based on a realist understanding of reality draws the validity expectations very close to those from a positivist experimental study (Easterby-Smith et al., 2012). It means eliminating additional plausible explanations for the studied causal relationships by restricting the environment to the investigation variables (Easterby-Smith et al., 2012). For instance, removing the interviewer figure for this study can help reduce the *social desirability* bias and, thus, maximise *internal validity*. It does not mean that the study presents a true reflection of reality. However, its analysis presents consistent evidence through statistical analysis regarding the expected relationship in a pre-defined set of variables. The methodology presented in this Section further supports the validity of the results. This approach consistently warrants that the evidence presented is a true reflection of reality.

The validity of the results has been checked according to the following parameters:

- Discriminant validity for the factors: each factor has been checked for strong correlations with other factors. The two factors cannot be considered discriminant if the correlation with any other factor is stronger than with itself. This analysis has been used to check if the factors can be considered independent and if loadings do not overlap.
- Construct validity: the Average Variance Extracted (AVE) has been used as the metric for the construct. Results for AVE >.500 have been considered acceptable (Fornell & Larcker, 1981; Lawrence, 2009).

One additional topic regarding validity has been addressed, which refers to the study's ability to be generalised beyond the context where the data collection occurred. Also defined as *external validity*, this generalisation can only be inferred if the study consistently establishes legitimacy outside the pre-defined framework (Easterby-Smith et al., 2012). As the current study is limited to one single automotive company with production plants in four

different cultural contexts, generalisability outside these pre-defined boundaries is limited and, thus, its external validity. To infer external validity, the results found in a large automotive company must also, for instance, be suitable for a small family-owned textile business or for a non-profit organization, which the current study cannot support with empirical evidence.

Supporting external validity claims for the current study would imply supporting the universalisation claims of the studied theories, which have precisely been criticized during the literature review. Moreover, defending this study's external validity would mean assuming an absolutist position regarding generalisation across cultures, precisely what the study aims to avoid. The generalisation issue discussed in Section 2.6 – Generalisation Across Cultures – presents the determinant argument that approaching the cross-cultural employee motivation issue with a universalist instead of an absolutist stance is the best-balanced option to push scientific research forward. Thus, special care has been taken when generalising the study's outcome and inferring generalisation to any other context setting.

4.5 Chapter Conclusion

The Chapter dealt with the philosophical debate often found in contemporary social sciences research. With an oversimplification of the existing ontological continuum, the first Section discussed how the current study is positioned within its research paradigm, posing a clear realist stance on the nature of reality and how it can be measured. Regarding its epistemological underpinning, by positioning the study within the post-positivist understanding of knowledge creation, it can apply its measurement instruments to provide a concrete answer to the cultural variability questions regarding employee motivation. This answer could only be given through these described lenses and respective quantitative methods.

Within the appropriate methodological tools for the stated paradigm, two datagathering methods have been analysed regarding efficiency, practicality, benefits and potential issues: *self-completion questionnaires* and *structured interviews*. Self-completion questionnaires have been advocated as the most suitable method for the current study due to geographically dispersed samples, language and cultural restrictions in training

interviewers, and minimisations of eventual power and social desirability biases. In contrast, structured interviews have been disqualified based on similar terms but with opposite expected results. The second Section ended with the arguments to support the chosen quantitative method and the study's cross-sectional design. At last, Section 4.4 defined and detailed the data collection and analysis methods. The Chapter ended with the respective ethical, reliability and validity considerations for the following *case* and *main* study.

5 Study 1 (Case Study) – Triggering Motivation Towards Training and Development in the Automotive Industry

Before discussing the *main study's* data collection and analysis in Chapter 6, one essential stopover has been considered appropriate and detailed in the following Sub-Sections. Chapter 5 reviews a *case study* regarding the consequences and issues faced while implementing a motivational training program within the automotive industry. The *case study*, including its data collection and analysis, aims to detail the need for academic consolidation and the call for further research by supporting the research question raised in the introductory Chapter and later answered by the *main study*. Additionally, the results presented here show the first indication that different cultural contexts might react differently to *autonomous* and *controlled forms of regulation*, further signalling the need for broader statistical validation.

A short reminder from the thesis structure Sub-Section presented in the introductory Chapter is suitable for understanding the sub-sequential studies detailed in Chapters 5 and 6. The figure below illustrates the cultural contexts, size, data and targets from the *case* and *main study* discussed in the two Chapters.



Figure 38. Case and Main Study Structure and Steps – Chapter 5, Focus on the Case Study (own work).

Chapter 5, focusing on the *case study*, starts with opening remarks on how the research topic evolved into the *main study*'s broader quantitative data collection. Then, it delimitates the two subsequential implementations of the training program. The first try-out was in Brazil in 2015, and the second implementation expanded the concept into the international production network in 2020. After an in-depth description of the training program and the motivational triggers used to engage the assembly line associates towards training and development, the Chapter moves on to the data collection and analysis before ending with the preliminary discussions and conclusions.

As briefly stated, the case study used for this purpose is set in the automotive industry, more precisely, in the international production network of car manufacturing and vehicle assembly. It involves engaging assembly line employees from the manufacturing process to develop their theoretical knowledge and practical skills regarding the vehicle assembly process. A case study methodology has been applied to achieve this purpose, exploring the field of cross-cultural employee motivation in the praxis-oriented background within the automotive industry. According to Denzin and Lincoln (2011), the case study methods are well suited for theory building, providing insights into research questions and hypotheses. Its exploratory, inductive epistemological context has been applied here to position the study within its field and generate the necessary impulse for the *main study*'s

research question and the first indication that *forms of regulation* are indeed cultural variables.

5.1 Evolution of the Research Topic and Reasoning for Academical Consolidation

Before deep diving into the *case study*, an introduction regarding the motivations behind the current study and a brief explanation of how the research topic evolved over time is deemed adequate. The environment where it takes place and the praxis-oriented manufacturing industrial background where the problem has been identified are also part of the reasoning for the needed academic support. Thus, these introductory *case study* remarks ease the issue behind cross-cultural employee motivation and the consequent call for further research.

The topic was first brought to the forefront in 2015 when dealing with the training and development of assembly line associates from a Brazilian production site within the automotive industry. The issue consisted of providing recurrent refreshment training, in presence through a local trainer, to company associates without making them feel like they were not doing their jobs right. In other words, find a way to motivate people to participate in refreshment training courses based on sheer self-interest and not a hierarchical obligation. The author developed a new training concept to overcome the described obstacle, building upon the mechanics of gamification and sport to engage employees towards self-motivated training and development. The concept was to be applied to nonmandatory and non-safety-relevant content already regularly scheduled to fulfil the job, but rather to increase the frequency of refreshment technical and quality control pieces of training to trigger employee engagement towards training and development. Its implementation was a complete success in Brazil and first triggered the intriguing question regarding how employees can be motivated in such a scenario. The positive results of the training program were evident, but the theoretical constructs and reasoning behind the success were not.

The training program's first implementation was restricted to the above-described boundaries in Brazil, and the theoretical underpinning surrounding the issue has been documented in an MBA final thesis (Nauiack, 2018). The work was methodologically still very

short of being called research; however, it was the first academic substantiation applied to explain the training program's success. It was suitable to provide some scholarly background and contributions to praxis regarding engaging assembly line associates in Brazil towards training and development, indicating possible further contributions if repeated or expanded into the international production network of the automotive industry.

The outcome of this program within the company's production division was substantial and documented in Appendix 1, with numerous requests for the project's recurrence and expansion. With the management's consent in the automotive group's central division, the second implementation across the international production network occurred in 2020. It expanded the concept first implemented in Brazil into three additional international production sites of the automotive group: Thailand, India and Germany. With the expansion, the need for planned and rigorous research became evident. Can this training concept, successfully applied in a Brazilian cultural context, be successfully implemented in a culture on the other side of the globe? Does it need to be adapted to fit the expectations better and apply the correct motivational triggers to engage employees from different cultural contexts? Are motivational triggers cultural variables or universal concepts? The training program was being expanded from a small 250 assembly employees with around 150 self-motivated participants in Brazil to an overseas program with four assembly plants accommodating over 3,000 employees and achieving over 1,000 participants. At the time of the program's expansion and due to its geographically and culturally dispersed contexts, these questions could not be answered with a practitioner's insight without further fundal academic research.

The following *case study* describes this journey through the two implementation loops in Brazil and subsequential expansion into the international production network, fomenting the inquiry and hypotheses and providing an initial indication of cultural variability regarding *forms of regulation*. The motivation behind the *main study* described in the next Chapter comes precisely from this interest in motivating assembly line associates across the international production network. A practical challenge in the daily business of the automotive industry sparked the interest; however, it is sustained by the significance of keeping the employee's motivational flame alive. The knowledge to answer the posed questions can only be granted by precisely applying strict methodological principles framed

by a meaningful ontological and epistemological paradigm through academic research. The dependency of the project's success on the answers to these above-posed questions has, since then, been the driving motivator in conducting the study.

5.2 Case Study Delimitation and the Implementation of the Training Program

As delineated above, the issue addressed by the *case study* has its background in cross-cultural employee motivation in the automotive industry. In 2015, the manufacturing plant in Brazil faced the issue of motivating assembly line associates to seek selfdevelopment through continuous practical and theoretical training. For associates who have been working assembling vehicles for the last five, ten or twenty years, it is tough to be selfmotivated towards improving skills already mastered through experience; formulating the issue as a question would be: How to engage associates to learn *how to do the job* when they already have been doing the same activity for the last twenty years?

For the manufacturing process, it is crucial from time to time to revise and revisit theoretical and practical knowledge through consistent training, whether they are mandatory or supplementary. New standards are constantly being developed or improved, new tools and benchmarks must be applied, and the knowledge must be updated. Consistent training must occur even if the associate has been doing the same manufacturing activity for decades. Thus, engaging these associates to do so presents a constant challenge. The training program in Brazil in 2015 gave an impulse to motivate assembly line employees towards training and development, as reported by the author in 2018 (Nauiack, 2018). Based on the information reported, this first implementation has been detailed in the Sub-Section below.

5.2.1 1st Implementation – Training Concept Try-out in the Brazilian Production Plant

In 2015, a new training concept called the Ultimate Quality Championship (UQC), using gamification strategies with elements of sport and competition, was developed at the Brazilian manufacturing site to answer the call for employee engagement towards training and development. Within six months, the concept was successfully implemented for the

assembly line associates in the production plant. The training concept consisted of 4 subsequent stages: theoretical training, practical training, time trials and the final event. The diagram below exemplifies the first two steps of the training concept:



Figure 39. Systematical Diagram for the Training Parkour - Theoretical and Practical Training (own work).

The first step of theoretical training has ensured that participants revisit the manufacturing concepts that need to be reviewed and have the necessary technical knowledge before carrying out the practical training in sub-sequential workbenches, the so-called training parkour. The system was built to facilitate refreshing existing knowledge, regardless of how long the participants have been working in the assembly process. The correct content of the theoretical and practical training has been defined based on current needs seen in the manufacturing process. For instance, the theoretical training for this stage could be tightening technology, quality inspection, and avoiding scratches and dents during assembly.

The first stage, the theoretical training, was conducted in groups of 15 people inside a classroom. Over approximately two months, three trainers took turns offering the courses an average of 3 times a week. The schedule had the capacity to train all assembly associates from the plant if needed. Since participation at any stage of the process was not mandatory, it only depended on the operator's interest in registering and participating. After completing the three theoretical trainings, the participant had the right to proceed to the next stage, where the practical training would be carried out. This second stage, the practical training, provided the participant with three workbenches or assembly stations where their motor skills required for vehicle assembly could be further developed. Each of these practical training workbenches was performed three times by each participant. The objective was to complete each workstation as quickly as possible without generating any process deviation or quality issues.

After the training steps were concluded, the participants moved to the time measurement stage, further engaging participants with a competitive element. Each participant had the right to take three time measurements to try their best result. During this time measurement period, a local judge appointed by the local management as a specialist in the specific scope would analyse the assembly process throughout the activity and apply penalties for non-conformances. For each issue or deviation from the standard process found, the associate received a 30-second penalty to be added to his final time. The best time could only be achieved if no deviation from the standard was seen, precisely to avoid deviations from the standard assembly process and focus on the final quality delivered. The best time from each participant was then input into a ranking, and the five best participants were invited to the championship final.



Figure 40. Systematical Diagram for the Time Trial System as Filter for the Final (Main Event) (own work; the names do not represent actual participants).

Besides the training content, additional support structures were created to increase participant engagement and interest. For instance, to allow instant feedback and track the

activities, participants received a passport to follow their progress at the beginning of the training program. This passport accompanied the member throughout the process, from theoretical training to time measurement, also providing instant feedback through a badge system each time a new step has been completed. The badge system, provided in the form of stickers, was glued to the passport every time the candidate reached a milestone. Participants' passports were arranged on a board to track the steps of the training concept. As described before, completing one training step enabled the participant to move on to the subsequent step of the process. For example, to complete the time measurements, the participant needed all the stickers from the previous training steps on their passport, ensuring that their training had been completed and qualifying them to participate in the competition. A participants' board has been arranged to help motivate individuals not yet registered and trigger the healthy competitiveness necessary for the game's further development towards the final event.



Figure 41. The UQC Passport, including its Badges (left) and the UQC Participants Board (right) (own work).

Besides the participants' board, other tools have also been used to engage participants, with one of the gamification mechanisms being using the badge system mentioned above for instant feedback (Chou, 2015; Hamari, 2017). Participants receive these when essential goals or process steps that need to be recognized have been achieved. In the theoretical training, participants were recognized for completing the basic steps necessary to advance to the next phase. As the basic training was the same for all, a differentiation between the participants was not quantitatively given; all who completed the theoretical and practical training received equal badges. A series of badges were created to ensure that respective recognition was given according to the performance during the time measuring rounds, assigning bronze, silver and gold depending on the time result. This system supported the engagement process, with participants seeking to achieve their best results compared to themselves and others.



Figure 42. Badges System for Instant Feedback (left) and Overall Objective Toten with the 60% Quote Line Regarding Participation (right) (own work).

Besides individual achievements, an *overall objective* has been defined to track the number of interactions between participants and the game's platform, shaping a healthy competitive environment. After completing each training or time measurement, the participant would receive a sphere to be placed in a transparent cylindrical totem, contributing to the overall achievement. The totem was arranged along with the participants' board, so it was possible to follow the general progress of the project during the months of implementation. The manufacturing department defined a 60% participation quote as a target, and after it was achieved, all participants received group recognition through a week of benefits during the lunch break.

For individual recognition, a ranking of the five best participants was presented on the cafeteria screens during lunchtime during the complete practical training and time measurement stage. Since the objective was not to discourage those still in the training process, a general ranking of all participants' time has not been made available. Only the top five times were shown daily on the cafeteria televisions and updated as the game progressed. A short video of the competitor was presented along with the participant's name, area and supervisor, providing recognition for the best results. This video presentation became essential for acknowledging those involved, adding another layer of engagement to the competition; all participants wanted to appear on television presenting their best time.

From the 250 assembly line employees, around 150 participated in the training program, with only the top 5 candidates being chosen to participate in the final. The ranking system was updated until the end of the time measurement phase and used to define the top competitors moving on to the final event. The final event infrastructure has been assembled over an area of approximately 420m² with a 120 m² stage in the centre for the competition. This setup accommodated the approximately 400 spectators who, supported by the management, stopped their daily business for more than two hours to watch and cheer at the championship final.



Figure 43. The Final Event (left) and The Golden Screwdriver (right) (own work).

Differently from the training stage, each process deviation or quality issue in the task execution at the final event ultimately disqualified the time measured, demanding additional focus to achieve perfection. This change made the championship more competitive for the top five participants and guaranteed that the task was completed with flawless quality. At the end of three rounds, the five finalists stood on the podium to receive their awards from the management team. In addition to the prizes, the first-place winner received a golden screwdriver trophy of die-cast aluminium to display at their workstation proudly. From the company's perspective, the results were very positive, and an example of the positive effect can be seen in Appendix 1, referencing an internal intranet article about the program. The engagement triggers applied appeared adequate for the assembly line associates in the automotive manufacturing plant in Brazil, with numerous requests for further continuation of the training program coming from the manufacturing line over the following months. Around 60% of the associates voluntarily joined the program to refresh their theoretical knowledge and practical skills without mandatory training.

5.2.2 2nd Implementation – Training Program Expansion into the Network

Four years later, at the company's headquarters in Germany in 2020, an expansion of this motivational program to the international production network was suggested based on the local success of the implementation in Brazil. With production plants in over twenty locations worldwide, four plants came together to expand the training program into its second implementation round: Plant Rayong in Thailand, Plant Chennai in India, Plant Araquari in Brazil and Plant Munich in Germany. The project expansion was internally agreed upon at the headquarters, and a project letter was signed by all plant managers involved. The new concept included training and competition at the local level and a final world event at the end, bringing together all four plants for the final round. The case of this program's expansion across the international production network in Thailand, India, Brazil and Germany has been used as the base for the data collection and analysis in the following Sub-Sections. The international network construct allows further exploration and broader data collection around the issue of cross-cultural employee motivation. The case study's analysed data provided the necessary input to refine the research question and hypotheses to be later answered and tested by the main study. It also provides the first indication that employees from different cultural contexts might react differently depending on the forms of regulation applied. The methodology to achieve this purpose is presented in the Sub-Section that follows.

5.3 Case Study Data Collection and Analysis

The *case study* has been used deliberately to illustrate further the practical problem faced in the industry and refine the research question supporting the hypotheses for the

main study. Consciously aware of the *case study*'s methodological ability as a recognized scientific method to go beyond exploration to delineate the research question (Denzin & Lincoln, 2011; Yin, 2009), it has been intentionally applied for this purpose. Thus, using *case study* methodology with this intention does not intend to raise the dispute of whether its methodological capabilities are limited, as Denzin and Lincoln (2011) disputed. It also does not imply that a *case study* as a method would not be able to tackle the issue at hand further. However, a better fit for precisely answering the research question has been found in the quantitative, cross-sectional research design with statistical validation. Further argumentation for this choice has already been presented and discussed in the last Chapter as most suitable for this study.

The second implementation round, the training program's expansion into the international production network, has been used to gather the necessary cross-cultural data for the *case study*, allowing for much broader data collection across four production plants in Thailand, India, Brazil and Germany. A small questionnaire has been used for the data collection, combining ten closed and two open-formulated questions to allow for quantitative and qualitative analysis, supporting its exploratory intentions. The quantitative data collection is based on a validated measuring instrument regarding *autonomous* and *controlled forms of regulation*. At the same time, the open qualitative questions allow the participants to freely express their opinions about the program. The aim was to understand better what motivated the participants to leave their workstations and daily businesses to participate in the training program. More precisely, which triggers motivate them to self-engage in training and development from already mastered manufacturing abilities?

The data collection took place after the training concept was successfully expanded and implemented across the network, meaning after the second implementation round described before. The questionnaire was distributed to participants from the training concept across all four production plants in Thailand, India, Brazil and Germany. A local gatekeeper has been nominated to minimise the potential researcher's bias and involvement, besides providing additional protection for the participants. The researcher has had no direct contact with the respondents during data collection, being impracticable to trace responses back to participants. The responses have been anonymised from the collection process onwards. Self-completed questionnaires have been digitally collected

without traceability or physically collected in a sealed box and stored securely before transcription and analysis. The results were stored in a high-security server with controlled access during the data analysis.

The sample was composed of respondents from all four cultural contexts. Questionnaires have been distributed to participants of the training concept, and the following number has been recorded:

Questionnaire	Language	Cultural	Total	Valid Responses	Valid Responses
		Context	Responses	Closed-Questions	Open-Questions
TV3.0 (Appendix 5)	Thai	Thailand	458	422	88
 EV3.0 (Appendix 2)	English	India	72	70	26
PV3.0 (Appendix 3)	Portuguese	Brazil	125	120	23
GV3.0 (Appendix 4)	German	Germany	19	13	2

TOTAL

Table 11. Case Study Data Collection – Total Number of Responses.

5.3.1 Quantitative Data Analysis

As presented in the table above, not all fulfilled questionnaires could be used for the data analysis. Some responses had to be discarded as part of the initial data-cleaning process due to excessive missing or unengaged responses. The following data cleaning and analysis steps have been applied for the case study:

- 1. Data consolidation in Microsoft Excel from all four production plants;
- 2. Data cleaning:
 - a. Check for missing rows → rows with more than 20% missing responses have been discarded. Around 2% of the responses were affected;

674

625

- b. Check for unengaged responses → clear unengaged responses such as repeating the same number across the board have been deleted;
- c. Check for missing data in columns → the missing response has been replaced with the median for the respective question. Around 1% of the total responses have been replaced. Each replacement did not represent more than 5% in any single question;
- 3. Import data into SPSS;
- 4. Check the pre-defined scale for each variable and correct it if necessary;

- 5. Descriptive Statistics:
 - a. Check for normal distribution for all questions, including skewness and kurtosis;
- 6. Reliability analysis;
 - a. Cronbach's Alpha
- 7. One-way ANOVA test.

Following the above steps, the data has been cleaned and imported into SPSS for analysis. First, descriptive statistics have been used to check if each question presents a normal distribution. According to the literature, the most strict intervals show that values should vary between |1| for skewness and |3| for kurtosis (Evans, 2017; Hancock et al., 2019) to ensure little to no variation in comparison to the normal distribution exists. Detailed results can be seen in Appendix 6, with no question presenting values over the more strict restriction of |1| for skewness and |3| for kurtosis and, thus, confirming a normal distribution and validating the data for further statistical tests. The second step checked the reliability of all forms of regulation through a Cronbach's Alpha analysis after combining the results of related questions. According to the literature, four forms of regulation have been tested by the questionnaire:



Figure 44. Case Study – Measurement Instruments and Respective Factor Loadings (own work).

According to the expected theoretical factor loadings above, each construct's measurement instrument has been tested for reliability with Cronbach's alpha. The results have been consolidated in the table below:

Measurement Instrument	Construct (Factor)	# Questions (Loadings)	Reliability (Cronbach's α)	Max. α if some questions deleted	Reliability found in the Literature ¹	Reference
Training and	Intrinsic	2	.824	-	.62 to .82	
Development	Identified	2	.854	-	.62 to .82	(R. M. Ryan &
Self-Regulation	Introjected	3	.773	.837	.62 to .82	Connell, 1989)
Questionnaire	External	3	.803	-	.62 to .82	

Table 12. Case Study – Reliability Results for all Four Forms of Regulation (Cronbach's α).

After testing questions for skewness and kurtosis and the reliability results from the triggers forms of regulation, an ANOVA has been applied to verify if there is a statistically significant difference in how the four cultural contexts respond to the *forms of regulation*. The cultural contexts with less than two participants have been removed from the analysis once they cannot be compared with ANOVA and post hoc Tukey's-b Tests. The results from the one-way ANOVA for the four remaining cultural contexts have been consolidated in the table below.

Table 13. One-way ANOVA results for all ten variables and the significant difference between groups – variables showing significant differences have been marked in green.

Construct	Sum of Squares	df	Mean Square	F	Sig.
(Factor)					
	(В	etween/ Within Grou	ups)		
B5.28_Ext	96.156/ 2,082.282	3/ 621	32.052/ 3.353	9.559	.000
B5.32_Ext	84.421/ 1,825.765	3/ 621	28.140/ 2.940	9.571	.000
B5.25_Ext	248.192/ 1,990.490	3/ 621	82.731/ 3.205	25.811	.000
B5.26_Introj	225.418/ 1,915.776	3/ 621	75.139/ 3.085	24.356	.000
B5.31_Introj	31.198/ 1,521.802	3/ 621	11.399/ 2.451	4.652	.000
B5.34_Introj	44.745/ 1,827.095	3/ 621	25.915/ 2.942	5.069	.000
B5.29_Ident	17.555/ 1,557.302	3/ 621	5.852/ 2.508	2.334	.073
B5.30_Ident	51.419/ 1,770.581	3/ 621	17.140/ 2.851	6.011	.000
B5.27_Intrin	53.648/ 1,673.398	3/ 621	17.883/ 2.695	6.636	.000
B5.33_Intrin	17.479/ 1,781.443	3/ 621	5.826/ 2.869	2.031	.108

¹ For the Basic Psychological Need Stisfaction Scale: Bulgarian Sample / US Sample (Deci et al., 2001)
The green-marked results above show a statistically significant difference between at least two groups in specific loadings for the *forms of regulation*. It is important to note that the ANOVA is the best fit for analysing continuous variables (Hancock et al., 2019). The Likert-scale ordinal type of variables tested above might be affected by results clustered at the end of the scale, causing the so-called floor or ceiling effect (Hancock et al., 2019). Once means found are much closer to the top of the scale, it would be expected that the ceiling effect would cause all questions to show no signs of significant difference between the groups, but that was not the case. Eight out of ten questions showed that at least two groups statistically differ in the degree to which their samples respond to specific *forms of regulation*. Thus, the ANOVA test presents the first indication that there might be differences in the way different cultural contexts react to the same *form of regulation*.

5.3.2 Qualitative Data Analysis

Moving on to the qualitative analysis and as discussed in the methodology Sub-Section for the *case study*, content analysis has been used to evaluate the qualitative answers. The verbatim, gist and superordinate analysis steps have been applied to cluster and interpret the data collected. The first step of the verbatim analysis has been done by filtering the main word or expression from each written sentence collected. In total, 184 sentences have been extracted from the feedback, and the verbatim analysis has provided 123 words or expressions after duplicate removal. The written feedback presented two inputs: motives and reasons for participating in the training concept and *structural and organisation* feedback for the training program. The latter included participants who did not comment or had no input. The tables below show the results, split into the categories and including the frequency with which the terms appeared:

Term (Motives)	Frequency	Term (Motives)	Frequency
Develop myself	3	Improve quality	1
Assess one's skills	2	Increase competitive skills	1
Gain new knowledge	2	Increase potential	1
Good	2	Interacting with people from other areas	1
Have to learn always	2	It is fun	1
Learn new knowledge	2	It is fun and exciting	1
Learn new things	2	Its a lot of fun	1
Like the challenge	2	Its a very good activity	1
Selfimprovement	2	Join for fun	1

 Table 14. Verbatim Analysis for the Case Study – Terms and Frequencies (Motives).

To develop myself	2	Join next time	1
360 degree knowledge	1	Joy of learning	1
Annual employee skill competition	1	Learn something new	1
Apprenticeship	1	Learning	1
Assess one's abilities	1	like to learn	1
Brings people together	1	Like to learn cross functional skills	1
challenge	1	Like to learn new things	1
Challenging content every year	1	love to learn	1
Chances of winning are low	1	Make us believe in ourselves	1
Competition	1	New experience	1
Create pride	1	Offers good recognition	1
Don't want to embarrass me	1	Opportunity to learn	1
Enhance development	1	Passing the test was a benchmark for me	1
Enhance own skills	1	Personal development	1
Enhancing own skills	1	Practice mediation and dexterity	1
Enjoy the training	1	Practice to improve	1
Excellent	1	Practice my skills	1
Excellent training knowledge and abilities	1	Production skill oriented	1
Explore own skills	1	Test own skills	1
Feel like I need something	1	Test skills	1
Feel recognized	1	Test your knowledge	1
Further develop learning and working	1	To develop myself	1
Good competition	1	Тор	1
Good for self-motivation	1	training to grow	1
Good to have theory and practice	1	Useful to employees	1
Great challenge	1	Very fun	1
Have prize money for winners	1	Very good	1
Help develop the organization	1	Very good activity	1
Helps to make better decisions in the future	1	Very good experience	1
Helps to understand the issues	1	Very nice program	1
Highly skill-enhancing activity	1	Want more competition	1
I can do it	1	Want new knowledge	1
If change no fun	1	Want to develop myself	1
If successful should move level in the company	1	Want to get better	1
Improve my skills	1	Want to test my abilities	1
Improve own skills	1	Would like more challenge	1

Table 15. Verbatim Analysis for the Case Study – Terms and Frequencies (Organisation and no comments).

Term (Organisation)	Frequency	Term (Organisation)	Frequency3
No	26	Need to involve office	1
Don't have	18	Night shift is not involved thoroughly	1
UQC all areas	5	not be discontinued	1
involve other technologies	3	Not covered for every department	1
Create subcategories	2	Not possible to participate in daily business	1
To have it every year	2	Prizes should be under the BMW brand	1
Better judgment needed	1	Provide additional time to participate	1
Do it more often	1	It should be done continuously	1
Doubts in the rules	1	Should do everyone	1
Extend to other areas	1	Should have all the time	1
I am from the office	1	Should have more time to participate	1
Insert PPEs	1	Superficial training	1
Involve indirect	1	Tired of working, no time	1
Keep test confidential	1	Too little time to prepare	1
Make it practical	1	Too technical for logistics	1
Missing understanding of rules	1	Want to have more often	1
More diverse competition	1		

After the verbatim analysis, the terms have been then interpreted, using synonyms when applicable to start the clustering process. The results from the second step, the gist analysis, can be seen in the tables below:

Gist Analysis (Motives)	Frequency	Gist Analysis (Motives)	Frequency
Like to learn new things/knowledge	20	Feels recognition	3
To develop/improve myself	15	Brings people together	2
Very nice program	9	Like the experience	2
Like the challenge	8	Low chances of winning	1
Test skills	7	Creates pride	1
It is fun/enjoyable	7	Don't want to embarrass me	1
Like the training orientation of the program	6	Good for self-motivation	1
Like the competition	5	Should include money prizes	1
Enhance skills	5	Should allow promotions if won	1
Beneficial for the employees/company	5	Test knowledge	1

 Table 16. Gist Analysis for the Case Study – Clustered Terms and Frequencies (Motives).

Table 17. Gist Analysis for the Case Study – Clustered Terms and Frequencies (Organisation and no comments).

Gist Anaylsis (Organisation)	Frequency	Gist Anaylsis (Organisation)	Frequency
No comments	44	Add PPEs to the training process	1
Involve all areas in the UQC	14	Keep test confidential	1
It should be done more often	7	Make it more practical	1
Additional time needed to prepare/train	5	Integrate night shift more thoroughly	1
Should create sub-categories	4	Include prizes from BMW	1
Improve rules transparency/communication	3	Training too superficial	1

The last step of the content analysis consists of clustering the gist results into superordinate categories, where the synonym relations of the gist analysis are then clustered into further interpreted relations. For this purpose, the known *forms of regulation* measured by the Self-Regulation Questionnaire (SRQ) (Black & Deci, 2000; R. M. Ryan & Connell, 1989) and applied in the quantitative analysis have been used to classify the terms. The idea behind the analysis is that terms not part of any known forms would indicate a new field or nuance of the regulation process that must be considered for further research. Thus, the gist analysis results have been clustered by the respective *form of regulation* they represent. This analysis is only relevant for the *motives* part of the qualitative data analysis; thus, the *organisational* feedback has not been further clustered into the superordinate categories. The result of this superordinate analysis per form of regulation can be seen below:

Regulation	Gist Analysis (Term)	Frequency	Regulation	Gist Analysis (Term)
	Should include money prizes	1		Like to learn new things/knowledge
External	Should allow promotions if won	1		Like the challenge
	TOTAL	2		Like the training orientation of the program
				Enhance skills
Regulation	Gist Analysis (Term)	Frequency	Identified	Beneficial for the employees/company
Integrated	To develop/improve myself	15		Brings people together
integrated	TOTAL	15		Like the experience
				Good for self-motivation
Regulation	Gist Analysis (Term)	Frequency		TOTAL
	Test skills	7		
	Like the competition	5	Regulation	Gist Analysis (Term)
	Feels recognition	3		Very nice program
	Low chances of winning	1	Intrinsic	It is fun/enjoyable
Introjected	Creates pride	1		TOTAL
	Don't want to embarrass me	1		
	Test knowledge	1		
	ΤΟΤΑΙ	10		

Table 18. Superordinate Analysis for the Case Study – Forms of Regulation and Frequencies (Motives).

All 101 terms and expressions from the gist analysis were allocated within one known *form of regulation* covered by the literature, with no qualitative feedback from participants leading to infer any new cluster regarding how motivation is regulated. The qualitative data show that the engagement triggers applied during the implementation of the training program provided all *forms of regulation* at some level or frequency, with participants from all four cultural contexts reacting to it. Interestingly, and surprisingly not covered in the literature reviewed, the most frequent motives to participate in the training program were due to *identified forms of regulation*. For the practitioner, it leads to infer that associates are keener to respond to this *form of regulation* than the others, calling for substantial reinforcement of this engagement trigger to achieve an optimal motivational level across the international network.

The quantitative and qualitative data results have contributed to the exploratory character of the *case study*, with quantitative measurement results indicating that there is indeed some level of cultural variability in how different cultural contexts react to *autonomous* versus *controlled forms of regulation*. However, due to its limited factor loadings, further research is needed before conclusions regarding cross-cultural employee motivation can be drawn. The discussion regarding the next steps and call for further research has been emphasized in the following Section.

5.4 Chapter Conclusion

The results presented in the *case study* are inconclusive. The ANOVA test used to compare the difference between groups showed that the samples in different cultural contexts attribute different levels of importance to the more *controlled forms of regulation*. At the same time, the same cannot be said about the more *autonomous forms of regulation*. Still, the test applied is limited, and broader research with larger samples needs to be conducted to compare *autonomous* and *controlled forms of regulation* across the four analysed cultural contexts.

The qualitative data collection showed no new signs of *forms of regulations* that cannot be classified within the known *controlled* and *autonomous* forms. This exploratory result further supports the need for broad quantitative analysis through a statistical method to provide evidence of how each cultural context reacts to the *form of regulation*. Although it provided an overview of the main reasons for participating in a training program in the automotive industry, the question remains if all the involved cultural contexts respond equally to the triggers. Even if limited by the number of questions loading in each regulation factor, the quantitative analysis indicated that there might be a significant difference in the degree to which each cultural context engages in such a training and development program. The *case study* suggests that the *forms of regulation* might vary between cultural contexts; thus, concrete evidence is needed to ensure that future implementations of the training program are appropriately adapted to the respective cultural context.

With the expansion of the training program across the international production network, the leading research questions for the study remain unanswered: Can the same triggers engage all assembly line employees from different cultural contexts? Even though the project was successful in Brazil and later across the production network, it does not mean that the other three cultures will respond equally to the triggers, or does it? The *case study*'s data has outlined no straightforward answer, requiring further academic support for the inquiry. The following Chapter, the *main study*, supports the cultural variability claim inferred so far with concrete evidence from broader data collection and rigorous analysis methods, consistently contributing to academic knowledge and directly providing practical implications in the industry.

6 Study 2 (Main Study) – Autonomous versus controlled forms of regulation: a crosscultural analysis from Thai, Indian, Brazilian and German cultural contexts.

Before moving into the *main study*, a short reminder regarding how the thesis is structured is suitable to position the current Chapter within the broader research inquiry. Once Chapter 5 relates to the *case study*, Chapter 6 moves into the *main study*, including its respective data collection and statistical analysis, to answer the research question. This *main study* confirms the indication raised by the *case study* regarding the cultural variability claim between cultural contexts and provides the main contributions to knowledge and praxis. The figure below reminds the reader of the cultural contexts, size, data and targets from the *case* and *main study* discussed in the two subsequent Chapters.



Figure 45. Case and Main Study Structure and Steps – Chapter 6, Focus on the Main Study (own work).

As defined above, Chapter 6 focuses on the *main study*, with Section 6.1 providing the opening remarks linking the *case study*'s indication with the methodological choices applied by the *main study* to answer the research question. After that, the Chapter moves on to the measurement instrument's piloting process. Before the broad distribution of the self-completion questionnaires to all samples in the international production network, the measurement instrument's English version was piloted to test its reliability. The pilot study has also been used to indicate the expected theoretical framework's model by statistically testing the factor's loadings with a series of Exploratory Factor Analyses (EFA) later confirmed by the broad data collection.

The main study's data collection and subsequential analysis is then described in Section 6.3. The data collection used the piloted, validated and translated questionnaires and the data analysis was conducted using two software, IBM SPSS and SmartPLS, for the statistical analysis. Analogously to the pilot, the quantitative analysis starts with descriptive statistics and reliability tests. The theoretical model is then investigated with a series of EFAs and later tested regarding its model fit using SEM. Based on the validated model, Multigroup Analysis (MGA) and ANOVA tests have then been used to test the study's main hypotheses and answer the research question. The Chapter ends with a short preliminary and conclusions before moving on to the detailed discussions of findings and implications in Chapter 7.

6.1 Main Study Delimitation and Introductory Remarks

The main study presents similar boundaries to those outlined for the *case study*. It moves from an indication generated by the *case study* based on limited sampling and measurement instruments to a broader hypotheses verification framework. Its data collection has been conducted with assembly line and office associate samples from four international production sites within the same automotive group. Its dispersed geographical locations and broad cultural dimensions spectrum (Hofstede, 2001; House et al., 2004) allow for a distinctive, rich data collection process. This multicoloured environment can be represented and statistically measured using robust methodological principles with broad measurement instruments, precisely the *main study*'s aim.

Some benefits and limitations arise based on limiting the study to one company in the automotive manufacturing branch. Firstly, these boundaries allow for removing possible additional causal components, isolating variables such as influence from the organizational culture or level of study from participants. By conducting the research within the same automotive group, basic work models and guidelines are applied across the international production network, also towards employee motivation and recognition, reducing unknown

causal, correlation and mediations relationships. Similar education levels are also expected once the company regulates the associate hiring processes when comparing assembly line and office associates from the production sites, further supporting direct comparisons.

However, by limiting the study to the described boundaries, any generalisation or inference outside the defined perimeter must be made cautiously. Further discussion about how the restrictions might be methodologically overcome for future studies can be found at the end of Chapter 7 under *Limitations and Future Research*. The *main study* has been carefully designed to provide the direct cross-cultural comparisons needed to answer the research question. Its cross-sectional design uses quantitative data collection and analysis and has been delimited by the above-described boundaries to facilitate this direct comparison between how different cultural contexts react to the same *autonomous* and *controlled forms of regulation*.

6.2 Pilot Study Data Collection and Analysis

As discussed before and based on the methodology presented in Chapter 4, a *pilot study* was administered before the main study occurred. The pilot has been used to validate the measurement instruments used and check the questionnaires' overall structure and all respective language translations. Consistent with the aim and based on the literature, the *pilot study* had the following objectives:

- Ensure measuring instruments and overall research design are functioning well (Bryman & Bell, 2011);
- Check the clarity and adequacy of the instructions presented (Bryman & Bell, 2011; McNeill & Chapman, 2005);
- Identify questions that make respondents uncomfortable to answer or questions with an undesired consistent influence to repeat results (Bryman & Bell, 2011; McNeill & Chapman, 2005; Newbold et al., 2013);
- Check if the measurement instruments used from the literature present the same reliable results as those found to exist in similar studies (Neuman, 2014);

- Pre-analyse the data, expected factors, and research framework constructs regarding its reliability (Hancock et al., 2019); providing insights on how to improve it, if necessary (Neuman, 2014);
- Pre-analyse the pilot data as a simulation for the final analysis after the main study's data collection (Rugg & Petre, 2007).

As described in Sub-Section 4.4.4 – Main Study Questionnaire Development, Testing and Validation – before the *pilot study*, initial data were collected to validate the steps during the translation process. This initial collection has not been included in the pilot study due to significant structural, sequence and translation changes conducted during the process. Some of the issues found during this initial phase and the correspondent necessary changes have been described below:

- Some respondents did not notice that some questions were reverse-coded. Thus,
 Part A of the final questionnaire, containing all questions related to *basic psychological needs*, have been moved to the front. Once the literature has
 validated this measurement instrument with the reverse-coded questions,
 moving it forward has ensured that the respondents were aware of this negative
 formulation from the beginning, keeping the participant's engagement high
 throughout the whole process;
- During the second pilot of the English version with ten participants, it was noted that two did not answer the final page of the questionnaire, the fourth one. It meant 20% missing responses in Part C, *work engagement* because they did not turn over the final page at the end of the questionnaire. Therefore, the whole questionnaire has been adapted to fit only three pages, drastically reducing the chance of participants missing any of the Parts or questions;
- Sentences would repetitively start with the answer *because*, which consistently annoyed some of the participants. Thus, the repetitive word has been moved to the question title to improve clarity and understanding;
- The example of how to answer the questionnaire was not clear enough and has been improved to include an answer marked in red with the respective legend and fulfilment instruction;

 Less than 5% of the participants answered some open questions throughout the questionnaire. Thus, the space available for the answers to those questions has been optimized to improve overall clarity and structure;

After initial feedback corrections, each language's new 2.0 version of the questionnaire has been consolidated. All data for the pilot study has been generated based on version 2.0 or above of the two-way translated questionnaires. After version 2.0, the main structure of the questionnaire was kept intact, and only grammatical corrections took place. The data collection point, marked in blue, is detailed in the diagram below:



Figure 46. Pilot Data Collection (Marked in Blue) (own work).

The pilot sample was composed of respondents from a similar population; however, they were not part of the target main study population (Neuman, 2014) to avoid future

issues regarding sample representativeness for the main study (Bryman & Bell, 2011; McNeill & Chapman, 2005). The data collection for the pilot has been conducted with a paper version of the questionnaire. The following number of participants has been recorded:

Questionnaire	Language	Cultural Context	Responses	Valid Responses
TV2.0	Thai	Thailand	13	13
EV2.0	English	India	7	7
PV2.0	Portuguese	Brazil	45	41
GV2.0	German	Germany	46	45
		TOTAL	111	106

Table 19. Pilot Study – Total Number of Responses.

As shown in the table above, not all fulfilled questionnaires could be used for the data analysis at the end. Some responses had to be discarded as part of the initial datacleaning process due to excessive missing or unengaged responses. The following data cleaning and analysis steps have been applied for the *pilot study*:

- 1. Data consolidation in Microsoft Excel;
- 2. Data cleaning:
 - a. Check for missing rows → rows with more than 20% missing responses have been discarded. Around 2% of the responses were affected;
 - b. Check for unengaged responses → clear unengaged responses such as repeating the same number across the board or missing to interpret the reverse coded questions have been deleted;
 - c. Check for missing data in columns → the missing response has been replaced with the median for the respective question. Around 1% of the total responses have been replaced. Each replacement did not represent more than 5% in any single question;
- 3. Import data into SPSS;
- 4. Check the pre-defined scale for each variable and correct it if necessary;
- 5. Recode reverse-coded questions;
- 6. Descriptive Statistics:
 - Check for normal distribution for all questions, including skewness and kurtosis;

- 7. Reliability analysis;
 - a. Cronbach's Alpha
- 8. EFA Exploratory Factor Analysis.

Following the above steps, the data has been cleaned and imported into SPSS for analysis. First, the reverse-coded questions have been re-coded accordingly. Then, descriptive statistics were used to check if each question presented a normal distribution. The check has been conducted based on each variable's values for skewness and kurtosis. According to the literature, the most strict intervals show that values should vary between |1| for skewness and |3| for kurtosis (Evans, 2017; Hancock et al., 2019) to ensure little to no variation compared to the normal distribution. Hancock et al. (2019) further argue that analytical problems are expected to occur only when results are not between |2| for skewness and |7| for kurtosis. If results are within this interval, little to no distortion is expected to happen (Hancock et al., 2019). Questions with extreme values must be watched closely during the following analysis steps before being removed from the study; they could affect overall reliability or present cross-loadings in other factors. Descriptive statistics results, including skewness and kurtosis for Parts A, B, and C of the questionnaire, can be found in Appendix 7.

The results show values over the more strict restriction of |1| for skewness and |3| for kurtosis. Even when applying this stricter rule, it is noticeable that most of the variables are under |1| for skewness, with 43% going above. For those higher than |1|, 96% are smaller than |1.5|, which is still very close to the established limit, further restricting distortions on subsequential analysis. However, if the |2| limits for skewness are used, as supported by Hancock et al. (2019), only one single variable, *B1.5_Ident*, presents a value higher than the limit. This variable was later watched closely in the following analysis for any distortion it might generate.

Regarding kurtosis, the results have been excellent; even when applying the most strict limitation of [3], only one variable has presented results over the limit. With 5.619, the same *B1.5_Ident* appears to be an issue in a normal distribution. Even though the value is below the [7] limits advocated by Hancock et al. (2019), the question was carefully observed

when further analysing the *pilot* data and later with the *main study* data collection and analysis—all other questions present kurtosis within the acceptable parameter.

As described in the methods Section, the second step has been to check the reliability of all expected factors using Cronbach's Alpha. According to the *theoretical research framework*, eight factors were expected to exist. The measurement instruments were supposed to load on these pre-defined factors accordingly, as described by the following diagram:



Figure 47. Pilot Study – Measurement Instruments and Respective Expected Factor Loadings (own work).

According to the expected theoretical factor loadings above, each construct's measurement instrument has been tested for reliability with Cronbach's alpha. The table below consolidates the reliability results for the pilot study, with all of them over the .700 threshold.

Measurement Instrument	Construct	# Questions	Reliability	Max. α if some	Reliability found in	Reference
	(Factor)	(Loadings)	(Cronbach's α)	questions deleted	the Literature ²	
Basic Psychological Need	Autonomy	7	.773	.805	.62/.79	
Satisfaction at Work	Competence	6	.764	.770	.81/.73	(Deci et al., 2001)
Scale	Relatedness	8	.784	.812	.57/.84	
Training and	Intrinsic	6	.835	-	.62 to .82	
Development	Identified	6	.804	-	.62 to .82	(R. M. Ryan &
Self-Regulation	Introjected	6	.852	-	.62 to .82	Connell, 1989)
Questionnaire	External	6	.826	-	.62 to .82	
Work & Well-being Survey	Work	17	.913	.916	.93	(Schaufeli &
(UWES)	Engagement					Bakker, 2004)

Table 20. Pilot Study – Reliability Results for all Eight Factors (Cronbach's α).

After the reliability analysis for every factor, a sequence of Exploratory Factor Analysis (EFA) was conducted to test which factors could be identified and clustered based only on the available responses without pre-defining any constraints. Starting with no factor limitation, the EFA identified 15 factors based on the available data. For the EFA conducted in SPSS, the following parameters have been set:

- Descriptive Statistics: Reproduced and KMO have been flagged;
- Extraction: Maximum Likelihood, extract based on Eigenvalue first and later restricted;
- Rotation: Promax
- Options: Sorted by size and Suppress small coefficients <.03 have been flagged.

Without any factor restrictions, the first results showed that some factors presented single loading from single questions, making it very complex to analyse the results and propose a theoretical construct. A factor restriction has been included to force the single results to load into one of the more substantial existing factors to improve the analysis. The number of allowed factors has been reduced until stability has been achieved in the pattern matrix. A clear pattern matrix has been reached by limiting the number of factors to five; results can be seen in Appendix 8.

² For the Basic Psychological Need Stisfaction Scale: Bulgarian Sample / US Sample (Deci et al., 2001)

The pattern matrix shows that the framework converges well when restricted to five factors. The only three cross-loadings shown are presented in the lower correlation level for each factor. Therefore, instead of removing the cross-loading questions to clean the matrix, small coefficient suppression has been raised to .4. As stated before, the EFA could not identify and distinctively separate all eight factors expected for the research framework but only five. The three missing factors seem to strongly correlate with another similar factor in the same construct.

The following diagram illustrates the strong correlation and resultant theoretical model described by the EFA. It is important to note that the described strong correlation is not seen between variables but rather with different constructs within the same variable. It happens one time between *autonomy* and *competence* within the *basic psychological needs* independent variable and two times between *autonomous* and *controlled* sub-constructs within the *form of regulation* mediating variable.



Figure 48. Research Conceptual Framework based on EFA of the Pilot Study (own work).

The identified high correlation and factor cross-loading between *intrinsic* and *identified* regulated triggers is expected once the two are considered more *autonomous forms of regulation*. The high correlation impeding the differentiation between these two

mediating variables has been extensively documented in the meta-review of meta-analyses provided by Ryan et al. (2023), confirming the result. The same expectation exists for the *introjected* and *external* regulated triggers once considered the more *controlled forms of regulation*. Separating both constructs could be achieved by removing a specific question with strong cross-factor loading to identify two factors. Due to the *pilot*'s limited amount of data collected, the decision has been made to maintain all questions for the *main study* and test if the expected level of detail and separation with additional data can be reached.

In conclusion, the *pilot study* has been used to test the capability of the chosen and developed measurement instruments in providing results for the posed research framework and hypotheses. Based on the pilot data analysis, it is safe to admit and support the following statements:

- Basic Psychological Needs With similar or better reliability values than the ones found in the literature, the chosen measurement instruments seem to provide the data reliably as expected. The primary issue is the strong crossloading between autonomy and competence, but before any new factor structure can be proposed, the main study has been conducted with the expectation that additional data might differentiate the two constructs;
- 2. Forms of Regulation Consistent reliability results with every set of six questions have been found to exist, with α achieving over .8 in each case; all four constructs seem to present coherent results within expectations: *intrinsic, identified, introjected* and *external*. Two strong correlations have been identified with the EFA, similar to the *basic psychological needs*. This strong correlation is expected once the two *intrinsic* and *identified* factors are known in the literature as *autonomous forms of regulation*. The same logic is valid for the cross-loading identified between *introjected* and *external*, both identified as *controlled regulation forms*. Additional data from the main study might support the separation of those constructs and, therefore, no changes in the measurement instruments have been conducted based on this conclusion;
- 3. *Work Engagement* EFA has provided evidence that the measurement instrument for *work engagement* presented one single factor, with all

questions loading in the same one. Reliability results for this set of questions are very good with α =.913, close to the expected value found in the literature for the UWES-17 of α =.93 (Schaufeli & Bakker, 2004);

4. Supported by the literature, the results presented are positive, achieving the expected metrics for a pilot study. Once no clear outliers can be identified without pondering the differences between the *pilot study* and the *main study*, all questions, variables, and measurement instruments have been kept intact for the final data collection. Any removal of questions, factors or variables has not been conducted at this stage; any change or deletion has been considered speculation on causalities and thus can not be confirmed nor supported by the *pilot study*. It is also valid to note that the *pilot study* has been applied in a similar population but mixed up answers from all four cultural contexts, possibly being the source of disturbance for better results.

To summarize, the chosen measurement instruments can quantify and evaluate the theoretical constructs, even if limited to the small cross-cultural sample from this *pilot study*. Questions' reliabilities have presented good to excellent results, with some even over .9., and factor loadings seem to follow the expected *theoretical framework* model. With the statements above supported by the *pilot* data and the literature, this data collection and analysis process can be safely extended to the *main study*. The results of the *main study* have been consolidated in the following Section.

6.3 Main Study Data Collection and Analysis

After detailing the methods in Chapter 4 and discussing the *pilot study* in the last Section, Section 6.3 consolidates all data analysis regarding the *main study*. The analysis starts with basic descriptive statistics and testing the reliability of all measurement instruments. After confirming that the data acquired is normally distributed, the construct and the relationships expected to exist between the variables are drafted into a theoretical model, first with an exploratory approach and later with a confirmatory objective. Based on the confirmed model's fit, the cross-cultural hypothesis is tested using two statistical methods: Multigroup Analysis (MGA) and One-way Analysis of Variance (one-way ANOVA). The detailed steps to the approach have been described below, starting with the data collection results.

The data collection process has been completed over nine months, gathering participants' responses with the local gatekeeper's support in each production plant. The questionnaires were successfully applied in the four samples in Thailand, India, Brazil and Germany using the methodology and administration methods presented in Sub-Section 4.4.6. The total amount of responses collected has been consolidated below.

Table 21. Main Study -	- Total Number	of Responses.
------------------------	----------------	---------------

Language	Cultural Context	Responses	Valid Responses
Thai	Thailand	503	470
English	India	136	72
Portuguese	Brazil	168	149
German	Germany	129	126
	TOTAL	936	817
	Language Thai English Portuguese German	LanguageCultural ContextThaiThailandEnglishIndiaPortugueseBrazilGermanGermanyTOTAL	LanguageCultural ContextResponsesThaiThailand503EnglishIndia136PortugueseBrazil168GermanGermany129TOTAL936

The available raw data, including all responses, was submitted through a series of steps to clean the data, leaving only the valid responses for analysis. Thus, the first step in preparing the collected data for analysis was to screen the results for missing and unengaged answers to avoid unwanted distortions. The following steps have been applied to sharpen the data set for further statistical analysis:

- 1. The four different data sets collected from each sample have been consolidated into one single Microsoft Excel file;
- All non-numerical responses presented as results for an ordinal Likert-scale variable have been converted into numerical data; for instance: (7) -Completely Agree has been changed in the standalone number 7 to allow the mathematical calculation by the used software, SPSS and SmartPLS;
- 3. All non-numerical categorical responses in a foreign language have been translated back from Thai, Portuguese or German language into English;
- 4. Using the consolidated Excel file, the data cleaning process has been conducted as follows:

- All rows have been checked for missing responses. Rows with more than 20% missing responses have been discarded entirely. Around 2,1% of the responses were affected by this process;
- b. All rows have been checked for unengaged responses. Clear, unengaged responses have been deleted, such as repeating the same number across the board or missing to interpret the reverse-coded questions. This process has been done systematically through a series of steps:
 - i. Standard deviation was calculated per Part of the questionnaire: A, Basic Psychological Need Satisfaction at Work Scale, B, Training and Development SRQ – SRQ T&D, and C, Work & Well-being Survey – UWES. If no deviation has been found to exist, which means the standard deviation was equal to zero, the respondent was likely unengaged. This issue has been even more prominent, showing clear signs of disengagement in Part A of the questionnaire, which included reverse-coded questions. Theoretically, this Part could not generate zero standard deviation if responded correctly once reversed coded questions are expected to present inverse reflected results at the other end of the Likert scale;
 - Missing to interpret two or more reversed formulated questions in Part A of the questionnaire also indicated that the respondent was likely unengaged. Unengaged respondents have been removed from the data set;
 - iii. Unrealistic short response times were also removed whenever time stamps were available in the data set. Some of the extractions reports, for instance, in Germany and India, reported a time stamp showing the total time to complete the questionnaire. Based on the *pilot study*, an engaged respondent is expected to complete the questionnaire as fast as 8 minutes. Time stamps around 2-3 minutes or even less

have to be considered unengaged respondents and have been removed from the data set accordingly;

- c. All variables have been checked for missing data in the column. The missing response has been replaced with the median for the respective question. Around 0,76% of the total responses have been replaced. The replacement of missing data did not achieve more than 2% in any single variable. The best-approximated fit has replaced the missing data to avoid distortions during the statistical evaluation:
 - Ordinary numerical Likert-scale missing responses have been replaced with the median from the data set per variable and cultural context;
 - ii. Continuous variables have been replaced with the mean from the data set per variable and cultural context;
 - iii. Categorical variables such as gender, cultural context and department cannot be extrapolated in any way and have been left blank. The total number of missing responses was less than 0,9% per analysed control variable.
- 5. All non-numerical data has been converted into an attributed numerical value to allow mathematical calculation using the software SPSS and SmartPLS;
- 6. The final data set containing only valid responses was then saved in a new table with only relevant rows and columns to facilitate data and variable recognition when importing it into the respective software.

After the data was adequately prepared, only valid responses remained. The data analysis was done using IBM SPSS Statistics 27 and SmartPLS 3. The data import steps and subsequent statistical analysis, as described in the methods Sub-Section, have been summarized below:

IBM SPSS Statistics 27:

- 1. Import data into SPSS;
- 2. Check the pre-defined scale for each variable and correct it if necessary;
- 3. Recode all reverse-coded questions;

- 4. Descriptive Statistics:
 - a. Check for normal distribution for each question using the whole data set, including skewness and kurtosis;
 - b. Check for normal distribution for each question when grouped by cultural context to allow for statistical analysis between groups, including skewness and kurtosis;
- 5. Means and standard deviation per Factor;
- 6. Reliability analysis;
 - a. Cronbach's Alpha for the whole sample;
 - b. Cronbach's Alpha, when grouped by cultural context;
- 7. EFA Exploratory Factor Analysis;
- 8. One-way ANOVA comparison between the cultural contexts.

SmartPLS 3:

- 1. Export data from SPSS in .csv format;
- 2. Import .csv file into SmartPLS 3;
- 3. Prepare the model with latent variable and factor loadings following the estimated model for the *research framework*;
- 4. Structural Equation Modeling (SEM) analysis on the model:
 - a. Path analysis for the *research framework* model:
 - i. Discriminant validity analysis;
 - ii. Construct reliability and validity analysis;
 - iii. Model fit analysis;
 - iv. Bootstrap analysis with 1000 samples;
 - b. Confirmatory Factor Analysis based on the reduced and optimized model by combining strongly correlated factors within the same variable to improve the construct's reliability and model fit:
 - i. Discriminant validity analysis;
 - ii. Construct reliability and validity analysis;
 - iii. Model fit analysis;
 - iv. Bootstrap analysis with 1000 samples;

- c. Mediation analysis for the *autonomous* and *controlled forms of regulation*;
- d. Path analysis per group cross-cultural comparisons;
- e. Multigroup Analysis (MGA) cross-cultural comparisons;

Results have been consolidated in the following Sub-Sections, mirroring the abovedefined sequence of process steps.

6.3.1 Descriptive Statistics

After the data was cleaned and imported into SPSS for analysis, the reverse-coded questions were re-coded based on the respective Likert scale. Descriptive statistics have been used to check whether each question presents a normal distribution, an essential prerequisite for most statistical tests. The check has been conducted based on each variable's values for skewness and kurtosis. According to the literature, the most strict intervals show that values should vary between |1| for skewness and |3| for kurtosis (Evans, 2017; Hancock et al., 2019) to ensure little to no variation compared to the normal distribution. Hancock et al. (2019) further argue that analytical problems are expected to occur only when results are not between |2| for skewness and |7| for kurtosis. If results are within this interval, little to no distortion is expected to happen (Hancock et al., 2019). The scholar further argues that questions with extreme values must be watched closely during the following analysis steps before being removed from the study; they could affect overall reliability or present unexpected cross-loadings in other factors.

The tables below show the results regarding the normal distribution for Parts A, B, and C of the questionnaire, respectively, *basic needs*, *motivational triggers* and *work engagement*. The extracted table with results for all variables can be found in Appendix 9; the summary table below shows the consolidated results for the whole data set:

Descriptive	Construct	Support Literature	# Questions	Examples (only relevant if values are higher
Statistics	(Factor)			than the limits defined by the literature)
	<111	(Evans, 2017; Hancock et al., 2019)	42	NA
Skewness	111 < Skewness < 121	(Hancock et al., 2019)	21	C1.10_WkEng (-1,586); B2.15_Ident (-1,527)
ORCHINE55	> 121	(Hancock et al., 2019)	-	-
	TOTAL		62	
	< 131	(Evans, 2017; Hancock et al., 2019)	62	NA
Kurtosis	131 < Skewness < 171	(Hancock et al., 2019)	-	-
11010010	> 171	(Hancock et al., 2019)	-	-
	TOTAL		62	

 Table 22. Normal Distribution Analysis – Skewness and Kurtosis Results for the Whole Data Set.

Based on the results, normal distribution exists in all 62 analysed questions, with most of the results falling into the most strict norm for skewness and kurtosis. No results present skewness >|2| or kurtosis >|3| in the whole data set, validating normal distribution for all questions. Skewness and kurtosis were also evaluated when splitting the data set into groups to allow further detailed cross-cultural analysis. Detailed results per cultural context can be seen in Appendix 10, while the table below shows the consolidated overview.

Table 23. Normal Distribution Analysis Skewness and Kartosis Resaits per country spent most of Life in

Descriptive Statistics	Construct (Factor)	Support Literature	port Literature # Question				Examples (only relevant if higher than limits)
	(, 2000)		Brazil	Thailand	India	Germany	
	<111	(Evans, 2017; Hancock et al., 2019)	31	42	44	40	NA
		(Hancock et al., 2019)	29	20	18	22	C1.17 (-1,946) BR
Skewness	1 < Skewness < 2						A1.3 (-1,776) TH
							C1.3 (-1,481) IN
							C1.1 (-1,497) DE
	> 2	(Hancock et al., 2019)	2	-	-	-	B2.19 (-2,119) BR
	TOTAL		62	62	62	62	
•	< 131	(Evans, 2017; Hancock et al., 2019)	58	62	62	62	NA
Kurtosis	3 < Skewness < 7	(Hancock et al., 2019)	4	-	-		B2.19 (4,781) BR
	>171	(Hancock et al., 2019)	-	-	-		-
	TOTAL		62	62	62	62	

Similar to the whole data set, the results per group show a normal distribution for most of the data. Only 2 questions out of 62 show skewness >|2|, but with numbers close to the |2| borderline and only affecting the Brazilian sample. Regarding kurtosis, results were similar to the whole data set presented before, with almost all data showing kurtosis <|3| and only 4 cases with kurtosis between |3| and |7|. No kurtosis >|7| was found to exist, validating normal distribution for further statistical tests.

Besides checking the data regarding its normal distribution, reliability analysis for each measurement instrument has been conducted using Cronbach's alpha. The reliability analysis was done first for the whole data set and later for each group to further validate cross-cultural analyses. Reliability tests have been conducted twice for each variable, including all items and removing the items with lower loading to increase the overall reliability of the measurement instrument, with both results being then compared with the literature for expected fit. The deleted items have been described below, and reliability results are consolidated afterwards.

Basic Psychological Needs:

- Autonomy: all 3 reversed coded questions (A1.5, A1.11 and A1.20) from a total of 7 have been removed to maximize reliability results, increasing it from .530 to .750;
- Competence: all 3 reversed coded questions (A1.3, A1.14 and A1.19) from a total of 6 have been removed to maximize reliability results, increasing it from .655 to .760;
- Relatedness: all 3 reversed coded questions (A1.7, A1.16 and A1.18) from a total of 8 have been removed to maximize reliability results, increasing it from .748 to .821.

Forms of Regulation:

• Identified: 1 question (B1.12) from a total of 6 has been removed to maximize reliability, increasing it from .865 to .868.

Work Engagement:

• Work Engagement: 5 questions (C1.11, C1.5, C1.16, C1.6, C1.14) from a total of 17 have been removed to maximize reliability, increasing from .907 to .943.

The table with descriptive statistics per factor loading and the detailed description regarding deletion can be found in Appendix 11 and the consolidated version below.

Measurement	Construct	# Questions	Reliability	# Questions	Max. α if some	Reliability found	Reference
Instrument	(Factor)	(Loadings)	(Cronbach's α)	(Loadings)	questions	in the	
				for Max. $\boldsymbol{\alpha}$	deleted	Literature ³	
Basic Psychological	Autonomy	7	.530	4	.750	.62/.79	(Desirated
Need Satisfaction at	Competence	6	.655	3	.760	.81/.73	(Deci et al.,
Work Scale	Relatedness	8	.748	5	.821	.57 / .84	2001)
Training and	Intrinsic	6	.906	-	.906	.62 to .82	
Development	Identified	6	.865	5	.868	.62 to .82	(R. M. Ryan &
Self-Regulation	Introjected	6	.831	-	.831	.62 to .82	Connell, 1989)
Questionnaire	External	6	.723	-	.723	.62 to .82	
Work & Well-being	Work	17	.907	12	.943	.93	(Schaufeli &
Survey (UWES)	Engagement						Bakker, 2004)

Table 24. Main Study – Reliability Results for all Eight Factors (Cronbach's α) Compared to the Literature.

Each analysed factor in the construct presented reliability results >.7 and within the expected results found in the respective literature, validating the whole sample for further statistical analysis. For the reliability analysis per group, the countries where respondents lived most of their lives, with samples smaller than ten, have been removed due to low representativeness for further statistical analysis. The following country results have been removed: Denmark, Spain, Mexico, Poland, Great Britain, Austria, France, Netherlands and the ones missing values. The total amount of cases removed was 22. The reliability results per group for Brazil, Thailand, India and Germany have been consolidated in the table below.

Measurement	Construct	# Question	Reliabil	ity / Max. α if so	Reliability found in	Reference		
Instrument	nstrument (Factor) for Max. α (Cronbach's α)			the Literature ⁴				
		(Loadings)						
			Brazil	Thailand	India	Germany	Bulgaria / US	
Basic Psychological	Autonomy	4	.803	.727	.741	.736	.62/.79	(Decietal
Need Satisfaction at	Competence	3	.607	.823	.613	.610	.81/.73	(Decret al., 2001)
Work Scale	Relatedness	5	.816	.871	.794	.726	.57 / .84	
Training and	Intrinsic	6	.858	.933	.809	.882	.62 to .82	
Development	Identified	5	.872	.882	.825	.811	.62 to .82	(R. M. Ryan &
Self-Regulation	Introjected	6	.783	.789	.765	.866	.62 to .82	Connell, 1989)
Questionnaire	External	6	.765	.634	.576	.788	.62 to .82	
Work & Well-being	Work	12	.937	.956	.855	.892	.93	(Schaufeli &
Survey (UWES)	Engagement							Bakker, 2004)

³ For the Basic Psychological Need Stisfaction Scale: Bulgarian Sample / US Sample (Deci et al., 2001)

⁴ For the Basic Psychological Need Stisfaction Scale: Bulgarian Sample / US Sample (Deci et al., 2001)

For the *competence* factor within the *basic psychological need* satisfaction scale, Brazil, India and Germany presented worse reliability results than Thailand compared to the whole sample, with reliability varying between 0.6 and 0.7. Besides this borderline result, the *controlled* forms of regulation factor also showed low reliability for India, with results between 0.5 and 0.6. These low-reliability factors might be attributed to the smaller sample sizes for specific cultural contexts; they must be carefully observed during further statistical analysis once they distort or limit the cross-cultural reliability results. All other analysed factors in the construct presented reliability >.7 and within the known results found in the respective literature, validating the group samples for further statistical analysis.

6.3.2 Exploratory Factor analysis (EFA)

Following a similar analysis sequence to the *pilot study*, an Exploratory Factor Analysis (EFA) was conducted before the model was tested and validated through Structural Equation Modeling (SEM). The idea is to check if the *main study* confirms the *pilot study's* results or if adaptations to the theoretical model are needed before modelling it in SmartPLS. After the reliability analysis for every factor has been confirmed in the last Sub-Section, a sequence of EFA's has been used to test which factors can be identified and, if needed, combined to simplify the theoretical model. The EFA's were conducted for each variable's measurement instrument: *basic psychological needs, forms of regulation* and *work engagement*. The EFAs were conducted in SPSS with the following parameters:

- Descriptive Statistics: Reproduced and KMO have been flagged;
- Extraction: Maximum Likelihood, extract based on Eigenvalue first and later restricted;
- Rotation: Promax Component correlation matrix provided values >.32 for direct oblimin;
- Options: Sorted by size and Suppress small coefficients <.03 have been flagged.

The following adequacy parameters have been checked for each EFA result:

• Check for adequacy: Kaiser-Meyer-Olkin Measure of Sampling Adequacy >.6;

• Significance <.001.

The EFA results for each variable's measurement instrument, *basic psychological needs, forms of regulation* and *work engagement* can be seen in the consolidated table below, with detailed interpretations for each variable in the following Sub-Sections.

Table 26. EFA – Factors.	Adequacy Results	(KMO and Bartlett's	Test) and Total	Variance Explained.
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Factor	Theoretical # of	Final # of Factors	Kaiser-Meyer-	Bartlett's Test	Total Variance
	Factors	without Strong	Olkin Measure	of Sphericity	Explained
		Cross-Loadings	of Sampling	Sig.	
		(Pattern Matrix)	Adequacy		
			>.6	<0.001	>60%
Basic Psychological Needs	3	1	.834	.000	46,38
(Autonomy, Competence and Relatedness)					
Autonomous Forms of Regulation	2	1	.946	.000	67,85
(Intrinsic and identified)					
Controlled Forms of Regulation	2	1	.878	.000	53,12
(External and Introjected)					
Work Engagement	1	1	.958	.000	61,90

6.3.2.1 EFA – Basic Psychological Needs

Starting with no factor limitation, the EFA applied to the *basic psychological needs* identified four factors generated by the data set. The extracted results presented strong cross-loading between the three factors expected to exist independently: *autonomy*, *competence* and *relatedness*. A clearer EFA, separating these factors, was only possible after limiting the factors to be extracted to three, according to the literature, and removing some loadings to maximize the factor's reliability. The following loadings have been removed to achieve the expected construct:

- Autonomy: all 3 reversed coded questions (A1.5, A1.11 and A1.20) from a total of 7, have been removed to maximize reliability results, increasing it from .530 to .750;
- Competence: all 3 reversed coded questions (A1.3, A1.14 and A1.19) from a total of 6, have been removed to maximize reliability results, increasing it from .655 to .760;

- Relatedness: all 3 reversed coded questions (A1.7, A1.16 and A1.18) from a total of 8, have been removed to maximize reliability results, increasing it from .748 to .821;
- Additionally, strong cross-loadings between the factors have also been removed.

The detailed EFA analysis for *basic psychological needs* can be found in Appendix 12. Results show that the adequacy meets KMO and Bartlett's Test >.6, with .834 and significance <.001. Once the construct was forced to fit with only three factors, its results represented only 46% of the total variance; thus, the results achieved with this EFA are limited due to these conditions. Even though the pattern matrix clearly separates the three expected factors for *basic psychological needs* without any cross-loadings, they have a lower explanation of the total variance and, thus, present a limited view of the model. The separation into those three independent factors must be further tested with confirmatory factor analysis and model fit during the structural equation modelling, Sub-Section 6.3.3, before conclusions can be drawn.

6.3.2.2 EFA – Forms of Regulation

The detailed EFA analysis for *forms of regulation* can be found in Appendix 13. Starting with no factor limitation, the EFA applied to the *forms of regulation* identified four factors generated by the data set. Even though the number of factors was within expectation, the factor loadings were not correctly divided into the four known forms of regulation: *intrinsic, identified, introjected* and *external*. Results show that the adequacy meets KMO and Bartlett's Test >.6, with .936 and significance <.001, with the four factors found by the EFA representing over 63% of the total variance. Even though the results are appropriate, the pattern table has shown an overlap of the two *autonomous* factors, *intrinsic* and *identified*, and the two *controlled* factors, *introjected* and *external*, similar to the results found by the *pilot study*.

Two additional EFAs have been done, one for the *autonomous* and one for the *controlled forms of regulation*, to force the appearance of the four known factors. By limiting the extracted factors to two, the model was forced to provide results for the separate constructs and the factors to appear for each independent analysis, if possible. The

adequacy test showed positive results with KMO and Bartlett's Test >.6 for both *autonomous* and *controlled forms of regulation*. The total variance explained resulted in over 67% for the *autonomous* and 53% for the *controlled*. However, the pattern table showed a strong cross-loading between the two *autonomous* factors, *intrinsic* and *identified*, and the two *controlled* factors, *introjected* and *external*. Thus, the single factors within *autonomous* and *controlled forms of regulation* cannot be extracted from the data set, suggesting a factor analysis with consolidated results for both of them. This simplified version of the *research framework* model is presented at the end of this Sub-Section before inputting the model in SmartPLS for the SEM analysis.

6.3.2.3 EFA – Work Engagement

Similarly to the other variables, the EFA applied to *work engagement* started with no factor limitation, identifying one single factor generated by the data set. As expected from the literature, a single factor explains this construct after removing the loadings to maximize reliability. Accordingly, the following loadings have been removed:

 Work Engagement: 5 questions (C1.11, C1.5, C1.16, C1.6, C1.14) from 17 have been removed to maximize the measurement instrument's reliability, increasing it from .907 to .943.

The detailed EFA analysis for *work engagement* can be found in Appendix 14. Results show that the adequacy meets KMO and Bartlett's Test >.6, with .958 and significance <.001, with the single factor found by the EFA representing almost 62% of the total variance and the factor matrix supporting this representation. The results for *work engagement* validate the theoretical model for further statistical analysis and are within the expectations based on the literature review. The consolidated theoretical model overview based on the EFA analysis of the three variables can be found in the following Sub-Section.

6.3.2.4 EFA – Theoretical Model Overview

As discussed above, *work engagement* has been explained with a single factor, and the *forms of motivation* were not able to be distinctively separated further than *autonomous*

and *controlled*. Regarding *basic psychological needs*, the *pilot study* indicated that *autonomy* and *competency* were strongly correlated and, therefore, have been considered a single factor. Differently from the *pilot study*, the EFA for the *main study* has been able to split the variable into the three factors when restraining the model; however, the results explained only 46% of the variances and must be treated with caution before the model fit confirmation. Thus, the theoretical model overview provides a guide for the SEM analysis and must be tested accordingly before drawing further conclusions regarding the model. The figure below illustrates the results of the EFA for the theoretical model for the *main study*.





Consistent with the *pilot study* results, the identified high correlation and factor cross-loading between *intrinsic* and *identified forms of regulation* is expected based on the literature once the two are considered more *autonomous*. The same expectation exists for the *introjected* and *external* forms of regulation once considered more *controlled*. The argument for separating both constructs by removing a specific question with strong cross-factor loading to identify two factors was unsuccessful during the EFA. The issue could be related to the sample size or limitation of the measurement instrument to measure these constructs discriminantly precisely. Factor loadings had strong correlations and could not be identified independently.

Once again, consistent with the *pilot study* results, it is essential to note that the described strong correlation has not been seen between variables but rather between different factors within the same variable. One time between a*utonomy* and *competence* during the *pilot study* within the basic psychological needs independent variable and two times between sub-constructs within the *form of regulation* mediating variable generating the *autonomous* and *controlled* factors. With these considerations noted, the theoretical model presented in this Sub-Section provides the initial input needed for the SEM analysis.

6.3.3 Structural Equation Modeling (SEM)

Based on the EFA results, the *research framework* has been modelled in SmartPLS for further analysis. The confirmatory characteristics of the path and factor analysis presented in the following Sub-Sections provide additional evidence for the model fit, testing the discriminant validity between the factors and the overall construct's reliability and validity. These results are then used to support the theoretical model with concrete statistical evidence of its fit before moving on to the cross-cultural analysis used to answer the research question.

The SEM evaluation started with modelling the construct and the subsequent path analysis for the theoretical model, with the overall construct and relationships created based on expectations from the literature review. All factors analysed in the SEM are reflective and not formative, meaning each loading reflects the analysed factors and the measured construct, with multiple factor loadings measuring the same factor simultaneously. Once they are not formative, one loading can be removed without invalidating the factor completely. Thus, all SmartPLS analyses have used consistent base calculation and bootstrapping algorithms to account for the correlation between these reflective factors. The figure below illustrates the theoretical model provided by the literature, including its respective factor loadings based on each measurement instrument used.



Figure 50. Main Study – Measurement Instruments and Respective Expected Factor Loadings (own work).

The model provided by the literature in the theoretical research framework has been tested before introducing the changes suggested by the pilot and main study EFAs and later moving on to an improved and optimized model. As explained in the methods Section, the SmartPLS modelling results have been evaluated based on the following criteria:

- Discriminant validity for the factors: each factor has been checked for strong
 correlations with other factors. This analysis has been used to check if the factors
 can be considered independent and loadings do not overlap. The two factors
 cannot be considered discriminant if the correlation with any other factor is
 stronger than with itself. The table's diagonal results showing the correlation
 strength from the factor with itself must present the highest correlation numbers
 from all cross-comparisons.
- Construct reliability and validity: Similar to the descriptive statistics, the reliability results per factor have been checked. Results for Cronbach's alpha >.700 have

been deemed acceptable (Cortina, 1993; Taber, 2018). Regarding validity, the Average Variance Extracted (AVE) has been used as the metric for the construct. Results for AVE >.500 have been considered acceptable (Fornell & Larcker, 1981; Lawrence, 2009).

- Overall model fit: the model has been checked regarding its overall fit. The Standardized Root Mean Squared Residual (SRMR) has been used as the metric for this test. Results for SRMR <.080 have been deemed acceptable (Hu & Bentler, 1999; Ringle, 2020).
- Bootstrap analysis with 1000 samples: the paths have been checked for statistical significance. For the bootstrap analysis, the T-Test with acceptable limits >1.96 and P-Values with acceptable limits <.050 have been used to verify the result's significance (Barrow, 2017; Newbold et al., 2013).

Three iterations were necessary until the construct achieved the reliability, validity and model fit metrics. Criteria acceptance results for each iterative process step have been consolidated in the table below, while the respective details have been described in the following sub-sections.

Iteration #	Description and Number of Factors	Discriminant Validity (HTMT Ratio)	Construct Reliability	Construct Validity	Overall Model Fit	Bootstrap Analysis with 1000 Sample
		correlation with any other factor cannot be stronger than with itself	>.700	(AVE) >.500	(SRMR) <.080	(P-Value) <.050
1 st Iteration	3 Basis Psychological Needs 4 Forms of Regulation 1 Work Engagement	Four factors show a strong correlation between them	All Factors >.700	4 Factor <.500	1.574	All Factors >.050
2 nd Iteration	1 Basic Psychological Needs 1 Autonomous Forms of Regulation 1 Controlled Forms of Regulation 1 Work Engagement	No factor shows a strong correlation between them	All Factors >.700	2 Factor <.500	.072	All Factors <.050
3 rd Iteration	1 Basic Psychological Needs 1 Autonomous Forms of Regulation 1 Controlled Forms of Regulation 1 Work Engagement	No factor shows a strong correlation between them	All Factors >.700	1 Factor <.500 (.475)	.065	All Factors <.050

 Table 27. SEM – Factors, Adequacy Results (KMO and Bartlett's Test) and Total Variance Explained.

6.3.3.1 Path Analysis – 1st Iteration

The initial theoretical framework has been modelled in SmartPLS 3 for analysis. Based on Cronbach's alpha results presented in Sub-Section 6.3.1 – Descriptive Statistics – of this Chapter, the loadings with low reliability have been removed from the factors to improve the overall reliability of the construct accordingly. The final model, including its results from the standard consistent PLS algorithms, is shown in the figure below.





The Fornell-Lacker Criterion and the Heterotrait-Monotrait Ratio (HTMT) discriminant validity analysis present three main issues regarding the correlation between the factors. First, the *basic psychological needs* factors of *autonomy, competence* and *relatedness* strongly correlate. These results corroborate the EFA results from Sub-Section 6.3.2, where the three factors were only able to be seen when forced into a model with only three factors and represented only 46% of the total variance when done so. It further supports the conclusion that this measurement instrument cannot distinguish between the three analysed sub-components of *basic psychological needs*. Thus, the sub-components have

been combined into one variable for the reduced and optimized theoretical model for further confirmatory factor analyses in the second iteration.

Secondly, similar results to the *pilot study* have been confirmed regarding the *forms of regulation*. The more *controlled* forms of regulation, *external* and *introjected*, present a strong correlation and cannot be analysed as independent factors. Thirdly, the same can be said about the more *autonomous* forms of regulation, *intrinsic* and *identified*, also presenting a strong correlation, making it impossible to separate the two factors. As discussed, the meta-review of meta-analyses from Ryan et al. (2023) supports the result, confirming the differentiation impracticality due to the high correlation between these two mediating factors.

Besides the factor's discriminant validity analysis, the construct has been tested regarding its reliability, validity, and overall model fit. Results for reliability have been positive, with all factors scoring over the .700 threshold, as seen in Section 6.3.1 of this Chapter. When analysing the AVE for construct validity, results from four of the eight factors show problems scoring under the .500 acceptable limit. The model fit results are also under expectation, with SRMR much higher than the .080 limit. Additionally, to evaluate the statistical significance of the paths found, a bootstrap analysis has been run in SmartPLS to simulate consistent and reliable results when simulating one thousand theoretical samples. The figure below shows non-significant statistical relevance for all paths, with P-Value over the .050 established limit and T-Statistics under the 1.96 limit. Detailed results can be found in Appendix 15.

The consolidated results show that the model fit is insufficient, with factors not being represented discriminately and construct validity not within an acceptable window. Overall, it indicates that a more fitting model is needed. More precisely, based on the first SEM path analysis and the available EFAs, a reduced and simplified construct with only one dependent variable, one independent variable and two mediating variables. The figure below illustrates this theoretical construct.



Figure 52. SEM – Path Analysis Results – Reduced and Optimized Theoretical Model (own work).

This new reduced and optimized theoretical model must be further tested before applying it to cross-cultural analyses. The path and confirmatory factor analysis in the following Sub-Sections refer to the second and third iterations, applying the same metrics to test the optimized model regarding its discriminant validity, construct reliability and validity and model fit.

6.3.3.2 Path Analysis - 2nd Iteration

Before the analysis and to improve the new model's construct validity, the path analysis loadings showing results under .500 have been removed. After comparing with the reliability analysis of Cronbach's alpha, the following loadings have been removed:

Basic Psychological Needs:

 Autonomy: all 3 reversed coded questions (A1.5, A1.11 and A1.20) from a total of 7 have been removed to maximize reliability results, increasing it from .530 to .750;
- Competence: all 3 reversed coded questions (A1.3, A1.14 and A1.19) from a total of 6 have been removed to maximize reliability results, increasing it from .655 to .760;
- Relatedness: all 3 reversed coded questions (A1.7, A1.16 and A1.18) from a total of 8 have been removed to maximize reliability results, increasing it from .748 to .821.

Forms of Regulation:

• Identified: 1 question (B1.12) from a total of 6 has been removed to maximize reliability, increasing it from .865 to .868.

Work Engagement:

 Work Engagement: 5 questions (C1.11, C1.5, C1.16, C1.6, C1.14) from a total of 17 have been removed to maximize reliability, increasing it from .907 to .943.

The construct was then modelled in SmartPLS, and the path analysis was run using the consistent PLS algorithm; the results can be found in the figure below.



Figure 53. SEM – CFA Reduced Model – Low-Reliability Loadings Removed (own work).

As mentioned, the same metrics have been applied for the optimized model to test results for discriminant validity, construct reliability and validity, and model fit factors. Results for the factor's discriminant validity show much better results, with all factors showing no correlations stronger than when compared to themselves. Results for reliability have also been positive, with all factors scoring over the .700 threshold. Even though the AVE for construct validity still showed factors scoring under the .500 limit, the model fit has improved significantly, with SRMR of .072, under the .080 limit. Thus, this theoretical model is a much better representation of the collected data. Detailed results can be found in Appendix 16.

Additionally, to evaluate the statistical significance of the paths, a bootstrap analysis has been run in SmartPLS to test consistent and reliable results when simulating one thousand theoretical samples. Results show non-significant statistical relevance for all paths, with P-Value over the .050 established limit and T-Statistics over the 1.96 limits. The bootstrap results have been consistently improved compared to the initial theoretical model. Loading for each factor and path between all factors were significant, with T-Statistics over the 1.96 limit and P-Values under the .050 limit, further validating the reduced theoretical model.

6.3.3.3 Path Analysis – 3rd Iteration

As presented above, the only metric not achieved with the reduced model is the AVE for construct validity, and factor loadings must be further analysed to improve the AVE metric's results. Results from *basic psychological needs* showed .452, and *controlled forms of regulation* showed .446, both under the .500 established acceptable limit. Even though the reliability for *controlled forms of regulation* has shown results of .723 according to the SPPS analysis, the construct validity for the factor was still below .500. Thus, SmartPLS results showing factor loadings under .600 have been removed to increase its construct's validity. The following loadings <.600 have been additionally removed:

- Basic Psychological Needs: deletion of A1.15_Aut and A1.21_Rel;
- Forms of Regulation: deletion of B1.11_Ext, B1.1_Introj and B2.14_Introj;

After the removal, the results for path analysis, factors discriminant validity, construct reliability and validity, and model fit have been the following.



Figure 54. SEM – CFA Reduced and Optimized Model – Low-Reliability Loadings under .600 Removed (own work).

Results for the factor's discriminant validity continue to show good results, with all factors showing no correlations stronger than when compared to themselves. Reliability results have also continued to be positive, with all factors scoring over the .700 threshold. The AVE results have also improved, with *controlled forms of regulation* showing a .501 result, slightly over the acceptable limit. The only restriction continues to be the AVE results for *basic psychological needs*, showing, even after improvement, a .475 result. This borderline result is much closer to the established limit than before but must be further considered as a possible limitation of the current study regarding construct validity. The model fit has improved even further after the optimization, presenting an SRMR of .065, under the .080 limit. Thus, the theoretical reduced and optimized model is a much better representation of the collected data. Detailed results can be found in Appendix 17.

Similar to the reduced model, a bootstrap analysis has been run in SmartPLS to evaluate the statistical significance of the paths to test consistent and reliable results when

simulating one thousand theoretical samples. All paths are statistically significant, with P-Value over the .050 established limit and T-Statistics over the 1.96 limits. The bootstrap results stayed consistent. Loading for each factor and path between all factors were significant, with T-Statistics over the 1.96 limit and P-Values under the .050 limit, further validating the reduced theoretical model. As presented above, the only metric not achieved with the reduced and optimized model is the construct validity for the *basic psychological needs* factor. Results showed a borderline result from .047, much closer to the .050 established acceptable limit.

Additionally, it is essential to notice that this final model presented a path of statistical significance between *controlled forms of regulation* and *work engagement*, also close to the borderline, with P-Value around .047. When repeatedly running the bootstrap with one thousand different random samples, sometimes the results have fallen over the 0.050 limit for P-Value and under the 1.96 limit for the T-Statistics. In other words, different random samples generated by the bootstrap procedure showed a T-Test significance close to the border between 1.8 and 2.0. Therefore, results must also be considered a limitation of the current study and have been addressed in Section 7.5.

Based on the positive results presented during the path and confirmatory factor analysis, the reduced and optimized model has been redeemed as an acceptable fit for the cross-cultural analysis conducted in the following Sub-Sections. Before moving on to the main cross-cultural hypothesis testing for the current study, a mediation analysis has been conducted to evaluate the impact of *controlled* and *autonomous* forms of regulation have on how *basic psychological need* fulfilment relates to *work engagement*. The results of the mediation analysis are presented in the Sub-Section that follows.

6.3.3.4 Mediation Analysis

Mediation analysis has been used to verify if and how the two *forms of regulation* influence the variable's relationships. It aims to check whether a positive, negative or neutral mediation exists in the available data for later literature comparison and the study's further contribution to knowledge. The mediation analysis has been done by bootstrapping the

model to verify if the mediation through *controlled* or *autonomous* regulation forms is statistically significant. The results have been consolidated in the table below.

Total Indirect Effect	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
Basic Needs -> Work	.170	.171	.035	4.823	.000
Engagement					
Specific Indirect Effect	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
Basic Needs ->	.041	.042	.021	1.905	.057
Controlled -> Work					
Engagement					
Basic Needs ->	.130	.129	.035	3.671	.000
Autonomous -> Work					
Engagement					

Table 28. SEM – Mediation Analysis – Total and Specific Indirect Effects from Forms of Regulation.

The total effect shows that *forms of regulation* have a statistically significant total indirect effect on the relationship between *basic needs* and *work engagement*. The P-Values results under .050 and T-Statistics over 1.96 confirm the overall significance. When independently analysed, the mediation is shown to solely come from the *autonomous* forms of regulation, with P-Values <.000, and *controlled* forms presenting a statistically non-significant result, with P-Values of .057. Following the cross-cultural analyses, these results corroborate the literature expectation and have been compared regarding hypothesis testing in Chapter 7.

6.3.3.5 Cross-cultural Comparisons – Path Analysis per Group

So far, the *main study* has presented how the theoretical estimated construct has been explored and tested regarding its reliability and validity. It presented a final reduced and optimized model showing acceptable metrics regarding fit and consistent statistical relevance. Based on this reduced and optimized confirmed model, a cross-cultural comparison has been conducted to test the hypothesis presented in Section 3.2 and answer the research question. Still, within the SEM umbrella, the Multigroup Analysis (MGA) has been applied to check if statistically significant differences exist between how different cultural contexts react to the same *forms of regulation*. Thus, the *autonomous* and *controlled forms of regulation* are here compared for each group to support or reject the respective hypotheses later.

The comparison has been made using the SmartPLS algorithm for MGA. It analyses the path coefficient for each cultural group and compares their differences to check if they are statistically significant. Analogously to the bootstrapping results for the path analyses, the expected P-Values with statistically significant differences should be under the .05 limit to confirm the null hypothesis. In other words, if P-Value results under the .050 limit exist when comparing two groups, their results are statistically significantly different.

For this analysis, the whole data set has been split into four cultural groups based on the control variable country where respondents lived the most time of their lives. In total, 13 groups would theoretically have been possible, but problematically most with tiny sample sizes. The groups presenting sample sizes ten or smaller have been removed from the analysis once no reliable statistical test can be achieved. As expected, the groups then converged into the four core cultural contexts targeted by this study: Brazil, Thailand, India and Germany. Before moving into the MGA, a path analysis per group has been done to ensure that group coefficient results are robust and statistically significant. The results for the path analysis per group have been presented below.

Path	Cultural	Path Coefficients	Path Coefficients	STDEV	t-Value	p-Value
	Group	Original	Mean			
Autonomous ->	Brazil	.174	.173	.132	1.320	.187
Work Engagement	Germany	.212	215	.088	2.401	.017
	India	.318	.329	.149	2.140	.033
	Thailand	.445	.449	.104	4.256	.000
Basic Needs ->	Brazil	.609	.614	.069	8.792	.000
Autonomous	Germany	.317	.346	.077	4.099	.000
	India	.653	.674	.066	9.822	.000
	Thailand	.695	.696	.027	25.293	.000
Basic Needs ->	Brazil	331	.348	.087	3.793	.000
Controlled	Germany	178	211	.145	1.228	.220
	India	.491	.530	.073	6.740	.000
	Thailand	.625	.626	.029	21.256	.000
Basic Needs ->	Brazil	.426	.435	.097	4.415	.000
Nork Engagement	Germany	.592	.602	.069	8.573	.000
	India	.205	.209	.148	1.382	.167

Table 29. SEM – Cross-cultural	Comparisons – Path	Coefficient Analysis.
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	Thailand	.253	.255	.071	3.546	.000
Controlled ->	Brazil	.037	.048	.071	0.520	.603
Work Engagement	Germany	027	032	.078	0.343	.732
	India	.129	.139	.150	0.862	.389
	Thailand	097	100	.090	1.069	.285

Most of the path coefficients have shown statistical significance. Particular issues can be seen in some cultural contexts, but the most prominent negative result is the path between *controlled forms of regulation* and *work engagement*. For this path, all coefficients show no statistical significance. The results were also predictable and referred back to the limited significance result found when bootstrapping the reduced and optimized model with the whole data set, with P-Value results close to the 0.050 limits. Splitting the sample into smaller groups further decreases the significance, causing an additional limitation for the current study. This limitation is further discussed in the next Chapter 7.

When splitting the data into groups, the small sample size made a bootstrap analysis much more complex, frequently invalidating results for specific path coefficient calculations. The bootstrap algorithm per group created problems for the smaller samples in Germany, India and Brazil for some specific paths between variables, providing a blank result. Thus, a bootstrap for one thousand randomly generated samples did not contribute to valid results for the study. Based on this path analysis' results and conscious of the relationship limitation between *controlled forms of regulation* and *work engagement*, the MGA has been conducted. The results can be seen in the following Sub-Section.

6.3.3.6 Cross-cultural Comparisons – Multigroup Analysis

The MGA compares the difference in the path coefficient between each group. Results are then tested regarding their statistical significance. In other words, it shows if the different cultural groups present a statistically significant difference for all analysed variable relationships and their mediating factors. The MGA results can be seen in the table below.

Path	Path	(Brazil -	(Brazil –	(Brazil -	(Germany -	(Germany -	(India -
	Coefficients	Germany)	India)	Thailand)	India)	Thailand)	Thailand)
Autonomous ->	difference	-,038	-,144	-,271	-,107	-,233	-,126
Work Engagement	p-Value	,832	,463	,098	,524	,088	,490
Basic Needs ->	difference	,292	-,043	-,086	-,335	-,378	-,043
Autonomous	p-Value	,007	,658	,235	,001	-	,581
Basic Needs ->	difference	,510	-,160	-,294	-,670	-,803	-,134
Controlled	p-Value	,029	,154	,000	,001	-	,080
Basic Needs -> Work	difference	-,166	,222	,173	,388	,339	-,049
Engagement	p-Value	,161	,192	,150	,007	,001	,808,
Controlled -> Work	difference	,064	-,092	,134	-,156	,070	,226
Engagement	p-Value	,537	,558	,248	,352	,563	,203

 Table 30. SEM – Cross-cultural Comparisons – MGA Results per Group.

Results have shown that some specific variables' relationships and mediation paths present significant differences between the cross-cultural samples. Three of the five paths presented significant differences, at least between two groups:

- Basic needs → Controlled: significant difference for Brazil-Germany, Brazil-Thailand and Germany-India comparisons;
- Basic needs → Autonomous: significant difference for Brazil-Germany and Germany-India comparisons;
- Basic needs → Work Engagement: significant difference for Germany-India and Germany-Thailand comparisons.

Of all seven significant path coefficient differences found, six exist when Germany is included in the comparison between groups. For the following discussion, it is essential to notice that the German sample only contains data collected from office respondents; no participants from the production shop floor have answered the questionnaire. The samples are mixed with office and production participants for all other cultural groups. Thus, the consistency in the results involving Germany raises the question of whether the statistically significant difference would be caused due to cultural differences or, eventually, other environmental aspects. To further stress the issue, new data set groups have been created to analyse results for production and office separately. For both cases, independent MGAs have been run, searching for statistically significant differences between the new groups. Results can be found below.

Path	Path	(Brazil -	(Brazil –	(Brazil -	(Germany -	(Germany -	(India -
	Coefficients	Germany)	India)	Thailand)	India)	Thailand)	Thailand)
Autonomous ->	difference	,173	,132	,051	-,040	-,122	-,081
Work Engagement	p-Value	,667	,782	,936	,827	,559	,781
Basic Needs ->	difference	,489	,071	,085	-,418	-,404	,014
Autonomous	p-Value	,000	,576	,577	,004	,020	,985
Basic Needs ->	difference	,595	-,123	-,283	-,718	-,878	-,160
Controlled	p-Value	,099	,597	,179	,005	,010	,322
Basic Needs -> Work	difference	-,484	-,326	-,551	,158	-,068	-,226
Engagement	p-Value	,248	,536	,269	,481	,926	,521
Controlled -> Work	difference	-,208	-,364	-,219	-,157	-,011	,146
Engagement	p-Value	,472	,317	,611	,530	,965	,671

 Table 31. SEM – Cross-cultural Comparisons – MGA Results per Group – Office Only.

 Table 32. SEM – Cross-cultural Comparisons – MGA Results per Group – Production Only.

Path	Path	(Brazil –	(Brazil -	(India -
	Coefficients	India)	Thailand)	Thailand)
Autonomous ->	difference	-,256	-,300	-,044
Work Engagement	p-Value	,355	,057	,924
Basic Needs ->	difference	-,075	-,129	-,054
Autonomous	p-Value	,493	,068	,554
Basic Needs ->	difference	-,222	-,251	-,030
Controlled	p-Value	,098	,002	,870
Basic Needs -> Work	difference	,350	,316	-,035
Engagement	p-Value	,169	,009	,985
Controlled -> Work	difference	,157	,179	,022
Engagement	p-Value	,565	,137	,985

Even when controlling for the department where respondents worked, some statistically significant differences have been found for specific variables and mediation relationships in different cultural groups. It means the department has not restricted the differences; they seem to exist despite that. Additional attention is needed regarding the limitations caused by the smaller sample sizes when splitting the data set further based on departments as done for this analysis. The results might not achieve statistical significance due to the limited data available. This limitation is further discussed in the following Chapter.

The MGA results show that some path coefficients seem to have a statistically significant difference for some cross-cultural evaluations. Even though the tests presented additional concrete evidence regarding cross-cultural variability for the analysed model, a relationship pattern besides Germany vs the other groups cannot be identified, only in some singular cases. To further stress the issue and cross-check the results before conclusions are drawn, an ANOVA has been used to triangulate results with the SEM analysis from this Sub-Section and validate the answer to the cross-cultural question. Results from the one-way ANOVA between the cultural groups have been presented in the following Sub-Section.

6.3.4 Cross-cultural Comparisons – One-way ANOVA

An additional statistical test, independent of the previous modelling, has been applied to cross-check the results of the SEM analysis. A one-way ANOVA is used to analyse if variance exists between two or more groups, testing whether the means from each group are considered statistically significantly different. Some pre-requisites must be fulfilled to apply the ANOVA test; thus, the following requirements have been checked before moving forward:

- Independent observations: each input is one independent participant → This has been ensured during data collection. The method does not allow for overlapping results, and each answer is one independent participant;
- Normal Distribution: ANOVA can only be applied to normally distributed data. This requisite has been checked in Sub-Section 6.3.1, presenting acceptable results for skewness and kurtosis;
- Homogeneity must be ensured: the variance is statistically significant and equal for all the subgroups when samples are not similar in size. In the current study, samples are not similar in size, varying from 72 valid responses in India to 470 valid responses in Thailand; therefore, the homogeneity must be tested.

With the first two requisites confirmed, the homogeneity must be analysed before proceeding. It has been done using Levene's test of homogeneity of variances, where the null hypothesis states that these are equal between groups. Results showed that from the 24 questions regarding forms of regulation, only three loadings presented significant values >.05: B1.3_Intrin, B1.4_Introj and B1.11_Ext. It is interesting to notice that each is loading in a different factor, leaving at least five homogeneous loadings for analysis, thus providing consistent results per factor. Generally speaking, the results appear to be homogenous for most of the data analysed, validating the use of ANOVA.

The one-way ANOVA has been applied once all prerequisites have been met. Results for the test have been presented in the table below, consolidated per *form of regulation*.

	Sie Between				Subset for	A	pha = 0.05			
Factor Loadina	Groups		Gro	up*				Mee	ans	
Louding	ANOVA	Germany	Thailand	Brazil	India		Germany	Thailand	Brazil	India
B1.2_Ext	<.001	1	2	3	3		2,44	3,02	3,84	3,85
B1.6_Ext	<.001	1	2	2	2		3,63	5,32	5,28	4,88
B1.11_Ext	<.001	1	2	3	3		3,91	4,66	5,21	5,32
B2.13_Ext	<.001	1	2	2	2		2,27	3,61	3,99	4,04
B2.18_Ext	<.001	1	3	2	3		3,28	5,51	4,56	5,24
B2.23_Ext	<.001	1	2	2	3		2,73	3,59	3,48	4,17
	AVERAGE	1,0	2,2	2,3	2,7		3,04	4,29	4,39	4,58
	STD. DEV.		0,72 0,70							
B1.1_Introj	<.001	1	2	2	2		3,60	4,90	4,78	4,79
B1.4_Introj	<.001	1	2	2	2		3,00	4,15	4,07	4,43
B1.9_Introj	<.001	1	2	2	3		3,22	5,03	4,66	5,28
B2.14_Introj	<.001	1	2	2	2		3,56	4,82	4,86	5,25
B2.16_Introj	<.001	1	3	2	3		2,35	5,05	3,95	4,97
B2.21_Introj	<.001	1	2	2	2		3,19	4,79	4,72	5,25
	AVERAGE	1,0	2,2	2,0	2,3		3,15	4,79	4,51	5,00
	STD. DEV.		0,0	60				0,8	33	
						_				
B1.5_Ident	<.001	3	1	3	1		5,88	5,26	5,99	5,53
B1.8_Ident	<.001	1	1	3	3		5,29	5,55	6,01	5,90
B1.12_Ident	<.001	1	2	2	2		4,65	5,21	5,51	5,60
B2.15_Ident	.052	1	1	1	1		6,05	6,32	6,25	6,33
B2.20_ldent	.051	1	1	1	1		5,50	5,66	5,92	5,93
B2.24_Ident	<.001	1	1	2	2		5,67	5,40	5,98	5,76
	AVERAGE	1,3	1,2	2,0	1,7		5,51	5,57	5,94	5,84
	STD. DEV.		0,3	37			0,21			
B1.3_Intrin	.345	1	1	1	1		4,74	4,90	4,64	4,76

 Table 33. Cross-cultural Comparisons – One-way ANOVA for each Question/Factor Loading.

	STD DEV		0	25			0	17	
	AVERAGE	1,5	1,0	1,5	1,5	5,50	5,25	5,62	5,58
B2.22_Intrin	.023	1	1	1	1	5,50	5,30	5,72	5,44
B2.19_Intrin	<.001	2	1	2	2	5,89	5,62	6,29	6,11
B2.17_Intrin	.030	2	1	1	1	5,64	5,18	5,05	5,17
B1.10_Intrin	<.001	1	1	2	2	5,35	5,21	5,96	6,00
B1.7_Intrin	<.001	2	1	2	2	5,86	5,30	6,08	5,97

*if mean results from a specific cultural context are found to be part of more than one group, then the leading group for the case is chosen to be the one with the closest results to the other means in the same group.

The table shows a statistically significant difference for every question measuring *external* and *introjected* forms of regulation. All six-factor loadings for both *controlled* forms of regulation present a statistically significant difference between at least two of the four analysed cultural groups. When comparing those results with the more *autonomous forms of regulation*, the evidence of the latter has not been so overwhelming. Four out of six-factor loading have presented significant statistical differences for *identified* forms of regulation and for the *intrinsic*, only half of them. The results show that the more *autonomous* the form of regulation is, the more homogeneous the means between the groups tend to be.

The homogeneity when comparing means between groups seems to increase with the *internalization degree* of the *forms of regulation*. It is evident in the table with the number of independent groups created for each factor loading; the more *autonomous* the forms of regulation are, the fewer groups created by the ANOVA analysis to accommodate the significant similar means. The tendency is also confirmed when analysing the consolidated standard variance for each *form of regulation*, which consistently reduces the more *autonomous* the forms of regulation are. To illustrate the analysis, the table below presents consolidated results for each *form of regulation*, including their means and standard deviation.

Form of		Consolidated Averages and Standard Deviations									
Form or Regulation			Group*				Means				
		Germany	Thailand	Brazil	India		Germany	Thailand	Brazil	India	
Extrinsis	AVERAGE	1,0	2,2	2,3	2,7		3,0	4,3	4,4	4,6	
Extrinsic	STD. DEV.		0,72					0,70			
Inter-Instead	AVERAGE	1,0	2,2	2,0	2,3		3,2	4,8	4,5	5,0	
Introjected	STD. DEV.		0,	60			0,83				
11-126-1	AVERAGE	1,3	1,2	2,0	1,7		5,5	5,6	5,9	5,8	
Identified	STD. DEV.		0,37				0,21				
Intrinsic	AVERAGE	1,5	1,0	1,5	1,5		5,5	5,3	5,6	5,6	

Table 34. Cross-cultural Comparisons – One-way ANOVA Consolidated Results per Form of Regulation.

STD. DEV.	0,25		0,17	
			<i>.</i>	

*if mean results from a specific cultural context are found to be part of more than one group, then the leading group for the case is chosen to be the one with the closest results to the other means in the same group.

Additionally, the analysis consistently shows that Germany is frequently placed in a separate group from the other three cultural contexts. Thailand, Brazil and India sometimes present similar means and are accommodated in the same group or combinations into two independent groups. However, Germany consistently presents significantly different results, especially for the *controlled forms of regulation*. Germany appears to have a more significant gap than other groups when analysing the more *controlled* forms of regulation, *extrinsic* and *introjected*.

This result is consistent with the ones found during the SEM analyses, which raises the same question as before regarding how those differences are somehow related to the departmental limitation of the German data set. Two additional ANOVA tests have been conducted to test this hypothesis, independently analysing the data based on the office vs production control variable. The results from the one-way ANOVAs for office and production for all four cultural groups have been consolidated below:

- Office data set grouped by cultural context:
 - Intrinsic, controlled: sig. < 0.001 for all factor loadings;
 - Introjected, controlled: sig. <0.001 for all factor loadings;
 - Identified, autonomous: three out of six factors with sig. >0.001 –
 B2.15_Ident, B2.20_Ident and B2.24_Ident;
 - Intrinsic, autonomous: three out of six factors with sig. >0.001 –
 B1.3_Intrin, B2.17_Intrin, B2.22_Intrin.
- Production data set grouped by cultural context:
 - Intrinsic, controlled: sig. < 0.001 for all factor loadings;
 - Introjected, controlled: sig. <0.001 for all factor loadings;
 - Identified, autonomous: three out of six factors with sig. >0.001 for identified –B2.15_Ident, B2.20_Ident, B2.24_Ident;
 - Intrinsic, autonomous: three out of six factors with sig. >0.001 –
 B1.3_Intrin; B2.17_Intrin; B2.22_Intrin.

As presented above, similar results to the samples per group are found when the departmental control variable is considered. A strong differentiation seems to exist between the cultural contexts if only production or only office is analysed, further validating the interpretation without this control variable. Further investigation has then been conducted to verify if a statistically significant difference between the means of the factor loading between office and production exists, even without grouping the data set by cultural context. When applying ANOVA to the whole sample, for all 24 factors, the significance was higher than .001, varying between .009 and .999. Thus, the null hypothesis is rejected, and no statistically significant difference exists for any factor loadings. In other words, the mean results of all *forms of regulation* do not significantly vary between office and production, further supporting the analysis that a cultural context plays a significant role in the differences found.

It is important to note that the ANOVA is the best fit for analysing continuous variables (Hancock et al., 2019). As mentioned during the use of this test for the pilot study, the Likert-scale ordinal type of variables tested here might be affected by results clustered at the end of the scale, causing the so-called floor or ceiling effect (Hancock et al., 2019). The results found are much closer to the top of the scale; thus, it would be expected that the ceiling effect would cause all questions to show no signs of significant difference between the groups, but that was not the case. Nineteen out of twenty-four questions showed that at least two groups statistically differ in the degree to which they samples respond to specific forms of regulation. Thus, the ANOVA test showed that there might be differences in the way different cultural backgrounds react to the same *form of regulation*.

For the reasons discussed, the questions that did not show significant differences must be treated with caution and cannot be discarded without further analysis. The ceiling effect might affect those questions if answers from all groups are clustered at the far end of the scale. It might be the case for some of the factors analysed here. Even though the means per group for question B2.15 are shown to be very close to each other, once the applied Likert scale stops at seven, the ANOVA comparison might be affected by the ceiling effect. If that was the case, it could mean that other significant differences could have been found if these were continuous variables. This note does not invalidate the conclusion drawn from the data. However, it could only increase the frequency where this difference has been

found to exist, especially in the more autonomous forms of regulation. Thus, the ANOVA test conducted in this Sub-Section consistently supports evidence of significant differences in how cultural groups react to the different *forms of regulation*.

6.4 Chapter Conclusion

The current Chapter provided a detailed, in-depth statistical analysis of the data collected in all four cultural contexts. Based on the methodology and methods defined, the data has been cleaned and prepared for analysis before being imported into two different software. IBM SPSS has been used for descriptive statistics, EFA and ANOVA, while SmartPLS has been used for all SEM evaluations, including path, CFA, mediation and Multi Group Analyses. The theoretical framework and consequential theoretical model proposed have been tested, reduced and optimized until an acceptable model fit for discriminant validity and construct reliability and validity has been reached.

The model was then used to run the cross-cultural analysis, providing concrete statistical evidence to test the hypotheses for the current study and answer the research question. The two statistical methods used for the cross-cultural analysis, SEM and ANOVA, further helped corroborate and reinforce results before conclusions in the next Chapter can be drawn. The SEM confirms the theoretical model fit and reliability, and its MGA tests the main relationship effects between the variables. Subsequently, the ANOVA further details the nuances and manifestation details of the different forms of regulation across the analysed cultural contexts, enriching the results. Further analysis depth and robustness regarding results have been reached by comparing control variables to ensure other factors, such as the departmental dispute office vs production, do not taint conclusions. The substantial results can be used to test the study's hypothesis, providing transparency to the issue of cross-cultural employee motivation. Impact and meaningful contribution to knowledge and practice, as well as limitations of the current study, are discussed in the following Chapter.

7 Discussion of Findings and Implications

Chapter 7 is central to the study; the four following Sections cover the study's findings and their implications in the field. The Chapter details and discusses the data analysis results, evaluating their impact on expanding academic knowledge and respective practical applications. The first Section tests the hypotheses formulated in Chapter 3 based on the study's conceptual framework. The data analysis results are challenged and discussed before confirming or rejecting each research framework hypothesis. Section 7.2 answers the cross-cultural enquiry, achieving the second and third research objectives and finally answering the research question.

The third Section of this Chapter grants this study's contributions to knowledge. The hypotheses tested are compared with the respective literature to provide additional cross-cultural validity for the claims presented in the field or to reject its assumptions. The comparisons are made systematically, starting from the core contributions to the knowledge provided by the *research framework* with a focus on *autonomous* vs *controlled* forms of regulation before moving on to the additional validation for the BPNT universality claim provided by the second and third set of hypotheses, ending with the study's contribution to the SDT Model in the Workplace meta-theoretical construct.

After detailing the contribution to knowledge, the fourth Section details the study's contribution to practice. It supports the practitioner in dealing with similar issues within the same environment or applying the same motivational concept in similar backgrounds. Focusing on assembly line employee motivation in the automotive industry, it draws back to Chapter 5's *case study* to present its conclusions regarding implementing similar motivational programs. This Chapter's Sections three and four jointly supplement each other and balance the contributions, justifying the current study regarding academia and practice.

Section 7.5 presents a discussion regarding this study's limitations. Firstly, the methodological approach, the research framework and the design are challenged regarding their limitations, including generalisations and inductive extrapolation of results. Secondly, the applied methods and statistical analyses are discussed. Lastly, limitations regarding how culture is defined and this study's results generalisation based on this definition are presented. For each identified limitation, a suggestion is given regarding how future research could mitigate those issues. The Chapter ends with a conclusion summarizing the current study's achievement for both theory and praxis in laying the groundwork for the conclusion on moving research forward in the field of cross-cultural employee motivation.

7.1 Hypothesis Testing and Link to the Literature

Based on the conceptual framework presented in Section 3.2, three sets of hypotheses have been posed for this study based on the literature reviewed. The first describes the core inquiry of the study and has been posed to answer the research question precisely. The framework expansion has been used to provide additional evidence regarding the *basic psychological needs* dispute found to exist in the literature. The idea is to ensure that this dispute did not taint the answer from the core inquiry and that the study's results provided extensive additional support throughout the SDT field when answering the research question. The figure below graphically presents these described frameworks.



Figure 55. Research Conceptual Framework for Single Cultural Context – Example Thailand (a) (own work).

The current study's research question and formulated aim have been placed within the above-detailed *research framework*, more precisely within the marked relationships with a focus on *autonomous* vs *controlled* forms of regulation. The overarching question converges to investigating if and how the motivational triggers from assembly line associates in Thailand, India, Brazil and Germany differ. To recapitulate, it has been defined as follows:

<u>AIM</u>: To investigate, using self-determination theory, the response difference of assembly line associates working in Thailand, India, Brazil and Germany regarding autonomous versus controlled forms of regulation.

This aim has later been described in the mathematical notation for hypothesis testing. The *research framework* hypothesis (Hx_r) for *controlled* and *autonomous forms of regulation* have been defined as follows:

• $H1,2_r$: some $H1,2_i \neq$ some $H1,2_i$

As discussed in the conceptual framework Chapter, if the alternative research hypothesis is rejected for both cases, the results corroborate the universality claim, and the generalisability of *controlled* and *autonomous forms of regulation* is ensured across cultural contexts. If $H1_r$ or $H2_r$ is confirmed, the effect of *forms of regulation* on *work engagement* varies depending on the culture, precisely answering the research question.

The following two Sub-Sections deal with the hypotheses testing for the research framework. First, the *research framework* has been validated by testing the relationships between both *forms of regulation* with *work engagement* and their cross-cultural universality. Second, the framework has been validated by testing the relationships between *basic psychological needs* and *work engagement* and the *autonomous* and *controlled forms of regulation*. All the hypotheses were then compared to the literature to corroborate or reject the universality claims.

7.1.1 1st Set of Hypothesis Testing

As mentioned above, the *research framework* has been designed to test whether the relationship between *autonomous* versus *controlled regulation* and *work engagement* remains constant in a cross-cultural context. From the literature, it would be expected that the results should be the same independent of the cultural context (Gagné et al., 2015; Kuvaas et al., 2017), meaning that $H1_a$ should present the same positive association as $H1_b$, $H1_c$ and $H1_d$. Analogously, the $H2_a$ should present the same slightly negative or neutral relation as $H2_b$, $H2_c$ and $H2_d$.

The results from $H1_{a,b,c,d}$ and $H2_{a,b,c,d}$ should confirm the relations presented in the literature. Once the positive relationship *autonomous forms of regulation* have in improving work behaviour does not depend on the culture (Gagné et al., 2015; Kuvaas et al., 2017), $H1_a$ should present the same positive association as $H1_b$, $H1_c$ and $H1_d$. Analogously, the $H2_a$ should present the same slightly negative or neutral relation as $H2_b$, $H2_c$ and $H2_d$. The table below consolidates the 1st set of hypotheses from the *research framework*.

Relationship Analysed	#	Textual Description	Cultural	Path	Hypothesis
(Variables)		and Mathematical Notation	Context	Coefficient	Confirmed?
	<i>U</i> 1	Autonomous forms of regulation are positively	Thailand	19 607 / 401)*	VEC (VEC)*
	пı _a	related to work engagement in Thailand	TIAIIAIIU	15.007 (.401)*	123 (123)
Autonomous Forms of	H1.	Autonomous forms of regulation are positively	India	286	VES
Regulation ->	пı _b	related to work engagement in India	IIIuid	.200	123
Work Engagement	<i>H</i> 1	Autonomous forms of regulation are positively	Brazil	101	YES
Work Engagement	11 ± c	related to work engagement in Brazil	DIALII	.101	120
	<i>H</i> 1.	Autonomous forms of regulation are positively	Germany	191	VES
	11 1 d	related to work engagement in Germany	actinany	.151	120
	<u>и</u> р	Controlled forms of regulation are neutral or	Thailand	-18 371 (- 047)*	VES (VES)*
	11 ² a	negatively related to work engagement in Thailand	manana	10.07 1 (-1047)	120(120)
Controlled Forms of	Н2.	Controlled forms of regulation are neutral or	India	174	NO
Regulation →	11 2 b	negatively related to work engagement in India	india		
Work Engagement	H2.	Controlled forms of regulation are neutral or	Brazil	.043	YES
	11 ± c	negatively related to work engagement in Brazil	BIGEN	10 10	
	H2.,	Controlled forms of regulation are neutral or	Germany	- 009	YES
	a	negatively related to work engagement in Germany	dormany		
	•	There is a statistically significant difference in how			
Cross-cultural alternative	H1	autonomous forms of regulation relate to work	ΔII	_	NO
hypothesis (Autonomous)	n_r	engagement across cultures	70		No
		$H1_r$: some $H1_i \neq$ some $H1_j$			
Cross-cultural alternative	Н2	There is a statistically significant difference in how	Δ11	_	NO
hypothesis (Controlled)	11 ² r	controlled forms of regulation relate to work	740	-	No

Table 35. Research Framework Hypotheses Testing – 1st Set of Hypothesis.

 $H2_r$: some $H2_i \neq$ some $H2_j$

*Only achievable with SEM – CFA Reduced Model – Low-Reliability Loadings Removed, not with the reduced and optimized model.

The table mostly confirms the literature expectations. For hypothesis testing, the path coefficient limit of |.100| has been considered relevant when analysing positive and negative results (Huber, Herrmann, Meyer, Vogel, & Vollhardt, 2007). Coefficients under this value have been considered to present neutral or no relation between the factors. For the *autonomous forms of regulation*, the paths for every cultural context show a significant positive relationship between the factors.

In the case of *controlled forms of regulation*, all coefficients besides the one from India fall under the |.100|, establishing the neutral relationship expected to exist in the literature. Differently, the coefficient from India shows a more significant .174 result, suggesting a positive relationship between the factors, contradicting the expectation and rejecting the alternative hypothesis posed. Even though the result from one particular cultural context seems to diverge from the other ones, to answer the research question, additional analysis has been conducted to evaluate if there is a statistically significant difference between the path coefficients for all four cultural backgrounds. The multi-group analysis results used to answer this question have been consolidated in the table below.

Path	Path	(Brazil -	(Brazil –	(Brazil -	(Germany -	(Germany -	(India -
	Coefficients	Germany)	India)	Thailand)	India)	Thailand)	Thailand)
Autonomous ->	difference	-,038	-,144	-,271	-,107	-,233	-,126
Work Engagement	p-Value	,832	,463	,098	,524	,088	,490
Controlled -> Work	difference	,064	-,092	,134	-,156	,070	,226
Engagement	p-Value	,537	,558	,248	,352	,563	,203

Table 36. SEM – Cross-cultural Comparisons – MGA Results per Group.

The table confirms that when comparing the path coefficients between the cultural contexts analysed, no difference can be considered significantly different, with all p-values marked in red >.050. Based on these results, the conclusion can be drawn that there is no statistically significant difference in how the four analysed cultural contexts react to *autonomous* or *controlled forms of regulation*, providing the first indication to answer the research question.

Additional considerations are essential before considering the research question closed, and the aim of the study achieved. It is essential to note that even though the theoretical construct presented an acceptable model fit and all paths showed statistically significant coefficients for the whole sample with 817 respondents, the same was not valid when dividing into smaller sub-samples or groups for comparison. During the data analysis, the coefficient results per cultural group did not present a statistically relevant result for any of the four cultural contexts when analysing the path between *controlled* motivation and *work engagement*. Meaning that, at least for the *controlled forms of regulation*, the analysis cannot be considered closed.

Even though the path coefficients for *controlled forms of regulation* per group cannot be considered statistically significant, the positive coefficient found in India could indicate that the cultural context might still play a role. Due to the limitation described above when applying structural equation modelling to analyse the theoretical model, a second statistical test has been conducted to cross-check the results. Even though the primary effect analysis has been conducted through the SEM MGA, the analysis of additional nuances and the manifestation of each form of regulation, specifically for the controlled forms, can be enriched with the second statistical method. The ANOVA, also presented in the last Chapter, shows that there is indeed some variation in how different cultures react to the more *controlled forms of regulation*. The table below presents the consolidated results per *form of regulation* from the conducted ANOVA for each factor.

F		Consolidated Averages and Standard Deviations								
Form or Regulation			Group*				Means			
Regulation		Germany	Thailand	Brazil	India		Germany	Thailand	Brazil	India
Eutrinaia	AVERAGE	1,0	2,2	2,3	2,7		3,0	4,3	4,4	4,6
Extrinsic	STD. DEV.		0,	72				0,7	viations Means Thailand Brazil 4,3 4,4 0,70 4,8 4,5 0,83 5,6 5,9 0,21 5,3 5,6 0,17	
	AVERAGE	1,0	2,2	2,0	2,3		3,2	4,8	4,5	5,0
Introjected	STD. DEV.		0,	60				d Deviations Means y Thailand Brazil India 4,3 4,4 4,6 0,70 4,8 4,5 5,0 0,83 5,6 5,9 5,8 0,21 5,3 5,6 5,6 0,17		
11	AVERAGE	1,3	1,2	2,0	1,7		5,5	5,6	5,9	5,8
Identified	STD. DEV.		0,	37				Means Means nany Thailand Brazil India 10 4,3 4,4 4,6 0,70 0,70 ,2 4,8 4,5 5,0 0,83 0,21 ,5 5,3 5,6 5,6 0,17		
	AVERAGE	1,5	1,0	1,5	1,5		5,5	5,3	5,6	5,6
Intrinsic	STD. DEV.		0.25				0.17			

 Table 37. Cross-cultural Comparisons – One-way ANOVA Consolidated Results per Form of Regulation.

*if mean results from a specific cultural context are found to be part of more than one group, then the leading group for the case is chosen to be the one with the closest results to the other means in the same group. On the left four-column block of the table, the first four columns show the average results from all six-factor loadings per factor. It describes which group the ANOVA would allocate to the cultural context regarding variance similarity between the groups. In other words, the closer the mean results are to each other between the groups, the more likely the difference between them is statistically irrelevant, meaning that they can be considered statistically equal. For example, the most extreme difference can be seen in the *external forms of regulation*, with results varying from an average group allocation of 1,0 for Germany and 2,7 for India. It shows that more often than not, the statistically similar variances from factor loadings in all four cultural contexts can be divided into three groups, with Germany being one separate group, Thailand and Brazil a second one, and India a Group of its own. The right side of the table corroborates this understanding with average means varying from 3,0 for the German responses to 4,6 in India.

This supplementary ANOVA analysis confirms the conjecture posed when analysing the main statistical effects and results of the MGA. It shows a clear statistically significant difference between the cultural contexts in the variance for the more *controlled forms of regulation*. The same is not valid for the more *autonomous* one, with cultural contexts often positioned in the same group and results varying from 1,0 to a maximum of 1,5. These results also enrich and corroborate what has been presented by the MGA; all four cultural contexts present the same positive relationship between *autonomous forms of regulation* and *work engagement*, and the difference between the cultural contexts or groups is statistically irrelevant. Thus, all cultural contexts react the same to *autonomous forms of regulation*, which further supports the literature on the topic (Gagné et al., 2015; Kuvaas et al., 2017).

Interestingly, within the *autonomous forms of regulation*, the ANOVA showed a different and unexpected result between the *introjected* and *intrinsic* ones. It would be expected and would follow the literature, that the more *autonomous* the triggers are, the more positive the relationship with *work engagement* should be. It means that the *intrinsic forms of regulation* would be expected to present the highest score when dealing with employee motivation towards *work engagement*. Instead, the *identified* form of *autonomous regulation* has shown the highest score for all four cultural contexts. *Identified* presents the highest results probably because participating in training and development

regarding vehicle assembly motor skills usually does not always happen out of pure joy or sheer pleasure. The interpretation here suggests that participants instead identify themselves with the overall objective of the activity, relating to its reflected values and internalising the reasons for doing so. Especially for a monotonous and repetitive activity such as vehicle assembly, it would be understandable to deduce that the participation in training and development for these skills does not come from the pure joy of the task but rather an identification with its goals.

These results and the interpretations above further support the literature on the issue. As discussed during the conceptual framework, Gagné & Deci (2005) mentioned that depending on the context and task, some level of more *controlled* or less *autonomous* forms of regulation could eventually be beneficial and, therefore, positively related to improvement in *work engagement*. More specifically, if dealing with unappealing and so-called *mundane* tasks, where intrinsic motivation is not present, other *autonomous*, as well as *controlled* forms of regulation play a more critical role than if applied to complex and more challenging tasks (Cerasoli et al., 2016; Deci & Ryan, 2000; Gagné & Deci, 2005; Kuvaas et al., 2017). Thus, the ANOVA results show that the more *autonomous* the *form of regulation* is, the better the results in every cultural context, achieving its peak with the *identified* instead of the *intrinsic form of regulation*.

Based on the same literature, the results for the *controlled forms of regulation*, *extrinsic* and *introjected*, also confirm the expectation for monotonous and repetitive activities. The average mean values show that *introjected* regulations play a more critical role than *external* ones when motivating the participants, with *external* ones presenting the lowest values for every cultural context. It is also interesting to note that Germany presents lower than average "somewhat disagree" results for the *external* and *introjected* regulation with respective 3,0 and 3,2 average means. The other cultural contexts, Thailand, Brazil and India, show a neutral with a slightly positive tendency of "somewhat true" with respective 4,3/4,8, 4,4/4,5 and 4,6/5,0 average means. The interpretation of these ANOVA results further refined the answer to the research question, building upon the SEM MGA results. It presents concrete evidence that: first, when dealing with monotonous activities, the *controlled forms of regulation* can play a more critical role; and second, the more *controlled* the *forms of regulation* are, the more they seem to vary between cultural contexts.

According to this analysis, employees in Thailand, Brazil and India reacted on average positively to *controlled forms of regulation* when motivated towards training and development, while Germany reacted negatively. The results from India also confirm what has been seen in the MGA from the SEM, where *controlled forms of regulation* presented a positive .174 path coefficient between *controlled forms of regulation* and *work engagement*. When comparing with the ANOVA results for *controlled forms of regulation*, both *external* and *introjected*, have been the highest from any cultural context with respective 4,6 and 5,0 mean averages. With 5,0 being a "somewhat agree" confirmation in the scale, *controlled forms of regulation* present a positive relationship to *work engagement* in Thai, Brazilian and Indian cultural contexts. It means that when dealing with mundane, monotonous tasks, such as vehicle assembly, some cultural contexts might still react positively to *controlled forms of regulation*. However, within the *controlled forms of regulation*, the more *introject* and less *external* they are, the better.

The ANOVA also presents one additional exciting conclusion to the statistical analysis conducted. The table shows that the more *autonomous* the *form of regulation* is, *identified* and *intrinsic*, the less the means vary between the cultural contexts. The statistical group allocation confirms it based on the variance similarities. The right side of the table shows that the means are also more similar when dealing with more *autonomous forms of regulation*. This reduction is made clear when analysing the standard deviations between the groups. The deviation continuously and systematically reduces when moving from more *controlled* to more *autonomous forms of regulation*, meaning that the more *autonomous* the forms of regulation are, the more the cultural contexts seem to react the same to the trigger.

7.1.2 2nd and 3rd Set of Hypothesis Testing

As presented during the literature review, the SDT poses that the *BPNT*, including the needs for *autonomy*, *competence* and *relatedness*, is inherent to all individuals, being part of the natural human development process and, therefore, universal (Chen et al., 2015; R. M. Ryan & Deci, 2000). The positive relation between need fulfilment and well-being has been extensively tested in the last decades, with several studies providing empirical evidence to support the universalization claim even in different cross-cultural domains (Chen et al., 2014;

Chirkov et al., 2003; Deci et al., 2001; Kaplan & Madjar, 2017; Landry & Whillans, 2018). Divergency within the field appears to exist mainly on a specific basic psychological need: *autonomy*. According to cultural relativist scholars, *autonomy* would be strongly linked to individualist societies but limited to collectivist ones (Markus & Kitayama, 2003; Oishi & Diener, 2001). This claim is based on the understanding that *autonomy* relates to the individual's capacity to decide of their own volition (Rudy et al., 2007). This definition of *autonomy* would reasonably frame this particular psychological need as a standard for individualist cultures.

The relativist statement proposes that individualist and collectivist cultural contexts would moderate correlations between *autonomy's* need fulfilment and well-being. Oishi et al. (2009) advocated that *autonomy* is seen as a stronger predictor of well-being for individualist cultures than for collectivist ones. In his work, autonomy is understood as taking independent action or following individualist decisions (Oishi et al., 2009). It means that the moderation provided by individualist values facilitates the need for fulfilment towards *autonomy*. However, SDT argues that this definition is inaccurate, strongly diverging from this understanding and standing by the theory's universality.

As discussed before, the *research framework* has been designed precisely to ensure that the results are not tainted by this dispute regarding the *basic psychological needs*' universality claim. The study is expected to confirm the universality claim advocated by SDT's seminal scholars, testing whether the relationship between *basic psychological needs* and *work engagement* remains constant in a cross-cultural context. From the literature, it would be expected that the results should be the same independent of the cultural context (Gagné et al., 2015; Kuvaas et al., 2017), meaning that $HBW1_a$ should present the same positive association as $HBW1_b$, $HBW1_c$ and $HBM1_d$. If that is correct, the BPNT universality claim can be tested by comparing the results between samples. In other words, testing if $HBMx_a$, $HBMx_b$, $HBMx_c$ and $HBMx_d$ present a statistically significant difference between the cultures in the degree to which they are associated. The table below consolidates the hypotheses on *basic psychological needs* and *work engagement* relationships.

Relationship Analysed	#	Textual Description	Cultural	Path	Hypothesis	
(Variables)		and Mathematical Notation	Context	Coefficient	Confirmed?	
	HBW1 _a	BPN are positively related to work engagement	Theiland	061 (050)*	NO (YES)	
		in Thailand	Tidiidiiu	901 (.250)*		
	HBW1 _b	BPN are positively related to work engagement	India	000	VEC	
$\mathrm{BPN} \rightarrow$		in India	IIIula	.223	123	
Work Engagement	HBW1 _c	BPN are positively related to work engagement	Brozil	500	VEC	
		in Brazil	DIdZII	.322	120	
		BPN are positively related to work engagement	Cormony	607	VEC	
		in Germany	Germany	.087	165	
		There is a statistically significant difference in				
Cross-cultural	11014/4	how BPN relates to work engagement across	A 11		VEC	
alternative hypothesis	HBW1 _r	cultures	All	-	162	
21		$HBW1_r$: some $HBW1_i \neq some \ HBW1_j$				

Table 38. Research Framework Hypotheses Testing -2^{nd} Set of Hypothesis.

*Only achievable with SEM – CFA Reduced Model – Low-Reliability Loadings Removed, not with the reduced and optimized model.

The table above shows a positive relationship between *basic psychological needs* and *work engagement* for all four cultural contexts; therefore, the universality claim advocated by the seminal scholar in the field is supported with additional evidence. Even though the path coefficients present different magnitudes, all four hypotheses have been confirmed in a cross-cultural environment. The cross-cultural hypothesis, shown at the end of the table, tests if the magnitude of the path results presents a statistically significant difference between the cultural contexts. It shows a statistically significant difference in the positive path coefficient between *basic psychological needs* and *work engagement* for the four cultures. The SEM MGA cross-cultural comparison confirms this; the results have been consolidated in the table below.

Table 39. SEM – Cross-cultural Comparisons – MGA Results per Group.

Path	Path	(Brazil -	(Brazil –	(Brazil -	(Germany -	(Germany -	(India -
	Coefficients	Germany)	India)	Thailand)	India)	Thailand)	Thailand)
Basic Needs -> Work	difference	-,166	,222	,173	,388	,339	-,049
Engagement	p-Value	,161	,192	,150	,007	,001	,808

The MGA results above show that there is indeed a statistically significant difference in how positive the relation between *BPN* and *work engagement* is for each analysed cultural context. The table presents a significant difference between Germany, with a path coefficient of .687, and Thailand and India, with path coefficients of .250 and .233, respectively. The table shows that the degree to which the positive relationship occurs varies between the cultural contexts, with Germany presenting the highest path coefficient. It does not change the fact that all four cultural contexts presented the expected positive relationship, confirming the BPNT universalization claim.

Besides testing the relationship between *BPN* and *work engagement*, the *research framework* presents the opportunity to test two other relationships from the SDT model for the workplace: *BPN* relationship to *controlled* and *autonomous forms of regulation*. Results from $HBM1_{a,b,c,d}$ and $HBM2_{a,b,c,d}$ should confirm the relations presented in the literature. Once the positive relationship *basic psychological needs* have towards *autonomous forms of regulation* does not depend on the culture (Gagné et al., 2015; Kuvaas et al., 2017), $HBM1_a$ should present the same positive association as $HBM1_b$, $HBM1_c$ and $HBM1_d$. Analogously, the $HBM2_a$ should present the same slightly negative or neutral relation as $HBM2_b$, $HBM2_c$ and $HBM2_d$ regarding *controlled forms of regulation*. If correct, the BPNT universality claim can be tested by comparing the sample results. In other words, testing if $HBMx_a$, $HBMx_b$, $HBMx_c$ and $HBMx_d$ present a statistically significant difference between the cultures in the degree to which they are associated. The table below consolidates all hypotheses from the *research framework* on *basic psychological needs* and *forms of regulation* relationships.

Relationship Analysed	#	Textual Description	Cultural	Path	Hypothesis	
(Variables)		and Mathematical Notation	Context	Coefficient	Confirmed?	
	HBM1 _a	BPN are positively related to autonomous	Thailand	745	VEC	
		forms of regulation in Thailand	Thalianu	.745		
	HRM1.	BPN are positively related to autonomous	India	739	VES	
Autonomous forms of	IIDM 1b	forms of regulation in India	inula	.705	120	
regulation	HBM1.	BPN are positively related to autonomous	Brazil	.681	YES	
- oguaton	II D II I C	forms of regulation in Brazil	Brazil	1001		
	HBM1 _d	BPN are positively related to autonomous	Germany	.360	YES	
	1121114a	forms of regulation in Germany	uonnanj			
	HBM2 _a	BPN are neutral or negatively related to	Thailand	.713	NO	
	u	controlled forms of regulation in Thailand			-	
BPN →	HBM2 _b	BPN are neutral or negatively related to	India	.654	NO	
Controlled forms of		controlled forms of regulation in India				
regulation	HBM2 _c	BPN are neutral or negatively related to	Brazil	.392	NO	
-		controlled forms of regulation in Brazil				
		BPN are neutral or negatively related to	Germany	220	YES	
		controlled forms of regulation in Germany				
		There is a statistically significant difference in				
Cross-cultural	HBM1 _r	how basic psychological needs relates to				
alternative hypothesis		autonomous forms of regulation across	All	-	YES	
(Autonomous)						
		$HBM1_r$: some $HBM1_i \neq$ some $HBM1_j$				
Cross-cultural		There is a statistically significant difference in				
alternative hypothesis	$HBM2_r$	how basic psychological needs relates to	All	-	YES	
(Controlled)		controlled forms of regulation across cultures				
		$HBMZ_r$: some $HBMZ_i \neq$ some $HBMZ_j$				

Table 40. Research Framework Hypotheses Testing -3^{rd} Set of Hypothesis.

As expected and advocated in the literature, the table above shows a positive relationship between *basic psychological needs* and *autonomous forms of regulation* for all four cultural contexts; therefore, a universality claim is supported with additional evidence. The same cannot be concluded for the relationship between *BPN* and *controlled forms of*

regulation. Results show that the hypothesis can only be confirmed for Germany, which presented a negative relationship with a path coefficient of -.220. The other three cultural contexts, Thailand, Brazil and India, presented a positive path coefficient, respectively .713, .392 and .654. This exciting result does not confirm the expectations from the literature regarding universalization but corroborates the analysis from the *research framework* regarding *forms of regulation*. There seems to be a difference in how Germany interacts with *controlled forms of regulation* compared to Thailand, India and Brazil. A similar result and, thus, the same explanation and arguments presented before fit this analysis. As discussed, scholars advocate that when dealing with monotonous and repetitive tasks, some *controlled forms of regulation* might positively affect motivation compared to more complex activities (Deci & Ryan, 2000; Gagné & Deci, 2005; Kuvaas et al., 2017).

Similar to the hypotheses tested before, the cross-cultural hypothesis shown at the end of the table tests if the magnitude of the path results presents a statistically significant difference between the cultural contexts. The SEM MGA cross-cultural comparison confirms this; the results have been consolidated in the table below.

Path	Path	(Brazil -	(Brazil –	(Brazil -	(Germany -	(Germany -	(India -
	Coefficients	Germany)	India)	Thailand)	India)	Thailand)	Thailand)
Basic Needs ->	difference	,292	-,043	-,086	-,335	-,378	-,043
Autonomous	p-Value	,007	,658	,235	,001	-	,581
Basic Needs ->	difference	,510	-,160	-,294	-,670	-,803	-,134
Controlled	p-Value	,029	,154	,000	,001	-	,080

Table 41. Research Framework – SEM – Cross-cultural Comparisons – MGA Results per Group.

The MGA results above show that there is indeed a statistically significant difference in how positive the relation between *BPN* and *forms of regulation* is for each analysed cultural context. Similarly to the analysis between *BPN* and *work engagement*, the table often shows a significant difference between Germany and other cultural contexts. The table shows that the degree to which the positive and negative relationships occur varies between the cultural contexts, with Germany presenting the lowest path coefficient for both *autonomous* and *controlled forms of regulation*. It means that even though *BPN* present a positive relationship with *autonomous forms of regulation*, the magnitude of the relationship may vary depending on the cultural context. The same statistically significant variation exists for the *controlled forms of regulation*, confirming both of the cross-cultural hypotheses.

7.2 Achievement of the 2nd and 3rd Research Objectives

All the above-detailed statistical analyses in sub-sections 7.1.1 and 7.1.2 have been considered to achieve the aim and finally answer the posed research question for this cross-cultural study. Restricted to this study's populations, results show concrete evidence that:

- 1. Autonomous forms of regulation:
 - a. General: Autonomous forms of regulation positively relate to work engagement in all four cultural contexts; therefore, their positive impact is culturally invariable. Both the main effects presented by the SEM and MGA and the nuances provided by the ANOVA confirm this relationship and crosscultural validity. Those results further corroborate the expectations presented by the literature (Gagné et al., 2015; Kuvaas et al., 2017);
 - b. Intrinsic versus identified: Identified forms of regulation presented the highest mean values instead of the expected intrinsic triggers for all cultural contexts. It means that when dealing with monotonous and repetitive tasks, the best autonomous form of regulation would be identified as the participation does not happen out of pure joy but rather an identification with the task goals and values.
- 2. Controlled forms of regulation:
 - a. General: The SEM and MGA show that *controlled forms of regulation* relate negatively or neutrally to *work engagement* for most of the samples and cases analysed, except for India. This result is restricted by the statistical significance limitation of the analysis when dividing the sample into smaller groups.
 - b. General: The ANOVA results show that the *controlled forms of regulation* can play a more critical role in employee motivation for the Thai, Brazilian and Indian cultural contexts but not for Germany. According to the literature, this

could happen when dealing with monotonous and repetitive activities (Deci & Ryan, 2000; Gagné & Deci, 2005; Kuvaas et al., 2017).

- c. General: The more *controlled the forms of regulation* are, the more their impact towards *work engagement* and employee motivation seems to vary between cultural contexts.
- d. *External* versus *introjected*: Although some cultural contexts might react positively to *controlled forms of regulation*, the more *introject* and less *external* they are, the better the results will be.

The research framework was designed to deal with the issue of cross-cultural employee motivation towards training and development. The analysis evaluated the relationship between *forms of regulation* and *work engagement*, directly comparing *autonomous* versus *controlled* forms of regulation in four different cultural contexts. The research question, its aim and respective 2nd and 3rd research objectives and the respective hypotheses have been defined as follows:

- Research Question: How does the cultural context influence how employees' motivation is regulated?
- Research Aim:To investigate, using self-determination theory, the response
difference of assembly line associates working in Thailand,
India, Brazil and Germany regarding *autonomous* versus
controlled forms of regulation.
- RO2: Using self-determination theory, to analyse and evaluate empirically whether *autonomous* and *controlled forms of regulation* will present the same expected positive or negative effect on assembly line associates' behaviour in Thailand, India, Brazil and Germany.
 - H1_{a,b,c,d}: Autonomous forms of regulation are positively related to work engagement in Thailand (a), India (b), Brazil (c) and Germany (d);

 H2_{a,b,c,d}: Controlled forms of regulation are neutral or negatively related to work engagement in Thailand (a), India (b), Brazil (c) and Germany (d);

RO3: Using self-determination theory, to analyse and evaluate empirically whether there are differences between cultures on how employees are motivated, and confirm if a unified motivational program can be developed and applied for production plants in Thailand, India, Brazil and Germany.

 \blacktriangleright H1,2_r: some H1,2_i \neq some H1,2_i

The focus is placed here on the second and third research objectives once the first has been accomplished theoretically and answered with the literature review and respective conceptual framework in Chapters 2 and 3, with its achievement described and discussed in Section 3.3.

Two hypotheses have been posed to answer the second research objective. The first relates to confirming if *autonomous forms of regulation* are positively related to *work engagement* in each of the four cultural contexts. The statistical evidence presented before confirms this hypothesis through the SEM analysis and the ANOVA for all cultural contexts. This study has shown that all four cultural contexts have the same positive relationship between *autonomous forms of regulation* and *work engagement*.

Comparetively, the second hypothesis from the 2nd research objective cannot be confirmed entirely; in both analyses, evidence supports that *controlled forms of regulation* are positively related to *work engagement* in some cases and some cultural contexts. It is evident through the results from the SEM path analysis in India and the ANOVA results for Thailand, Brazil and India. Therefore, only the hypothesis for Germany, $H2_d$, can be confirmed, showing that *controlled forms of regulation* have a neutral to negative impact on *work engagement*. The other three hypotheses for Thailand, Brazil and India, mainly due to the ANOVA results, cannot be entirely confirmed as they presented some positive relationships, primarily when dealing with monotonous and repetitive activities such as vehicle assembly. Thus, based on these conclusions, the 2nd research objective is answered.

Based on the statement above and the statistical evidence findings, the 3rd research objective can be discussed. Its hypothesis tests the universality claim regarding *forms of regulation*. It suggests that if all hypotheses from the 2nd research objective are confirmed, all cultural contexts reacted similarly to the *autonomous* and *controlled* forms of regulation. Statistical evidence suggests that cultural contexts have reacted differently to the same triggers for some cases of *controlled forms of regulation*; thus, the hypothesis from the 3rd research objective cannot be entirely confirmed. This study cannot confirm the universality claim in a cross-cultural context regarding *controlled* and *autonomous forms of regulation*, meaning that there are nuances in regulating motivation in different cultural contexts, especially when dealing with *controlled forms of regulation*, precisely answering the 3rd research objective.

The research aim is achieved with the 2nd and 3rd research objectives answered with the statistical evidence presented above, and the 1st research objective is achieved with the literature review outlining the conceptual framework presented in Sub-Section 3.2. The investigation, using self-determination theory, of the difference in *autonomous* versus *controlled forms of regulation* of assembly line associates working in Thailand, India, Brazil and Germany has been successfully concluded.

The answer to the research question on how the motivational triggers from assembly line associates in Thailand, India, Brazil and Germany differ is that they differ in terms of how cultural contexts such as Thailand, Brazil, and India have a positive reaction to some types of *controlled forms of regulation* where Germany has a negative reaction. In the case of *autonomous forms of regulation*, the cultural contexts presented no statistically significant difference in how they react to the trigger, meaning that those can be applied across all these cultural contexts without adaptation. The answer to this study's research question further supports the literature regarding universality claims for the *autonomous* and relativist claims for the *controlled forms of regulation*.

This analysis is limited to the *forms of regula*tion and their impact on *work engagement*. It was the critical issue from the *research framework* to complete the research aim and answer the question. Besides focusing only on the *forms of regulation*, based on the literature review, additional relationships have been analysed to cover the SDT concept of

basic psychological needs theory universalisation, which some scholars have challenged. With results from the 2nd and 3rd set of hypotheses presented in Sub-section 7.1.2 proving support for the BPNT universalization regarding their positive correlation between need fulfilment and work engagement, the statistically significant differences found to exist on how different cultural contexts react to different forms of regulation are further supported with concrete evidence and not tainted by the dispute found to exist in the literature.

7.3 Contribution to Knowledge and Implication in the Field

After testing the hypotheses for the *research framework* and analysing the data results, their interpretation and comparison to the current literature provide the contribution to knowledge to be discussed in this Section. Five direct contributions to knowledge are identified based on this study's results. These are listed below:

Contributions to Knowledge:

- A. Contribution to theory: the study provided empirical evidence that, even though the support to the SDT BPNT universally improves work engagement, different cultures might achieve this need support through different *forms of regulation*, displaying more *controlling* or *autonomous* reasons for pursuing need-satisfying activities depending on the cultural context;
- B. Contribution to methods: new measuring instruments have been created, translated into four languages and validated – The Training and Development Self-Regulation Questionnaire (SRQ-T&D):
 - NEW Training and Development Self-Regulation Questionnaire (SRQ-T&D) measuring instrument – creation, translation into four languages and statistical validation;
 - EXISTING Basic Psychological Need Satisfaction at Work Scale measuring instrument – translation into Thai language and statistical validation;
 - EXISTING Work Engagement measuring instrument translation into two languages and statistical validation;

- C. Contribution to theory: provided additional cross-cultural validity for the SDT basic psychological needs positive relation to work engagement. Support existing theory with additional empirical data for Thailand, India, Brazil and Germany in the automotive industry;
- D. Contribution to theory: provided additional cross-cultural validity for the SDT claim of mediation through *autonomous forms of regulation* to be positive and *controlled* to be neutral or negative, in this study, found to be neutral;
- E. Contribution to theory: provided additional cross-cultural validity for the Basic SDT Model in the Workplace regarding the analysed factors, their relationships and overall construct.

As described above and planned during the research framework's design, the first two contributions are the unique core contributions to the knowledge provided by the current study. First, it provides empirical evidence to answer the call for further research on how employees from different cultures have different approaches regarding *controlled* and *autonomous forms of regulation*, even if they have the same *basic psychological needs* to fulfil. Second, creating, translating and validating a new self-regulation measuring instrument for training and development.

Furthermore, the *research framework* aimed to ensure that the debate in the literature regarding the universality of the BPNT did not taint the results regarding *forms of regulation*. Thus, it fits its purpose by providing additional cross-cultural validity for the construct, its mediating factors and the BPNT itself. It provides unique results in four new cultural contexts in the automotive industry and ensures that the results from the research framework for this specific study are valid and reliable for the environment and samples analysed. In other words, for this study, the literature debate has no impact on the core analyses and conclusions regarding forms of regulation. The following overview has been created to consolidate all five contributions, facilitating the visualisation.





All five contributions have been supported with empirical evidence and confronted with the respective literature. After discussing the contribution to knowledge, the Chapter moves on to the contribution to practice and the study's limitations, including suggestions for future research. The contributions to knowledge mentioned above have been further detailed in the following Sub-Sections.

7.3.1 Cross-cultural Differences in Responding to *Autonomous* and *Controlled* Forms of Regulation

The first Sub-Section deals with the first and most significant contribution to knowledge from the current study. By answering the 2nd and 3rd research objectives, this contribution categorically provides evidence to achieve the research aim and answer the research question. It shows that different cultural contexts have different responses to *controlled* versus *autonomous forms of regulation*, besides describing the magnitude of those differences and their statistical significance for each *form of regulation*. The consolidated statement of this contribution to theory is presented below:

A. Contribution to theory: the study provided empirical evidence that, even though the support to the SDT BPNT universally improves work engagement,
different cultures might achieve this need support through different forms of regulation, displaying more controlling or autonomous reasons for pursuing need-satisfying activities depending on the cultural context.

As frequently stated throughout this study, the BPNT advocates that the *basic psychological needs* do not vary between cultures, meaning those *needs* are universal and relevant to all individuals (Gagné & Deci, 2005; Gagné et al., 2015; Monnot, 2018). Even though the seminal scholars from the SDT defend the universality of *psychological needs* and their positive correlation to well-being independent of cultural background, they also suggest that what might differ between the cultures are the *motives* and how individuals are led to fulfil any particular *psychological need*. The claim of *psychological needs* being universally valid to all individuals and *motives* being a cultural variable has been supported with concrete evidence by this study.

The literature review showed that even when scholars openly disagree regarding the importance and definition of *basic psychological needs* (Locke & Schattke, 2019; R. M. Ryan & Deci, 2019b), they collectively acknowledge that additional research on intrinsic versus extrinsic motivation is needed. Ryan and Deci (2019b) support this call to action, encouraging researchers to provide additional evidence. It is deemed essential to differentiate the *type of motivation, controlled* versus *autonomous,* and the sub-type *forms of regulation* to better anticipate employee behaviour and engagement in the workplace (Deci et al., 2017). Monnot (2018) further argues that even though the satisfaction of *basic psychological needs* is essential for intrinsic motivation across all cultural contexts, the response to extrinsic rewards depends on cultural variability.

Other scholars and studies further support the *call to action* mentioned above. De Castella et al. (De Castella et al., 2013) advocate notable differences in achievement motivation and self-regulation when analysing a cross-cultural context. King et al. (2017) found that even though extrinsic goals are relevant for all students across different cultural contexts, they might predict better learning in one culture if compared to another. Guillen-Royo and Kasser (2014) criticize the available literature, arguing that samples from economically developing nations are often under-represented in such studies. They also

stated that college students do not represent working-class or slum residents when studying the universalisation of psychological needs and motivational triggers.

The current study has been designed to answer this call, providing additional empirical evidence of cultural variability regarding motivational triggers. It tested how different cultural contexts react to *controlled* versus *autonomous forms of regulation*, providing a concrete contribution to knowledge in the field of employee motivation. This evidence has been provided in four additional cultural contexts, three of which are not considered part of the Western, industrialized nations seen in several studies throughout the literature review: Thailand, Brazil and India. Guillen-Royo and Kasser (2014) mention that these cultural contexts are often underrepresented in cross-cultural studies, with not a single SDT study including the Thai cultural background found during the literature review.

The study's results are even more interesting when noticing that precisely those three cultural contexts have presented significant differences, with a positive reaction to *controlled forms of regulation*, opposite to the negative relationship found in a Western industrialised cultural context such as Germany. The statistical analysis shows, at least for the *controlled forms of regulation*, that Germany has a different relationship than Thailand, Brazil and India, further confirming the need for cross-cultural evidence before assuming any theory's universalisation. It is also apparent that the more *autonomous* the *forms of regulation* are, the more the different cultural contexts seem to present a more homogeneous response. It further supports the expected theoretical relationship and is illustrated by the diagram below.

Needs, Motives and Values								
Cultural Variability	High Cultural Var	iability		Low Cultural Variability				
Theoretical	Values		Needs					
Framework	N.A.	Motives						
Type of Motivation		Extrinsic Motivation Triggers (Autonomous vs Controlled) Intrinsi Motivati						
Form of Regulation		External Regulation	Introjected Regulation	Identified Regulation	Integrated Regulation	Intrinsic Regulation		
Degree of Internalization		•	More Controlled	More Autonomous				
	Cultural Variable (per definition)	Expe	ected Cross-cultura	l Variability	Low Cross-	ultural Variability		

Figure 57. Needs, Motives and Values and the Expected Cross-cultural Variability (own work).

The diagram designed based on the literature review indicates that motives with a more *controlled* degree of internalization would be more susceptible to cultural variability than *autonomous* ones. The more *autonomous* the form of regulation is, the more intrinsic the type of motivation is, and the more convergency to *basic psychological need* fulfilment in terms of cultural variability is expected to be seen. On the other hand, the more *controlled* the trigger is, the greater the cultural variability is expected to exist. The expectation was drawn from the review, not a factual statement, until the data analysis and hypotheses testing were concluded. The current study provided empirical evidence to support this claim; the more *controlled* the degree of internalisation is, the more culture seems to play an essential role regarding cross-cultural variability.

The study has used some control variables to cross-check results and ensure the cross-cultural analysis has not been influenced by specific factors such as age, gender or the department within the company. The departmental discussion is crucial, especially for Germany, where the sample consisted of office employees only, with no participant from the shop floor, raising the question of whether this sample's characteristics have possibly biased the German-specific results. The data analysis showed that even when controlling for the department where respondents worked, office versus production, some statistically significant differences have been found for specific variables and mediation relationships between different cultural groups. It means the department has not restricted the differences; they seem to exist despite that.

Besides the restrictions regarding limited explored cultural contexts, the current study provides evidence from a different sector, the automotive branch. It further diverges from studies conducted in the classroom with psychology studies, which do not broadly represent employee motivation. It expands the scope primarily to working-class associates on the shop floor, providing new evidence to the field. In the same line of thought, Jugert et al. (2014) advocate that systematical investigation in motivation requires consistent sampling from various cultural contexts to measure culture-related similarities and variations. This study provided another systematical investigation, collecting and analysing the data based on robust methodological principles with samples from four different cultural contexts. Its contribution to knowledge further supports the field with data for future metaanalyses regarding how employees are motivated, which *forms of regulation* are more beneficial and when and where they should be applied depending on the cultural background.

To summarize, the core contribution to knowledge discussed in this Sub-Section provided concrete evidence that the relationship between *forms of regulation* and *work engagement* might depend on the culture where they are applied. This evidence does not have the purpose of closing the argument and presenting a final claim regarding cultural variability towards *forms of regulation* but of instigating and fomenting further research on the topic to test causality and diversify the sample and cultural contexts involved. As Chirkov et al. (2003) commented at the end of their study, even after confirming the universality hypothesis, they had done so in samples from only four cultures; this study is no different. Thus, their argument is also valid here; this result does not begin to cover all cultural forms nor the plethora of nuances within a country's culture, calling for additional studies in other cultural contexts in other parts of the world.

The difficulty of finding a decisive argument is presumably the same as in any theory searching for definitive empirical confirmation; one single negative result could decisively disprove the claim (Popper, 2014). Challenging the universalisation status quo of any theory helps move research forward and further promotes the discussion within the field. As stated before, the study has shown evidence to support the cross-cultural variability claim regarding *controlled forms of regulation*, thus playing its contributions to the established body of knowledge in the field.

7.3.2 Methods – Validation of Measurement Instruments

Besides the core contribution to knowledge presented above, the current study also contributed to the SDT methods by providing a new Self-Regulation measuring instrument for Training and Development. The consolidated statement of this contribution to theory is presented below:

> B. Contribution to methods: new measuring instruments have been created, translated into four languages and validated – The Training and Development Self-Regulation Questionnaire (SRQ-T&D)

As described above, based on existing and validated measuring instruments regarding self-regulation, a new questionnaire has been created, translated into four languages and validated with concrete statistical data. In addition to this core contribution, the other two measuring instruments used during the study have been translated and validated for additional languages beyond the ones found in the literature. All these stated contributions have been consolidated below:

- NEW Training and Development Self-Regulation Questionnaire (SRQ-T&D) created, translated into three languages and statistically validated;
 - New measurement instrument for Training and Development based on existing English versions of three validated SRQ measurement instruments. An adaptation of the Self-Regulation Questionnaire (SRQ) (Center for Self-Determination Theory, 2021d), introduced by Ryan and Connel (1989), has been used for the quantitative data generation regarding *motives*. The adapted questionnaire is based on the combination of the Learning Self-Regulation Questionnaire (SRQ-L) (Black & Deci, 2000), the Academic Self-Regulation Questionnaire (SRQ-A) (R. M. Ryan & Connell, 1989), and the Exercise Self-Regulation Questionnaire (SRQ-E) (Center for Self-Determination Theory, 2021d). All three base questionnaires have already been adapted, tested and translated into various studies and languages within the field of Self-Determination Theory, providing additional reliability in a cross-cultural context;

- Translation and validation of the new questionnaire in a total of 4 languages: English, German, Brazilian Portuguese and Thai.
- II. EXISTING BPN fulfilment has been measured using the Basic Psychological Need Satisfaction at Work Scale measurement instrument – The measurement instrument has been translated into two new languages, and its reliability has been statistically validated for future research;
 - The Basic Psychological Need Satisfaction at Work Scale used in the data collection has been translated and validated by scholars into English (Center for Self-Determination Theory, 2021b) and German (Center for Self-Determination Theory, 2021c) but not in Brazilian Portuguese and Thai. The current study provided the translation and validation from this measuring instrument into these two additional languages;
- III. EXISTING Work Engagement has been measured using the Utrecht Work Engagement Scale (UWES) – The measurement instrument has been translated into two new languages, and its reliability has been statistically validated for future research;
 - Utrecht Work Engagement Scale used in the data collection has been previously translated and validated into English, German and Brazilian Portuguese but only regarding the student/academic version (Schaufeli & Bakker, 2004). For the standard scale, the current study has translated and validated this measuring instrument into two additional languages: Brazilian Portuguese and Thai.

Each questionnaire described above supports expanding the available methods for research towards employee motivation. They have been based on available and validated measuring instruments and thus contribute directly to the field, further supporting the respective literature and scholars. The three measuring instruments described, their relationship to the variables, and the contributions to the literature have been consolidated in the diagram below:



Figure 58. Measurement Instruments for Research Framework (own work).

After discussing the two core contributions to knowledge, the following Sub-Sections describe the additional cross-cultural validation for the existing theories granted by the *research framework*.

7.3.3 Cross-cultural Validity for the SDT Basic Psychological Needs

During the research design, a *research framework* has been suggested to test and ensure the study results and its core contributions have not been tainted by the universality dispute regarding *basic psychological needs*. This framework was expected to confirm the universality claim advocated by SDT's seminal scholars. Its generated data contribute to knowledge and the field by supporting the universality claim in another industry and four additional cultural contexts. Thus, the framework ensures that cultural differences are seen only as a form of *motivation*, including its *regulating factors*, rather than *basic psychological needs*. The consolidated statement of this contribution to theory is presented below: C. Contribution to theory: provided additional cross-cultural validity for the SDT basic psychological needs positive relation to improved work behaviour.
 Support existing theory with additional empirical data (for Thailand, India, Brazil and Germany in the automotive industry);

According to the analysed literature, the SDT's BPNT has been extensively tested in the cross-cultural domain, and consistently across the papers, the universality claim has been supported with empirical evidence (Gagné et al., 2015; Kuvaas et al., 2017; Vansteenkiste et al., 2020). Even when substantial evidence is consistently presented, scholars do not seem to put the discussion to rest. For instance, Chirkov et al. (2003) advocated at the end of their study that even after confirming the universality hypothesis, they had done so in samples from only four cultures.

The logical argument is that a single study comparing a couple of cultural contexts does not begin to cover all cultural forms, calling for additional research with additional samples worldwide. The current study provides additional evidence to support the BPNT universality claim in another four cultural contexts: Thailand, Brazil, India and Germany. Its data shows a positive relationship between *basic psychological needs* and *work engagement* for all four cultural backgrounds. It confirms that fulfilling the SDT's three *basic psychological needs* not provide and engaging employees independent of the culture.

Another interpretation of the data presents a relevant indication regarding the dispute within the field. The divergence regarding the universality claim appeared to exist mainly on a specific *basic psychological need: autonomy*. According to cultural relativist scholars, *autonomy* would be strongly linked to individualist societies but limited to collectivist ones (Markus & Kitayama, 2003; Oishi & Diener, 2001). This claim is based on the understanding that *autonomy* relates to the individual's capacity to decide independently (Rudy et al., 2007). This definition of *autonomy* would reasonably frame this particular psychological need as a standard for individualist cultures.

The statement proposes that individualist and collectivist cultural contexts would moderate correlations between *autonomy's* need fulfilment and well-being. Oishi et al. (2009) advocated that autonomy is seen as a stronger predictor of well-being for individualist cultures than for collectivist ones. As discussed before, *autonomy* is understood

as taking independent action or following individualist decisions (Oishi et al., 2009), meaning that the moderation provided by individualist values facilitates the need for fulfilment towards *autonomy*, with SDT arguing that this is inaccurate, strongly diverging from this understanding and standing by the theory's universality.

According to SDT scholars, *autonomy* is not defined by the individual's ability to act independently but to decide and choose according to one's own volition. It implies that even if someone decides to follow a millenary tradition in a collectivist society but conducts this choice based on their resolution, this *autonomy* would also positively affect psychological well-being and human growth (R. M. Ryan & Deci, 2019a). This understanding of *autonomy* allows individuals from collectivist cultures to choose, consciously supporting their needs. This claim has been consistently supported by evidence from the literature (Chen et al., 2014; Chirkov et al., 2003; Kaplan & Madjar, 2017). According to scholars, independent of the values rooted in any culture, the fundamental psychological need for *autonomy* is inherent to human nature. Therefore, its satisfaction is essential for healthy psychological development. This study's data support this universality claim, showing a positive relationship between BPN and work engagement for all four samples.

Interestingly, this study's results show that the magnitude of the paths found in the SEM presented a statistically significant difference when Germany was compared to Thailand and India. The path coefficient result for Germany was .687, while Thailand and India presented a path coefficient of .250 and .223, respectively. According to Hofstede (2001), Germany has a more individualist tendency when compared to Thailand and India, which are more collectivist. It would support the cultural relativist scholars' thesis regarding this basic psychological need. Unfortunately, no statement or claim can be made once this study has not been designed to test the *autonomy* hypothesis. The data interpretation has been presented here as an indication to instigate further research on the topic to clarify if significant differences in correlation can be found depending on the degree of individualism from different cultural backgrounds.

With the physical borders slowly vanishing in the current global scenario, the constantly changing environment demands consistent research to validate any theory (Menard et al., 2018). The importance of the systematical testing of the BPNT is evident in

the literature with several arguments explaining the limitations inherent to the analysed studies' design: some samples might not represent a given culture in general, student samples cannot be extended to working-class populations, results from one sample cannot be extended to a whole culture, and so on. There is still additional empirical evidence to be found in cultures and samples not yet tested, opening up space for continuous research in the field. Therefore, this study contributes to knowledge by further supporting the BPN universality claim in four additional cultural backgrounds within the automotive branch. Future meta-analysis research can profit from this study's results to provide a definitive statement regarding the BPNT universality across several cultural contexts.

7.3.4 Cross-cultural Validity for the Autonomous vs Controlled Mediation Effects

Before moving on to the last point, which presents this study's contribution to the overall SDT Model in the Workplace (Deci et al., 2017), the mediation effects found must be discussed. This meta-model has been used to define this study's *research framework*; it suggests that forms of *motivation* and how they are regulated, *forms of regulation*, mediate the relationship between the independent and dependent variables. According to the literature, a positive mediation is expected to exist for *autonomous* but not *controlled regulation forms*. The current study has tested this claim; thus, the consolidated statement of this contribution to theory is presented below:

D. Contribution to theory: provided additional cross-cultural validity for the SDT claim of mediation through *autonomous forms of regulation* to be positive and *controlled* to be neutral or negative, in this study, found to be neutral;

When presenting the SDT Model for the Workplace, Deci et al. (2017) describe that usually, studies have used need satisfaction or motivation as independent variables, with some studies using both. They are used primarily as mediating variables between the dependent and independent ones, which is the case for the current study. The scholars also advocate with several examples from the literature that *autonomous forms of motivation* positively mediate less stress under job pressure, higher job performance, company profitability, less burnout, and smaller turnover, while *controlled forms of motivation* tended to present the opposite results.

The current study has presented concrete evidence to support this claim partially. The total effect shows that *forms of regulation* have a statistically significant total indirect effect on the relationship between *basic needs* and *work engagement*. The P-Values results under .050 and T-Statistics over 1.96 confirm the overall significance. When independently analysed, the mediation is shown to solely come from the *autonomous* forms of regulation, with P-Values <.000, and *controlled* forms presenting a statistically non-significant result, with P-Values of .057.

These results corroborate the literature expectation on *autonomous forms of regulation*, presenting a statistically significant positive mediating effect on the relationship between dependent and independent variables. Regarding *controlled forms of regulation*, this study's data analysis did not show the expected negative effect but rather a nonsignificant one. Thus, this study contributes to knowledge by further supporting the positive mediating effect *autonomous forms of regulation* have on the relationship between basic *psychological needs satisfaction* and *work engagement*.

7.3.5 Cross-cultural Validity for the Basic SDT Model in the Workplace

The final contribution to knowledge refers to this study's data analysis regarding the model used as the basis for its *research framework*. The SDT Model in the Workplace has been presented by Deci et al. (2017) when consolidating the core elements from the SDT mini-theories applied to the work domain. By basing the current study's research framework on some of the same core elements, it was possible to test the construct regarding its factor's discriminant validity, reliability results and overall model fit. Thus, the consolidated statement of this contribution to theory is presented below:

E. Contribution to theory: provided additional cross-cultural validity for the Basic SDT Model in the Workplace regarding the analysed factors, their relationships and overall construct.

The SDT Model in the Workplace has been based on several studies analysing different variable relationships and mediation. According to the same paper defining model, usually, research has been conducted by defining the independent variables as workplace

context or individual differences and the dependent ones being the work behaviour results or well-being. Mediation was often researched as the *basic psychological needs* or motivations, *controlled* and *autonomous*. The paper further explains that sometimes studies have used the need satisfaction variable to predict motivation, usually mediating between dependent and independent variables, similar to what has been done in this study. In other words, some studies used a sub-set of variables depending on the study's design and the expected outcome (Deci et al., 2017). The figure below shows the SDT Model in the Workplace, highlighting the sub-set of variables chosen for this study's *research framework*.



Figure 59. Basic SDT Model in the Workplace: Delimitation of the Research Framework. Adapted from Deci et al. (2017, p. 23).

The chosen framework has been tested using the SmartPLS software through SEM. After modelling the construct with the individual factors and loadings, its fit, reliability and validity have been evaluated based on the following criteria:

- Factor discriminant validity two factors cannot be considered discriminant if the correlation with any other factor is stronger than with itself.
- Construct reliability Cronbach's alphas >.700 have been deemed acceptable (Cortina, 1993; Taber, 2018).
- Construct validity Average Variance Extracted (AVE) >.500 has been considered acceptable (Fornell & Larcker, 1981; Lawrence, 2009).

- Overall model fit Standardized Root Mean Squared Residual (SRMR) <.080 has been deemed acceptable (Hu & Bentler, 1999; Ringle, 2020).
- Statistical significance bootstrap analysis with 1000 samples has been used to test the paths, where P-Values with acceptable limits <.050 have been used to verify the result's significance (Barrow, 2017; Newbold et al., 2013).

After three iterations, the reduced and optimized model showed a positive outcome. The factor's discriminant validity presented good results, with all factors showing no correlations with other factors stronger than when compared to themselves. Reliability has also been ensured, with all factors scoring over the .700 threshold. The AVE results for the reduced and optimized mode have also improved, with *controlled forms of regulation* showing a .501 result, slightly over the acceptable limit. The only restriction continued to be the AVE results for the *basic psychological needs* factor, showing a .475 result. This borderline result is much closer to the established limit than before model optimization. However, it must be further considered as a possible construct validity limitation of the current study. It is further discussed in the respective Sub-Section of this Chapter. At last, the overall model fit has improved, showing a positive result with an SRMR of .065, under the .080 limit. Thus, the reduced and optimized model is a much better representation of the collected data, and its schematical representation can be seen in the figure below.



Figure 60. SEM – Path Analysis Results – Reduced and Optimized Theoretical Model (own work).

With the results presented above, the current study has validated the SDT model in the Workplace through robust methodological standards and consistent statistical analysis. Thus, its results provide further valuable contributions to knowledge by testing the model's fit and the individual factors' reliability, including their relationships and overall construct validity. It validates the construct for future research using any sub-set of the variables tested here or eventually meta-analysis for further cross-cultural validation in other cultural contexts and industries, being the fifth and last identified contribution to knowledge.

7.4 Contribution to Practice

Besides the five contributions to knowledge discussed in the last Section, the study provides the practitioner with additional insights regarding the future implementation of motivational programs in the automotive industry. As stated in the introduction Chapter and later discussed in depth during the *case study* analysis, this research has a practical background besides its theoretical framework and contributions to knowledge. Its research question has also been posed to support the future implementation of training and motivation programs for assembly line associates within the production network of the automotive industry. The following Sub-Section presents and discusses the study's contribution to practice, focusing on the resulting actionable points and providing the practitioner with concrete recommendations for future implementation of such motivational programs across different cultural backgrounds.

This Section has a pre-determined structure to facilitate the discussion of the results and present the recommendations. Firstly, the data analysis results from the *case study* and the *main study* have been presented and discussed, focusing on their practical implications. Secondly, based on the data analysed, the conclusions regarding cultural variability and the respective contribution to practice have been stated. Thirdly, recommendations for implementing future motivational programs or expanding existing ones across the production network have been given. Limitations and suggestions for future research have not been addressed here but are consolidated in the following Sub-Section of this Chapter before its conclusion.

7.4.1 Case Study Results and Respective Guidelines to Practice

The *case study* presented in Chapter 5 has provided quantitative and qualitative evidence regarding cross-cultural variability towards *autonomous* and *controlled forms of regulation*. The quantitative analysis conducted, ANOVA, has shown a statistically significant difference between at least two groups in some specific *forms of regulation*. Eight out of ten questions showed that at least two groups statistically differ in the degree to which the samples respond to specific *forms of regulation*. Thus, the ANOVA test showed that there might be differences in the way different cultural backgrounds react to the same *form of regulation*.

Even though the small sample size and limited two-factor loadings per *form of regulation* provided by the *case study* gave some indication regarding the motivation variability across different cultural contexts, they did not allow for a reliable conclusion due to those limitations. Therefore, the *main study* has been designed to collect the data, answer the research questions, and support the indication with concrete evidence. The *main study* later confirmed the cultural variability hypothesis regarding *autonomous* and *controlled forms of regulation* through robust methodology and reliable statistical analyses. In other words, the *main study* later confirmed the indication provided by the quantitative analysis from the *case study*. Especially regarding the influence *controlled forms of regulation* have on *work engagement*, the different cultural contexts showed statistically different results, with Thailand, India and Brazil presenting a substantial positive relationship compared to the negative relationship seen in the German sample.

Apart from the quantitative results from the *case* and *main study*, the *case study's* qualitative content analysis provided additional insight into why employees would participate in such a training concept. The qualitative data collection used open questions to allow respondents to state why they participated in the training concept willingly. As presented in Chapter 5, during the case study qualitative analysis, only two short open questions were used to capture any additional inputs not covered by the quantitative questionnaire on why associates would participate in such a training program. Common answers included more autonomous reasons for participating, such as "Joy of learning", "It's fun and exciting", "Like the challenge"; and some more controlled reasons, such as "Feel recognized", "Create pride", "Have prize money for winners".

Results have been ordered and clustered as defined by the content analysis methodology. The known *forms of regulation* measured by and applied in the quantitative analysis have been used to classify the terms for the final clustering. All 101 terms and expressions from the gist analysis were allocated within one known *form of regulation* covered by the literature and measured by the Self-Regulation Questionnaire (SRQ) (Black & Deci, 2000; R. M. Ryan & Connell, 1989), with no qualitative feedback from participants leading to infer any new cluster regarding how motivation is regulated. The results have been consolidated in the table below after three content analysis iterations: verbatim, gist and superordinate analysis.

Gist Analysis (Term)	Frequency	Regulation	Gist Analysis (Term)	Frequency	Regulation
Should include money prizes 1		External	Like to learn new things/knowledge	20	Identified
Should allow promotions if				-	
won	1	External	Like the challenge	8	Identified
TOTAL	2	External	Like the training orientation of the program	6	Identified
			Enhance skills	5	Identified
Gist Analysis (Term)	Frequency	Regulation	Beneficial for the employees/company	5	Identified
To develop/improve myself	15	Integrated	Brings people together	2	Identified
TOTAL	15	Integrated	Like the experience	2	Identified
			Good for self-motivation	1	Identified
Gist Analysis (Term)	Frequency	Regulation	TOTAL	49	Identified
Test skills	7	Introjected			
Like the competition	5	Introjected	Gist Analysis (Term)	Frequency	Regulation
Feels recognition	3	Introjected	Very nice program	9	Intrinsic
Low chances of winning	1	Introjected	It is fun/enjoyable	7	Intrinsic
Creates pride	1	Introjected	TOTAL	16	Intrinsic
Don't want to embarrass me	1	Introjected			
Test knowledge	1	Introjected			
TOTAL	19	Introjected			

Table 42. Superordinate Analysis for the Case Study – Forms of Regulation and Frequencies (Motivation).

Based on these results, it is interesting to note that employees seem to participate in the training concept mainly due to *identified forms of regulation*, with a frequency of 49 out of 101. The table also shows that frequency decreases when moving on to an even more *autonomous form of regulation*. When applying *intrinsic forms of regulation*, participating solely for the fun and joy of the tasks, the total frequency dropped to 16 out of 101. The same pattern has been seen in the quantitative ANOVA results from the *main study*, with the literature likewise supporting it. This phenomenon presumably has the exact same reason for the quantitative and qualitative results. Due to the monotonous and repetitive characteristics of manual tasks related to vehicle assembly in the automotive industry, it is more challenging to engage associates based on joy and more effortless with identification towards the goals and values behind the activity. In other words, *identified forms of regulation* should be applied independently of the cultural context.

Furthermore, the table above also shows crucial information regarding the more controlled forms of regulation. As expected from the literature, external forms of regulation, which would mean providing cash prizes or promotions, did not provide such a positive outcome, being restricted to only 2 positive responses out of 101. These results were also expected, corroborating the literature on the topic. They are further supported by the quantitative results from the main study, which presented the most negligible positive effect on work engagement, often neutral or even negative, independent of the cultural context. In short, external forms of regulation should be avoided independent of the cultural context in which the motivation program is applied.

Final remarks are essential to highlight that the *controlled*, specifically the *introjected forms of regulation*, also seem to play an important role. The qualitative results from the *case study* show a frequency of 19 out of 101, even higher than the 16 responses given to fully *autonomous intrinsic forms of regulation*. Even though they play an essential role, the limited sampling from the case study did not allow for a comparison between groups has not been able to be made. However, the importance of the use of *introjected controlled forms of regulation* for some cultural contexts has been consistently confirmed by the statistical analysis of the main study. It represents the main contribution to knowledge discussed in the last Section and the answer to the research questions. In other words, *controlled introjected forms of regulations* should be applied depending on the cultural context to trigger further motivation to participate in such training programs.

7.4.2 Main Study Results and Respective Guidelines to Practice

The main study's results corroborate the case study's conclusions. Its statistical analysis confirmed the cultural variability regarding controlled forms of regulation and the universality claim towards more autonomous forms of regulation. It is highlighted by the ANOVA results, which compare the means between the groups to evaluate if their difference can be considered statistically different. The most extreme difference was found in the extrinsic forms of regulation, with results varying from an average group allocation of 1,0 for

Germany and 2,7 for India. It confirms that, more often than not, the factor loading's variances in all four cultural contexts can be divided into three groups, with Germany being one separate group, Thailand and Brazil a second one, and India, a group of its own. Thus, a statistically significant difference between groups can be seen when dealing with more *controlled forms of regulation*.

India's specific case and the conjecture of cultural variance regarding *controlled forms of regulation* have also been confirmed by the SEM, where a positive .174 path coefficient between *controlled forms of regulation* and *work engagement* for the cultural context can be seen. When comparing India's SEM path analysis with its ANOVA results, *controlled forms of regulation*, both *extrinsic* and *introjected*, have been the highest from any cultural context with respective 4,6 and 5,0 mean averages, further confirming the existing cultural variance between groups for this factor.

It is essential to note that the same is not valid for the more *autonomous forms of regulation*, with cultural contexts often positioned in the same group and results varying from 1,0 to a maximum of 1,5. This ANOVA interpretation also corroborates what has been presented by the MGA; all four cultural contexts present the same positive relationship between *autonomous forms of regulation* and *work engagement*, and the difference between the cultural contexts or groups is statistically irrelevant. Thus, all cultural contexts react the same to *autonomous forms of regulation*, which further supports the literature on the topic (Gagné et al., 2015; Kuvaas et al., 2017).

Still, regarding *autonomous forms of regulation*, the analysis also showed different results between the *introjected* and *intrinsic forms of regulation*. The *identified* form of *autonomous* regulation has shown the highest positive results for all four cultural contexts. The meaning of the highest results being found behind *identified* instead of *intrinsic forms of regulations* is most likely because participating in training and development regarding vehicle assembly usually does not happen out of sheer pleasure. Especially for a monotonous and repetitive activity such as vehicle assembly, it would be logical to deduce that the participation in training and development for these skills does not come from the pure joy of the task but rather an identification with its goals, which the data have supported. Thus, the ANOVA results show that the more *autonomous* the *form of regulation*.

is, the better the results in every cultural context, achieving its peak with the *identified* instead of the *intrinsic form of regulation*.

Results for the *controlled forms of regulation, extrinsic* and *introjected*, also confirm the expectation for monotonous and repetitive activities defined in the literature. The average mean values show that *introjected* regulations play a more critical role than *extrinsic* ones when motivating the participants, with *extrinsic* ones presenting the lowest values for every cultural context. It provides two conclusions: first, when dealing with monotonous activities, the *controlled forms of regulation* can play an important role; and second, the more *controlled* the *forms of regulation* are, the more they seem to vary between cultural contexts. According to the analysis, Thailand, Brazil and Indian employees reacted positively to *controlled forms of regulation* when motivated towards training and development, while Germany reacted negatively. It means that when dealing with mundane, monotonous tasks, such as vehicle assembly, some cultural contexts might still react positively to *controlled forms of regulation*. However, within the *controlled forms of regulation*, the more *introject* and less *extrinsic* they are, the better the result is expected.

To summarize, according to the main study's results, cultural variability continuously and systematically reduces when moving from more *controlled* to more *autonomous forms of regulation*. It means that the more *autonomous* the *forms of regulation* are, the more the cultural contexts seem to react positively to the same trigger. This conclusion poses a crucial guideline for practitioners: *identified* and *intrinsic* triggers should be applied whenever possible and universally to all cultural contexts to achieve a positive result, with *identified* triggers playing a more crucial role. On the other hand, *controlled*, more precisely *introjected forms of regulation* should be applied whenever possible to supplement the overall positive motivational results but stay restricted to Thailand, Brazil and India. In contrast, *external forms of regulation* should be avoided universally. Furthermore, future implementations in Germany should focus on *autonomous forms of regulation*; otherwise, the opposite negative effect might impact the motivational intention of the training concept.

7.4.3 Contributions to Practice

The recommendations for practitioners and, thus, this study's contribution to practice have been consolidated below. The following contributions to practice have been drawn from the case and the main study's data analysis results. The recommendations below should not be treated as rules for every case but rather guidelines for implementing motivation programs across intercultural production networks in the automotive industry.

Contribution to Practice:

- A. Contribution to practice: motivational programs and their respective triggers applied to achieve motivational results must be adapted depending on the cultural context where they are to be implemented;
- B. Contribution to practice: *autonomous* motivational triggers, more precisely *identified* and *intrinsic forms of regulation*, have a positive influence on *work engagement* across all analysed cultural contexts and, thus, should be applied universally. For monotonous and repetitive tasks, such as vehicle assembly, the *identified forms of regulation* play a more critical role than the *intrinsic* ones;
- C. Contribution to practice: *controlled* motivational triggers, more precisely, *introjected forms of regulation*, have a positive influence on *work engagement* in some cultural contexts, such as Thailand, India and Brazil and a negative influence in others, such as Germany. Therefore, motivational programs should consider the use of *controlled forms of regulation* to supplement the positive results provided by *autonomous forms of regulation* but restrict these to the cultural contexts positively affected by it;
- D. Contribution to practice: *controlled* motivational triggers, more precisely, *external forms of regulation*, have a negative to neutral influence on *work engagement* in all cultural contexts and, thus, should be avoided universally.

These guidelines shall help the practitioner aiming to roll out motivational programs across different countries and cultural contexts, avoiding mistakes which could generate effects opposing the expectations. Even though the results have been statistically deemed reliable and valid, it is essential to note that this study is limited to the four cultural contexts analysed and the industry where it took place. For cultural contexts presenting similar cultural backgrounds or similar industrial activities, it is prudent to use these recommendations with caution, testing if the results found by this study can be replicated. This study has shown that some motivational triggers are cultural variants; it would be naïve to assume that the guidelines above are rules to be rolled out universally without a closer examination of each case. Thus, they serve as a guide for the practitioner for future implementation of motivational programs and not as a one-size-fits-all solution.

7.4.4 Actionable Points and Recipe for Future Motivational Programs

Based on the contributions to practice stated above, this Sub-Section provides actionable points for the practitioner in the field to facilitate future implementation. Each contribution has been further detailed, and concrete examples of implementing the mentioned triggers have been given. The *case study* discussed in Chapter 5 has been used as a baseline to provide concrete examples; therefore, the practitioner has a direct reference on implementing these guidelines in the industry.

> A. Contribution to practice: motivational programs and their respective triggers applied to achieve motivational results must be adapted depending on the cultural context where they are to be implemented;

The first contribution to practice suggests adapting any motivational program depending on the cultural context where it will be implemented. It refers foremost to the *forms of regulation* and the motivational triggers used in motivational programs to engage employees in their work environment. As discussed several times and further supported by this study, the *basic psychological needs* and their support have a positive effect on *work engagement* universally; thus, only the focus on specific *forms of regulation* must take place, and their weight in terms of motivational triggers must be adapted depending on the cultural context where the implementation takes place. Blindly rolling out motivational programs without this careful consideration is deemed unwise.

B. Contribution to practice: *autonomous* motivational triggers, more precisely *identified* and *intrinsic forms of regulation*, have a positive influence on *work engagement* across all analysed cultural contexts and, thus, should be applied

universally. For monotonous and repetitive tasks, such as vehicle assembly, the *identified forms of regulation* play a more critical role than the *intrinsic* ones;

According to the literature, the internalization process is considered *autonomous* when the behaviour has an *internal perceived locus of causality* (Black & Deci, 2000). It means the motive to engage in a particular task is volitional (R. M. Ryan & Connell, 1989). The task is seen as personal identification and importance or based on sheer interest and enjoyment (Gagné & Forest, 2008; Grant et al., 2011; Kaplan & Madjar, 2017). In this study, it referred to the *identified regulation*, which points to the execution of a task due to the individual's identification of its goals, values or significance (Chirkov et al., 2003; Gagné et al., 2015; Rudy et al., 2007), and *intrinsic regulation*, which refers to engaging in a particular activity out of pure enjoyment and interest, the highest autonomous form of regulation directly linked to the intrinsic type of motivation (Chirkov et al., 2003).

For monotonous and repetitive tasks such as vehicle assembly, the study has shown that participation due to mere joy is not as strong as ensuring the associate identifies himself or herself with the task's significance. Thus, for future implementations, the practitioner should apply more triggers to foment an understanding of the goals and values behind the activity. A concrete example from the case study would be the rule created in the training program to ensure flawless quality was delivered even in challenging under time pressure, where the assembly process had to be conducted as quickly as possible. By completely losing the time trial run if one process step mistake has been committed, the associate better identifies themselves with the quality goal; an issue with the product leaving the factory after the assembly has been completed can hardly be recovered and generate similar consequences. Additionally, allowing the employee to use the theoretical knowledge in a practical workbench provides the associate with a direct reference on how the training might facilitate their daily routine, saving time or improving their workload. Even if not as vital as identification, providing joy also positively influences the results; therefore, using gamification mechanics to make the process fun and exciting can also be suggested.

C. Contribution to practice: *controlled* motivational triggers, more precisely, *introjected forms of regulation*, have a positive influence on *work*

engagement in some cultural contexts, such as Thailand, India and Brazil and a negative influence in others, such as Germany. Therefore, motivational programs should consider the use of *controlled forms of regulation* to supplement the positive results provided by *autonomous forms of regulation* but restricted to the cultural contexts positively affected by it;

Scholars consider the internalization process to be *controlled* when the behaviour has an *external perceived locus of causality* (Black & Deci, 2000). It is the case when the individual is externally triggered by punishment avoidance and reward orientation or through introjected enforcement to avoid the feeling of guilt or fear or to seek recognition and improve self-esteem (Deci et al., 2017; Howard et al., 2016; Slemp et al., 2018). In this study, the contribution to practice above refers to the *introjected regulation*, which is defined as controlling the behaviour through self-imposed constraints internal to the individual, such as fear, shame, ego or self-pride pressures (Chirkov et al., 2003; Gagné et al., 2015; Rudy et al., 2007).

Practitioners applying the guideline above should consider using *introjected regulation* for cultural contexts such as Thailand, India and Brazil, which presented a positive relationship with *work engagement*. Based on the concrete examples provided by the *case study*, those cultural contexts react positively to recognition from colleagues, friends, family or hierarchy. The recognition of participants' development and results in a board at the shop floor common area, showing the top competitors on a monitor in the cafeteria, and direct feedback with the badge and passport system are examples that can be implemented to support this *form of regulation*. The final event, where the top 5 participants can compete on stage in front of all colleagues and hierarchy, is another example of the future implementation of motivational programs in those cultural contexts.

> D. Contribution to practice: *controlled* motivational triggers, more precisely, *external forms of regulation*, have a negative to neutral influence on *work engagement* in all cultural contexts and, thus, should be avoided universally;

External Regulation is the classical extrinsic motive to regulate behaviour (Chirkov et al., 2003). That means the individual acts to avoid unwanted punishment or to receive a benefit (Gagné & Deci, 2005; Rudy et al., 2007). Based on this study's results, this form of

regulation should be avoided altogether because it has, in the best-case scenario, a neutral relation with work engagement and, in the worst case, a negative one. Concrete examples to avoid would be to provide cash prizes and promotions for the best candidates or directly punish the ones with the worst results with additional working hours, complementary training or penalties.

The consolidated table below provides concrete examples of implementing the contribution to practice provided by the current study. This implementation plan does not intend to be a recipe but a backbone supporting the practitioner. Adaptations, exclusions and expansion of these suggestions are welcome and eventually necessary depending on the cultural context and industry where applied. It is strongly recommended to find similar triggers within the same *forms of regulation* when adapting the concept to a new background; otherwise, new statistical validation is necessary to ensure the same results are achieved.

Table 43. Contribution to Practice – Actionable Points.

Contribution to Practice	Degree of	Form of Regulation	Culturally	Trigger	Actionable Points
	Internalization		Variable or	Positive	
			Universal *	Correlation*	
A. motivational programs must be					- Support basic psychological need
adapted depending on the cultural					fulfilment;
context where they are to be					- Adapt motivational triggers and forms of
implemented	-	-	-	-	regulation based on the cultural context;
					- Avoid rolling out motivational programs
					across the international network without
					considering cultural adaptation.
B. Autonomous motivational triggers,			•		- Create an enjoyable/fun environment for
intrinsic forms of regulation, have a					the motivational programs towards training
positive influence on work engagement	Autonomous	Intrinsic	Universal	High	and development;
across all analysed cultural contexts					- Use gamification mechanics to engage and
and, thus, should be applied universally.					excite participants and spectators.
B. Autonomous motivational triggers,			•		- Apply triggers to foment an understanding
identified forms of regulation, have a					of the goals and values behind the activity;
positive influence on work engagement	A	late and the st	[]	Marriel Back	- Allow participants to apply theoretical
across all analysed cultural contexts	Autonomous	Identified	Universal	very High	knowledge in a practical workbench $ ightarrow$
and, thus, should be applied universally.					direct reference to facilitate the daily routine,
					saving time or improving workload.
C. Controlled motivational triggers,					- Allow for positive recognition from
introjected forms of regulation,					colleagues, friends, family, or hierarchy to be
positively influence work engagement in					done publicly;
some cultural contexts, such as					- Provide board/monitor to display
Thailand, India and Brazil and negatively	0		Culturally		participants' development and results;
influence in others, such as Germany.	Controlled	Introjected	Variable	Medium	- Immediate feedback with badge system;
					- Final Event with stage recognition from
					management and colleagues.
D. Controlled motivational triggers,			•		- Avoid cash prizes or promotions;
external forms of regulation, have a					- Avoid tangible rewards;
negative to neutral influence on work	Controlled	External	Universal	Low	- Avoid tangible penalties or negative
engagement in all cultural contexts and,					feedback;
thus, should be avoided universally					- Avoid punishment with additional working
					hours or complementary training.

*According to the study's results – for the Thai, Indian, Brazilian and German cultural context for vehicle assembly in the automotive industry.

The current study has been positioned within the SDT theory to answer a theoretical and practical question on motivating associates across various cultural contexts. As discussed before, the drive behind the study comes precisely from this interest in motivating assembly line associates across the international production network; this issue is seen as a practical challenge in the daily business of the automotive industry. The study's contribution to practice discussed in this Sub-Section provides an additional tool and guidelines to better deal with associate motivation in a cross-cultural context.

Specifically, for the further development of the training concept detailed in the *case study* and future roll-out of the same concept in the international production network of the automotive group, this study's results and recommendations must be considered. Before repeating the exact implementation in Thailand, India, Brazil and Germany, the training concept and its respective motivational triggers must be adapted based on the culturally variable *controlled forms of regulation*. For expansion in the international network, including 30 production sites in at least nine countries, additional caution is recommended regarding possible cultural variation in the *forms of regulation*. The guidelines above should be applied and measured for efficacy to pilot the program in the new production sites. Similar results should be expected in similar cultural contexts within the network; however, statistical validation is needed to ensure positive results towards *work engagement* and avoid unwanted opposite effects.

The contributions to the practice and respective actionable points discussed so far provide crucial recommendations for the practitioner. They apply foremost to motivate employees from diverse cultural contexts towards further training and development when dealing with a repetitive and monotonous task such as vehicle assembly. These recommendations can be extended to similar constructs if applied with caution and tested for similar results. As stated, caution is advised when rolling out similar implementations in different cultural contexts or industries. By respecting and proactively dealing with the expected cultural variability for future implementations, the practitioner can ensure positive results and successful implementation of motivational programs in the future.

7.5 Limitations and Future Research

Before closing the Chapter and moving into the conclusion, important notes must be taken regarding this study's limitations and, consequently, how these limitations can be avoided or minimized in future research. This Sub-Section presents three main types of identified limitations. Firstly, there are overall methodological limitations concerning the research framework and design; Secondly, there are limitations regarding the methods for

statistical analysis and their results for the current study; and lastly, limitations regarding cultural context and how to define them. For each limitation, at least one recommendation has been made regarding how future research could address these issues to improve results further.

The study's cross-sectional design creates limitations regarding the research framework and overall methodological choices. By testing the construct and its factors in cross-sectional instead of longitudinal design, the statistical analysis is limited to the interaction and relation between the model's factors; no causality between them can be inferred. A single temporal window for the data collection has been chosen, which does not allow for results comparison over time or even before and after the practical implementation of the motivational program detailed in the *case study*, causing the same effect. Future research could apply a longitudinal design to test causal relationships between the variables, especially regarding *controlled forms of regulation* causing positive effects towards *work engagement* for specific cultures, which the current study has claimed to exist. Collecting data before and after the motivational program's implementation would also make it possible to directly measure how the training concept positively affects *work engagement* and the magnitude of this relation, thus recommending further inquiry.

Another methodological limitation is the environment where the study was conducted. By sampling the population within the automotive industry in specific cultural contexts, the generalisation possibilities for this study's claims are also limited to the same settings. Besides its restriction to one specific industry, the same issue must be addressed regarding the cultural context where the study occurs. As discussed during the literature review, the definition of culture cannot be bound to geographical borders once it ignores significant within-country heterogeneity and across-border similarities (Nelson, 2014; Newman & Sheikh, 2012). Thus, the current study intentionally used cultural contexts as a definition instead of a country's geographical limitations. It allows for similar values and costumes to be defined as local culture, with this study comparing results. This interpretation also limits the study and its conclusions to the cultural context where the data has been collected. Even though significant studies have shown that by sampling a dominant sub-culture within the national level, several patterns of behaviours can be predicted for the whole culture (House et al., 2004), it would be naïve to assume that in geographically large

countries, such as Brazil, or culturally heterogeneous countries, such as India, it would automatically provide the same results without proper statistical meta-analyses. Future research should evaluate if the results found here can be replicated in additional cultural contexts, even within the same country, before generalisation and universalisation of this study's claim can occur.

Further methodological limitations regarding sample size also conceivably impact results. Even though the total number of valid respondents after the data screening and cleaning process has been considerably high, with 817 valid questionnaires, when dividing into groups for cross-cultural comparisons, this was not the case. The number of valid responses varied from 72 participants in India to 470 in Thailand. Two main issues arise from this limitation. Firstly, the small sample size in India, for instance, reduces the statistical power of the analysis for this specific group, affecting its skewness and kurtosis analysis and limiting reliability for some specific statistical analyses. Secondly, for some statistical tests, the heterogeneity between sample sizes can cause further restrictions regarding results. Future research could mitigate this potential error by increasing and levelling the sample sizes to facilitate statistical analysis.

Lastly, the defined *research framework* provided an initial model to be tested during the structural equation modelling that did not provide an appropriate fit. Over three interaction processes, this model has been reduced and optimized to fit the requested metrics for reliable statistical analysis. Based on the SDT literature, no theoretical harm has been caused by the optimization process with the framework within the expected metamodel (Deci et al., 2017; R. Ryan et al., 2023; Slemp et al., 2018). However, the reduced model could no longer single out sub-components of the variables for statistical analysis. For instance, the initial framework was supposed to independently test each sub-component of the independent variable of *basic psychological needs*. Due to this narrow fit, the final model has consolidated the sub-components to include *autonomy, competence* and *relatedness* in one *basic psychological need* factor. The same has been seen for *controlled forms of regulation*, consolidating the *introjected* and *external* sub-components, and *autonomous forms of regulation*, consolidating the *identified* and *intrinsic* ones.

Due to this consolidation of sub-components into one single factor, some questions remain unanswered and should be further addressed by future research. When analysing the relationship between BPN and work engagement, Germany presented a path coefficient of .687, while Thailand and India presented path coefficients of .250 and .233, respectively. With all four cultural contexts presenting the expected positive relationship, these results support the universality claim from the literature, even though the analysis showed them to be statistically significantly different. Thus, the alternative cross-cultural hypothesis has been confirmed; there is a statistically significant difference in how BPN relates to work engagement across cultures, even if all respond positively. Unfortunately, due to the consolidation of the sub-components into a single factor, no further evaluation can be conducted on whether autonomy played a more significant role for a more individualist country like Germany than for collectivist ones such as Thailand, as advocated by some scholars (Markus & Kitayama, 2003; Oishi & Diener, 2001; Rudy et al., 2007). Future research should focus on this relationship to explain why the statistically significant difference in the positive relationship between Germany, Thailand and India seems to exist and if it can be attributed to a single factor, such as *autonomy*.

Besides the limitations mentioned above due to the study's design, some limitations regarding the applied statistical methods and their results must be discussed. Regarding the *main study's* CFA, it is essential to note that the final model presented a path of statistical significance between *controlled forms of regulation* and *work engagement* close to the metric borderline, with a P-Value of .047 and a T-Value of 1.99. When repeatedly running the bootstrap with one thousand different random samples, some results fell under the .050 limit for P-Value and over the 1.96 limits for the T-Statistics. In other words, different random samples generated by the bootstrap procedure showed a T-Test significance close to the border between 1.8 and 2.0. Thus, specific path borderline results must be considered an eventual limitation of the current study. Future research can address the issue by increasing its sample size to improve the results' statistical significance.

The MGA showed most of the path coefficients to have statistical significance. Singular issues can be seen in particular cultural contexts, but the most prominent negative result is the path between *controlled* forms of regulation and *work engagement*. For this relationship, the path coefficients per group presented no statistical significance, with P-

Values over the limit. The results were predictable and referred back to the limited significance result found when bootstrapping the reduced and optimized model discussed before. Even though the path coefficient between these two factors was still within the metrics, its borderline results caused the statistical significance to decrease when dividing the data set into smaller groups for cross-cultural comparisons. A similar issue occurs when dividing the groups into smaller samples for a departmental comparison - office versus production.

The current study addressed the issue by providing one additional statistical analysis, the ANOVA, to cross-check, triangulate and compare the results between groups for the relationship between controlled *forms of regulation* and *work engagement*. This issue could also be addressed by increasing the sample size or designing the study to focus only on this relationship, splitting *controlled forms of regulation* into the sub-component of *introjected* and *external regulation* to analyse the issue's magnitude and better compare the crosscultural samples.

Additional limitation toward methods has been identified in one measurement instrument. The Basic Psychological Need Satisfaction at Work Scale questionnaire has three reversed coded questions for each sub-factor of this variable: *autonomy, competence* and *relatedness*. During the data analysis, all reverse-coded questions did not meet the reliability criteria, being removed as a factor loading from every analysis. Even though four loadings remained per factor, consistently reducing each one by three loadings possibly limited the power of the statistical results. Reversed coded questions provided an essential indicator for unengaged respondents used during data cleaning but presented a poor reliability result overall. Future research could evaluate if testing participants' engagement through reversed questions in this measurement instrument provides the best outcome or if a different instrument would provide similar results.

A final limitation regarding how culture and cultural boundaries are defined must be addressed. As discussed during the literature review, a precise delimitation of cultural borders facilitates direct sample comparison when applying cross-sectional designs. Even if the fact that nation and culture are not the same is briefly ignored for argument, adopting a pre-defined set of values or boundaries, such as those provided by Hofstede (2001),

bounding a culture together when defining the study's cross-cultural framework facilitates the research process. Recent literature has been found to critique the idea of pre-defined boundary conditions for cultural constructs by suggesting abandoning the term *culture* altogether.

Poortinga (2015) advocates that finding a consensus on how culture should be defined is impossible; others would probably reject the concept even if a particular group of scholars agreed on a standard definition (Poortinga, 2015). While abandoning the concept of culture altogether appears impracticable when comparing populations across different cultural contexts, limiting culture to a national level is a dangerous over-simplification. The definition of culture cannot be bound to geographical borders once it ignores significant within-country heterogeneity and across-border similarities (Nelson, 2014; Newman & Sheikh, 2012). Thus, to define and differentiate cultural context, social commonalities, religion and beliefs, proximity between groups should be used to determine where a specific culture starts and the other ends (Monnot, 2018). This study's choice to avoid oversimplifying culture at a national level implies that its results should not be generalised to a whole nation, sometimes not even to a whole region.

The study indicates that the relationships found for specific cultural contexts and extrapolations to similar cultural backgrounds outside the analysed samples and populations must be cautiously followed. As advocated before, this understanding does not weaken cross-cultural research's importance but increases it. The less a cultural sample can be extrapolated to the national level, the more studies are needed to test the same hypothesis in various cultural contexts before providing universalised solutions. Future studies should focus on expanding the number of cultural contexts tested, between and within a geographical border of countries and cultures, so that later robust meta-analytical research can support or refute universality claims.

7.6 Chapter Conclusion

This Chapter presented the pivotal discussion of the current study. The investigation regarding the difference in *autonomous* versus *controlled forms of regulation* of assembly line associates working in Thailand, India, Brazil and Germany has been concluded by

providing concrete evidence regarding the universality claim. Based on its hypothesis testing, it showed, discussed and determined the conclusions to be drawn from the data, providing the core contributions to knowledge and practice. It wraps up the study by achieving all research objectives and answering the research question.

The hypothesis testing confirms a statistically significant difference between the four analysed cultural contexts on how they react to *forms of regulation*. Even when all cultural backgrounds react positively to *autonomous forms of regulation*, there seems to be a difference in the degree to which they do so. This result is even more interesting for the *controlled forms of regulation*, with the statistical analysis showing that some cultures react positively and some negatively to these triggers. The 2nd and 3rd sets of hypotheses further enhance the analysis, confirming the positive relationship between *basic psychological need* variables and *work engagement* for all cultures and providing similar results regarding *controlled forms of regulation* and their relationship with *basic psychological needs*.

Based on these hypotheses' confirmation and rejections, the main contribution to the theory is presented, where even though the support to the SDT BPNT universally improves *work engagement*, the study provided empirical evidence that different cultures might achieve this need support through different *forms of regulation*, displaying more *controlling* or *autonomous* reasons for pursuing need-satisfying activities depending on the cultural context. Additional contributions to knowledge are also provided to the field regarding methods and further cross-cultural validity of the *autonomous forms of regulation* mediation claims and the model fit for four factors within the Basic SDT Model in the Workplace.

Besides the contributions to knowledge, the Chapter presented its contribution to practice by providing guidelines for any practitioner trying to implement a motivational program in a cross-cultural context. The theoretical contributions are used to detail each actionable point from this guideline further, drawing concrete examples of implementing them based on the *case study* presented. It also allows the practitioner to reformulate the recipe from the *case study*, repeating its implementation in the same countries or expanding it into new cultural contexts.

Finally, the Chapter also discussed all identified limitations of the current study. Generalisations and theory universalisation claims have been the central issue of this study, and challenging them is the central point of the research question and objectives. Thus, understanding the study's limitations is essential to ensure the results are not extrapolated without the correct scientific method and proper evidence. To avoid these misinterpretations, the Chapter suggested how future research could address these limitations. Recommendations for future research have been drawn to mitigate issues and possibly answer additional questions raised by the current study.

The discussions of finding and their implications Chapter marks the end of the study. With data to support the study's hypotheses testing and substantial contributions to knowledge and practice, the Chapter has detailed and supported the study's claims in the cross-cultural employee motivation field. The next and final Chapter of the thesis concludes the current work. It provides further insight into how in-depth analysis of different crosscultural constructs could help push research forward regarding cross-cultural employee motivation.

8.1 Final Reflection – Moving Research Forward

The study helps to push the boundaries where cross-cultural research has been conducted and is needed even though it is rooted in the self-determination theory (Deci & Ryan, 2000) and its respective self-determination model for the workplace (Deci et al., 2017; Slemp et al., 2018). Supported by concrete evidence, the call for caution regarding overgeneralisation might have further implications. Distinctly, it draws on and provides additional insights and implications for other fields of enquiry. For instance, action-trait (Bernard, 2016) and achievement motivation (Duda & Allison, 1989) have also shown trends in the universalisation of management theories, which could profit from the cross-cultural debate. Furthermore, the study also supports the relativist positions well noted across many recent motivational studies, such as those concerning job characteristics and job satisfaction (Gu et al., 2022; S. H. Kim et al., 2021), performance appraisal and rewards (Farndale & Murrer, 2015; Magnusson et al., 2014; Muduli, 2011; Newman & Sheikh, 2012; Snelgar et al., 2013), achievement motivation and goals (De Castella et al., 2013; Fornerino et al., 2011; King, 2016) as well as game-based simulation (Madni, 2013).

Ultimately, the study provided a fresh view on a recurrent question. It advanced the border where cross-cultural motivational research has collected the data to support the claims presented in the literature. By further expanding the sampling into heterogeneous cultural contexts and yet in another branch of the industry, it has attempted to move away from the limitations and bias found in Western research, where theories in social sciences have been primarily developed and applied for centuries (C. Kim, 1999; King et al., 2017). Scholars consistently point out that even within the Self Determination Theory, most data has been collected within the United States (Rudy et al., 2007). Seminal authors, such as Deci et al. (2001), agree with the statement, affirming that theories used to understand the motivation processes are often based on Western ideology's goals and needs.

Aydinli-Karakulak and Bender (2015) advocate that studies should avoid Western bias, moving beyond comparing East versus West to include more samples from diverse countries. The direct application of any Western-biased theory in a non-Western cultural

background presents a relevant risk to the workplace and the business without any concerns about possible cross-cultural relativism (Farndale & Murrer, 2015). Based on these statements, it is essential to include and expand research outside Western borders to avoid generalisations distorted by Western-biased theories and increase awareness of cultural variances.

Furthermore, according to Guillen-Royo and Kasser (2014), samples from economically developing nations are often under-represented. Even social-economic differences within nations can be the source of cultural variation (Knoll et al., 2021). It further advocates that results found by sampling college students cannot be used to represent and generalise behaviour from shop floor workers or even slum residents when studying the universalisation of *psychological needs* and motivational triggers. Jugert et al. (2014) support this claim by saying that motivation needs systematic investigation and consistent sampling from various cultural contexts to measure culture-related similarities and variations, precisely what the current study has further supported with concrete evidence.

This understanding allows, for instance, to hypothesise if an *externally regulated* extrinsic motivation is positively related to supporting a lower hierarchical need where this need is not yet fulfilled, being more appropriate for cultural contexts and samples from less economically developed nations. For example, in a culture where *financial safety* is not yet given, an *extrinsic external regulation* such as a monetary or tangible reward would be more effective as a trigger for behavioural change than in a context where financial safety is a given. Thus, generalisation from motivational theories can only be ensured by consistent sampling from various cultural contexts, industries and social classes.

The two theoretical positions discussed here are seen across the literature, with studies providing empirical evidence to support both claims. Usually, one side focuses on proving generalisability and reliability across all cultures while the other paces before any generalisation, searching for evidence of differences across nations and backgrounds. According to King et al. (2017), this dichotomy is expressed through researchers assuming an *absolutist* or *relativist* stance regarding motivation theories. An *absolutist* position would claim that all psychological motives are generalisable across all human beings and, therefore,

universal. On the other hand, the *relativist* would defend that any generalisation is uncertain, and each culture's role should be considered during the research. In between those two positions, King et al. (2017) define a third one: the *universalist* approach. The *universalist* perspective provides a balance from the hard ends defended by the *absolutists* and *relativists*, being proposed as the best path to push scientific research forward (King et al., 2017), allowing the researcher to look for differences and similarities when applying them to different cultural backgrounds.

Based on this understanding of the *absolutist*, *relativist*, and *universalist* stances described, the SDT's scholars appear to generally adopt an *absolutist* position regarding *basic psychological needs* fulfilment. Analogously, concerning motivational triggers, the approach seen in the literature seems more *relativist*. Differently from these two positions, the current study has adopted a *universalist* stance, looking for differences and similarities between various cultural contexts without categorically defining any given theory as valid or invalid in every cultural context.

As described in the earlier Chapters, various values and beliefs are found across different cultural contexts. Therefore it would be reasonable to expect that a theory would not be equally reliable in every organisational environment and cultural context (Magnusson et al., 2014). To embrace an *absolutist* stance by directly applying the same management approach in different cultural contexts without considering proper adaptation would be risky and undermine its effectiveness (Engelen et al., 2018b; Muduli, 2011; Snelgar et al., 2013). This notion is also valid for motivational theories, providing an overarching one without considering the influence that cultural contexts could impose a substantial challenge or at least present themselves as superficial. In this regard, instead of demanding an *absolutist* position, a *universalist* approach could offer a more exciting position when studying motivation in a cross-cultural environment, thus, being applied to the current study.

The need for this kind of cross-cultural approach is evident to ensure the reliability of motivational studies in the future. The current study contributes to this call by providing additional empirical evidence to yet another industry and cultural context, consistently opposing the Western bias tendency often found in contemporary research. The *universalist* approach applied, including its in-depth analysis of different cross-cultural constructs, is
therefore advocated to be the most fitting to push research forward in the field of crosscultural employee motivation.

8.2 Closing Note

The journey through the doctorate process is undoubtedly unique. Unique in the sense that the chosen topic is often so specific that it is hard to find someone sharing the same interest in the subject for a discussion, but also unique in the way it provides its personal development for the researchers involved. The learning goes beyond the data analysis results and their contribution to academia; the doctorate consistently challenges the researchers and irreversibly changes them along the way.

The challenge provided by a doctorate journey is not one of the competitive kind, as it is usually seen in the daily business where a limited number of vacancies has only one candidate who fits the job description. It characterizes itself as an individual internal challenge. The researcher consistently challenges themselves regarding their ability to move forward, independent of the chosen path and the headaches that come with it. For instance, collecting data across the international production network during a pandemic state has presented an interesting challenge for the current study. As another example, holding on to the researcher's ontological paradigm to precisely answer the research question has often been more demanding than expected at the beginning of the journey. Alternatively, consistently planning and adapting the research timeline with a possibly variable deadline four years in the future without losing sight of the necessary steps in between has also been an exciting task.

The successful conclusion of this study and the consequent contributions to knowledge and practice provided is undoubtedly an exciting milestone to achieve. However, it is safe to say that this doctoral journey will be more likely missed due to the unique challenge it provided for the researcher and, most importantly, the captivating colleagues met along the way.

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The golden screwdriver 18.12.2015

The Ultimate Quality Championship (UQC) training program at Araquari Plant in Brazil focuses on basic skills development in the assembly technology.

The main target was to change the associate's mindset about the training area. Usually this area is used when people have to improve a process or skill but not often the associates visit this area for self-improvement. The UQC concept involved a training phase including both theoretical and practical content. The practical training consisted of a 3-bench circuit: tightening, connectors and quality. Every employee could join and the five best performances would participate in a main event.

Behind the training program there is a concept based on two main pillars: gamification and sport. The first pillar uses game thinking and game mechanics in non-game contexts. The second pillar brings the idea of maintaining or improving physical ability and skills while providing entertainment to participants and spectators. Combining characteristics of those two ideas allows to improve someone's skill while bringing motivation and enjoyment to the people involved.

In March 2015 the training plan started and covered more than seven months of preparation. After that, the associates training phase reached two months with over 536 training hours. The global participation target of more than 60% of the assembly employees was reched although UQC is a voluntary program. The whole training structure and main event was developed and prepared mainly by the technology's team.

Quality during performance

During the 2 months training phase a Top 5 ranking was formed with the best participants considering the quality of their performance and time trial. Those five best associates were then classified for the final event. On December 3rd, 2015, almost 400 people stopped to cheer and appreciate their colleagues while they tried their best to win the golden screwdriver for the first time. As accomplished in the training phase, the final event criteria was quality during the performance, any mistake would disqualify the time taken.

At the end, all five participants were awarded with BMW LifeStyle prizes. The champion, who achieved the time of 4 min and 27,6 sec, received also a test drive experience with the currently produced models as well as the golden casted screwdriver trophy. Not only self-motivation but also joy and entertainment were brought together on this successful day.

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Appendix 2 – English Version of the Questionnaire (EV3.0)

Need Satisfaction, Training & Development and Well-Being Questionnaire



Dear colleague, you are being invited to participate in the research conducted by the <u>University of Gloucestershire</u> (UK) regarding selfregulated motivational triggers and their influence on <u>skills training and development</u> in the automotive industry. Your participation is highly appreciated, it will only take around <u>10-15 min</u> of your time. Upon completion it will be collected in a sealed box and stored in a high security server with restricted access. This questionnaire, including all answers, <u>will be kept anonymous</u> and used for research purposes only. No questionnaire and/or answers can be traced back to any participant.

Please answer the questions reflecting your honest opinion. You may refrain from answering any question you are not comfortable with.

How to answer the questionnaire (EXAMPLE Part A-B):					EX.	AMPLE	
A1. How do I feel about my job during the last 12 months?	Notat all true			Somewhat	ļ		Very true
1. I really like the people I work with.	Ò—	Ó	ò	Ò	*	Ô	Ó
	Not at all true			Som ewhat true			Verytru
A1. How do I feel about my job during the last 12 months?	1	2	3	4	5	6	~
) I really like the people I work with	0	0	0	0	0	0	0
2. I de net feel very competent when I am at work	0	0	0	0	0	0	0
Deeple at work tell me Lam good at what Lide	0	0	0	0	0	0	0
Feel pressured at work	0	0	0	0	0	0	0
Last class with accels at work.	0	0	0	0	0	0	0
. I get along with people at work.	0	0	0	0	0	0	0
. I pretty much keep to myself when I am at work.	0	0	0	0	0	0	0
a. I am free to express my ideas and opinions on the job.	0	0	0	0	0	0	0
9. I consider the people I work with to be my friends.	0	0	0	0	0	0	0
LO. I have been able to learn interesting new skills on my job.	0	0	0	0	0	0	0
1. When I am at work, I have to do what I am told.	0	0	0	0	0	0	0
Most days I feel a sense of accomplishment from working.	0	0	0	0	0	0	0
L3. My feelings are taken into consideration at work.	0	0	0	0	0	0	0
14. On my job I do not get much of a chance to show how capable I am.	0	0	0	0	-0-	0	-0
15. People at work care about me.	0	0	0	0	0	0	-0
16. There are not many people at work that I am close to.	0	0	0	0	0	0	0
17. I feel like I can pretty much be myself at work.	0	0	0	0	0	0	0
18. The people I work with do not seem to like me much.	0	0	0	0	0	0	0
19. When I am working I often do not feel very capable.	0	0	0	0	0	0	0
20. There is not much opportunity for me to decide for myself	0	0	0	0	0	0	0
now to go about my work.							
21. People at work are pretty friendly towards me.	0	0	0	0	0	0	0
A2. Is there anything else you would like to comment regarding how yo	ou feel abo	out vour	iob? Fee	l free to c	omment		

PART A - Basic Need Satisfaction at Work

PART B - <u>Training & Development</u>								
P1 participate (opgage in THEODETICAL trainings because)	Notat all			Somewhat			Very true	
1. I want my boss/colleagues to think I'm good at what I do.		2	3	4	5	6		
2. I'll get in trouble at work if I don't.	0—	-0-	-0-	-0-	-0-	-0-	0	
3. it's fun.	0—	0	0	0	0	0	-0	
4. I will feel bad about myself if I don't do it.	0—	-0-	-0-	-0-	-0-	-0-	0	
5. I want to understand the subject.	0—	0	0	0	0	0	-0	
6. that's what I'm supposed to do.	0—	-0-	-0-	-0-	-0-	0	0	
7. I enjoy practicing my skills.	0—	0	0	0	0	0	-0	
8. it feels important to me personally to accomplish this goal.	0—	0	0	0	0	0	0	
9. I want my colleagues to think I'm good.	0—	0	0	0	0	0	0	
10. I enjoy testing my skills in challenging activities.	0—	0	0	0	0	0	0	
11. I want my boss to say nice things about me.	0	0	0	0	0	0	0	
12. I want to find out if I'm good or bad at it.	0—	0	0	0	0	0	0	
B2. I participate/engage in PRACTICAL trainings because:	Notat all			Somewhat			Very true	
13. I don't want my boss to get be mad at me.	1	2	3	4	5	6	7	
14. I want my boss to think I'm a good employee.	0	0					0	
15. I want to learn new things.	0							
16. I'll be ashamed of myself if it didn't get done.	0	0					0	
17. it's fun.	0							
18. I have to.	0		0	0	0	0		
19. I enjoy learning.	0							
20. I feel like it's the best way to improve myself.	0	_0_	_0_	_0_	_0_	_0_	0	
21. I would feel bad about myself if I did not.	0—	_0_	_0_	_0_	_0_		0	
22. it's fun to test my skills in high-performance environments.	0—	_0_	_0_		_0_		0	
23. I feel like I have no choice; that's what I'm supposed to do.	0	_0_					O	
24. it's important to me to try demanding challenges.	0	0	0	0	0	0	0	
B3. I participated in the UOC (Ultimate Quality Championship) 202(0/2021:							
O Yes O No O I don't know what the U	QC is (please g	o to Part	C).					
B4. I would participate in the next UQC (Ultimate Quality Champion	nsnip): OC is (plaasa g	o to Part	C)					
	de is (piease gi		с).					
B5. Why did I (would I) participate in the UQC training platform?	Not at all true 1	2	3	Som ewhat true 4	5	6	Very true 7	
25. Because that's what I'm supposed to do.	Ō-	Ō	Ŏ	Ò	Ŏ	Ŏ	Ò	
26. So my boss will think I'm good in what I do.	0—	0	0	0	0	0	0	
27. Because I enjoy doing the trainings (practical/theoretical).	0-	0	0	0	0	0	0	
28. Because I will get the championship trophy if I succeed.	0-	0	0	0	0	0	0	
29. Because improving my skills is an important value for me.	0	0	0	0	0	0	0	
30. Because it's important to me to try to do well.	0-	0	0	0	0	0	0	
31. Because I will feel really proud of myself if I do well.	0-	0	0	0	0	0	0	
32. Because I would get a reward if I do well (trip/driving experience)) O-	0	0	0	0	0	0	
33. Because the UQC is fun.	0-	0	0	0	0	0	0	
34. Because my family/friends would be really proud if I do well.	0—	0	0	0	0	0	0	

87. Is there a different reason why you participate/engage in THEOR	ETICAL/F	RACTICAL	training	s? Feel fr	ee to co	mment.	
PART C – <u>Wo</u> rl	k & Wel	l-being					
How to answer the questionnaire (EXAMPLE Part C):		A four timor	00000	A four	r ⊳ E)	KAMPLE	
C1. How often do I feel this way about my job?	Never	a year or less	month or less	times a month	On ce a week	A few times a week	Every day
1. At my work, I feel bursting with energy.	0		2 ————————————————————————————————————				
C1. How often do I feel this way about my job?	Never 0	A few times a year or less 1	On ce a month or less 2	A few times a month 3	On ce a week 4	A few times a week 5	Every day 6
1. At my work, I feel bursting with energy.	0—	0	0	0	0	0	0
2. I find the work that I do full of meaning and purpose.	0—	0	0	0	0	0	-0
3. Time flies when I'm working.	0—	0	0	0	0	0	0
4. At my job, I feel strong and vigorous.	0	0	0	0	0	0	0
5. I am enthusiastic about my job.	0—	0	0	0	0	0	0
5. When I am working, I forget everything else around me.	0	0	0	0	0	0	-0
7. My job inspires me.	0—	0	0	0	0	0	0
3. When I get up in the morning, I feel like going to work.	0—	0	0	0	0	0	0
9. I feel happy when I am working intensely.	0	0	0	0	0	0	0
10. I am proud on the work that I do.	0	0	0	0	0	0	0
11. I am immersed in my work.	0—	0	0	0	0	0	-0
12. I can continue working for very long periods at a time.	0—	0	0	0	0	0	-0
13. To me, my job is challenging.	0—	0	0	0	0	0	-0
14. I get carried away when I'm working.	0—	0	0	0	0	0	0
15. At my job, I am very resilient, mentally.	0	0	0	0	0	0	0
16. It is difficult to detach myself from my job.	0—	0	0	0	0	0	-0
17. At my work I always persevere, even when things do not go well.	0—	0	0	0	0	0	0
C2. Is there anything else you would like to comment regarding how	often yo	u feel this	way abo	ut your j	ob? Fee	free to co	mmen
PARID – Clos D1. My age is represented within the following range:	ing Que	estions					
○ Under 20 ○ 20-30 ○ 31-40 ○ 41-50	0	51-60	00	ver 60			
D2. My area:							
Office OProduction							
D3. Years of work at the company:							
01 02 03 04 05 06 07 08 09 01	0 011	012 01	3 ()14	O15 ()more t	han 15	
D4. My gender is / I identify myself best with the following gender:							
○ Male ○ Female ○ Other:							
D5. My country of birth is:							
○ Thailand ○ Other:							
D6. Country I lived most of my life in:							

Questionário sobre Satisfação de Necessidades Básicas, Treinamento e Bem-Estar.



Caro Colega, esse é um convite para você participar de uma pesquisa conduzida pela <u>Universidade de Gloucestershire</u> (Reino Unido) sobre gatilhos de motivação autoregulada e sua influência em <u>treinamento e desenvolvimento de habilidades</u> na indústria automotiva. Sua participação será muito bem-vinda e terá duração de <u>10 a 15 minutos</u>. Quando finalizado, o questionário será coletado e armazenado em uma urna selada e as informações salvas em um servidor de alta segurança com acesso restrito. Esse questionário com suas respostas, <u>será anônimo</u> e utilizado somente para pesquisa. Nenhum questionário ficará vinculada ao participante. Por favor responda com sinceridade. Caso se sinta desconfortável com alguma pergunta, você pode optar por não respondê-la.

PARTE A - Satisfação de Necessidades Básicas no Trabalho

Como responder o questionário (EXEMPLO Parte A-B):	EX	EMPLO	de Preen	chimento ·	•		
A1. Como me sinto no meu trabalho nos últimos 12 meses?	Discordo			Concord o		0	Concord o mpletamente
1 Fu realmente gosto das nessoas com quem trabalho		2	3	4	5	6	0
1. Eu realmente gosto das pessoas com quem trabalho.	0	0	0	0		U	U
	Discordo completam en	te		Concordo parcialmente			Concord o completamente
A1. Como me sinto no meu trabalho nos últimos 12 meses?	1	2	3	4	5	6	7
1. Eu sinto que tenho autonomia sobre minhas atividades.	0	0	0	0	0	0	0
2. Eu realmente gosto das pessoas com quem trabalho.	0	0	0	0	0	0	0
3. Não me sinto muito competente quando estou no trabalho.	0	0	0	0	0	0	0
4. Pessoas no trabalho me dizem que sou bom/boa no que faço.	0	0	0	0	0	0	0
5. Eu me sinto pressionado(a) no local de trabalho.	0	0	0	0	0	0	0
6. Me relaciono bem com as pessoas no trabalho.	0	0	0	0	0	0	0
7. Eu sou um pouco mais fechado(a) quando estou trabalhando.	0	0	0	0	0	0	0
8. Sou livre para expressar minhas ideias e opiniões no trabalho.	0	0	0	0	0	0	0
9. Meus colegas de trabalho são meus amigos.	0	0	0	0	0	0	0
10. Eu tenho oportunidade de aprender novas habilidades no trabalho.	0	0	0	0	0	0	0
11. Quando eu estou no trabalho tenho que fazer o que me dizem.	0	0	0	0	0	0	0
12. Na maioria dos dias eu me sinto realizado(a) no trabalho.	0	0	0	0	0	0	0
13. Meus sentimentos são levados em consideração.	0	0	0	0	0	0	0
14. No trabalho não tenho muitas chances de mostrar do que sou capa	z. O	0	0	0	0	0	0
15. As pessoas do meu trabalho se importam comigo.	0	0	0	0	0	0	0
16. Não tenho muitas pessoas no trabalho de quem eu seia próximo(a).	0	0	0	0	0	0	0
17. Eu posso ser eu mesmo(a) no meu local de trabalho.	0	0	0	0	0	0	0
18. As pessoas com quem trabalho não parecem gostar muito de mim.	0	0	0	0	0	0	0
19. Quando estou trabalhando geralmente não me sinto muito canaz.	0	0	0	0	0	0	0
20. Fu não tenho muita oportunidade de decidir como fazer as coisas	0	0	0	0	0	0	0
no meu trabalho	0				0		0
21 Percess no trabalho são ham amisfusis semire	0	0	0	0	0	0	0
21. ressoas no trabalno sao bem amigaveis comigo.	0	0	0	0	0	0	0
A2. Haveria algo a mais que você queira comentar a respeito de como	se sente se	obre seu	trabalho	? Fique à v	ontade	para co	mentar.
				. 24			

PARTE B - <u>Treinamento & E</u>	Desenvo	olvime	<u>ento</u>				
D B1 Eu participo/me envolvo em treinamentos TEÓRICOS porque: om	iscordo letamente		c	Concord o arcialmente		c	Concordo ompletamente
1. Quero que meu gestor/colegas pensem que sou bom/boa no que faço.		2		4	5	6	-0
2. Eu teria problemas no trabalho se não participasse.	0	-0	-0-	_0	_0_	0_	0
3. É divertido.	0	0	0				
4. Me sentiria mal se não fizesse isso.	<u> </u>	_0	_0_	0	_0_	_0_	O
5. Eu quero entender do assunto.	0	0					
6. Isso é o que eu devo fazer.	0			0	_0		
7. Eu gosto de treinar minhas habilidades.	0	0					
8. É importante para mim que eu atinja esse objetivo.	0	0					
9. Eu quero que meus colegas pensem que sou bom/boa.	0				_0		
10. Gosto de treinar e desafiar minhas habilidades.	0	0		0			
11. Eu gostaria que meu gestor falasse coisas boas sobre mim.	0	_0	_0		_0	0	
12. Eu gostaria de descobrir se sou bom/boa ou não no tema.	<u> </u>	_0	_0_		_0_	_0_	0
,	Discordo	Ŭ	0	Concordo	Ŭ	Ŭ	Concordo
B2. Eu participo/me envolvo em treinamentos PRÁTICOS porque: com	pletamente 1	2	3	parcialmente 4	5	6	:ompletamente 7
13. Eu não quero que meu gestor fique descontente comigo.	0	0	Ó	0	0	Ó	—O
14. Quero que meu gestor pense que eu sou um(a) bom/boa funcionário(a).	0	0	0	0	0	0	O
15. Eu quero aprender coisas novas.	0	0	0	0	0	0	—O
16. Me sentiria envergonhado(a) se não fizesse isso.	0	0	0	0	0	0	—O
17. É divertido.	0	0	0	0	0	0	—O
18. Eu tenho que participar.	0	0	0	0	0	0	—O
19. Eu gosto de aprender.	0	0	0	0	0	0	—O
20. Parece ser a melhor maneira de me desenvolver.	0	0	0	0	0	0	—O
21. Me sentiria mal comigo mesmo(a) se não fizesse isso.	0	0	0	0	0	0	—O
22. É divertido testar minhas habilidades em ambiente de alto desempenho	0	0	0	0	0	0	—0
23. Eu sinto que não tenho escolha; é o que devo fazer.	0	0	0	0	0	0	—O
24. É importante me testar em novos desafios.	0	0	0	0	0	0	O
B3 Eu participai do LIOC (<i>Liltimate Quality Championshin</i>) 2020/2021							
	vor nule	nara a i	narte C d	o question	ário)		
	voi puic	puluu		o question	unoj.		
B4. Eu participaria do próximo UQC (Ultimate Quality Championship):							
○ Sim ○ Não ○ Eu não sei o que é o UQC (por fa	vor pule	para a	parte C d	o question	ário).		
B5. Por que participei/participaria do UQC?	Disc or do			Concord o			Concord o
25. Porque isso é o que eu devo fazer.		2	3		5		7
26. Para que meu gestor pense que eu sou bom no que faço.	0—	_0_			_0_		0
27. Porque eu gosto de fazer os treinamentos (práticos/teóricos).	0			0			
28. Porque se eu vencer vou ficar com o troféu de campeão.	0	_0_			_0_		
29. Porque melhorar minhas habilidades é importante para mim	$\tilde{\mathbf{O}}$	0			0		
30. Porque é importante para mim tentar me sair bem	0	0	0	0	0	0	
31. Porque sentirei muito orgulho de mim mesmo(a) se for hem	\sim	0	0	0	0	0	0
32 Porque se eu for hem serei premiado (viagem/driving experience)	0	0	0	0	0	0	0
33. Porque o LIOC é divertido	0	0	0	0	0	0	0
33. Forque o oque e divertido. 34. Porque minha família/amigos ficariam orgulhocos de mim so ou for hom	0	0	0	0	0	0	-
per rorque minina familia/amigos nuariam orgunosos de mim se eu for bem	. 0—	0	0	0	0	0	

Γ

				•			mentar
PARTE C – Traba	lho e B	em-Esta	ır				
		EXEMPL	— O de Pree	enchimer	ito 🖣		
Como responder o questionário (EXEMPLO Parte C):		Poucas	Umavez	Po ucas	Umavez	Algumas	Todor o
C1. Com que frequência me sinto dessa forma no trabalho?	Nunca	ano	ou menos	mês	semana 4	sem ana	dias
1. No meu trabalho, me sinto cheio de energia.	Ŏ-	Ō	Ō	Ŏ	×	Ŏ	—Ŏ
		Poucas vezes no	Uma vez por mês	Po ucas vezes no	Umavez	Algumas vezes por	Tod os os
1. Com que frequência me sinto dessa forma no meu trabalho?	Nu nca 0	ano 1	ou meno s 2	mês 3	semana 4	semana 5	dias 6
No meu trabalho, me sinto cheio(a) de energia.	0—	0	0	0	0	0	0
Eu considero o meu trabalho cheio de significado e propósito.	0—	0	0	0	0	0	-0
O tempo voa quando estou no trabalho.	0	0	0	0	0	0	0
No meu ambiente de trabalho me sinto bem fisicamente.	0	0	0	0	0	0	0
Sou entusiasmado pelo meu trabalho.	0	0	0	0	0	0	0
Quando estou trabalhando, eu me desligo de todo o resto.	0	0	0	0	0	0	0
Meu trabalho me inspira.	0—	0	0	0	0	0	-0
Tenho prazer em acordar e ir trabalhar.	0—	0	0	0	0	0	-0
Eu me sinto bem quando trabalho intensamente.	0	0	0	0	0	0	0
). Tenho orgulho do trabalho que realizo.	0	0	0	0	0	0	-0
1. Eu estou imerso(a) no meu trabalho.	0—	0	0	0	0	0	-0
2. Eu posso continuar trabalhando por períodos longos.	0—	0	0	0	0	0	-0
3. Para mim, meu trabalho é desafiador.	0—	0	0	0	0	0	-0
 Eu me empolgo quando estou trabalhando. 	0—	0	0	0	0	0	-0
5. No meu trabalho, eu sou mentalmente muito resiliente.	0-	0	0	0	0	0	0
5. É difícil eu me desligar do meu trabalho.	0—	0	0	0	0	0	-0
7. Sou sempre perseverante, mesmo que as coisas não corram bem.	0—	0	0	0	0	0	_0
2. Haveria alguma coisa que você gostaria de dizer sobre como você	ê se sente	e no trab	alho? Fiqı	ue à vont	ade para	comenta	r.
1. A minha idade é:	rguntas	Finals					
○ Abaixo de 20 ○ 20-30 anos ○ 31-40 anos ○ 41-50 an	os O	51-60 and	os Om	nais de 60) anos		
2. Minha area de trabalho:							
O Escritório O Producao							
3. Anos de trabalho na empresa:							
$\bigcirc 1 \bigcirc 2 \bigcirc 3 \bigcirc 4 \bigcirc 5 \bigcirc 6 \bigcirc 7 \bigcirc 8 \bigcirc 9 \bigcirc 1 $	0 011	O12 O	13 014	O15 ()mais de	e 15	
4. Meu gênero é / me identifico melhor com o seguinte gênero:							
O Masculino O Feminino O Outro:	(sir	nta-se à v	ontade pa	ara escrev	ver o gên	ero)	
5. Meu país de nascimento é:							
O Brasil O Outro: (se o	quiser, in	dique seu	ı país de r	asciment	to)		
6. País em que vivi a maior parte da minha vida:							
O Brasil O Outro: (se o	quiser, in	dique ond	de passou	a maior	parte da :	sua vida)	

Fragebogen zur Bedürfnisbefriedigung, Training & Weiterbildung und Wohlbefinden



Liebe Kolleg*in, Du bist herzlich eingeladen, an der Umfrage der <u>University of Gloucestershire</u> (UK) zu selbst regulierten Motivationsauslösern und deren Einfluss auf das <u>Training von Fähigkeiten und Weiterbildung</u> in der Automobilindustrie teilzunehmen. Deine Teilnahme schätzen wir sehr. Die Umfrage wird ca. <u>10-15 Minuten</u> in Anspruch nehmen. Nach dem Ausfüllen wird der Fragebogen in einer versiegelten Box gesammelt und auf einem Hochsicherheitsserver mit eingeschränktem Zugang gespeichert. Der Fragebogen sowie Deine Antworten werden <u>anonym bleiben</u> und nur für wissenschaftliche Zwecke verwendet. Kein Fragebogen und/oder keine der Antworten können zu einem Teilnehmenden zurückverfolgt werden. Bitte beantworte die Fragen ehrlich mit Deiner eigenen Meinung. Fragen, bei denen Du Dich unwohl fühlst, kannst Du selbstverständlich auslassen.

TEIL A - Befriedigung der Grundbedürfnisse bei der Arbeit So beantwortest Du den Fragebogen (BEISPIEL Teil A-B): BEISPIEL Trifft voll und Trifft ü berhaupt Trifft nichtzu A1. Wie empfand ich die Arbeit in den letzten 12 Monaten? ganz zu ò ò Ô 1. Ich mag die Menschen, mit denen ich arbeite, sehr. **Trifft überhaupt** Trifft Trifft voll und nichtzu eher zu 4 ganz zu 7 A1. Wie empfand ich die Arbeit/meinen Job in den letzten 12 Monaten? 1. Ich habe das Gefühl, dass ich in meinem Job viel mitbestimmen kann. 2. Ich mag die Menschen, mit denen ich arbeite, sehr. 3. Ich fühle mich nicht sehr kompetent, wenn ich bei der Arbeit bin. 4. Meine Arbeitskollegen sagen mir, dass ich gut bin in dem, was ich mache. 🔘 5. Ich fühle mich bei der Arbeit unter Druck gesetzt. 6. Ich komme gut mit meinen Kolleg*innen zurecht. 7. Ich bleibe eher für mich, wenn ich bei der Arbeit bin. 8. Ich kann meine Ideen und Meinungen in meinem Job frei äußern. 9. Ich sehe meine Kolleg*innen als meine Freunde. 10. Ich habe in meinem Job interessante neue Fähigkeiten erlernen können. 🔘 11. Wenn ich bei der Arbeit bin, muss ich tun, was mir gesagt wird. 12. Ich habe oft das Gefühl, etwas in der Arbeit erreicht zu haben. 13. Auf meine Gefühle wird bei der Arbeit Rücksicht genommen. 14. Ich habe nicht oft die Möglichkeit zu zeigen was ich kann. 15. Die Menschen bei der Arbeit interessieren/kümmern sich für/um mich. 🔘 16. Es gibt nicht viele Menschen bei der Arbeit, denen ich nahestehe. 17. Ich habe das Gefühl, dass ich bei der Arbeit ich selbst sein kann. 0 0 0 18. Meine Arbeitskollegen scheinen mich nicht besonders zu mögen. 19. Wenn ich arbeite, fühle ich mich oft nicht sehr leistungsfähig. 0 0 0 0 0 0 0 0 0 20. Es gibt nicht viele Möglichkeiten für mich zu entscheiden, wie ich meine Arbeit gestalte. 0 0 0 0 0 21. Die Menschen bei der Arbeit sind ziemlich freundlich zu mir. A2. Gibt es noch etwas was Du bezüglich Deiner Arbeit hinzufügen möchtest? Teile gerne Deine Gedanken/Gefühle.

Tritlethouse Tritlethouse Tritlethouse 1. Ich mochte, dass mein/e Cheffin denkt, dass ich meine Arbeit gut mache. 0 0 0 0 0 2. Ich Ärger auf der Arbeit bekomme, wenn ich nicht teilnehme. 0 0 0 0 0 3. Is Spaß macht. 0 0 0 0 0 0 4. Ich mich schliecht fühlen werde, wenn ich nicht teilnehme. 0 0 0 0 5. Ich das Thema versitehen möchte. 0 0 0 0 0 5. Is das ist, was ich machen soll. 0 0 0 0 0 5. Is das ist, was ich machen soll. 0 0 0 0 0 1. Ich möchte, dass mein/e Kolleg "innen denken, dass ich gut bin. 0 0 0 0 1. Ich möchte, dass mein/e Kolleg "innen denken, dass ich gut bin. 0 0 0 0 1. Ich möchte, dass mein/e Cheffin gut über mich redet. 0 0 0 0 0 1. Ich möchte, dass mein/e Cheffin gut über mich ist. 1	TEIL B - <u>Training & </u>	Weiterbil	dung					
	R1 Ich nehme an THEORETISCHEN Schulungen teil weil:	Trifft überhau nicht zu	pt		Trifft eher zu			Trifft voll und ganz zu
2. Ich Ärger auf der Arbeit bekomme, venn ich nicht teilnehme. O O O 3. Es Späß macht. O O O O 4. Ich mich schliecht fühlen werde, venn ich nicht teilnehme. O O O O 5. Es das ist, was ich machen soll. O O O O O 7. Es mir Freude macht, meine Fähigkeiten zu trainieren. O O O O O 8. Es sich für mich persönlich wichtig anfühlt, dieses Ziel zu erreichen. O	1. Ich möchte, dass mein/e Chef*in denkt, dass ich meine Arbeit gut mac	he. O	2	3	4	5	6	7
	2. Ich Ärger auf der Arbeit bekomme, wenn ich nicht teilnehme.	0—	-0-	-0-	-0-	0	-0-	0
	3. Es Spaß macht.	0—						0
5. Ich das Thema verstehen möchte. 6. Es das ist, was ich machen soll. 7. Es mir Freude macht, meine Fähigkeiten zu trainieren. 8. Es das für minie Fähigkeiten zu trainieren. 9. Ich möchte, dass mein/e Kölleg*innen denken, dass ich gut bin. 10. Ich möchte, dass mein/e Kölleg*innen denken, dass ich gut bin. 11. Ich möchte, dass mein/e Chef*in gut über mich redet. 12. Ich herausfinden möchte, ob ich gut oder schlecht darin bin. 82. Ich nehme an PRAKTISCHEN Schulungen teil, well: 13. Ich nicht möchte, dass mein/e Chef*in gut über mich redet. 14. Ich möchte, dass mein/e Chef*in dest, leil se lein/e gute/r Mitarbeiter*in 15. Ich neue Dinge lernen möchte. 16. Ich mich schämen werde, wenn ich es nicht mache. 17. Es späß macht. 18. Ich nicht schämen werde, wenn ich sein ich tit eline/e gute/r Mitarbeiter*in 19. Ich mächte, dass mein/e Chef*in dess eilt u erreissem. 21. Ich nich schämen werde, wenn ich es nicht mache. 23. Ich heiten schlecht fühlen werde, wenn ich nicht teilnehme. 20. Ich das Gefühl habe, dass es der beste Weg ist, mich zu verbessem. 21. Ich nich schlecht fühlen werde, wenn ich nicht teilnehme. 23. Ich keine andere Wahl habe. Es ist was ich machen muss. 24. Ich weiß nicht, was UQC ist (bitte gehe zu Teil C). 83. Ich habe bei der UQC (Uttimate Quality Championship) 2020/2021 teilgenommer: 21. B. Späß macht. 23. Ich keine andere Suhl habe. Es ist was ich machen soll. 24. Es wink fühlen werde, wenn ich nicht, was UQC ist (bitte gehe zu Teil C). 83. Ich habe bei der UQC (Uttimate Qualit	4. Ich mich schlecht fühlen werde, wenn ich nicht teilnehme.	0-	_0_	_0_	_0_	_0_	_0_	0
6. Es das ist, was ich machen soll. 7. Es mir Freude macht, meine Fähigkeiten zu trainieren. 8. Es sich für mich persönlich wichtig anfühlt, dieses Ziel zu erreichen. 9. Ich möchte, dass mein/e Kolleg*innen denken, dass ich gut bin. 0. E. smir Spaß macht, meine Fähigkeiten zu testen. 11. Ich möchte, dass mein/e Kolleg*innen denken, dass ich gut bin. 0. E. smir Spaß macht, meine Fähigkeiten zu testen. 12. Ich herausfinden möchte, obis hgut oder schlecht darin bin. 23. Ich nehme an PRACTSCHEN Schulungen teil, weil: 7. Tiff Sikeriver 7. Is ich neichte, dass mein/e Chef*in denkt, ich sei ein/e gute/r Mitarbeiter*in. 13. Ich nicht möchte, dass mein/e Chef*in denkt, ich sei ein/e gute/r Mitarbeiter*in. 14. Ich möchte, dass mein/e Chef*in denkt, ich sei ein/e gute/r Mitarbeiter*in. 15. Ich neue Dinge lernen möchte. 16. Ich mich schämen werde, wenn ich es nicht mache. 17. Es Spaß macht. 18. Ich adsetfühl habe, dass es der beste Weg ist, mich zu verbessern. 20. Ich das Gefühl habe, dass es der beste Weg ist, mich zu verbessern. 21. Ich mich schlecht fühlen werde, wenn ich nich teilnehme. 22. Is smart Spaß, meine Fähigkeiten zu testen. 23. Ich heide andere Wahl habe. Es ist was ich machen muss. 24. Es mir wichtig ist, anspruchsvolle Herausforderungen auszuprobieren. 23. Ich habe bei der UQC (Ultimate Quality Championship) 2020/2021 teilgenommen: 23. Ich habe bei der nächsten UQC (Ultimate Quality Championship) teilnehmen: 23. Weil die das ist, was ich machen soll. 24. Ba mit mein/e Chef*in denkt, dass ich gut bin, in de	5. Ich das Thema verstehen möchte.	0						0
7. Es mir Freude macht, meine Fähigkeiten zu trainieren. 0 0 0 8. Es sich für mich persönlich wichtig anfühlt, dieses Ziel zu erreichen. 0 0 0 9. Ich möchte, dass mein/e Kölleg*innen denken, dass ich gut bin. 0 0 0 0 10. Es mir Spaß macht, meine Fähigkeiten zu testen. 0 0 0 0 0 11. Ich möchte, dass mein/e Chef*in gut über mich redet. 0	6. Es das ist, was ich machen soll.	0						
8. Es sich für mich persönlich wichtig anfühlt, dieses Ziel zu erreichen. 9. Ich möchte, dass mein/e Kolleg*innen denken, dass ich gut bin. 10. Es mir Spaß macht, meine Fähigkeiten zu testen. 11. Ich möchte, dass mein/e Chef*in gut über mich redet. 12. Ich herausfinden möchte, ob ich gut oder schlecht darin bin. 13. Ich nicht möchte, dass mein/e Chef*in gut über mich redet. 13. Ich nicht möchte, dass mein/e Chef*in denkt, ich sei ein/e gute/r Mitarbeiter*in. 14. Ich möchte, dass mein/e Chef*in denkt, ich sei ein/e gute/r Mitarbeiter*in. 15. Ich neue Dinge lernen möchte. 16. Ich mich schlaem werde, wenn ich es nicht mache. 17. Es Spaß macht. 18. Ich as Gefühl habe, dass es der beste Weg ist, mich zu verbessem. 20. Ich das Gefühl habe, dass es der beste Weg ist, mich zu verbessem. 21. Ich mich spaß, meine Fähigkeiten zu testen. 22. Ich keine andree Wahl habe. Es ist was ich machen muss. 23. Ich habe bei der UQC (Ultimate Quality Championship) 2020/2021 teilgenommen: 23. Ich habe bei der UQC (Ultimate Quality Championship) 2020/2021 teilgenommen: 23. Ich habe bei der UQC (Ultimate Quality Championship) 2020/2021 teilgenommen: 23. Weil es das ist, was ich machen soll. 24. Es mir wichtig ist, anspruchsvolle Herausforderungen auszuprobieren. 25. Weil es das ist, was ich machen soll. 26. Damit mein/e Chef*in denkt, dass ich gut bin, in dem was ich mache. 27. Weil es mir Spaß macht, dir Trainings zu machen (Praxis/Theorie). 28. Weil lich die Siegentrophäe bekommen werde, wenn ich gavin und gavin u	7. Es mir Freude macht, meine Fähigkeiten zu trainieren.	0						
3. Ich möchte, dass mein/e Kolleg*innen denken, dass ich gut bin. 10. Es mir Spaß macht, meine Fähigkeiten zu testen. 11. Ich möchte, dass mein/e Chef*in gut über nich redet. 12. Ich herausfinden möchte, ob ich gut oder schlecht darin bin. 82. Ich nehme an PRAKTISCHEN Schulungen teil, weil: 11. Ich möchte, dass mein/e Chef*in böse auf mich ist. 13. Ich nicht möchte, dass mein/e Chef*in böse auf mich ist. 14. Ich möchte, dass mein/e Chef*in böse auf mich ist. 15. Ich neue Binge lernen möchte. 16. Ich mich schämen werde, wenn ich es nicht mache. 17. Ist Spaß macht. 18. Ich sam achten muss. 19. Ist mich schächter fühlen werde, wenn ich es sit, mich zu verbesern. 10. Ich mächter, fühlen werde, wenn ich nicht teilnehme. 11. Ich möchte, dass ein/e Chuffin böse auf inch ist. 16. Ich mich schämen werde, wenn ich nicht teilnehme. 17. Ist Spaß macht. 18. Ich sancht nuss. 19. Ist mir Spaß, meine Fähigkeiten zu testen. 10. Ich das Gefühl habe, dass es der beste Weg ist, mich zu verbesern. 11. Ich möchte, dass nich mächten muss. 12. Ich habe bei der UQC (Ultimate Quality Championship) züb/Zübzi teilgenommen: 13. Ich habe bei der nächsten UQC teilnehmen? 14. Ich würde ich bei der UQC teilnehmen? 15. Weil es das ist, was ich machen soll. 26. Bant mein/e Chef*in denkt, dass ich gut bin, in dem was ich mache. 10. I a 10. I weiß nicht, was UQC ist (bittig gehe zu Teil C). 18. Ich würde ich bei der UQC teilnehmen? 18. Starum habe ich / würde ich bei d	8. Es sich für mich persönlich wichtig anfühlt, dieses Ziel zu erreichen.	0						0
10. Es mir Späß macht, meine Fähigkeiten zu testen. 0 0 0 11. Ich möchte, dass mein/e Chef*in gut über mich redet. 0 0 0 0 12. Ich nehme an PRAKTISCHEN Schulungen teil, weil: Triffit überhauf meinter and some in the som	9. Ich möchte, dass mein/e Kolleg*innen denken, dass ich gut bin.	0						0
11. Ich möchte, dass mein/e Chef*in gut über mich redet. 12. Ich herausfinden möchte, ob ich gut oder schlecht darin bin. 12. Ich herausfinden möchte, dass mein/e Chef*in böse auf mich ist. 13. Ich nicht möchte, dass mein/e Chef*in böse auf mich ist. 14. Ich möchte, dass mein/e Chef*in denkt, ich sei ein/e gute/r Mitarbeiter*in. 15. Ich neue Dinge lernen möchte. 16. Ich mich schämen werde, wenn ich es nicht mache. 17. Is 5paß macht. 18. Ich as Gefühl häbe, dass es der beste Weg ist, mich zu verbessern. 19. Ist mich schämen werde, wenn ich nicht teilnehme. 21. Ich möchter, fühlt her werde, wenn ich nicht teilnehme. 22. Ist macht muss. 23. Ich hase nächt fühlen werde, wenn ich nicht teilnehme. 24. Es mir wichtig ist, anspruchsvolle Herausforderungen auszuprobieren. 23. Ich kaie andere Wahl habe. 24. Ich würde bei der UQC (Ultimate Quality Championship) 2020/2021 teilgenommen: 33. Ich habe bei der UQC (Ultimate Quality Championship) 2020/2021 teilgenommen: 34. Ich wirde ich bei der UQC (Ultimate Quality Championship) teilnehmen: 35. Weil es das ist, was ich machen soll. 26. Bamit mein/e Chef*in denkt, dass ich gut bin, in dem was ich mache. 27. Weil es mir Spaß macht, die Trainings zu machen (Praxis/Theorie). 28. Weil die die Siegertrophäe bekommen werde, wenn ich gewinne. 30. Weil wirkle hold er UQC (Ultimate Quality Championship) teilnehmen: 31. Ol keine siegertrophäe bekommen werde, wenn ich gewinne. 32. Weil es das ist, was ich machen soll. 29. Weil ge as ist, was ich machen soll. 26. Dami	10. Es mir Spaß macht, meine Fähigkeiten zu testen.	0						
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13. Ich nicht möchte, dass mein/e Chef*in böse auf mich ist. 0	B2. Ich nehme an PRAKTISCHEN Schulungen teil, weil:	nicht zu 1	2	3	eher zu 4	5	6	ganz zu 7
14. Ich möchte, dass mein/e Chef*in denkt, ich sei ein/e gute/r Mitarbeiter*in. 15. Ich meu Dinge lernen möchte. 16. Ich mich schämen werde, wenn ich es nicht mache. 17. Es Spaß macht. 18. Ich se machen muss. 19. Is sin if Spaß macht zu lernen. 20. Ich das Gefühl habe, dass es der beste Weg ist, mich zu verbessern. 21. Ich mich schlecht fühlen werde, wenn ich nicht teilnehme. 22. Es macht Spaß, meine Fähigkeiten zu testen. 23. Ich keine andere Wahl habe. Es ist was ich machen muss. 24. Es mir wichtig ist, anspruchsvolle Herausforderungen auszuprobieren. 31. Ich habe bei der UQC (Ultimate Quality Championship) 2020/2021 teilgenommen: 31. Ich würde bei der nächsten UQC (Ultimate Quality Championship) teilnehmen: 32. Ki kais ich machen soll. 33. Ich habe bei der UQC (Ultimate Quality Championship) teilnehmen: 34. Ich würde bei der nächsten uQC (Ultimate Quality Championship) teilnehmen: 35. Weil es das ist, was ich machen soll. 36. Damit mein/e Chef*in denkt, dass ich gut bin, in dem was ich mache. 30. Weil ich die Siegertrophäe bekommen werde, wenn ich gewinne. 31. Weil ich die Siegertrophäe bekommen werde, wenn ich gewinne. 33. Weil ich die Siegertrophäe bekommen werde, wenn ich gesten. 34. Weil ich wicklich stol zuf mich sein werde, wenn ich gesten. 33. Weil das UQC Spaß macht. 34. Weil ich wicklich stol zuf mich sein werde, wenn ich gut bin. 33. Weil das UQC Spaß macht. 34. Weil ich wirklich stolz auf mich sein werde, wenn ich gut bin. 33. Weil das UQC Spaß macht. 34. W	 13. Ich nicht möchte, dass mein/e Chef*in böse auf mich ist. 	0—	0	Ó	0	0	Ó	0
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	34. Weil meine Familie/Freunde sehr stolz wären, wenn ich es gut mache	. 0	0	0	0	0	0	0

37. Gibt es sonstigen Gründe, warum Du am THEORETISCHEN/PRAKT	TISCHEN	I Training t	eilnimmst	? Teile g	erne Dei	ine Gedan	ken/G
TEIL C – <u>Arbeit 8</u>	& Woh	lbefinder	<u>1</u>				
					- 	BEISPIEL	
So beantwortest Du den Fragebogen (BEISPIEL Teil C):		Ein paar mal im Jahr oder	Einmal im Monat od ei	Ein paar Mal im	Einmal in der	Ein paar Mal in der	Jeden
C1. Wie oft habe ich dieses Gefühl bei der Arbeit?	Nie 0	weniger 1	weniger 2	Monat 3	Woche 4	Woche 5	Tag 6
1. Bei der Arbeit fühle ich mich voller Energie.	0	0	0	0	×	0	0
		Ein paar mal im Jahr oder	Einmal im Monat oder	Ein paar Mal im	Einmal in der	Ein paar Mal in der	Jeden
1. Wie oft habe ich dieses Gefühl bei der Arbeit?	Nie 0	weniger 1	weniger 2	Monat 3	Woche 4	Woche 5	Tag 6
. Bei der Arbeit fühle ich mich voller Energie.	0-	0	0	0	0	0	-0
2. Ich finde meine Arbeit voller Sinn und Zweck.	0-	0	0	0	0	0	-0
3. Die Zeit vergeht schnell, wenn ich arbeite.	0	0	0	0	0	0	0
 In meinem Job f	0	0	0	0	0	0	0
i. Ich bin begeistert von meinem Job.	0	0	0	0	0	0	0
5. Wenn ich arbeite, vergesse ich alles andere um mich herum.	0-	0	0	0	0	0	-0
⁷ . Mein Job inspiriert mich.	0-	0	0	0	0	0	-0
3. Wenn ich morgens aufstehe, habe ich Lust, zur Arbeit zu gehen.	0-	0	0	0	0	0	0
 Ich fühle mich glücklich, wenn ich hart arbeite. 	0-	0	0	0	0	0	-0
10. Ich bin stolz auf die Arbeit, die ich mache.	0	0	0	0	0	0	-0
1. Ich bin in meine Arbeit vertieft.	0-	0	0	0	0	0	0
12. Ich kann sehr lange am Stück arbeiten.	0-	0	0	0	0	0	0
L3. Für mich ist meine Arbeit herausfordernd.	0-	0	0	0	0	0	0
4. Ich bin oft in Gedanken / schweife ab, während der Arbeit.	0-	0	0	0	0	0	0
L5. Ich bin sehr belastbar bei der Arbeit (mental/geistig).	0-	0	0	0	0	0	-0
16. Mir fällt es schwer, mich von meinem Job loszulösen.	0-	0	0	0	0	0	0
17. Ich halte immer durch, auch wenn die Dinge mal schieflaufen.	0-	0	0	0	0	0	-0
2. Möchtest Du noch etwas dazu sagen, wie Du Dich in der Arbeit fü	ühlst? To	eile gerne I	Deine Ged	lanken.			
TEIL D – Abschli D1. Mein Alter ist:	ießend	le Fragen					
○ Unter 20 ○ 20-30 ○ 31-40 ○ 41-50	С	51-60	O Üb	ber 60			
)2. Meine Abteilung:							
O Büro O Produktion							
)3. Ich arbeite seit so vielen Jahren im Unternehmen:							
$\bigcirc 1 \bigcirc 2 \bigcirc 3 \bigcirc 4 \bigcirc 5 \bigcirc 6 \bigcirc 7 \bigcirc 8 \bigcirc 9 \bigcirc 1$	0 011	O12 O	13 014	015 (mehr a	ls 15	
)4. Mein Geschlecht ist/ ich identifiziere mich am ehesten mit dem f	folgende	en Geschlee	cht:				
○ Männlich ○ Weiblich ○ Divers ○ Sonstige	s:						
D5. Mein Geburtsland ist:							
Obeutschland Obeutschland<							

แบบสอบถามความพึงพอใจ



เรียน เพื่อนพนักงานทุกท่าน ท่านได้รับเชิญไห้เข้าร่วมตอบแบบสอบถามในงานวิจัยเกี่ยวกับแรงจูงใจในการทำงาน การพัฒนาทักษะในการทำงาน และการฝึกอบรมในอุตสาหกรรมรถยนต์ ที่ถูกจัดขึ้นโดย มหาวิทยาลัย Gloucestershire ประเทศอังกฤษ ขอขอบคุณเป็นอย่างสูงสำหรับความร่วมมือในการตอบแบบสอบถาม โดยการตอบแบบสอบถามนี้ใช้เวลาเพียง 10 – 15 นาที ผลจากแบบสอบถามจะถูกเก็บไว้สำหรับการวิจัยเพียงเท่านั้น โดยจะไม่สามารถระบุตัวตนผู้ทำแบบสอบถามได้ แบบสอบถามจะถูกเก็บรักษาไว้ในสถานที่ที่ปลอดภัย และจำกัดการเข้าถึงจากผู้ที่ไม่ได้รับอนุญาต กรุณาตอบแบบสอบถามตามความคิดเห็นของคุณ และสามารถงดแสดงความคิดเห็น สำหรับคำถามที่คุณไม่ต้องการจะแสดงความคิดเห็น

Part A - <u>ความต้องการขั้นพื้นฐานในที่ทำงาน</u>

<u>วิธีการตอบแบบสอบถาม (ดัวอย่าง สำหรับ Part A และ B)</u>							
A1. คณรัสึกอย่างไรเกี่ยวกับงานของคณในช่วง 12 เดือน ที่ผ่านมา	1				• 91	วอยาง	
	เมถูกต่องหงหง	2	3	4	5	6	ากต่องหลุด 7
1. ฉันรู้สิกดีกับเพื่อนร่วมงาน	0	0	0	0		0	0
A1. คุณรู้สึกอย่างไรเกียวกับงานของคุณในช่วง 12 เดือน ที่ผ่านมา	ไม่ถูกต้องทั้งห	เมด	, QU	ต้องเป็นบางส	(วน		ถูกต้องที่สุด "
1. ฉันรู้สึกว่าฉันมีส่วนร่วมในการตัดสินใจในงานของฉัน	0	Ó	ò	Ō	ò	Ô	0
2. ฉันรู้สึกดีกับเพื่อนร่วมงาน	0	0	0	0	0	0	0
3. ฉันรู้สึกไร้ความสามารถ เมื่อฉันอยู่ที่ทำงาน	0	0	0	0	0	0	0
4. เพื่อนร่วมงานบอกว่าฉันทำงานที่ได้รับมอบหมายได้เป็นอย่างดี	0	0	0	0	0	0	0
5. ฉันรู้สึกกดดันในที่ทำงาน	0	0	0	0	0	0	0
6. ฉันเข้ากับเพื่อนร่วมงานได้ดี	0	0	0	0	0	0	0
7. ฉันค่อนข้างเก็บตัวเวลาอยู่ที่ทำงาน	0	0	0	0	0	0	0
8. ฉันมีอิสระที่จะแสดงความคิดเห็นในหรือแนวคิดใหม่ ๆ ในการทำงาน	0	0	0	0	0	0	0
9. ฉันคิดว่าทุกคนในที่ทำงานคือเพื่อนของฉัน	0	0	0	0	0	0	0
10. ฉันสามารถเรียนรู้ทักษะที่น่าสนใจใหม่ ๆ จากงานของฉัน	0	0	0	0	0	0	0
11. เมื่อฉันอยู่ที่ทำงาน ฉันต้องทำในสิ่งที่ฉันถูกบอกให้ทำ	0	0	0	0	0	0	0
12. ส่วนใหญ่ฉันรู้สึกประสบความสำเร็จในการทำงาน	0	0	0	0	0	0	0
13. ความรู้สึกของฉันถูกนำมาเป็นส่วนหนึ่งในที่ทำงาน	0	0	0	0	0	0	0
14. ฉันไม่ค่อยมีโอกาสได้แสดงความสามารถในการทำงานของฉัน	0	0	0	0	0	0	0
15. เพื่อนร่วมงานเป็นห่วงฉัน	0	0	0	0	0	0	0
16. ฉันสนิทกับเพื่อนร่วมงานเป็นบางคนเท่านั้น	0	0	0	0	0	0	0
17. ฉันรู้สึกว่าฉันสามารถเป็นตัวของตัวเองในการทำงาน	0	0	0	0	0	0	0
18. เพื่อนร่วมงานของฉันดูจะไม่ค่อยชอบฉัน	0	0	0	0	0	0	O
19. ฉันรู้สึกไม่มีความสามารถในระหว่างการทำงานอยู่บ่อยครั้ง	0	0	0	0	0	0	0
20. ฉันไม่ค่อยได้รับโอกาสให้ตัดสินใจในการทำงาน	0	0	0	0	0	0	0
21. เพื่อนร่วมงานค่อนข้างเป็นมิตรกับฉัน	0	0	0	0	0	0	0
A2. ความคิดเห็นเพิ่มเติมเกี่ยวกับหัวข้อ คุณรู้สึกอย่างไรเกี่ยวกับงานของคุณ							

PART B - <u>การฝึกอบรม</u> แ	เละการ	<u>รพัฒนา</u>					
B1. ฉันเข้าร่วมการฝึกอบรม <u>ภาคทฤษฎ</u> ี เพราะ ^{ไม่ถู} ้	าต้องทั้งหม	เด	ถูกเ	ต้องเป็นบ <i>าง</i> ส	ี่วน	_	ถูกต้องที่สุด -
1. ฉันต้องการให้หัวหน้า และ เพื่อนร่วมงานคิดว่าฉันทำงานที่ได้รับมอบหมายได้ดี	1 ()	2 ()	- ³	4	-0	6	
2. ฉันจะมีปัญหาในที่ทำงาน ถ้าฉันไม่เข้าร่วม	0—	0	0	0	0	0	0
3. ฉันสนุกกับการฝึกอบรม	0—	0	0	0	0	0	0
4. ฉันจะรู้สึกแย่กับตัวฉันเองถ้าฉันไม่เข้าร่วม	0	0	0	0	0	0	0
5. ฉันอยากมีความเข้าใจในหัวข้อนั้น ๆ มากขึ้น	0—	0	0	0	0	0	0
6. การฝึกอบรมภาคทฤษฎีเป็นสิ่งที่ฉันควรทำ	0—	0	0	0	0	0	0
7. ฉันรู้สึกสนุกสนานในการฝึกอบรมทักษะของฉัน	0—	0	0	0	0	0	0
8. ฉันรู้สึกว่าการบรรลุเป้าหมายในการฝึกอบรมเป็นสิ่งสำคัญ	0—	0	0	0	0	0	0
9. ฉันต้องการให้เพื่อนร่วมงานคิดว่าฉันทำงานได้ดี	0—	0	0	0	0	0	0
10. ฉันรู้สึกสนุกในการทดสอบทักษะของฉันในกิจกรรมระหว่างการฝึกอบรม	0—	0	0	0	0	0	0
11. ฉันต้องการให้หัวหน้าพูดถึงเรื่องดี ๆ ของฉัน	0—	0	0	0	0	0	0
12. ฉันต้องการที่จะประเมินตัวเองว่าระดับความสามารถของฉันอยู่ในระดับดีหรือแย่	0—	0	0	0	0	0	0
B2. ฉันเข้าร่วมการฝึกอบรมภาคปฏิบัติ เพราะ _{ไม่กุ} .	าต้องทั้งหม	เด	ญก	ต้องเป็นบางส	่วน		ถูกต้องที่สุด
13. ฉันไม่ต้องการให้หัวหน้าโมโหฉัน	1 ()	2 ()	3	4	5	6	~O
14. ฉันอยากให้หัวหน้าฉันคิดว่าฉันเป็นพนักงานที่ดี	0—	0	0	0	0	0	0
15. ฉันต้องการเรียนรู้สิ่งใหม่ๆ	0—	0	0	0	0	0	0
16. ฉันรู้สึกละอายใจถ้าฉันทำมันไม่สำเร็จ	0—	0	0	0	0	0	0
17. การฝึกอบรมทำให้ฉันรู้สึกสนุก	0—	0	0	0	0	0	-0
18. การฝึกอบรมภาคปฏิบัติเป็นสิ่งที่ฉันควรทำ	0—	0	0	0	0	0	-0
19. ฉันรู้สึกสนุกสนานกับการเรียนรู้	0—	0	0	0	0	0	-0
20. ฉันรู้สึกว่านี่คือวิธีที่ดีที่สุดในการพัฒนาตัวเอง	0—	-0-	-0-	-0-	-0-	-0-	-0
21. ฉันจะรู้สึกแย่กับตัวเองถ้าฉันไม่ได้ทำมัน	0—	0	0	0	0	0	0
22. ฉันรู้สึกสนุกที่ได้ทดสอบความสามารถของฉันในสภาพแวดล้อมที่มีการแข่งขันสูง	0—	0	0	0	0	0	0
23. ฉันรู้สึกว่าฉันไม่มีทางเลือก นั่นคือสิ่งที่ฉันควรจะทำ	0—	0	0	0	0	0	0
24. มันสำคัญกับฉันในการทำสิ่งที่ท้าทาย	0—	0	0	0	0	0	0
B3. ฉันเข้าร่วมการแข่งขันทักษะของพนักงาน (UQC Ultimate Quality Champion	nship 2	020/202 1	L)				
○ใช่ ○ไม่ใช่ ○ฉันไม่รู้ว่าการแข่งขันทักษะของพนักงา	าน (UQ(C) คืออะไร	(ศึกษาใน	Part C)			
B4. ฉันต้องการจะเข้าร่วมการแข่งขันทักษะของพนักงาน (UQC Ultimate Quality	Champ	oionship	2020/202	21) ในครั้	์เด่อไป		
	าน (UQ	C) คืออะไร	ร (ศึกษาใน	۱ Part C)			
B5. ทำไมฉันถึงเข้าร่วม (หรือมีความต้องการจะเข้าร่วม) ในการแข่งขันทักษะของพ	นักงาน	(UQC Ult	imate Q	uality Ch	ampions	hip 2020	/2021)
lùŋ.	กต้องทั้งหม	10 2	តូក 3	เต่องเป็นบางส 4	ร่าน 5	6	ยองหาสุพ 7
25. เพราะนั้นคือสิ่งที่ฉันควรจะทำ	0	0	-0-	0	0	-0-	-0
26. หัวหน้าของฉันจะคิดว่าฉันทำงานของฉันได้ดี	0—	0	0	0	0	0	0
27. เพราะฉันมีความสนุกสนานในการฝึกอบรม (ทั้งภาคทฤษฎี และ ปฏิบัติ)	0—	0	0	0	0	0	0
28. เพราะฉันจะได้รับรางวัลถ้าฉันเป็นผู้ชนะ	0—	0	0	0	0	0	0
[29. เพราะการพัฒนาทักษะตัวเองสำคัญสำหรับฉัน	0	0	0	0	0	0	0
30. เพราะการพยายามทำการแข่งขันให้ดินันสำคัญสำหรับฉัน	0—	0	0	0	0	0	0
[31. เพราะฉันจะภูมิไจกับตัวเองถ้าฉันสามารถทำได้ดี	0	0	0	0	0	0	0
[32. เพราะฉนจะได้รับประสบการณ์ไหม่ ๆ ถ้าฉันทำได้ดี (การท่องเทียว/ ประสบการณ์ในการขับขึ่)	0—	0	0	0	0	0	-0
33. เพราะการแข่งขนทกษะของพนกงาน (UQC) สนุก	0—	0	0	0	0	0	-0
34. เพราะครอบครว หรอ เพอนของฉนจะภูมิไจถ้าฉันทำได้ดิ	0	0	0	0	0	0	0

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B6.คณมคาแน	ะนาห	รอด	าาตชร	มสาหรา	เการแข	งขา	งทกจ	₄ะพนกงาน	UOC	หรอเม	112	19F	รดอสทา	181
						• • •	******	301110110 110	~~~					

B7. คุณมีเหตุผลอื่น ๆ ที่เข้าร่วมการฝึกอบรมทั้งภาคทฤษฎีและภาคปฏิบัติหรือไม่? โปรดอธิบาย

PART C – <u>การบริหา</u>	รการทำงาห	เและการ	<u>ใช้ชีวิต</u>				
<u>วิธีการตอบแบบสอบถาม (ตัวอย่างสำหรับ Part C)</u> :		บางครั้งใน 111 หรือ	เดือน	หลาย คะ้ำใน	🕈 ตัว	วอย่าง	
C1. คุณรู้สึกแบบนี้บ่อยแค่ไหนในการทำงาน 1. สันรัฐเป็นนาระชับในกระร้องกา	ไม่เคย 0	น้อยกว่า 1	ละครั้ง 2	1 เดือน 3	ละครั้ง 4	หลายครั้ง 5	ทุกวัน 6
1. ชนรูลกมแรงกระดุน เนการทางาน	0		0	0		0	0
C1. คุณรู้สึกแบบนี้บ่อยแค่ไหนในการทำงาน	ไม่เคย 0	บางครั้งใน 1 ปี หรือ น้อยกว่า 1	เดือน ละครั้ง 2	หลาย ครั้งใน 1 เดือน 3	สัปดาห์ ละครั้ง 4	ส้ปดาห์ละ หลายครั้ง 5	ทุกวัน 6
1. ฉันรู้สึกมีแรงกระตุ้นในการทำงาน	0	0	0	0	0	0	0
2. ฉันทำงานอย่างมีจุดมุ่งหมาย	0—	0	0	0	0	0	0
3. ฉันรู้สึกว่าเวลาผ่านไปเร็วมากในระหว่างการทำงาน	0—	0	0	0	0	0	0
4. ฉันกระฉับกระเฉงในที่ทำงาน	0—	0	0	0	0	0	0
5. ฉันเหนื่อยกับงานของฉัน	0-	0	0	0	0	0	0
6. ในเวลาที่ฉันทำงาน ฉันได้นึกถึงสิ่งต่าง ๆ รอบตัว	0	0	0	0	0	0	-0
7. งานของฉันสร้างแรงบันดาลใจให้ฉัน	Õ—	_0	_0	_0_	_0_	0	-0
8. เมื่อฉันตื่นนอนตอนเช้า ฉันรู้สึกอยากไปทำงาน	<u> </u>	_0	0				_0
9. ฉันมีความสขเมื่อฉันได้ทำงานอย่างเต็มที่	<u> </u>	_0	_0	_0_	_0_	_0	_0
10 ฉันภมิใจกับงานที่ฉันทำ	0-		0				_0
	0	0					_0
	0	0	0	0	0	0	
13. สำหรับฉัน การทำงานคือความท้าทาย	0	0	0	0		0	_0
13 สามารินพ การการการการการการการการการการการการการก	0						
17. หรือเป็นมายายของกับ 15. กับปีความยื่อหยุ่มในบายของกับ	0	0	0			0	
 ม. นหมาย เมยงเกยู่ หนุ่ง แยบบนนุ่ง นับของ สาย เมยงเป็น เป็น เป็น เป็น เป็น เป็น เป็น เป็น	0	0	0	0	0	0	0
10. มหอ การาวานแกรงของแอกแอะเวองงาหออกจับไข่ก่าวรูประโภคขึ้น 17. วันใช้ความแต่กระกาปมกกระกำหายทุกครั้นไข่ก่าวรูประโภคขึ้น	0	0	0	0	0	0	0
דע. מארסטו ואשר וכואראי ויאו ועראלעטיע מיז ומבאקב גינעסא	0	0	0	0	0	0	0
C2. คุณมีความคิดเห็นเพิ่มเติมที่เกี่ยวข้องกับข้อมูลในหัวข้อ "คุณรู้สึกแบ	บนี้บ่อยแค่ไห	หในการทำ	เงาน" หรื	รือไม่? โป [.]	รดอธิบาย	J	
PART D	– ส่วนสุดท์	้ำย					
D1. ผู้ตอบแบบสอบถามมีอายุอยู่ใหช่วง?	r						
ุ	0	51-60	Oı	มากกว่า 60)		
D2. พื้นที่ทำงานของฉัน:							
🔿 พื้นที่สำนักงาน 🔿 พื้นที่ปฏิบัติการ							
D3. อายุงานที่บริษัท BMW:							
$\bigcirc 1 \bigcirc 2 \bigcirc 3 \bigcirc 4 \bigcirc 5 \bigcirc 6 \bigcirc 7 \bigcirc 8 \bigcirc 9 ($	010 011	012 01	13 ()14	015	⊖มากกว่	ำ 15 ปี	
D4. เพศของผู้ตอบแบบสอบถาม?			. J		a .		
()ชาย ()หญิง ()LGBT ()อื่นๆ_			_ (เพศที	ระบุความเ	ป็นคุณ)		
บร. สถานทเกดของผู้ตอบแบบสอบถาม	1	d -	3~1				
บบระเทศเทย ∪ อนๆ D6 ประเทศที่ออปชัสวิตอย่ยววนวนะสี่สอ	(ระบุปร	ะเทศทคุณเก	ାଡ଼ି)				
 	(==1)=	ะเทศที่อกเจ	าศัยอย่อว	านายที่สุด			
	(10 Å Å Å Å	∞•ritiriti646∐ 9	រកប្រជាព	,∘vo ivo fib¶∛ 9	''		
ขอบคุณที่เข้าร่	วมตอบแบร	บสอบถาม	J				

		B5.25_	B5.26_	B5.27_	B5.28_	B5.29_	B5.30_	B5.31_	B5.32_	B5.33_	B5.34_
		Ext	Introj	Intrin	Ext	Ident	Ident	Introj	Ext	Intrin	Introj
N	Valid	625	625	625	625	625	625	625	625	625	625
	Missing	0	0	0	0	0	0	0	0	0	0
Skewness		-,087	-,122	-,539	-,184	-,854	-,649	-,916	-,672	-,550	-,556
Std. Error of	Skewness	,098	,098	,098	,098	,098	,098	,098	,098	,098	,098
Kurtosis		-,922	-,887	-,491	-,867	-,232	-,438	,038	-,548	-,487	-,582
Std. Error of	Kurtosis	,195	,195	,195	,195	,195	,195	,195	,195	,195	,195

Skew and Kurtosis for Self-Regulation Measurement Instrument B5.25-B5.34

					Std.				
	Ν	Minimum	Maximum	Mean	Deviation	Skev	wness	Kur	tosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
A1.1 Aut	106	1	7	5,29	1,518	-,893	,235	,488	,465
A1.2_Rel	106	1	7	5,33	1,439	-,776	,235	,026	,465
A1.3 Com	106	2	7	5,62	1,483	-,914	,235	-,278	,465
A1.4 Com	106	2	7	5,54	1,303	<mark>-1,110</mark>	,235	,825	,465
A1.5 Aut	106	1	7	4,34	1,740	-,228	,235	-1,092	,465
A1.6 Rel	106	2	7	5,90	1,014	<mark>-1,019</mark>	,235	1,353	,465
A1.7 Rel	106	1	7	4,29	1,857	-,284	,235	-1,126	,465
A1.8 Aut	106	1	7	5,68	1,335	<mark>-1,471</mark>	,235	2,524	,465
A1.9_Rel	106	1	7	4,29	1,662	-,440	,235	-,489	,465
A1.10 Com	106	1	7	5,52	1,526	-,946	,235	,263	,465
A1.11_Aut	106	1	7	4,25	1,851	-,175	,235	-1,148	,465
A1.12_Com	106	1	7	4,75	1,639	-,374	,235	-,599	,465
A1.13_Aut	106	1	7	4,45	1,651	-,316	,235	-,839	,465
A1.14_Com	106	1	7	5,19	1,616	-,865	,235	-,109	,465
A1.15_Rel	106	1	7	4,72	1,446	-,608	,235	-,034	,465
A1.16_Rel	106	1	7	4,08	1,773	-,100	,235	-,824	,465
A1.17_Aut	106	1	7	5,33	1,608	<mark>-1,003</mark>	,235	,425	,465
A1.18_Rel	106	3	7	5,94	1,128	<mark>-1,063</mark>	,235	,421	,465
A1.19_Com	106	2	7	5,75	1,461	<mark>-1,226</mark>	,235	,591	,465
A1.20_Aut	106	1	7	5,55	1,604	<mark>-1,229</mark>	,235	,772	,465
A1.21 Rel	106	1	7	5,65	1,258	<mark>-1,242</mark>	,235	1,703	,465

Pilot Study – Skew and Kurtosis for Basic Psychological Needs Measurement Instrument A1.1-A1.21.

Pilot Study – Skew and Kurtosis for Motivational Triggers Measurement Instrument B1.1-B1.24.

					Std.				
	Ν	Minimum	Maximum	Mean	Deviation	Skev	vness	Kur	tosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
B1.1_Introj	106	1	7	4,03	2,104	-,069	,235	-1,321	,465
B1.2_Ext	106	1	7	2,82	2,027	,850	,235	-,560	,465
B1.3 Intrin	106	1	7	4,79	1,787	-,425	,235	-,802	,465
B1.4_Introj	106	1	7	3,92	1,965	-,062	,235	-1,209	,465
B1.5_Ident	106	1	7	6,20	1,116	<mark>-2,119</mark>	,235	<mark>5,619</mark>	,465
B1.6 Ext	106	1	7	4,30	1,943	-,071	,235	-1,210	,465
B1.7 Intrin	106	3	7	5,95	1,268	<mark>-1,139</mark>	,235	,244	,465

B1.8_Ident	106	2	7	5,87	1,339	<mark>-1,332</mark>	,235	1,159	,465
B1.9_Introj	106	1	7	4,02	2,052	-,093	,235	-1,180	,465
B1.10_Intrin	106	1	7	5,80	1,348	<mark>-1,199</mark>	,235	,960	,465
B1.11_Ext	106	1	7	4,45	1,888	-,393	,235	-,856	,465
B1.12_Ident	106	1	7	5,56	1,537	-,982	,235	,148	,465
B2.13_Ext	106	1	7	2,83	1,910	,624	,235	-,932	,465
B2.14 Introj	106	1	7	3,91	2,017	-,110	,235	-1,267	,465
B2.15_Ident	106	4	7	6,37	,854	<mark>-1,259</mark>	,235	,807	,465
B2.16 Introj	106	1	7	3,48	2,170	,334	,235	-1,362	,465
B2.17 Intrin	106	1	7	5,61	1,411	<mark>-1,023</mark>	,235	,838	,465
B2.18 Ext	106	1	7	3,45	2,143	,439	,235	-1,183	,465
B2.19_Intrin	106	3	7	6,14	,970	<mark>-1,246</mark>	,235	1,273	,465
B2.20 Ident	106	2	7	5,98	1,121	<mark>-1,161</mark>	,235	,966	,465
B2.21_Introj	106	1	7	3,88	2,036	,100	,235	-1,281	,465
B2.22_Intrin	106	1	7	5,66	1,517	<mark>-1,354</mark>	,235	1,315	,465
B2.23_Ext	106	1	7	2,65	1,826	,887	,235	-,426	,465
B2.24_Ident	106	1	7	5,79	1,255	<mark>-1,159</mark>	,235	1,166	,465

Pilot Study – Skew and Kurtosis for Work Engagement Measurement Instrument C1.1-C1.17.

					Std.				
	Ν	Minimum	Maximum	Mean	Deviation	Skev	vness	Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
C1.1_WkEng	106	0	6	4,46	1,156	<mark>-1,470</mark>	,235	2,687	,465
C1.2_WkEng	106	0	6	4,39	1,405	-,993	,235	,408	,465
C1.3_WkEng	106	0	6	4,85	1,256	<mark>-1,444</mark>	,235	2,376	,465
C1.4 WkEng	105	0	6	4,32	1,362	<mark>-1,144</mark>	,236	1,300	,467
C1.5_WkEng	106	0	6	4,15	1,608	-,713	,235	-,409	,465
C1.6 WkEng	106	0	6	3,84	1,719	-,583	,235	-,499	,465
C1.7 WkEng	106	0	6	3,99	1,589	-,623	,235	-,404	,465
C1.8 WkEng	106	0	6	3,69	1,675	-,658	,235	-,507	,465
C1.9 WkEng	106	0	6	4,44	1,519	<mark>-1,071</mark>	,235	,549	,465
C1.10 WkEng	105	0	6	4,76	1,341	<mark>-1,284</mark>	,236	1,396	,467
C1.11 WkEng	105	0	6	4,49	1,520	<mark>-1,053</mark>	,236	,607	,467
C1.12_WkEng	106	0	6	4,49	1,340	<mark>-1,009</mark>	,235	1,099	,465
C1.13 WkEng	105	0	6	4,33	1,452	-,718	,236	-,014	,467
C1.14_WkEng	106	0	6	3,78	1,555	-,450	,235	-,442	,465
C1.15_WkEng	105	1	6	4,75	1,239	<mark>-1,248</mark>	,236	1,426	,467
C1.16_WkEng	105	0	6	3,45	1,593	-,172	,236	-,688	,467
C1.17_WkEng	105	1	6	4,80	1,259	<mark>-1,294</mark>	,236	1,401	,467

Pilot Study – EFA Pattern Matrix with 5-Factor Limitation. Small Coefficients Suppression at .3 on the left and .4 on the right (own work).

Pattern Matrix ^a						Pattern Matrix ^a						
	3 I	<u>э</u>	Factor	a I	5		8 T	2	Factor	a I	5	
C1 12 W// 5 2 2	007	-2	3	4	<u> </u>	01.12 10/1/5 22	1	- 2	3	4	5	
C1.7 WKEng	740				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	C1.7 WKEng	740					
C1.3 WkEng	,740					C1.3 WkEng	727					
C1 10 WkEng	725				2	C1.10 WkEng	725					
C1.5 WkEng	712					C1.5 WkEng	712					
C1 4 WkEng	675				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	C1.4 WkEng	675					
C1.11 WkEng	671				0	C1.11 WkEng	671					
C1.8 W/kEng	662					C1.8 W/kEng	662					
C1.1 WkEng	660					C1.1 WkEng	660					
C1.12 WkEng	629				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	C1.12 WkEng	629					
C1.2 WkEng	625				0	C1.2 WkEng	625					
C1.6 WkEng	619					C1.6 WkEng	619					
C1 14 WkEng	510					C1.14 WkEnn	510					
C1.15 WkEng	452		-		7	C1.15 WkEng	452					
A1 14 Com	376	1			0	A1 14 Com						
C1.16 WkEng	351					C1.16 WkEng						
B1 7 Intrin	,001	808				B1 7 Intrin		808				
B2.24 Ident		783				B2.24 Ident		783				
B2 20 Ident		761			0	B2 20 Ident		761				
31.10 Intrin		751				B1 10 Intrin		751				
B2 15 Ident		7/0			-	B215 Ident		7/0				
B2.10_Intrin		700			7	B2.22 Intrin		700				
B2.22_Intrin		,709			0	B2.10 Intrin		,709				
B2.19_IIIUIII		,009			2	D2.19_IIIUIII		,009				
D1.0_IUEIR		,099				D1.0_luent		,099				
B1.12_Ident		,571			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	B1.12_Ident		,5/1				
21.2 Intrin		,049			0	D2.17_mm		,049				
S1.5_Inum		,520				P1.5_Intern		,520				
ST.S_Ident		800,				D1.5_Ident		,506				
D1.0 Introi		,304	707		7	C1.17_VVKETIg			707			
21.11 Evt			770		0	D1.11 Evt			770			
D1.11_CXL			,779		2	B1.11_CXI			,779			
D2.14_Introj			,112			D2.14_Initioj			,112			
B1.1_initoj			,071			B1.1_Initoj			,071			
P2.21 Introj			,000		0	P2.21 Introj			,000			
D2.21_Init()			,009			D2.21_Initioj			,033			
D2.13_CA			,034			02.13_CA			,034			
D2.10_CAL			504		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	P1 4 Introi			504			
01.4_mmoj			,334		3	D1.6 Evt			,334			
21.0_EX			5/4		2				5/6			
D1.2_CX			,340			01.2_CA			,540			
1 21 Rol			,407	696	77	41 21 Rol			,407	696		
1.21_((6)				674	3	A1.2 Dol				674		
1.3_Nei				650		A1.3_(Ke)				650		
1.6 Rel				645	-	A1.6 Rol				645		
1118 Ref				570	7	A1 18 Pol				570		
1115 Rol				510	0	A1.15 Pol				510		
1.12_Com	301			473		A1.12 Com				473		
41.16 Rol	,381			470		41.16 Pol				473		
110_0em				313	77	A1.10_Com				,472		
1 7 Rol				,313	0	A1.7 Rol						
1.20 Aut					740	A1.20 Aut					7.4	
1.20_Aut					724	A1.20_Aut					70	
11.0_Aut					607	A1.0_AUL					,12	
1 1 Aut					550	A1.1 Aut					,00	
1.1_Aut					,009	A1.2 Com					,05	
1.3_00m				222	,420	A1.3_00m					,42	
NI.IT_AUT				,320	,413	AT.T/_AUT					,41	
1.9_VVKEng				200	,401	C1.9_WkEng	_				,40	
41.13_Aut				,332	,398	A1.13_Aut						
41.19_Com					,339	A1.19_Com						
41.4_Com						A1.4_Com						
And the second sec						A15 Aut						

Descriptive Statistics												
	N Minimum Maximum Mean Std. Deviation Skewness						Ku	tosis				
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error			
A1.1_Aut	817	1	7	5,07	1,519	-,587	,086	-,136	,171			
A1.2_Rel	817	1	7	5,70	1,358	-,840	,086	-,089	,171			
A1.3_Com	817	1	7	5,64	1,855	<mark>-1,143</mark>	,086	-,046	,171			
A1.4_Com	817	1	7	<mark>5,54</mark>	1,409	<mark>-1,015</mark>	,086	,743	,171			
A1.5_Aut	817	1	7	5,28	1,679	-,677	,086	-,485	,171			
A1.6_Rel	817	1	7	5,97	1,261	<mark>-1,239</mark>	,086	1,020	,171			
A1.7_Rel	817	1	7	4,99	1,831	-,479	,086	-,939	,171			
A1.8_Aut	817	1	7	5,22	1,502	-,638	,086	-,153	,171			
A1.9_Rel	817	1	7	5 ,29	1,656	-,679	,086	-,468	,171			
A1.10_Com	817	1	7	5,74	1,451	<mark>-1,134</mark>	,086	,664	,171			
A1.11_Aut	817	1	7	3,26	1,657	,354	,086	-,625	,171			
A1.12_Com	817	1	7	5,30	1,511	-,725	,086	-,130	,171			
A1.13_Aut	817	1	7	4,26	1,708	-,238	,086	-,761	,171			
A1.14_Com	817	1	7	4,72	1,760	-,381	,086	-,840	,171			
A1.15_Rel	817	1	7	4,53	1,614	-,316	,086	-,500	,171			
A1.16_Rel	817	1	7	4,53	1,843	-,225	,086	-,996	,171			
A1.17 Aut	817	1	7	5,19	1,536	-,674	,086	-,101	,171			
A1.18_Rel	817	1	7	5,63	1,504	<mark>-1,004</mark>	,086	,197	,171			
A1.19 Com	817	1	7	5,74	1,591	<mark>-1,214</mark>	,086	,551	,171			
A1.20 Aut	817	1	7	5,08	1,690	-,625	,086	-,439	,171			
A1.21_Rel	817	1	7	5,67	1,422	<mark>-1,074</mark>	,086	,673	,171			
B1.1_Introj	817	1	7	4,70	1,844	-,452	,086	-,743	,171			
B1.2 Ext	817	1	7	3,19	1,859	,468	,086	-,752	,171			
B1.3_Intrin	817	1	7	4,82	1,638	-,378	,086	-,566	,171			
B1.4_Introj	817	1	7	3,99	1,943	-,021	,086	-1,084	,171			
B1.5_Ident	817	1	7	5,51	1,479	-,834	,086	-,052	,171			
B1.6_Ext	817	1	7	5,06	1,658	-,571	,086	-,430	,171			
B1.7_Intrin	817	1	7	5,59	1,428	-,831	,086	-,036	,171			
B1.8_Ident	817	1	7	5,63	1,484	<mark>-1,030</mark>	,086	,406	,171			
B1.9_Introj	817	1	7	4,73	1,895	-, <mark>501</mark>	,086	-,845	,171			
B1.10_Intrin	817	1	7	5,45	1,489	-,814	,086	-,008	,171			
B1.11_Ext	817	1	7	4,72	1,795	-,400	,086	-,733	,171			
B1.12_Ident	817	1	7	5,24	1,574	-,752	,086	-,006	,171			
B2.13_Ext	817	1	7	3,53	2,090	,290	,086	-1,154	,171			
B2.14_Introj	817	1	7	4,70	1,903	-,413	,086	-,885	,171			
B2.15_Ident	817	1	7	6,15	1,225	<mark>-1,527</mark>	,086	1,775	,171			

Appendix 9 – Main Study: Descriptive Statistics & Skew/Kurtosis (whole sample)
B2.16_Introj	817	1	7	4,47	1,996	-,311	,086	-1,074	,171
B2.17_Intrin	817	1	7	5,22	1,632	-,699	,086	-,215	,171
B2.18_Ext	817	1	7	5,01	1,822	-,581	,086	-,636	,171
B2.19_Intrin	817	1	7	5,83	1,356	<mark>-1,125</mark>	,086	,642	,171
B2.20_Ident	817	1	7	5,71	1,430	<mark>-1,045</mark>	,086	,458	,171
B2.21_Introj	817	1	7	4,59	1,870	-,366	,086	-,901	,171
B2.22 Intrin	817	1	7	5,43	1,474	-,799	,086	,023	,171
B2.23_Ext	817	1	7	3,52	1,766	,174	,086	-,818	,171
B2.24 Ident	817	1	7	5,59	1,454	-,941	,086	,243	,171
C1.1 WkEng	817	0	6	4,75	1,391	<mark>-1,229</mark>	,086	,914	,171
C1.2 WkEng	817	0	6	4,97	1,390	<mark>-1,392</mark>	,086	1,144	,171
C1.3_WkEng	817	0	6	4,69	1,471	<mark>-1,224</mark>	,086	,912	,171
C1.4 WkEng	817	0	6	4,77	1,380	<mark>-1,269</mark>	,086	1,182	,171
C1.5_WkEng	817	0	6	3,42	1,957	-,334	,086	-1,095	,171
C1.6_WkEng	817	0	6	3,99	1,726	-,682	,086	-,448	,171
C1.7_WkEng	817	0	6	4,57	1,531	-,986	,086	,147	,171
C1.8_WkEng	817	0	6	4,57	1,530	<mark>-1,047</mark>	,086	,374	,171
C1.9_WkEng	817	0	6	4,77	1,427	<mark>-1,163</mark>	,086	,629	,171
C1.10_WkEng	817	0	6	5,04	1,372	<mark>-1,586</mark>	,086	1,893	,171
C1.11_WkEng	817	0	6	3,09	2,145	-,147	,086	-1,408	,171
C1.12_WkEng	817	0	6	4,49	1,536	-,935	,086	,027	,171
C1.13_WkEng	817	0	6	4,62	1,505	<mark>-1,040</mark>	,086	,347	,171
C1.14_WkEng	817	0	6	4,06	1,794	-,724	,086	-,523	,171
C1.15_WkEng	817	0	6	4,56	1,468	<mark>-1,131</mark>	,086	,715	,171
C1.16_WkEng	817	0	6	2,81	2,057	,036	,086	-1,309	,171
C1.17_WkEng	817	0	6	4,83	1,451	<mark>-1,351</mark>	,086	1,225	,171
Valid N (listwise)	817								

			Desci	ipuve staustics				
		Ν	Mean	Std. Deviation	Skev	vness	Kur	osis
Country Li	ved the Most	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Brazil	A1.1_Aut	148	5,36	1,462	-,908	,199	,823	,396
	A1.2 Rel	148	5,67	1,352	-,867	,199	,132	,396
	A1.3_Com	148	5,52	1,939	<mark>-1,063</mark>	,199	-,215	,396
	A1.4 Com	148	5,56	1,430	<mark>-1,384</mark>	,199	1,968	,396
	A1.5 Aut	148	4,74	1,811	-,376	,199	-,792	,396
	A1.6 Rel	148	6,08	1,116	<mark>-1,294</mark>	,199	1,314	,396
	A1.7 Rel	148	4,18	1,901	,033	,199	-1,094	,396
	A1.8 Aut	148	5,57	1,504	<mark>-1,008</mark>	,199	,712	,396
	A1.9 Rel	148	4,59	1,516	-,070	,199	-,560	,396
	A1.10_Com	148	5,39	1,692	<mark>-1,024</mark>	,199	,222	,396
	A1.11 Aut	148	3,20	1,658	,444	,199	-,347	,396
	A1.12_Com	148	5,18	1,582	-,504	,199	-,763	,396
	A1.13_Aut	148	4,63	1,679	-,462	,199	-,474	,396
	A1.14_Com	148	4,38	2,035	-,232	,199	-1,246	,396
	A1.15_Rel	148	4,68	1,596	-,422	,199	-,431	,396
	A1.16_Rel	148	4,21	1,853	,014	,199	-1,051	,396
	A1.17_Aut	148	5,31	1,529	-,781	,199	,143	,396
	A1.18_Rel	148	5,35	1,678	-,895	,199	-,067	,396
	A1.19_Com	148	5,69	1,761	<mark>-1,267</mark>	,199	,532	,396
	A1.20_Aut	148	4,82	1,745	-,420	,199	-,595	,396
	A1.21_Rel	148	5,28	1,565	-,870	,199	,313	,396
	B1.1_Introj	148	4,78	1,969	-,519	,199	-,847	,396
	B1.2_Ext	148	3,84	2,023	,050	,199	-1,217	,396
	B1.3_Intrin	148	4,64	1,726	-,356	,199	-,638	,396
	B1.4_Introj	148	4,07	2,007	-,098	,199	-1,167	,396
	B1.5 Ident	148	5,99	1,322	<mark>-1,527</mark>	,199	2,064	,396
	B1.6_Ext	148	5,28	1,616	-,784	,199	,038	,396
	B1.7_Intrin	148	6,08	1,175	<mark>-1,332</mark>	,199	1,342	,396
	B1.8 Ident	148	6,01	1,330	<mark>-1,556</mark>	,199	2,295	,396
	B1.9 Introj	148	4,66	2,069	-,458	,199	-1,022	,396
	B1.10_Intrin	148	5,96	1,319	<mark>-1,277</mark>	,199	,994	,396
	B1.11 Ext	148	5,21	1,762	-,664	,199	-,537	,396
	B1.12 Ident	148	5,60	1,511	-,953	,199	,263	,396
	B2.13_Ext	148	3,99	2,067	,000	,199	-1,206	,396
	B2.14 Introj	148	4,86	1,869	-,574	,199	-,706	,396

Descriptive Statistics

	B2.15_Ident	148	6,25	1,124	<mark>-1,557</mark>	,199	2,003	,396
	B2.16_Introj	148	3,95	2,015	, <mark>030</mark>	,199	-1,118	,396
	B2.17_Intrin	148	5,05	1,745	-,606	,199	-,456	,396
	B2.18_Ext	148	4,56	1,949	-,409	,199	-,851	,396
	B2.19_Intrin	148	6,29	1,168	<mark>-2,119</mark>	,199	<mark>4,781</mark>	,396
	B2.20_Ident	148	5,92	1,327	<mark>-1,105</mark>	,199	,325	,396
	B2.21 Introj	148	4,72	1,972	-,508	,199	-,884	,396
	B2.22_Intrin	148	5,72	1,448	<mark>-1,101</mark>	,199	,584	,396
	B2.23 Ext	148	3,48	1,932	,157	,199	-1,169	,396
	B2.24 Ident	148	5,98	1,312	<mark>-1,447</mark>	,199	1,902	,396
	C1.1 WkEng	148	4,98	1,097	<mark>-1,839</mark>	,199	<mark>4,118</mark>	,396
	C1.2_WkEng	148	5,03	1,355	<mark>-1,613</mark>	,199	1,823	,396
	C1.3 WkEng	148	4,82	1,395	<mark>-1,421</mark>	,199	1,663	,396
	C1.4_WkEng	148	4,68	1,471	<mark>-1,658</mark>	,199	2,560	,396
	C1.5_WkEng	148	4,80	1,395	<mark>-1,416</mark>	,199	1,474	,396
	C1.6_WkEng	148	4,47	1,445	<mark>-1,050</mark>	,199	,679	,396
	C1.7_WkEng	148	4,74	1,472	<mark>-1,426</mark>	,199	1,574	,396
	C1.8_WkEng	148	4,72	1,615	<mark>-1,493</mark>	,199	1,517	,396
	C1.9_WkEng	148	4,68	1,410	<mark>-1,206</mark>	,199	,984	,396
	C1.10_WkEng	148	5,26	1,174	<mark>-2,112</mark>	,199	<mark>4,727</mark>	,396
	C1.11_WkEng	148	4,81	1,357	<mark>-1,372</mark>	,199	1,471	,396
	C1.12_WkEng	148	4,57	1,535	<mark>-1,199</mark>	,199	,810	,396
	C1.13_WkEng	148	4,79	1,486	<mark>-1,501</mark>	,199	1,764	,396
	C1.14_WkEng	148	4,70	1,403	<mark>-1,376</mark>	,199	1,524	,396
	C1.15_WkEng	148	4,81	1,197	<mark>-1,364</mark>	,199	2,104	,396
	C1.16_WkEng	148	3,86	1,765	-,631	,199	-,513	,396
	C1.17_WkEng	148	5,09	1,178	<mark>-1,946</mark>	,199	<mark>4,622</mark>	,396
	Valid N (listwise)	148						
Thailand	A1.1_Aut	471	5,06	1,552	-,525	,113	-,275	,225
	A1.2_Rel	471	5,70	1,452	-,843	,113	-,309	,225
	A1.3 Com	471	6,07	1,654	<mark>-1,776</mark>	,113	1,994	,225
	A1.4_Com	471	5,61	1,425	-,933	,113	,334	,225
	A1.5_Aut	471	5,79	1,471	<mark>-1,041</mark>	,113	,168	,225
	A1.6 Rel	471	6,03	1,331	<mark>-1,364</mark>	,113	1,110	,225
	A1.7 Rel	471	5,60	1,622	-,920	,113	-,196	,225
	A1.8_Aut	471	5,05	1,523	-,460	,113	-,410	,225
	A1.9 Rel	471	5,85	1,441	<mark>-1,178</mark>	,113	,668	,225
	A1.10_Com	471	5,95	1,383	<mark>-1,346</mark>	,113	1,102	,225
	A1.11_Aut	471	3,08	1,670	,493	,113	-,497	,225
	A1.12_Com	471	5,57	1,447	-,972	,113	,469	,225
	A1.13_Aut	471	4,07	1,753	-,099	,113	-,816	,225

A1.14_Com	471	4,99	1,671	-,465	,113	-,665	,225
A1.15_Rel	471	4,34	1,663	-,202	,113	-,579	,225
A1.16_Rel	471	4,77	1,883	-,409	,113	-,900	,225
A1.17_Aut	471	5,23	1,575	-,626	,113	-,327	,225
A1.18_Rel	471	5,74	1,473	<mark>-1,012</mark>	,113	,161	,225
A1.19_Com	471	5,97	1,450	<mark>-1,360</mark>	,113	,962	,225
A1.20 Aut	471	5,25	1,658	-,673	,113	-,367	,225
A1.21_Rel	471	5,72	1,480	<mark>-1,075</mark>	,113	,429	,225
B1.1 Introj	471	4,90	1,688	-,503	,113	-,441	,225
B1.2 Ext	471	3,02	1,788	,541	,113	-,529	,225
B1.3 Intrin	471	4,90	1,613	-,327	,113	-,611	,225
B1.4_Introj	471	4,15	1,931	-,096	,113	-1,002	,225
B1.5 Ident	471	5,26	1,536	-,487	,113	-,658	,225
B1.6_Ext	471	5,32	1,523	-,538	,113	-,543	,225
B1.7_Intrin	471	5,30	1,532	-,555	,113	-,472	,225
B1.8_Ident	471	5,55	1,494	-,804	,113	-,238	,225
B1.9_Introj	471	5,03	1,718	-,612	,113	-,487	,225
B1.10_Intrin	471	5,21	1,553	-,586	,113	-,376	,225
B1.11_Ext	471	4,66	1,742	-,317	,113	-,641	,225
B1.12_Ident	471	5,21	1,523	-,602	,113	-,172	,225
B2.13_Ext	471	3,61	2,139	,246	,113	-1,179	,225
B2.14_Introj	471	4,82	1,818	-,395	,113	-,779	,225
B2.15_Ident	471	6,05	1,358	<mark>-1,395</mark>	,113	1,106	,225
B2.16_Introj	471	5,05	1,756	-,564	,113	-,621	,225
B2.17_Intrin	471	5,18	1,640	-,611	,113	-,319	,225
B2.18_Ext	471	5,51	1,594	-,812	,113	-,236	,225
B2.19_Intrin	471	5,62	1,461	-,826	,113	-,160	,225
B2.20_Ident	471	5,66	1,503	-,952	,113	,152	,225
B2.21_Introj	471	4,79	1,768	-,393	,113	-,731	,225
B2.22_Intrin	471	5,30	1,522	-,642	,113	-,267	,225
B2.23 Ext	471	3,59	1,696	,122	,113	-,600	,225
B2.24_Ident	471	5,40	1,554	-,722	,113	-,341	,225
C1.1_WkEng	471	4,86	1,472	<mark>-1,249</mark>	,113	,608	,225
C1.2 WkEng	471	5,20	1,322	<mark>-1,811</mark>	,113	2,631	,225
C1.3 WkEng	471	4,61	1,564	<mark>-1,138</mark>	,113	,553	,225
C1.4_WkEng	471	4,95	1,328	<mark>-1,370</mark>	,113	1,194	,225
C1.5 WkEng	471	2,54	1,848	,170	,113	-1,063	,225
C1.6_WkEng	471	3,92	1,822	-,577	,113	-,715	,225
C1.7_WkEng	471	4,69	1,513	<mark>-1,008</mark>	,113	,066	,225
C1.8_WkEng	471	4,59	1,544	<mark>-1,002</mark>	,113	,199	,225
C1.9_WkEng	471	4,90	1,445	<mark>-1,303</mark>	,113	,886	,225

	C1.10_WkEng	471	5,09	1,442	<mark>-1,623</mark>	,113	1,717	,225
	C1.11_WkEng	471	1,90	1,853	,646	,113	-,777	,225
	C1.12_WkEng	471	4,45	1,642	-,849	,113	-,330	,225
	C1.13_WkEng	471	4,73	1,518	<mark>-1,094</mark>	,113	,334	,225
	C1.14_WkEng	471	4,04	1,927	-,733	,113	-,665	,225
	C1.15_WkEng	471	4,50	1,583	<mark>-1,045</mark>	,113	,338	,225
	C1.16 WkEng	471	2,22	2,047	,438	,113	-1,162	,225
	C1.17_WkEng	471	4,79	1,570	<mark>-1,265</mark>	,113	,681	,225
	Valid N (listwise)	471						
India	A1.1 Aut	72	5,36	1,166	-,366	,283	-,325	,559
	A1.2 Rel	72	5,82	1,053	-,447	,283	-,689	,559
	A1.3_Com	72	4,81	1,896	-,311	,283	-1,194	,559
	A1.4 Com	72	5,42	1,230	-,899	,283	1,485	,559
	A1.5_Aut	72	4,03	1,678	-,137	,283	-,673	,559
	A1.6_Rel	72	5,22	1,355	-,487	,283	,364	,559
	A1.7_Rel	72	2,92	1,286	,731	,283	,657	,559
	A1.8 Aut	72	5,47	1,342	<mark>-1,035</mark>	,283	1,153	,559
	A1.9 Rel	72	5,64	1,190	-,546	,283	-,397	,559
	A1.10 Com	72	5,63	1,215	-,591	,283	-,186	,559
	 A1.11 Aut	72	3,28	1,426	.360	,283	233	,559
	 A1.12 Com	72	5.31	1,158	348	.283	393	.559
	A1.13 Aut	72	4.85	1,450	- 581	.283	361	.559
	A1 14 Com	72	4.17	1,583	.221	.283	- 903	.559
	A1 15 Rel	72	5.08	1,518	- 443	283	- 632	,559
	A1 16 Rel	72	3.93	1 613	116	283	- 799	,559
	A1 17 Aut	72	5 18	1 346	- 696	283	446	559
	A1 18 Rel	72	4 67	1 565	- 171	283	- 945	559
	A1 19 Com	72	4 94	1,868	- 504	283	- 925	559
	A1 20 Aut	72	4 51	1,000	,001	283	- 903	,000
	A1 21 Rel	72	5.53	1 150	,200	283	- 334	,550
	B1.1 Introi	72	4 79	1,100	- 450	283	- 190	,559
	B12 Ext	72	3.85	1,000	,100	,200	- 654	,559
	B1.3 Intrin	72	4 76	1,002	, 100	,200	- 503	,000
	B1.4 Introi	72	4,10	1,003	-,500	,203	-,303	,559
	B1.4 Introj	72	5.52	1 204	4 027	,203	-,700	,559
	B1.5 Ident	72	0,00	1,304	-1,027	,203	,714	,559
		12	4,00	1,310	-,220	,203	-,385	,009
		12	5,97	,964	-,623	,283	-,547	,559
		12	5,90	1,050	-,626	,283	-,115	,559
	B1.9_Introj	/2	5,28	1,313	-,765	,283	,022	,559
	B1.10_Intrin	72	6,00	,919	-,783	,283	-,041	,559
	B1.11_Ext	72	5,32	1,546	-,980	,283	,498	,559

	B1.12_Ident	72	5,51	1,394	<mark>-1,184</mark>	,283	1,173	,559
	B2.13_Ext	72	4,04	1,842	-,174	,283	-,943	,559
	B2.14_Introj	72	5,25	1,693	-,889	,283	,020	,559
	B2.15_Ident	72	6,32	,962	<mark>-1,373</mark>	,283	,879	,559
	B2.16_Introj	72	4,97	1,547	-,821	,283	,309	, <mark>5</mark> 59
	B2.17_Intrin	72	5,17	1,728	-,669	,283	-,488	, <mark>5</mark> 59
	B2.18 Ext	72	5,24	1,409	-,279	,283	-,735	, <mark>5</mark> 59
	B2.19_Intrin	72	6,11	,958	<mark>-1,019</mark>	,283	,234	, <mark>559</mark>
	B2.20 Ident	72	5,93	,998	-,821	,283	,109	, <mark>5</mark> 59
	B2.21 Introj	72	5,25	1,480	-,875	,283	,809	, <mark>5</mark> 59
	B2.22 Intrin	72	5,44	1,433	<mark>-1,008</mark>	,283	,666	, <mark>5</mark> 59
	B2.23_Ext	72	4,17	1,627	-,115	,283	-,531	, <mark>5</mark> 59
	B2.24 Ident	72	5,76	1,068	-,436	,283	-1,022	,559
	C1.1_WkEng	72	4,31	1,589	-,868	,283	,145	, <mark>559</mark>
	C1.2_WkEng	72	4,88	1,299	-,911	,283	-,137	,559
	C1.3_WkEng	72	4,94	1,331	<mark>-1,481</mark>	,283	2,193	,559
	C1.4_WkEng	72	4,99	1,284	<mark>-1,289</mark>	,283	1,128	,559
	C1.5_WkEng	72	<mark>5,0</mark> 8	1,135	<mark>-1,059</mark>	,283	,116	,559
	C1.6_WkEng	72	4,32	1,564	<mark>-1,211</mark>	,283	1,026	, <mark>55</mark> 9
	C1.7_WkEng	72	<mark>5,0</mark> 6	1,112	<mark>-1,250</mark>	,283	1,369	, <mark>559</mark>
	C1.8_WkEng	72	<mark>5,00</mark>	1,187	<mark>-1,196</mark>	,283	,887	,559
	C1.9_WkEng	72	5,11	1,029	-,947	,283	,074	, <mark>5</mark> 59
	C1.10_WkEng	72	5,22	1,010	<mark>-1,308</mark>	,283	1,007	, <mark>559</mark>
	C1.11_WkEng	72	5,11	,987	<mark>-1,043</mark>	,283	,551	, <mark>5</mark> 59
	C1.12_WkEng	72	4,76	1,228	-,754	,283	-,161	, <mark>559</mark>
	C1.13_WkEng	72	4,81	1,328	<mark>-1,375</mark>	,283	2,001	,559
	C1.14_WkEng	72	4,31	1,307	-,436	,283	-,622	,559
	C1.15_WkEng	72	4,57	1,382	<mark>-1,086</mark>	,283	,961	, <mark>559</mark>
	C1.16_WkEng	72	4,40	1,598	<mark>-1,117</mark>	,283	,802	, <mark>5</mark> 59
	C1.17_WkEng	72	4,69	1,380	<mark>-1,344</mark>	,283	2,068	, <mark>5</mark> 59
	Valid N (listwise)	72						
Germany	A1.1_Aut	104	4,63	1,449	-,371	,237	-,573	,469
	A1.2_Rel	104	5,6 3	1,124	-,908	,237	,880	,469
	A1.3 Com	104	4,79	1,836	-,391	,237	-1,284	,469
	A1.4 Com	104	5,32	1,388	<mark>-1,011</mark>	,237	,741	,469
	A1.5_Aut	104	4,72	1,410	-,209	,237	-,774	,469
	A1.6 Rel	104	<mark>6,0</mark> 8	,856	-,908	,237	,503	,469
	A1.7_Rel	104	5,03	1,281	-,507	,237	-,286	,469
	A1.8_Aut	104	5,32	1,353	-,743	,237	,031	,469
	A1.9_Rel	104	3,78	1,607	-,046	,237	-,873	,469
	A1.10_Com	104	5,36	1,307	-,583	,237	-,205	,469

A1.11_Aut	104	4,18	1,467	-,210	,237	-,817	,469
A1.12_Com	104	4,34	1,363	-,493	,237	-,291	,469
A1.13_Aut	104	4,04	1,487	-,230	,237	-,747	,469
A1.14_Com	104	4,65	1,581	-,581	,237	-,558	,469
A1.15_Rel	104	4,73	1,264	-,212	,237	-,209	,469
A1.16_Rel	104	4,34	1,670	-,193	,237	-,918	,469
A1.17 Aut	104	4,97	1,347	-,967	,237	,931	,469
A1.18_Rel	104	6,21	,855	<mark>-1,183</mark>	,237	1,581	,469
A1.19 Com	104	5,43	1,440	<mark>-1,116</mark>	,237	,522	,469
A1.20 Aut	104	5,18	1,531	<mark>-1,075</mark>	,237	,507	,469
A1.21 Rel	104	5,98	,995	<mark>-1,288</mark>	,237	2,413	,469
B1.1_Introj	104	3,60	2,116	,259	,237	-1,343	,469
B1.2 Ext	104	2,44	1,588	<mark>1,124</mark>	,237	,712	,469
B1.3_Intrin	104	4,74	1,660	-,536	,237	-,504	,469
B1.4_Introj	104	3,00	1,735	,580	,237	-,706	,469
B1.5_Ident	104	5,87	1,297	<mark>-1,776</mark>	,237	<mark>3,662</mark>	,469
B1.6_Ext	104	3,63	1,818	,072	,237	-1,123	,469
B1.7_Intrin	104	5,86	1,250	<mark>-1,152</mark>	,237	,455	,469
B1.8_Ident	104	5,29	1,727	<mark>-1,057</mark>	,237	,273	,469
B1.9_Introj	104	3,22	1,946	,488	,237	-1,120	,469
B1.10_Intrin	104	5,35	1,493	-,936	,237	,407	,469
B1.11_Ext	104	3,91	1,870	-,099	,237	-1,193	,469
B1.12_Ident	104	4,65	1,810	-,669	,237	-,507	,469
B2.13_Ext	104	2,27	1,559	<mark>1,404</mark>	,237	1,362	,469
B2.14_Introj	104	3,56	1,999	,118	,237	-1,339	,469
B2.15_Ident	104	6,33	,897	<mark>-1,357</mark>	,237	1,504	,469
B2.16_Introj	104	2,35	1,581	<mark>1,152</mark>	,237	,503	,469
B2.17_Intrin	104	5,64	1,277	<mark>-1,072</mark>	,237	1,079	,469
B2.18_Ext	104	3,28	1,726	,354	,237	-,806	,469
B2.19_Intrin	104	5,89	1,173	<mark>-1,408</mark>	,237	2,447	,469
B2.20 Ident	104	5,50	1,421	<mark>-1,107</mark>	,237	,740	,469
B2.21_Introj	104	3,19	1,758	,390	,237	-1,171	,469
B2.22_Intrin	104	5,50	1,292	<mark>-1,142</mark>	,237	1,293	,469
B2.23 Ext	104	2,73	1,638	,836	,237	-,142	,469
B2.24 Ident	104	5,67	1,347	<mark>-1,446</mark>	,237	2,181	,469
C1.1_WkEng	104	4,38	1,135	<mark>-1,497</mark>	,237	2,547	,469
C1.2 WkEng	104	3,98	1,351	-,663	,237	-,287	,469
C1.3_WkEng	104	4,72	1,218	<mark>-1,154</mark>	,237	,935	,469
C1.4_WkEng	104	4,06	1,245	-,788	,237	,510	,469
C1.5_WkEng	104	4,11	1,292	-,669	,237	-,268	,469
C1.6_WkEng	104	3,47	1,619	-,591	,237	-,449	,469

C1.7_WkEng	104	3,50	1,455	-,521	,237	-,538	,469
C1.8_WkEng	104	3,89	1,365	-,623	,237	-,299	,469
C1.9_WkEng	104	4,15	1,426	-,584	,237	-,375	,469
C1.10_WkEng	104	4,44	1,343	<mark>-1,028</mark>	,237	,816	,469
C1.11_WkEng	104	4,41	1,220	-,810	,237	,279	,469
C1.12_WkEng	104	4,47	1,214	-,910	,237	,268	,469
C1.13 WkEng	104	3,76	1,347	-,691	,237	-,093	,469
C1.14_WkEng	104	3,00	1,507	,000	,237	-,661	,469
C1.15 WkEng	104	4,54	1,269	<mark>-1,193</mark>	,237	,947	,469
C1.16 WkEng	104	2,90	1,628	,117	,237	-,661	,469
C1.17 WkEng	104	4,73	1,248	<mark>-1,030</mark>	,237	,522	,469
Valid N (listwise)	104						

Factor	Mean	STDEV	Ν	Reliability	Factor	Mean	STDEV	Ν	Reliability
				(Cronbach's α)*					(Cronbach's α)*
A1.1_Aut	5,07	1,519	817		B1.5_Ident	5,51	1,479	817	
A1.5_Aut	5,28	1,679	817		B1.8_Ident	5,63	1,484	817	
A1.8_Aut	5,22	1,502	817		B1.12_Ident	5,24	1,574	817	000
A1.11_Aut	3,26	1,657	817	750	B2.15_Ident	6,15	1,225	817	
A1.13_Aut	4,26	1,708	817		B2.20_Ident	5,71	1,430	817	
A1.17_Aut	5,19	1,536	817		B2.24_Ident	5,59	1,454	817	
A1.20_Aut	5,08	1,690	817		B1.3_Intrin	4,82	1,638	817	
A1.1_Aut	5,07	1,519	817		B1.7_Intrin	5,58	1,428	817	
A1.2_Rel	5,70	1,358	817		B1.10_Intrin	5,45	1,489	817	-
A1.6_Rel	5,97	1,261	817		B2.17_Intrin	5,22	1,632	817	
A1.7_Rel	4,99	1,831	817		B2.19_Intrin	5,83	1,356	817	**
A1.9_Rel	5,29	1,656	817		B2.22_Intrin	5,43	1,474	817	
A1.15_Rel	4,53	1,614	817		C1.1_WkEng	4,75	1,391	817	
A1.16_Rel	4,53	1,843	817		C1.2_WkEng	4,97	1,390	817	-
A1.18_Rel	5,63	1,504	817		C1.3_WkEng	4,69	1,471	817	***
A1.21_Rel	5,67	1,422	817		C1.4_WkEng	4,77	1,380	817	
A1.3_Com	5,64	1,855	817		C1.5_WkEng	3,42	1,957	817	-
A1.4_Com	5,54	1,409	817		C1.6_WkEng	3,99	1,726	817	-
A1.10_Com	5,74	1,451	817		C1.7_WkEng	4,57	1,531	817	-
A1.12_Com	5,30	1,511	817		C1.8_WkEng	4,57	1,530	817	-
A1.14_Com	4,72	1,760	817		C1.9_WkEng	4,77	1,427	817	.943
A1.19_Com	5,74	1,591	817		C1.10_WkEng	5,04	1,372	817	-
B1.2_Ext	3,19	1,859	817		C1.11_WkEng	3,09	2,145	817	
B1.6_Ext	5,06	1,658	817		C1.12_WkEng	4,49	1,536	817	-
B1.11_Ext	4,72	1,795	817		C1.13_WkEng	4,62	1,505	817	-
B2.13_Ext	3,53	2,090	817		C1.14_WkEng	4,06	1,794	817	-
B2.18_Ext	5,01	1,822	817		C1.15_WkEng	4,56	1,468	817	-
B2.23_Ext	3,52	1,766	817		C1.16_WkEng	2,81	2,057	817	-
B1.1_Introj	4,70	1,844	817		C1.17_WkEng	4,83	1,451	817	-
B1.4_Introj	3,99	1,943	817			•	•		
B1.9_Introj	4,73	1,895	817						
B2.14_Introj	4,70	1,903	817	öji		•	•		
B2.16_Introj	4,47	1,996	817	-		-	-		
B2.21_Introj	4,59	1,870	817			•	•		

Main Study – Means, Standard Deviation and Reliability per Factor.

*Factors marked in grey have been removed to increase the reliability of the measurement instrument.

EFA Basic Psychological Needs – Adequacy Results (KMO and Bartlett's Test).

Kaiser-Meyer-Olkin Measure of	,834			
Bartlett's Test of Sphericity	artlett's Test of Sphericity Approx. Chi-Square			
	df	45		
	Sig.	,000		

EFA Basic Psychological Needs - Total Variance Explained.

							Rotation Sums of
		Initial Eigenva	lues	Extract	ion Sums of Squa	red Loadings	Squared Loadings ^a
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	3,685	36,854	36,854	3,225	32,251	32,251	2,747
2	1,590	15,903	52,757	,933	9,325	41,576	2,843
3	,949	9,491	62,247	, 4 80	4,802	46,377	1,256
4	,789	7,895	70,142				
5	,673	6,733	76,875				

EFA Basic Psychological Needs – Pattern Matrix.

		Factor	
	1	2	3
A1.8_Aut	,775		
A1.1_Aut	,715		
A1.17_Aut	,529		
A1.13_Aut	,515		
A1.6_Rel		,785	
A1.2_Rel		,758	
A1.21_Rel		,744	
A1.19_Com			,676
A1.3_Com			,570
A1.14_Com			,457

EFA Forms of Regulation – Adequacy Results (KMO and Bartlett's Test).

Kaiser-Meyer-Olkin Measure of	,936	
Bartlett's Test of Sphericity	ohericity Approx. Chi-Square	
	df	276
	Sig.	,000

EFA Forms of Regulation – Total Variance Explained.

							Rotation Sums of
Comp		Initial Eigenva	alues	Extract	ion Sums of Squa	ared Loadings	Squared Loadings ^a
onent	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	9,788	40,783	40,783	9,788	40,783	40,783	8,917
2	3,030	12,624	53,407	3,030	12,624	53,407	5,447
3	1,344	5,598	59,005	1,344	5,598	59,005	4,924
4	1,019	4,247	63,252	1,019	4,247	63,252	2,927
5	,891	3,714	66,965				
6	,814	3,392	70,357				

EFA Forms of Regulation – Pattern Matrix.

	Component				
	1	2	3	4	
B1.7_Intrin	,890				
B2.19 Intrin	,862				
B2.24 Ident	,822				
B1.10 Intrin	,811				
B2.17 Intrin	,804				
B2.15_Ident	,803				
B2.20_Ident	,783				
B1.8_Ident	,776				
B2.22_Intrin	,771				
B1.3_Intrin	,718				
B1.5_Ident	,715			,303	

B1.11_Ext		,848		
B1.1_Introj		,765		
B2.14_Introj		,741		
B1.9_Introj		,713		
B1.12_Ident	,399	,522		
B2.16_Introj			,779	
B2.18 Ext			,665	
B2.21_Introj			,656	
B2.23 Ext			,607	
B2.13 Ext		,359	,487	
B1.2 Ext				,711
B1.4_Introj				,670
B1.6 Ext	,343		,345	,375

EFA Autonomous Forms of Regulation – Adequacy Results (KMO and Bartlett's Test).

Kaiser-Meyer-Olkin Measure of	,946	
Bartlett's Test of Sphericity	Approx. Chi-Square	6918,790
	df	66
	Sig.	,000

EFA Controlled Forms of Regulation - Adequacy Results (KMO and Bartlett's Test).

Kaiser-Meyer-Olkin Measure of	,878	
Bartlett's Test of Sphericity	Approx. Chi-Square	3772,868
	df	66
	Sig.	,000

EFA Autonomous Forms of Regulation – Total Variance Explained.

							Rotation Sums of
		Initial Eigenv	alues	Extra	ction Sums of Sq	uared Loadings	Squared Loadings ^a
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7,357	61,310	61,310	7,357	61,310	61,310	6,865
2	,785	6,542	67,852	,785	6,542	67,852	6,133
3	,730	6,081	73,933				
4	,676	5,637	79,570				

EFA Controlled Forms of Regulation – Total Variance Explained.

							Rotation Sums of
Initial Eigenvalues			Extrac	tion Sums of Squ	ared Loadings	Squared Loadings ^a	
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5,111	42,590	42,590	5,111	42,590	42,590	4,466
2	1,264	10,532	53,122	1,264	10,532	53,122	4,093
3	1,061	8,840	61,962				
4	,843	7,026	68,988				

EFA Autonomous and Controlled Forms of Regulation – Pattern Matrix.

Pattern Matrix - Autonomous						
	Component					
	1	2				
B2.17_Intrin	,944					
B2.20_Ident	,857					
B2.22 Intrin	,833					
B2.19_Intrin	,822					
B2.24_Ident	,751					
B2.15_Ident	,709					
B1.3_Intrin	,577					
B1.5_Ident		,838				
B1.12_Ident		,836				
B1.8_Ident		,748				
B1.10_Intrin		,690				
B1.7_Intrin		,632				

Pattern Matrix - Controlled							
	Component						
	1	2					
B2.16_Introj	,813						
B2.18_Ext	,796						
B2.21 Introj	,740						
B1.6 Ext	,738						
B1.4_Introj	,703						
B2.23_Ext	,477						
B1.2_Ext	,406						
B1.11_Ext		,883					
B1.1_Introj		,824					
B2.14 Introj		,806					
B1.9 Introj		,753					
B2.13_Ext	,303	,378					

EFA Work Engagement – Adequacy Results (KMO and Bartlett's Test).

Kaiser-Meyer-Olkin Measure of	,958	
Bartlett's Test of Sphericity	Sphericity Approx. Chi-Square	
	df	66
	Sig.	,000

EFA Work Engagement – Total Variance Explained.

	Initial Eigenvalues				action Sums of So	uared Loadings
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7,428	61,898	61,898	7,428	61,898	61,898
2	,761	6,339	68,237			
3	,636	5,296	73,533			

EFA Work Engagement – Factor Matrix.

	Factor
	1
C1.10_WkEng	,860
C1.9_WkEng	,831
C1.8 WkEng	,823
C1.4_WkEng	,812
C1.2_WkEng	,806
C1.7_WkEng	,806
C1.13_WkEng	,767
C1.1_WkEng	,746
C1.3_WkEng	,687
C1.12_WkEng	,684
C1.17_WkEng	, <mark>671</mark>
C1.15 WkEng	,640

Discriminant	Validity							
Fornell-Lard	cker Criterion	Cross Loa	idings 🔲 H	eterotrait-Mono	otrait Ratio (HT	MT)	erotrait-Monotr	ait Ratio (HTM1
Autonomy	Autonomy .671	Competence	External Re	Identified R	Intrinsic Re	Introjected	Relatedness	Work Enga
Competence	.895	.719						
External Re	.396	.561	.640					
Identified R	.631	.698	.663	.758				
Intrinsic Reg	.628	.635	.640	.996	.788			
Introjected	.373	.543	.888	.580	.550	.675		
Relatedness	.827	.935	.492	.620	.566	.439	.677	
Work Engag	.527	.609	.412	.528	.502	.378	.491	.764

SEM – Path Analysis Results – Discriminant Validity Formell-Larcker Criterion (own work).

SEM – Path Analysis Results – Discriminant Validity HTMT (own work).

Discriminant	Validity							
Fornell-Lard	cker Criterion	Cross Loa	adings 🔳 H	eterotrait-Mono	otrait Ratio (HT	MT)	erotrait-Monotr	ait Ratio (HTMT
Autonomy	Autonomy	Competence	External Re	Identified R	Intrinsic Re	Introjected	Relatedness	Work Enga
Competence	.904							
External Re	.390	.542						
Identified R	.630	.700	.656					
Intrinsic Reg	.627	.637	.634	.994				
Introjected	.384	.541	1.005	.577	.551			
Relatedness	.850	.939	.463	.620	.570	.436		
Work Engag	.532	.605	.399	.528	.500	.374	.493	

SEM – Path Analysis Results – Construct Reliability (Cronbach's Alpha) and Validity (AVE) (own work).

Matrix	Cronbach's Alpha	rho_A		Composite Reliabilit		
Autonomy	Cronbach's	rho_A	Con	nposite	Average Va	
Competence	.759	.767		.762	.517	
External Re	.703	.805		.702	.410	
Identified R	.870	.873		.871	.575	
Intrinsic Reg	.907	.909		.907	.621	
Introjected	.831	.840		.832	.455	
Relatedness	.767	.781		.769	.458	
Work Engag	.943	.947		.943	.584	

SEM – Path Analysis Results – Model Fit (own work).

Fit Summ	ary	
	Saturated	Estimated
SRMR	.053	1.574
d_ULS	2.759	2451.283
d_G	1.003	n/a
Chi-Square	4346.696	n/a
NFI	.817	n/a

SEM – Path Analysis Results – Bootstrap Results for 1000 samples (own work).

Mean, STD	EV, T-Values, P	-Values		Confidence Inte	rvals	Confi	dence Interval
^	Original Sa	Sample I	Me	Standard D	T Sta	tistics (P Values
Autonomy	550		682	.805		.683	.495
Autonomy	.021	-	041	.523		.039	.969
Autonomy	.287	-	252	.387		.742	.458
Autonomy	600		790	1.145		.524	.600
Competenc	1.337	1.	719	2.308		.579	.563
Competenc	.917	1.	139	1.617		.567	.571
Competenc	.565		721	1.240		.456	.649
Competenc	1.641	2.	197	3.325		.494	.622
External Re	.057	~	103	5.228		.011	.991
Identified R	3.321	-2.	389	118.775		.028	.978
Intrinsic Reg	-2.810	2.	824	118.026		.024	.981
Introjected	055		264	6.734		.008	.993
Relatedness	303	~	564	1.652		.184	.854
Relatedness	254	-	422	1.198		.212	.832
Relatedness	200	-	325	.937		.213	.831
Relatedness	600	-	985	2.384		.252	.801

Fornell-La	rcker Criterion	Cross Load	dings 🔟 H	eterotrait-Mono
	Autonomous	Basic Needs	Controlled	Work Enga
Autonomous	.773			
Basic Needs	.657	.672		
Controlled	.630	.518	.668	
Work Engag	.514	.568	.411	.764

SEM – CFA Reduced Model – Discriminant Validity Formell-Larcker Criterion (own work).

SEM – CFA Reduced Model – Discriminant Validity HTMT (own work).

Discriminant	t Validity (Co	omplete)		
Fornell-La	rcker Criterion	Cross Load	dings 🔳 H	leterotrait-Monot
Autonomous	Autonomous	Basic Needs	Controlled	Work Enga
Basic Needs	.656			
Controlled	.619	.496		
Work Engag	.514	.560	.397	

SEM – CFA Reduced Model – Construct Reliability (Cronbach's Alpha) and Validity (AVE) (own work).

Construct Reliability and Validity (Complete)							
Matrix	Cronbach's Alp	ha 👯 rho	o_A	nposite Reliabilit			
	Cronbach's	rho_A	Composite	Average Va			
Autonomou	IS .942	.943	.942	.598			
Basic Needs	.891	.898	.890	.452			
Controlled	.870	.878	.862	.446			
Work Engag	943	.948	.943	.584			
Work Engag	943	.948	.943	.58			

SEM – CFA Reduced Model – Model Fit (own work).

Fit Summ	ary	
	Saturated	Estimated
SRMR	.052	.072
d_ULS	2.366	4.456
d_G	.975	1.025
Chi-Square	4258.203	4384.455
NFI	.812	.807

SEM – CFA Reduced Model – Bootstrap Results for 1000 samples (own work).

Path Coeffic	ients (Comp	lete)					
Mean, STD	Mean, STDEV, T-Values, P-Values		Confidence Intervals			Confidence Interval	
	Original Sa	Sample	Me	Standard D	T Sta	tistics (P Values
Autonomou	.208		.210	.053		3.907	.000
Basic Needs	.657		.658	.028		23.316	.000
Basic Needs	.518		.522	.030		17.025	.000
Basic Needs	.392		.390	.055		7.182	.000
Controlled	.077		.078	.039		1.974	.049

Fornell-La	rcker Criterion	Cross Load	dings	E He	eterotrait-Monotra
Autonomous	Autonomous	Basic Needs	Cont	rolled	Work Enga
Basic Needs	.659				
Controlled	.641	.548			
Work Engag	.514	.573		.421	

SEM – CFA Reduced and Optimized Model – Discriminant Validity Formell-Larcker Criterion (own work).

SEM – CFA Reduced and Optimized Model – Discriminant Validity HTMT (own work).

Discriminant valuity (complete)							
Fornell-Larcker Criterion		Cross Load	dings 🔳 H	Heterotrait-Monotr			
Autonomous	Autonomous .773	Basic Needs	Controlled	Work Enga			
Basic Needs	.659	.689					
Controlled	.646	.555	.708				
Work Engag	.513	.579	.427	.764			

SEM – CFA Reduced and Optimized Model – Construct Reliability (Cronbach's Alpha) and Validity (AVE) (own work).

onstruct	Rell	ability and va	manty (C	omh	nete)			
Matrix		Cronbach's Alph	na 👫 rh	👫 rho_A		Composite Reliability		
	С	ronbach's	rho_A	Cor	mposite	Average Va		
Autonomou	s	.942	.944		.942	.598		
Basic Needs		.878	.883		.878	.475		
Controlled		.833	.841		.832	.501		
Work Engag		.943	.948		.943	.584		

SEM – CFA Reduced and Optimized Model – Model Fit (own work).

Fit Summa	ary	
	Saturated	Estimated
SRMR	.047	.065
d_ULS	1.464	2.835
d_G	.727	.773
Chi-Square	3140.861	3252.183
NFI	.845	.839

SEM – CFA Reduced and Optimized Model – Bootstrap Results for 1000 samples (own work).

Mean, STD	EV, T-Values, P	-Values		Confidence Inte	rvals	Confi	dence Intervals
	Original Sa	Sample	Me	Standard D	T Sta	tistics (P Values
Autonomou	.197		.197	.053		3.727	.000
Basic Needs	.659		.661	.027		23.999	.000
Basic Needs	.555		.559	.031		17.822	.000
Basic Needs	.409		.409	.057		7.123	.000
Controlled	.073		.074	.037		1.990	.047