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The relationships of team diversity, social capital and ambidexterity

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by

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ABSTRACT

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This study seeks to gain insights into the impact of team diversity on building ambidextrous teams, i.e., managing trade-offs of "exploiting the present" and "exploring the future." Given the inconsistent findings of the effects of diversity on team outcomes to date, the effect (if any) will likely be mediated and/or moderated by contextual factors. Hence, in this study, I have examined team social capital to understand better its role in fostering the relationship between team diversity and team ambidexterity.

The results of this empirical study using 211 work teams (include 1,342 managers and employees) from two multi-national companies spanning fourteen countries showed that both team diversity and team social capital are reliable predictors of team ambidexterity. While the business case for diversity appears to be a "no-brainer" for most researchers and managers alike, but the formation of diverse teams will not automatically lead to team ambidexterity. Unlike many other forms of capital, social capital increases rather than decreases with use. So, it is important for organizations to pay equal, if not more, attention on building and nurturing team social capital.

Keywords: Surface-level Diversity, Deep-level Diversity, Social Capital, Team Ambidexterity

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LIST OF ABBREVIATIONS

AMB	Ambidexterity
CD	Cognitive Diversity
COY	Company
DLD	Deep-Level Diversity
ED	Educational Level Diversity
EXPT	Exploitative Learning
EXPR	Exploratory Learning
FD	Functional Experience Diversity
GD	Gender Diversity
IDMSD	Intuitive Decision-Making Style Diversity
IND	Industry Experience Diversity
OTM	Average Organization Tenure
RDMS	Rational Decision-Making Diversity
RSC	Relational Social Capital
SLD	Surface-Level Diversity
SSC	Structural Social Capital
TS	Team Size
TTD	Team Tenure Diversity
TTM	Average Team Tenure
VD	Values Diversity

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Soon after obtaining my EMBA from the Kellogg School of Management at Northwestern University and the Hong Kong University of Science and Technology almost six years ago, I stumbled upon a new Ph.D. (General Management) program offered by the Singapore Management University (SMU). As I was walking in the park one morning, I got a surprise call from Professor Philip Charles Zerrillo (a.k.a. Dr. Z). I had earlier expressed interest in the inaugural Ph.D. program so Dr. Z called to check if I was still keen on taking up the challenge as he was planning for the second intake in December 2012. One of the admission requirements was a good SMU admission test results, particularly for those without a GRE/GMAT taken within five years before the proposed date of admission. I had just completed an intensive World's No. 1 EMBA program (a.k.a. Kellogg-HKUST program), so I did not have the appetite to take any admission test then. I told Dr. Z my concern, and he candidly responded, "*Luke, come on, don't make a mountain out of a molehill! The admission test is the least of your problem, and the real hard work starts after that.*" Dr. Z was the Professor of Marketing (Practice) at the SMU, so as you can imagine, it does not take much effort for him to convince me. The rest is history.

As the saying goes, it takes a village to get a Ph.D. The path to a doctoral degree is very long and tortuous, and I am forever grateful for the unwavering support and constant encouragement from those that helped me achieve this goal. Without each of you, I would not have come this far. As this Ph.D. journey comes to an end, I would like to acknowledge the following people who made this dissertation possible.

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CHAPTER 1. INTRODUCTION

1.1 Background

The speed of technological innovation is increasing at an unprecedented rate, and no industry sector will be immune to the rapid pace of disruptions brought about by the digital revolution. It took 75 years for the telephone to reach 100 million users globally, 16 years for mobile phones, seven years for the World Wide Web, four and a half years for Facebook, almost three and a half years for Whatsapp, twenty-six months for Apple App Store, fourteen months for WeChat, and merely less than a month for Pokémon Go (Dreischmeier, Close, & Trichet, 2015, p. 4; Millward, 2018; Perez, 2016). According to Capgemini (2015), 52% of the Fortune 500 companies have either experienced bankruptcy, been taken over, or gone out of business entirely since 2000. In a study to investigate corporate survival and death, the Boston Consulting Group (BCG) found that public companies have one-in-three chance of perishing over a five-year horizon, which is six times higher than the mortality rate for companies more than 40 years ago (Reeves & Pueschel, 2015).

Why some companies die or fizzle out while others manage to survive over decades or even centuries? What explains the “longevity”? It could be the size of the company, transformational capability, cultural context or even pure good luck (Napolitano, Marino, & Ojala, 2015) but Stanford Graduate School of Business Professor Charles O'Reilly attributed “longevity” to "organizational ambidexterity" – “*the ability of a company to manage its current business while simultaneously preparing for changing conditions*” (Krakovsky, 2013). At a recent Artificial Intelligence (AI) conference (IESE, 2018), attended by top business leaders and academics, Julian Birkinshaw, a professor at the London Business School, asserts

that "*the best firms – and by extension, the best managers – are good at managing complex trade-offs, even over time and in the face of shareholder pressure*." Professor Birkinshaw described this as "ambidexterity" – "*being efficient at doing things now but also at exploring new things for the future*" (C. B. Gibson & Birkinshaw, 2004; Raisch, Birkinshaw, Probst, & Tushman, 2009). AI, he said, "*is not good at this* [being ambidextrous] *and is unlikely to become so. Nor, is it good at building processes for reconciling diverse points of view"*. He underscored that "*in a left-to-right spectrum of human intelligence, team intelligence, crowd intelligence, and artificial intelligence, the left side is where trade-offs are done better*." (IESE, 2018). Despite its importance, not all companies have been able to engage in ambidextrous innovation. A recent study by BCG shows that only 2% of the 2500 public companies they analyzed have consistently outperformed their industry peers on both growth and profitability in both stable and turbulent periods (Haanaes, Reeves, & Wurlod, 2018). These "2% companies," as BCG calls them, have been successful due to their ability to pursue and integrate exploratory and exploitative activities simultaneously.

Ambidexterity has been widely studied in areas such as organizational design, organizational learning, strategy, innovation, strategic alliances, marketing, international venturing, and operations management (Cantarello, Martini, & Nosella, 2012; Hughes, 2018) over the last few decades. Extant literature review shows that there are more than 50 definitions attributed to organizational ambidexterity (Cantarello et al., 2012; Hughes, 2018; Simsek, 2009). Majority of the studies on ambidexterity have adopted a macro-level perspective, i.e., carrying out the analysis at firm, organization, business unit, and, in recent years, top management team (TMT). There is very limited understanding of how

ambidexterity is interpreted, achieved and sustained in practice at the meso- or team-level (Cantarello et al., 2012; Kostopoulos & Bozionelos, 2011; Lavie, Stettner, & Tushman, 2010).

It might sound like a cliché, but change is the "new normal." The ability to effectively manage current business needs while preparing the organizations to thrive in the face of uncertainty and change depends to a large extent on diversity. Many organizations are restructuring themselves to capitalize on the benefits of diverse work teams and networks to adapt to change and solve complex business problems. Hence, it is critically important to understand the dynamics of team diversity and the linkage between diversity and ambidexterity as workplace grow increasingly more diverse. Many academic studies have investigated the effects of team diversity on team processes and outcomes (Jackson, May, & Whitney, 1995; Pelled, Eisenhardt, & Xin, 1999; K. Y. Williams & O'Reilly III, 1998) but unfortunately the effects vary considerably from study to study (Jackson, Joshi, & Erhardt, 2003; Van Knippenberg & Schippers, 2007).

Studies have shown that work teams (both co-located and distributed) can be formed and disbanded quickly to drive strategic and tactical decision outcomes but it requires timely and substantial coordination and integration of resources within and outside of their formal team structures (R. Cross, Ehrlich, Dawson, & Helferich, 2008; Sommerfeld & Moise-Cheung, 2016). Such a team’s ability to dynamically gain access to and orchestrate resources with speed and agility can be attributed to their “social capital” – an area which has been widely researched over the past decade (Borgatti & Foster, 2003; Borgatti, Mehra, Brass, & Labianca, 2009; R. L. Cross & Parker, 2004; Kilduff & Tsai, 2003). Social capital (including

relational, structural and cognitive dimensions) refers to the set of social resources embedded in not only relationships but also interactions among different actors and the processes derived from those relationships (Nahapiet & Ghoshal, 1998). From the information and decision-making perspective, social capital is deemed as a critical factor in increasing the efficiency and effectiveness in information gathering, processing, diffusion, and utilization, hence leading to actions taken to produce desired outcomes. Extant literature review shows that most studies on social capital tend to focus on the structural and/or relational dimensions (Zheng, 2010) and only few have explicitly examined how the interrelationships among the three dimensions influence the impact of diversity on team outcomes.

Building on the aforementioned research gaps, this study examines the role of social capital (i.e., structural, relational, and cognitive dimensions) in fostering the relationship between team diversity (e.g., increases the access to information) and team ambidexterity (e.g., search for, experiment with, and develop new knowledge, and concurrently refine and recombine existing knowledge).

1.2 Purpose of the Study

The purpose of conducting this empirical research is to gain insights into the impact of team diversity (Van Knippenberg, De Dreu, & Homan, 2004) on building ambidextrous teams. In this study, I adopt the definition of "team ambidexterity" proposed by Jansen and his colleagues, i.e., *the extent to which teams engage in exploratory and exploitative learning simultaneously, as their members search for, experiment with and develop new knowledge and skills while they concurrently refine, recombine and implement existing ones* (Jansen, Kostopoulos, Mihalache, & Papalexandris, 2016). Given the inconsistent findings of the effects of diversity on

various outcomes to date, the effect (if any) will likely be mediated and/or moderated by contextual factors. This study aims to address the ambiguous effects associated with team diversity to team ambidexterity by examining the mediating and moderating roles of social capital (i.e., structural, relational, and cognitive dimensions).

1.3 Research Questions

The central research question for this study was: "Does social capital foster the relationships between diversity and ambidexterity at a team level?". The secondary research questions included the following:

1. To what extent does the composition of a team, along surface-level or deep-level individual attributes, relate to team ambidexterity?
2. Is there sufficient evidence to suggest a curvilinear relationship (in addition to a linear relationship) between team diversity and team ambidexterity?
3. How do the three different dimensions of social capital relate to each other in explaining the effect on team ambidexterity?
4. Among the varied forms of social capital, which kind of embeddedness influence the relationship between team diversity and team ambidexterity?
5. Does social capital produce a greater direct impact or influence on team ambidexterity than team diversity?

The following Hypotheses are derived from the research questions:

Table 1 – Proposed Hypotheses Derived from Research Questions

Proposed Hypotheses	
H_{1a}	There is a positive relationship between team surface-level diversity and team ambidexterity.

H_{1b}	There is a positive relationship between team deep-level diversity and team ambidexterity.
H_2	There is a curvilinear U-shaped relationship between team surface-level diversity and team ambidexterity, such that both low and high surface-level diversity will exhibit high levels of team ambidexterity.
H_{3a}	The team relational capital mediates the positive relationship between team cognitive capital and team ambidexterity.
H_{3b}	The team relational capital mediates the positive relationship between team structural capital and team ambidexterity.
H_{3c}	There is a non-linear positive relationship between team relational capital and team ambidexterity such that when team relational capital is high (vs. low), the positive relationship is stronger.
H_{3d}	The team structural capital mediates the positive relationship between team cognitive capital and team ambidexterity.
H_{3e}	The team structural capital mediates the positive relationship between team relational capital and team ambidexterity.
H_{3f}	There is a non-linear positive relationship between team structural capital and team ambidexterity such that when team structural capital is high (vs. low), the positive relationship is stronger.
H_{4a}	The positive relationship between team surface-level diversity and team ambidexterity is sequentially mediated first, by team cognitive capital; and second, by team relational capital.
H_{4b}	The positive relationship between team deep-level diversity and team ambidexterity is sequentially mediated first, by team cognitive capital; and second, by team relational capital.
H_{4c}	The positive relationship between team surface-level diversity and team ambidexterity is sequentially mediated first, by team cognitive capital; and second, by team structural capital.
H_{4d}	The positive relationship between team deep-level diversity and team ambidexterity is sequentially mediated first, by team cognitive capital; and second, by team structural capital.

1.4 Approach to the Study

Philosophical paradigms are the models that are derived from "worldviews" or "systems of beliefs" about the nature of knowledge and existence. Postpositivism and constructivism are two key philosophical paradigms of conducting research. According to Creswell and Creswell (2017, pp. 3 - 9), the postpositivists hold a deterministic philosophy in which causes (probably) determine effects or outcomes. The problems examined by postpositivists reflect the need to identify and assess the causes (i.e., quantitative research with empirical observation and measurement) that

influence outcomes (i.e., mainly focus on "theory verification"). Constructivists, on the other hand, adopt the view that knowledge is derived from the meanings attached to the concerned phenomenon. Hence, researchers interact with the subjects of study to obtain data and are aware of inquiry changes of both the researcher and the subjects. Constructivism is typically seen as an approach to qualitative research and focus mainly on theory generation (Trochim & Donnelly, 2001, pp. 18 - 19).

For this study, I will adopt the postpositivist paradigm, hence proposed the use of quantitative research to study the relationships between team diversity, social capital, and ambidexterity. There are two key quantitative research designs commonly adopted by researchers, and they are survey research and experimental research (Cooper & Schindler, 2011 - Chapter 9 and 10; Creswell & Creswell, 2017, pp. 12 - 13). This research aims to study the strength and relationship of existing constructs found in the extant literature (e.g., social capital and ambidexterity) versus the development of new constructs. Hence, a survey design was chosen for this empirical study instead of experimental design. Both completely randomized experimental and quasi-experimental designs would be more appropriate if the research question seeks to determine if a specific treatment influences an outcome.

This study is a cross-sectional, exploratory, quantitative analysis based upon deductions made from the results of the administration of questionnaires via online survey platforms MaritzCX and Qualtrics (Subramanian, 2017).

1.5 Theoretical Framework

The constructs and concepts in this study are grounded in the following theories:

1.5.1 Diversity

Social categorization (includes social identity and similarity-attraction), information/decision making, categorization-elaboration model and diversity faultlines (Hornsey, 2008; Joshi & Roh, 2008, 2009; Lau & Murnighan, 1998; Meyer, 2017; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987; Van Knippenberg & Schippers, 2007; K. Y. Williams & O'Reilly III, 1998)

1.5.2 Social Capital

Structural, relational and cognitive social capital, structural-hole, weak ties and closed network (Adler & Kwon, 2002; Bourdieu, 2011; Burt, 2000; Coleman, 1988; Granovetter, 1992; Kwon & Adler, 2014; Nahapiet & Ghoshal, 1998)

1.5.3 Ambidexterity

Organizational learning, exploratory learning, and exploitative learning (Argyris & Schön, 1997; A. Edmondson & Moingeon, 1998; A. C. Edmondson, 2002; C. B. Gibson & Birkinshaw, 2004; Jansen, Van Den Bosch, & Volberda, 2006; Kostopoulos & Bozionelos, 2011; Levinthal & March, 1993; Levitt & March, 1988; March, 1991; O'Reilly & Tushman, 2013; Raisch et al., 2009; Tushman & O'Reilly III, 1996)

As shown in Figure 1, the conceptual model depicts the relationships between team diversity, team social capital, and team ambidexterity. To be specific, this dissertation promotes the theory that there is a relationship between team diversity and team ambidexterity and team social capital plays a critical role in fostering the relationship.

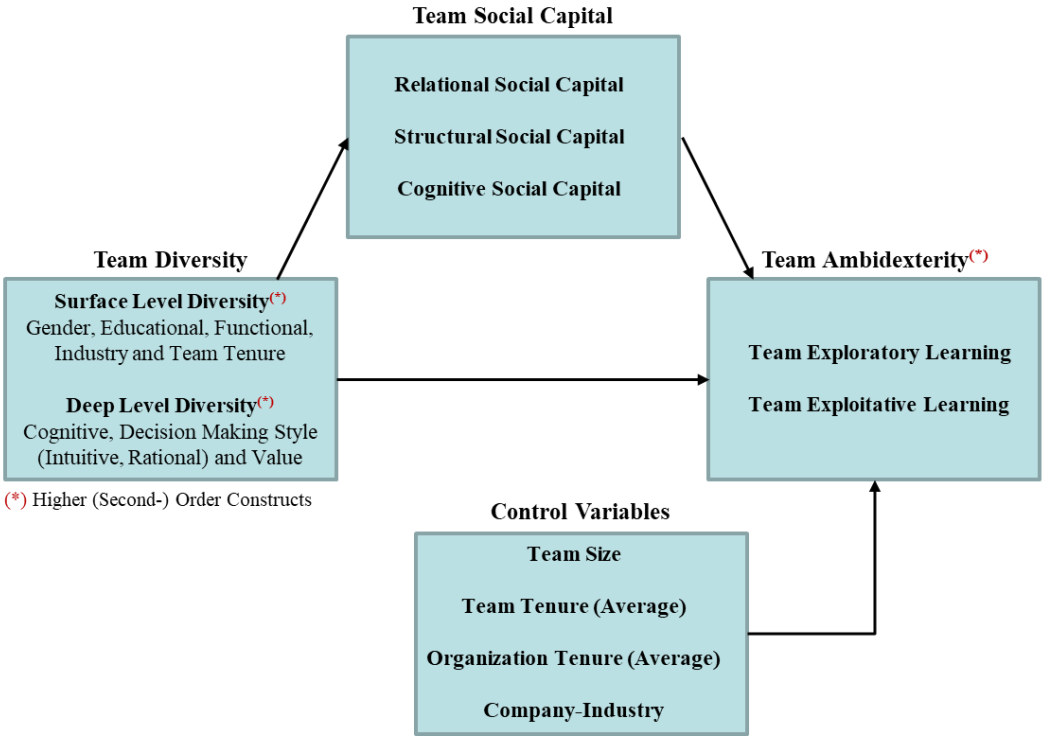

Figure 1 – The relationships of team diversity, social capital and ambidexterity (conceptual model)

1.6 Definition of Terms

The following table contains the definitions of key terms used in this study. The glossary serves as a "quick aid" to facilitate reading and is by no means exhaustive.

Table 2 – Definition of Key Terms (Not in Alphabetical Order)

Terms	Definition
Work team	In this study, I have defined work teams as a group of employees (1) reporting directly to the same manager, (2) working together on a permanent basis (vs. cross-functional project team) and (3) who has individual and mutual accountability. According to Katzenbach and Smith (1993), a team is more than the sum of its parts, and the essence of a team is a shared commitment - *"without it, groups perform as individuals and, with it, they become a powerful unit of collective performance."*
Team ambidexterity	Team ambidexterity is defined as the extent to which teams engage in exploratory and exploitative learning simultaneously, as their members search for, experiment with

	and develop new knowledge and skills while they concurrently refine, recombine and implement existing ones (Jansen et al., 2016). See Table 38 for survey questions.
Team learning	Team learning is defined as a process by which a team takes action, obtains and reflects upon feedback and makes changes to adapt or improve (A. C. Edmondson, 2002).
Exploratory learning	Exploratory learning is considered as a form of organization learning focusing on "exploration" which includes things captured by terms such as search, variation, risk-taking, experimentation, play, flexibility, discovery, innovation (March, 1991).
Exploitative learning	Exploitative learning is considered as a form of organization learning focusing "exploitation" which includes things captured by terms such as refinement, choice, production, efficiency, selection, implementation, execution (March, 1991).
Team diversity	Team diversity is defined as the distribution of differences among the members of a team with respect to a common attribute (Harrison & Klein, 2007).
Surface-level diversity	Surface-level diversity is defined as the extent to which a team is heterogeneous on characteristics that can be reasonably estimated after brief exposure, such as age, gender, ethnicity, functional background, and organizational tenure (Bell, 2007; Mohammed & Angell, 2004).
Deep-level diversity	Deep-level diversity is defined as the extent to which a team is heterogeneous on underlying psychological characteristics such as attitudes, personality, and values (Bell, 2007; Mohammed & Angell, 2004), usually not immediately observable and must therefore be discovered through mutual interaction over time (Harrison, Price, Gavin, & Florey, 2002).
Gender diversity	Gender diversity in terms of variety is calculated using an index which accounts for the proportion of each gender category (either male, female or do not wish to be associated with either gender) within any given team (see Biemann and Kearney (2010) or Table 4 for the bias-corrected formulae; see APPENDIX A. SURVEY INSTRUMENTTable 35 for survey question).
Education level diversity	Educational level diversity in terms of variety is calculated using an index which accounts for the proportion of each education level category (e.g., Bachelor's, Master's, Ph.D., etc.) within any given team (see Biemann and Kearney (2010) or Table 4 for the bias-corrected formulae; see Table 35 for survey question).
Functional experience diversity	Functional experience diversity in terms of variety is calculated using an index which accounts for the proportion of each functional category (e.g., Sales, Marketing, Customer

	Services, Operations, etc.) within any given team (see Biemann and Kearney (2010) or Table 4 for the bias-corrected formulae; see Table 35 for survey question).
Industry experience diversity	Industry experience diversity in terms of variety is calculated using an index which accounts for the proportion of each industry category (e.g., Manufacturing, Retail Trade, Information & Communication Technology, Finance, and Insurance) within any given team (see Biemann and Kearney (2010) or Table 4 for the bias-corrected formulae; see Table 35 for survey question).
Team tenure diversity	Team tenure is defined as the length of time that team members have interacted with one another (Katz, 1982). Team tenure diversity accounts for the differences in team tenure among team members, i.e., the effect of having a mix of experienced and newer team members. Team tenure diversity in terms of disparity is calculated using an index which accounts for the coefficient of variation of team member's tenure (see Biemann and Kearney (2010) or Table 4 for the bias-corrected formulae).
Cognitive diversity	Cognitive diversity is defined as the extent to which the thinking styles, skills, knowledge, belief, and values are perceived by team members (Dahlin, Weingart, & Hinds, 2005). Cognitive diversity is operationalized as separation using an index which represents the dispersion or standard deviation of team members' perceived extent of diversity (see Biemann and Kearney (2010) or Table 4 for the bias-corrected formulae; see Table 36 for survey questions).
Decision-making style diversity	Decision-making style is defined as the learned, habitual response pattern exhibited by an individual when confronted with a decision situation (S. G. Scott & Bruce, 1995). Rational decision-making style is characterized by careful, thorough, objective information gathering and weighing alternatives. It symbolizes a systematic appraisal and logical deliberation with an expanded time perspective. Intuitive decision-making style is to approach the task personally, emotionally and holistically on the basis of feelings. The intuitive decision maker uses an internal hunch that decisions are basically right and makes decisions quickly, without the deliberation typical of a rational decision maker. Any team member could favor the rational decision-making style, intuitive decision-making style, both, or neither in a given situation or context. In other words, we can expect some team members to have an intrinsic preference for one of the two decision making styles while others may adopt either or both styles in a given situation or context. Hence, in this study, I conceive rational and intuitive decision-making styles as independent of one another, i.e., orthogonal not the opposite end of a single continuum. Decision-making style diversity is operationalized as separation using an index which represents the dispersion or

	standard deviation of team members' perceived extent of diversity (see Biemann and Kearney (2010) or Table 4 for the bias-corrected formulae; see Table 36 for survey questions).
Values diversity	Values diversity is defined as the extent to which members of a given team exhibit a general propensity toward team collectivistic orientation, This includes members' belief about the effects of personal pursuits on team productivity, the value attached to working as a team and norms about the subordination of personal needs (Wagner, 1995). Value diversity is operationalized as separation using an index which represents the dispersion or standard deviation of team members' perceived extent of diversity (see Biemann and Kearney (2010) or Table 4 for the bias-corrected formulae; see Table 36 for survey questions).
Social capital	The sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit (Nahapiet & Ghoshal, 1998)
Relational social capital	The relational dimension of social capital concerns the nature and quality of the relationship ties actors have with their contacts which have developed through a history of interactions. (Nahapiet & Ghoshal, 1998). See Table 37 for survey questions.
Structural social capital	The structural dimension of social capital refers to the overall pattern of connections between network actors, i.e., it involves the network of ties and the relationships possessed by actors (Nahapiet & Ghoshal, 1998). See Table 37 for survey questions.
Cognitive social capital	The cognitive dimension of social capital refers to the resources providing shared representation, interpretations, and systems of meaning among parties (Nahapiet & Ghoshal, 1998). See Table 37 for survey questions.
Endogenous latent variable	The term endogenous describes latent target constructs in the structural model that are explained by other constructs via structural model relationships (Joe F Hair, Ringle, & Sarstedt, 2011; Hair Jr, Hult, Ringle, & Sarstedt, 2016, p. 12)
Exogenous latent variable	The term exogenous is used to describe latent constructs that do not have any structural path relationships pointing at them. In other words, these are constructs that explain other constructs in the model (Joe F Hair et al., 2011; Hair Jr et al., 2016, p. 12).
Latent variable	A variable which cannot be directly measured or observed due to its abstractness and complexity but predicted through observed measures (Hair Jr et al., 2016, p. 6).
Structural equation modeling	SEM is a second-generation multivariate analysis technique and can be viewed as a combination of factor analysis and regression or path analysis. In general, SEM-based approaches provide the researchers with the flexibility to perform the

	following: (a) model relationships among multiple endogenous and exogenous variables, (b) incorporate unobservable latent variables measured indirectly by indicator variables while accounting for measurement error in observed variables, (c) statistically test a priori substantive/theoretical and measurement assumptions against empirical data (Chin, 1998; Hox & Bechger, 1998). There are two types of SEM: covariance-based SEM (CB-SEM) and partial least squares SEM (PLS-SEM); also known as PLS path modeling. Both methods differ from a statistical point of view and are designed to achieve different objectives and rely on different philosophies of measurement. Neither of the techniques is generally superior to the other, and neither of them is appropriate for all situations. For the "rules of thumb" for choosing between PLS-SEM and CB-SEM, please read Joe F Hair et al. (2011, p. 144).
Measurement model	An element of a path model that contains the indicators and their relationships with the constructs and is also called the outer model in PLS-SEM (Hair Jr et al., 2016).
Reflective measurement	A type of measurement model setup in which measures represent the effects (or manifestations) of an underlying construct. Causality is from the construct to its measures or indicators (Hair Jr et al., 2016).
Formative measurement	A type of measurement model setup in which the indicators fully form or cause the construct and arrows point from the indicators to the construct (Hair Jr et al., 2016).
Bootstrapping	A resampling technique that draws a large number of subsamples from the original data (with replacement) and estimates models for each subsample. It is used to determine standard errors of coefficients to assess their statistical significance without relying on distributional assumptions (Hair Jr et al., 2016).

1.7 Significance of the Study

Extant literature review shows that majority of the journal articles on the field of diversity, social capital and ambidexterity tend to focus on:

1. Either single or multiple western countries including the USA (e.g., Nemanich & Vera, 2009; Yan & Guan, 2018) and Europe including Netherlands, Germany, Greece, Italy, UK and Spain (e.g., Boerner, Linkohr, & Kiefer, 2011; García-Granero, Fernández-Mesa, Jansen, & Vega-Jurado, 2017; Jansen et al., 2016; López-Fernández & Sánchez-Gardey, 2010).

Konrad (2003) suggested that most research on the linkages between diversity and team outcomes have mainly been conducted in western countries especially in the USA. There is only a handful of studies on the diversity-ambidexterity relationships in the Asian context, and they tend to focus only on a single country like China or Taiwan (e.g., Li, 2014; Li, Li, Lin, & Liu, 2018; Li, Liu, Lin, & Ma, 2016).

2. Either firm, organization or business unit as the unit of analysis. Most studies on ambidexterity tend to focus on firm, organization or business unit level (i.e., macro-level) analysis (Cantarello et al., 2012, pp. 30-33; Simsek, 2009, pp. 600-601) and there are far fewer number of studies focusing on work teams (or meso-level) beyond TMT (e.g., Jansen et al., 2016; Kostopoulos & Bozionelos, 2011).
3. Either one or two dimensions of social capital and/or examine their effects on team outcomes independently. Most studies tend to focus only on the structural and/or relational dimensions of social capital. (Zheng, 2010). There are insufficient studies looking into how the interrelationships among the three different aspects influence the impact of diversity on team outcomes (e.g., Li, 2013).
4. Either direct and indirect linear effects of diversity and/or social capital on ambidexterity. There are a limited number of studies which explicitly examined the curvilinear effects of diversity and/or social capital (e.g., Chi, Huang, & Lin, 2009; Earley & Mosakowski, 2000; C. Gibson & Vermeulen, 2003; Li et al., 2018)

This study offers insights into how work teams may be composed to foster the dimensions social capital (i.e., relational, structural and cognitive) that lead to

ambidextrous teams (i.e., ability to balance between exploratory and exploitative learnings), addresses the literature gaps highlighted earlier and attempted to make the following methodological, conceptual/theoretical and practical contributions.

1. Methodological contribution: This study is based on data collected from work teams from two multinational corporations (MNCs) spanning 14 countries across the Asia Pacific (APAC) region. Based on my limited literature review, this is by far the first pan-APAC study on the relationships of team diversity, social capital, and ambidexterity. MNCs settings are appropriate to help address the research questions outlined in Section 1.3 as they provide a context characterized by substantial heterogeneity and complexity. Externally, the two participating companies operate in multiple countries and, hence their employees are exposed to a variety of institutional, regulatory, cultural, political, competitive and economic environments. Internally, given the size of their businesses, their work teams will likely be comprised of managers and employees with a wide variety of educational backgrounds, functional experiences, cognitive abilities, values and beliefs (Roth & Kostova, 2003).
2. Conceptual/Theoretical contribution: MNCs offer us the conditions of “high variability and complexity” (Roth & Kostova, 2003) so this study has the potential to "generalize" or "expand" some of the relevant diversity, social capital and/or ambidexterity theories by examining the “boundary conditions” and “unexplored” explanatory variables (e.g., non-linear mediators and/or moderators). This study will draw on and contribute to scholarly literature that examines the effects of social capital on ambidexterity. More specifically, this study will advance the

conceptualization of social capital constructs by exploring the interrelationships among the three dimensions (i.e., relational, structural and cognitive) concurrently, study their non-linear effects and determine if social capital produces a more significant direct impact on ambidexterity than team diversity.

3. Practical contribution: It is of interest and increasing importance especially for MNCs to better understand how diversity in team compositions may affect outcomes such as talent acquisition, employee satisfaction, team innovation, and organization performance (Milliken & Martins, 1996). The results of this study can offer additional insights to empower business leaders to design and operationalize targeted measures to enhance diverse work teams' effectiveness and, in turn, lead to higher employee productivity, satisfaction and performance. During the initial stage of "team formation", the selection of appropriate team members (with a balanced proportion of heterogeneity) is a crucial, albeit challenging, task for any business leaders. Beyond the initial stage, the enduring efforts to manage the diversity of teams are equally, if not more, important. I expect the findings to suggest that building collective "social capital" shared by team members to be a more effective approach to foster team ambidextrous behavior over time. Today, more than 85% of Fortune 500 companies (Jones & Donnelly, 2017) have some shape or form of diversity and inclusion programs (i.e., based on their diversity and inclusion policies posted on their corporate website) and most of these programs focused primarily on, e.g., female and minority groups. I know of MNCs which assign arbitrary "gender diversity" targets to their senior managers and, to meet the targets,

senior managers might end up "hiring female for the sake of hiring female." The empirical findings of this study suggest that companies should avoid basing their hiring or team formation decisions solely on surface-level characteristics by assuming that surface-level characteristics (e.g., gender) are congruent with deep-level characteristics (e.g., cognitive ability). Unlike many other forms of capital (e.g., financial capital), social capital increases rather than decreases with use (Nahapiet & Ghoshal, 1998, p. 258). Interaction is a prerequisite for the development and maintenance of dense social capital (Bourdieu, 1986), and this is where managers should pay equal, if not more, attention.

1.8 Assumptions of the Study

1. The survey questionnaires were created based on the constructs and measurement items adapted from the extant literature to preserve the content validity. Since this study involves the use of self-reporting instruments and measures, it is assumed that each participant will answer each question truthfully and, to the best of their knowledge and ability.
2. The survey questionnaire was first created in English and, subsequently, translated into Simplified Chinese and Japanese to cater for participants in China and Japan respectively. The study assumed that the participants will choose their preferred language option and can understand and appropriately respond to the questionnaire.
3. It is assumed that the two participating companies' senior management and/or HR organization will help encourage team managers' and members' participation to generate enough samples.

4. It is assumed that the data gathered will support the purpose of the study and the findings will eventually contribute to diversity, social capital, ambidexterity and partial least squares structural equation modeling (PLS-SEM) literature.
5. It is assumed that the findings will offer managers insights to enhance diverse work teams' effectiveness and, in turn, lead to higher employee productivity and satisfaction.
6. Lastly, it is assumed that the research findings will be disseminated (e.g., shared, presented or published) in aggregated form and/or with individual data anonymized to protect the confidentiality of the study's participants.

CHAPTER 2. LITERATURE REVIEW

2.1 Ambidexterity

The term "ambidexterity" refers to an individual's ability to use both hands equally well and has been widely used as a "metaphor" to describe an organization's ability to simultaneously engage in activities of exploration and exploitation and to manage the paradoxical demand related to it.

2.1.1 Exploratory and Exploitative Learning

In his seminal paper, March (1991) proposes that exploration and exploitation are fundamentally two distinct activities essential for organizational learning and they compete for scarce resources. Whereas exploration is associated with activities like "*search, variation, risk-taking, experimentation, play, flexibility, discovery, innovation*," exploitation involves activities like "*refinement, choice, production, efficiency, selection, implementation, execution*" (March, 1991, p. 71).

Instead of focusing only on one approach at the expense of the other, March (1991) suggests the need to find an appropriate balance between the two, but unfortunately, the precise optimal mix of exploitation and exploration is difficult to specify. Over-emphasizing on exploratory activities can lead an organization into a "failure trap," i.e., continuous consumption of organization resources without any line of sight to short-term returns to ensure its current viability. Conversely, focusing excessively on exploitation activities can drive an organization into a "success trap," i.e., short-term returns might impede the search of profitable long-term opportunities to ensure its future viability (Levinthal & March, 1993; March, 1991).

With increasing business complexity and competitive intensity driven by globalization and digitization, organizations and teams need to pursue a balanced two-pronged innovation approach. On the one hand, they need to continue to exploit existing technology and capabilities to drive incremental improvements, satisfy the needs of existing customers and focus on short-term financial results. On the other hand, they need to explore, develop and acquire new forms of knowledge and capabilities to drive radical innovations (e.g., in areas like the internet of things and artificial intelligence), create and capture future customer or market demands and focus on long-term performance outcomes. The imperative need for both exploitation and exploration has led to organizations driving their teams to become more ambidextrous, i.e., capable of simultaneously exploiting existing competencies and exploring new opportunities. Are exploitation and exploration regarded as "two" or "two different and orthogonal aspects of organizational behavior"? According to Gupta, Smith, and Shalley (2006), the answer to the question above depends on the conceptual definition of the terms "exploration" and "exploitation" and if they are treated as "competing" or "complementary" aspects of organizational decision and actions.

2.1.2 Structural, Contextual and Punctuated

Based on the prior literature, there are several approaches prescribed by researchers to balance the demands of exploration and exploitation: "structural ambidexterity" (O'Reilly & Tushman, 2004; Tushman & O'Reilly III, 1996; Tushman & O'Reilly, 1997), "contextual ambidexterity" (C. B. Gibson & Birkinshaw, 2004) and "punctuated ambidexterity" (Gupta et al., 2006). Structural ambidexterity is defined by Gupta et al. (2006, p. 693) as *"[...] the synchronous*

pursuit of both exploration and exploitation via loosely coupled and differentiated subunits or individuals, each of which specializes in either exploration or exploitation.". According to C. B. Gibson and Birkinshaw (2004, p. 201), contextual ambidexterity *is defined as "the behavioral capacity to simultaneously demonstrate alignment and adaptability across an entire business unit. Alignment refers to coherence among all the patterns of activities in the business unit; they are working together toward the same goals. Adaptability refers to the capacity to reconfigure activities in the business unit quickly to meet changing demands in the task environment*.". Punctuated ambidexterity refers to "*[…] temporal cycling between long periods of exploitation and short bursts of exploration.*" according to Gupta et al. (2006, p. 698)

2.1.3 Team Ambidexterity Construct

For this dissertation, C. B. Gibson and Birkinshaw (2004)'s contextual ambidexterity concept is more relevant and applicable, i.e., regard "ambidexterity" as "*the behavioral orientation and capacity of a team to simultaneously demonstrate alignment and adaptability and engage in exploitation and exploration activities.*". For instance, sales managers and teams will need to focus their attention on "when" and "how" to divide and orchestrate their scarce resources to develop future quarters' sales pipeline for long-term sustainable growth (exploration activities) and meet customer implementation timeline and achieve current quarter sales revenue targets (exploitation activities). Here the "contextual factors" to drive the team's ambidextrous orientations can be team diversity and team social capital which are of interest to me.

There appears to be no consensus among researchers on the definition of ambidexterity (e.g., Cantarello et al., 2012, pp. 30-31 list 28 different definitions) and its measurement. Furthermore, most of the studies on ambidexterity have considered firm, organization, business unit, TMT or individual as the unit of analysis. There is far fewer number of studies on work teams (Kozlowski & Bell, 2003) beyond TMT (see few exceptions - Jansen et al., 2016; Kostopoulos & Bozionelos, 2011; Nemanich & Vera, 2009). Based on extant literature, I will adopt the definition of "team ambidexterity" as "a collective learning behavior of team members that search for, experiment with, and develop new knowledge, and concurrently refine and recombine existing knowledge" (Jansen et al., 2016).

Some researchers have treated ambidexterity as a bipolar construct with exploratory and exploitation occupying the opposite end of a single continuum (Simsek, Heavey, Veiga, & Souder, 2009). On the other hand, other researchers have considered exploratory and exploitation as orthogonal constructs with two distinct dimensions (C. B. Gibson & Birkinshaw, 2004; He & Wong, 2004; Jansen, Tempelaar, Van den Bosch, & Volberda, 2009). Prior studies have presented various approaches for measuring ambidexterity (which comprises exploration and exploitation) including subtracting, adding and multiplying. For example, He and Wong (2004) subtracted exploitation score from exploration score and used an absolute difference score for ambidexterity, Lubatkin, Simsek, Ling, and Veiga (2006) added the scores of exploitation and exploration to measure ambidexterity and C. B. Gibson and Birkinshaw (2004) measure ambidexterity by multiplying the scores of exploitation and exploration.

The choice of a measure of team ambidexterity as a higher- (second-) order construct (HOC) requires the selection of a formative (similar to the concept of "molar" or "collect" model) or a reflective (similar to the concept "molecular" or "spread" model") approach to analysis. If the HOC is formative, it is a combination of several specific LOCs representing more concrete components that form the general concept. Hence, a change in LOC's value due, e.g., to a change in a respondent's assessment of the trait being captured by the LOCs changes the value of the HOC. On the other hand, the HOC is reflective, the general concept is manifested in several more specific LOCs, and these LOCs are generally highly correlated. (Hair Jr, Sarstedt, Ringle, & Gudergan, 2017, p. 43). For this research, I adopted the orthogonal perspective and considered the team ambidexterity as a second-order construct with exploratory learning and exploitative learning each representing a distinct and non-substitutable component (Pertusa-Ortega & Molina-Azorín, 2018).

2.2 Diversity

There has been no shortage of peer-reviewed research articles (in management literature) and popular press and books on diversity over the last 30 years (Jonsen, Maznevski, & Schneider, 2011). However, there remain gaps between "academics" and "practitioners" perspectives on diversity and/or diversity management (Pendry, Driscoll, & Field, 2007). In fact, there appears to be an ongoing disconnect between the "theoretical promise" and "practical reality" of diversity in team processes and outcomes. This has resulted in scholars questioning the relevance of extant research on diversity management or criticizing diversity

management researchers for not being "market-oriented enough" (Jonsen et al., 2011; Joshi & Roh, 2008).

There are many reasons why there are ongoing "gaps" between "research findings" and "managerial practice" (Rynes, Brown, & Colbert, 2002a; Rynes, Colbert, & Brown, 2002b). On the one hand, diversity practitioners are generally unaware of many rigorous peer-reviewed academic studies about what diversity management concepts or approaches are known to work. Hence, they were unable to fully take advantage of the knowledge or findings that could increase the impact of corporate diversity management initiatives or programs in achieving their corporate mandates (*so practitioners cannot implement what they do not know*). On the other hand, academics are often unfamiliar with how diversity work in real business settings. Some academics might not fully appreciate the challenges involved in operationalizing their findings in the corporate workplace so were only able to focus on research studies with little practical value (e.g., lab studies involving students with no practical business experience might lack generalizability). Some of them often lack access to the corporate information they need for conclusive and/or timely diversity studies (*so practitioners may have knowledge of research findings but fail to implement them*).

2.2.1 Diversity Theory

The social identity perspective (comprising social identity theory and self-categorization theory) suggests that (a) people define and differentiate themselves in terms of group memberships i.e., in-group vs out-group and (b) people tend to favor, trust and more willing to work with in-group vs outgroup members (Mohammed & Angell, 2004; Van Knippenberg & Schippers, 2007). Similarity–

attraction perspective, which does not concern about group membership but instead focuses on interpersonal similarity (primarily in attitudes and values) and suggests that people prefer similarity in their interactions (Mohammed & Angell, 2004; Van Knippenberg & Schippers, 2007). Though proposed by different scholars, similarity-attraction (Donn Bryne in 1971), social identity (Henri Tajfel in 1978), and self-categorization (John Turner in 1982) theories mostly arrive at the same assertion that people prefer to work with people similar to themselves.

A third theoretical perspective, which predicted partly on the similarity/attraction perspective and guided team diversity research over the last two decades, focuses on how information and decision making might be affected by variations in team compositions (K. Y. Williams & O'Reilly III, 1998). Both social identity and similarity perspectives argue for the positive benefits of homogeneity on group process. Hence the theories are often invoked to explain the negative outcomes of team diversity. On the other hand, information and decision making theorists make the opposite assertion and argue the positive effects of team diversity as a result of the access to a broader range of task-relevant knowledge, skills, abilities, information, opinions or perspectives (Van Knippenberg & Schippers, 2007).

According to Van Knippenberg et al. (2004), diversity research has typically examined social categorization processes and information/decision-making processes in isolation, and it is probably one of the critical reasons why extant research is unable to reconcile the effects team diversity accurately (e.g., either null, positive or negative). The distinction between social category diversity and informational diversity may not be as clear-cut as it seems. Van Knippenberg and

his colleagues propose collaboration-elaboration model (CEM) which (among other things) suggests that "social category differences" are confounded with "informational differences" and any dimension of diversity (e.g., gender or cognitive knowledge) can function as both social category diversity and informational diversity. In other words, social category differences may cause the positive effects implied in the information/decision-making perspective while informational differences may give rise to social categorization processes which induced the adverse effects.

Traditionally, diversity research has focused on the effects of different dimensions of diversity in isolation largely ignoring the possibilities of the presence of a dimension of diversity may be contingent on the diversity of other dimensions (Jackson & Joshi, 2004). In the corporate world, it is common to find work teams' members differ on a variety of dimensions and, in some cases, these differences may be correlated to some extent (e.g., gender and age may covary while gender and cultural differences may be independent of each other). Lau and Murnighan (1998) coined the term "faultlines" which suggest that a group may be split into "homogenous" sub-groups based on the "combinations of correlated dimensions of diversity" (e.g., gender and age; all male employees are below the age of 25 while all female employees are above the age of 45). In other words, the stronger the diversity faultline, the more likely subgroups will emerge and, the subgroups will, in turn, have either positive or negative effects on team processes and/or outcomes (Bezrukova, Jehn, Zanutto, & Thatcher, 2009; Homan, van Knippenberg, Van Kleef, & De Dreu, 2007; Lau & Murnighan, 2005).

2.2.2 Topologies of Diversity

Over the years, researchers have proposed various topologies to categorize various dimensions of diversity to study higher order construct. Jackson et al. (1995) propose that individual attributes can be categorized as either readily-detectable or underlying, and as either task-related or relations-oriented. Jackson and colleagues suggest that readily detectable attributes (e.g., task-related: educational level, team tenure; relations-oriented: gender, ethnic background) are those that can be easily and unambiguously determined with only brief exposure while underlying attributes (e.g., task-related: knowledge, skills, abilities; relations-oriented: social status, attitudes, values) are less obvious and needed more time to uncover through interactions (Jackson et al., 2003; Milliken & Martins, 1996). In general, educational level, functional background, organization and team tenure are considered as "highly job-related" attributes, whereas demographic attributes like age, gender, ethnicity, and nationality are regarded as "less job-related."

Some other researchers categorize dimensions of diversity into surface-level vs. deep-level variables. Surface-level diversity refers to the extent to which a team is heterogeneous on demographic characteristics that can be reasonably estimated after brief exposure, e.g., gender, age, ethnicity, functional background, education level, and team tenure). On the other hand, deep-level diversity considers team members' differences in underlying psychological characteristics such as cognitive knowledge, personality factors, values, and attitudes usually not immediately observable and must therefore be discovered through mutual interaction over time (Bell, 2007; Harrison, Price, & Bell, 1998; Harrison et al., 2002; Mohammed & Angell, 2004; Phillips & Loyd, 2006).

Most researchers and managers alike generally believe that surface-level diversity (e.g., gender) is “beneficial” to team functioning or decision-making as their conventional wisdom suggests that team members who look different on the surface are likely to share different perspectives. The fundamental assumption is here is the congruence between surface-level and deep-level characteristics (Phillips & Loyd, 2006). However, in reality, the two types of diversity attributes may not always be congruent, i.e., the differences in perspective may come from people who do not look different on the surface (Jehn, Northcraft, & Neale, 1999; Shemla, Meyer, Greer, & Jehn, 2016).

From information/ decision-making perspective, teams with a higher level of deep-level diversity will possess a greater variety of knowledge, task-related skills, cognitive abilities, unique perspectives and complementary decision-making style, which, in turn, lead to higher quality output across various decision contexts (e.g., process improvement or radical innovation). In general, team deep-level diversity is expected to have a positive influence on the levels of exploitation learning and exploration learning of the team, hence team ambidexterity.

2.2.3 Dimensions of Team Diversity

To date, a wide range of research has been conducted on the effects of team diversity on performance but mostly examine only one or two dimensions of either surface-level diversity or deep-level diversity (Mohammed & Angell, 2004) in isolation. While much academic research often focused on either demographic or job-related diversity dimensions (Jackson et al., 2003), majority of the managerial/practitioner studies has, so far, been focused on women or more broadly "gender diversity" e.g., Curtis, Schmid, and Struber (2012); Hunt, Layton, and

Prince (2015). An often-asked question is “do companies with women on the board (or top/management team) perform better than companies whose boards (or top/management team) are all-male?”. Many companies’ executives (including C-level and HR diversity champions) have a general belief that "gender diversity” or, more specifically, hiring more female, has a “positive effect on performance." They often based their assertions on studies by consulting firms, financial institutions or information providers e.g., Catalyst (Troiano, 2013), McKinsey (Hunt et al., 2015), Thomson Reuters (Reuters, 2013), Credit Suisse (Curtis et al., 2012) and Deloitte (Diplock, Wilderotter, & Kilaas, 2013) without fully understanding the assumptions made or the effect size of the variables examined. However many peer-reviewed academic research studies including recent meta-analyses (Horwitz & Horwitz, 2007; Pletzer, Nikolova, Kedzior, & Voelpel, 2015; Post & Byron, 2015; Tsui & O'reilly III, 1989; K. Y. Williams & O'Reilly III, 1998) offer inconclusive findings i.e., gender diversity-performance either negative, positive or neutral (or no relationship).

Having worked in the corporate world for more than two decades, I can understand why many of the debates in favor of “gender diversity” are intuitive. Many practitioners have argued that diversity offers different perspectives, alternative opinions, new knowledge, and even challenge the status quo. They intuitively think that “active deliberations” and “information exchanges” tend to lead to “more effective decision making,” and the greater the “gender diversity,” the more likely the team can identify "innovative solutions" with "varying perspectives." While we might achieve innovative outcomes eventually but “does gender diversity always lead to more active deliberations and hence more effective

decision making"? I think it depends as research on diversity-performance relationships are far from being conclusive.

Now assuming that the women named to corporate boards indeed have perspectives and opinions which are different from most of the men on these boards, these women executives may not speak up in board conversations ("Does Gender Diversity on Boards Really Boost Company Performance?," 2017), and they may lack the social capital or influence to steer the board's decisions. Research has shown that minorities (or outliers) in a group often held back from expressing values, beliefs, and opinions that run counter to the values, beliefs, and opinions of the majorities. Now even if the minorities (or outliers) chose to speak up, the majorities might choose to ignore their views. If such "team dynamics" occur within the corporate boards (or other kinds of work teams), the boards may not enjoy the actual benefits of having, e.g., cognitive diversity. The logic is "*the greater a board's cognitive diversity, the more options it is likely to consider and the more deeply it is likely to debate those options."*

2.2.4 Non-Linear Team Diversity-Outcomes Relationship

Many academic studies have shown that a clear depiction of the direct diversity-performance relationships could not be established, i.e., team diversity may either have a positive effect or negative effect on performance and, in some cases, neutral or no effect at all (Van Knippenberg et al., 2004). Van Knippenberg and Schippers (2007, pp. 532-534) suggests that there are sufficient indicators exist to warrant a closer look at the curvilinear effects of diversity.

Within the diversity literature, Dahlin et al. (2005) have found an inverted U-shaped pattern of the linkage between educational diversity and team information

use, Chi et al. (2009) have found an inverted U-shaped relationship between organizational tenure diversity and team innovation, M. Ali, Kulik, and Metz (2011) have found an inverted U-shaped relationship between gender diversity and employee productivity, Luan, Ling, and Xie (2016) have found an inverted U-shaped relationship between educational diversity and team creativity, and most recently, Li et al. (2018) have shown that functional background diversity has a curvilinear (an inverted U-shaped) relationship with team ambidexterity.

One key observation is that the aforementioned studies considered only one aspect of surface-level diversity (e.g., either gender diversity, educational diversity, organization tenure diversity or functional background diversity) and the relationships were explained through e.g., social identity and information processing perspectives (Joshi & Roh, 2009; Van Knippenberg & Schippers, 2007). The curvilinear effects of diversity are far from straightforward, but it might help to shed some light on the inconsistent findings in diversity research, e.g., the inconsistent positive, negative or null relationships might be due to the restriction of the range effects.

In the case of a U-shaped relationship, we will likely observe a "negative effect" as the quadratic polynomial curve is monotonically decreasing[1] when we restrict the consideration between the lower level and a moderate level of diversity. Conversely, we will likely observe a "positive effect" if we restrict the consideration between a moderate level and a higher level of diversity as that part of the quadratic polynomial curve is monotonically increasing[2]. However, if the sample collected is

[1] A function is called monotonically decreasing (also decreasing or non-increasing) if for all $x \; and \; y \; such \; that \; x \; \leq y \; one \; has \; f(x) \geq f(y) \; i.e. \; f \; reverses \; the \; order.$

[2] A function is called monotonically increasing (also increasing or non-decreasing) if for all $x \; and \; y \; such \; that \; x \; \leq y \; one \; has \; f(x) \leq f(y) \; i.e. \; f \; preserves \; the \; order.$

centered or bias towards the local maximum point, we might observe a null effect as the gradient of a maximum (or stationary) point is zero. This suggests that we may get different results depending on how one operationalize the constructs, the underlying data sets and the potential interactions among the variables (including self-moderation).

As suggested by Lau and Murnighan (1998), differences and similarities between team members' backgrounds may result in “faultlines” among team members and the formation of subgroups that might potentially disrupt team processes and activities such as exploratory learning and exploitative learning. Teams with moderate surface-level diversity (across multiple dimensions) are likely to witness stronger divides (or faultlines) and the formation of subgroups. The faultline perspective, along with the similarly/attraction perspective, suggests that team members of a subgroup tend to jell better and share ideas and opinions more often within their subgroup than with others (outside of the subgroup). This “alienation” might lead to the dismay of other members of the same team which, in turn, lead to an increase of relational and/or task conflicts between different subgroups. Hence, convergence will become increasingly difficult for teams with moderate surface-level diversity, and it not only threatens the team’s alignment and cohesiveness but also impacts team exploratory and exploitative learning behaviors (or team ambidexterity).

Teams with low surface-level diversity (across multiple dimensions) should foster team learning behaviors. For example, having other team members, whom they perceived are similar to themselves, helps create a sense of alignment and cohesion and, in turn, makes them feel more comfortable to openly exchange

information and experiment with novel approaches, while concurrently leveraging or building on their existing knowledge. Team with high surface-level diversity will likely have access to a wider variety of resources and information as predicted by the information/decision making perspective. According to Phillips, Northcraft, and Neale (2006), the mere presence of surface-level diversity might trigger expectations that deep-level diversity (i.e., informational differences) may be present in teams, making it more likely for team members to raise and discuss unique information that may be critical to team processes and outcomes. Given that everyone on the team appears to be different, high surface-level diversity teams have a "cohort effect" similar to low surface diversity teams, but it is a "cohort effect" based on "variety" (i.e., "we all have something unique to offer") which is a condition necessary for team ambidexterity.

2.2.5 Diversity Conceptualization and Operationalization

In reviewing 40 years of research, K. Y. Williams and O'Reilly III (1998) concluded that there were no consistent main effects of demographic diversity on performance and they suggested increasing the complexity of how diversity is conceptualized to integrate more intervening variables, types of diversity, and moderators. Jackson et al. (2003, p. 806) and Jackson and Joshi (2004, p. 682) call for researchers to simultaneously examine the joint effects of several of the dimensions of heterogeneity that characterize intact teams while Van Knippenberg and colleagues also urge researchers to move beyond conceptualizations and operationalizations of diversity simply as dispersion on a single dimension of diversity (Van Knippenberg & Schippers, 2007, p. 534). The effect of work teams (including top management team) diversity on team (or organization) ambidexterity

(i.e., exploratory learning and exploitative learning) have been widely researched (March, 1991; Raisch & Birkinshaw, 2008; Tushman & O'Reilly III, 1996) but findings vary from study to study (García-Granero et al., 2017; Jansen et al., 2016; Li, 2013; Li et al., 2018)

In response, this study incorporates the suggestions above in several ways.

1. This study simultaneously examines five aspects of surface-level diversity (i.e., gender, educational level, functional experience, industry experience and team tenure) and four aspects of deep-level diversity (cognitive, rational/intuitive decision-making style, value) and review their joint effects on team ambidexterity.
2. This study follows the framework proposed by Harrison and Klein (2007, p. 1203) who suggest that diversity is best conceptualized in three ways - separation, variety, disparity - which vary in terms of their substance, pattern, and operationalization and, ultimately, their consequences. This study deviates from most other studies which typically operationalize diversity using "variety" which underpins the value-in-diversity perspective. Please refer to Table 3 for definitions, examples and foundational theories.

    a. Variety: gender diversity, educational level diversity, functional experience diversity, industry experience diversity;

    b. Separation: cognitive diversity, intuitive/rational decision-making style diversity, values diversity; and

    c. Disparity: team tenure diversity

3. This study examines the impact of diversity beyond the simple main effects and explores the non-linear effect of team diversity on team ambidexterity.

Hypothesis 1a: There is a positive relationship between team surface-level diversity and team ambidexterity.

Hypothesis 1b: There is a positive relationship between team deep-level diversity and team ambidexterity.

Hypothesis 2: There is a curvilinear U-shaped relationship between team surface-level diversity and team ambidexterity, such that both low and high surface-level diversity will exhibit high levels of team ambidexterity.

Table 3 – Meanings and Properties of Within-Unit Diversity Types

Diversity type	Meaning and Synonyms	Attribute Examples	Predicted Outcomes[α]	Foundational Theories
Separation (on attribute S)	Composition of differences in (lateral) position or opinion among unit members, primarily of value, belief, or attitude; disagreement or opposition	Opinions, beliefs, values, and attributes, especially regarding team goals and processes	Reduced cohesiveness, more interpersonal conflict, distrust, decreased task performance	Similarity attraction; social categorization; attraction, selection, and attrition (ASA)
Variety (on attribute V)	Composition of differences in kind, source, or category of relevant knowledge or experience among unit members; unique or distinctive information	Content expertise, functional background, nonredundant network ties, industry experience	Greater creativity, innovation, higher decision quality, more task conflict, increased unit flexibility	Information processing; law of requisite variety; variation, selection, and retention (VSR)

Disparity (on attribute D)	Composition of (vertical) differences in the proportion of socially valued assets or resources held among unit members; inequality or relative concentration	Pay, income, prestige, status, decision-making authority, social power	More within-unit competition, resentful deviance, reduced member input, withdrawal	Distributive (in)justice and (in)equity; status hierarchy; tournament; social stratification

[α] *Generally, but not in all diversity conceptualizations or studies.*

According to Biemann and Kearney (2010), many of the existing diversity measures are affected by the group sizes in a sample, and they urged researchers to adopt the bias-corrected formulas to investigate the effects of group diversity in organizational settings.

Table 4 – Bias-Corrected Operationalizations of Group Diversity Types

Diversity type	Index	Common formula	Bias-corrected formula
Variety	Blau's index	$\text{Blau} = 1 - \sum_{i=1}^{k} p_i^2$	$\text{Blau}_N = 1 - \sum \frac{N_i(N_i-1)}{N(N-1)}$ N_i is the absolute frequency of group members in the ith category and N is the group size
Separation	Standard deviation	$SD = \sqrt{\frac{\sum(X_i - \bar{X})^2}{N}}$	$SD_N = \sqrt{\frac{\sum(X_i-\bar{X})^2}{q}}$ where $q = \frac{(N-1)}{C_N^2}$ and $C_N = \frac{\Gamma\left(\frac{N-1}{2}\right)\sqrt{\frac{N-1}{2}}}{\Gamma\left(\frac{N}{2}\right)}$ Γ is the Gamma function and N is the group size
Disparity	Coefficient of variation	$\text{V} = \frac{SD}{\bar{X}}$	$V_N = \frac{SD_N}{\bar{X}}$

2.3 Social Capital

Social capital is a complex multidimensional concept which has been widely discussed and gained much attention from scholars over the past few decades (Borgatti & Foster, 2003; Bourdieu, 2011; Coleman, 1988; R. L. Cross & Parker, 2004; Granovetter, 1992; Kilduff & Tsai, 2003; Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). The popularity and currency of the social capital concept have been attributed to the theoretical formulations by Bourdieu (1986), Coleman (1988) and Putnam (1993). While the concept gains popularity in multidisciplinary research and the literature on social capital grew at an exponential rate in the last few decades (Kwon & Adler, 2014), there appears to be no precise and completely accepted definition and measurement. As a result, social capital means different things to different researchers and practitioners (Adam & Rončević, 2003; Adler & Kwon, 2002; Bhandari & Yasunobu, 2009; Lin, 1999; Nahapiet & Ghoshal, 1998; Portes, 1998; Schuller, Baron, & Field, 2000; Tzanakis, 2013).

2.3.1 Social Capital Theory

Bourdieu (1986, p. 248) defined the term social capital as *"[…] the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition or, in other words, to membership of a group, which provides each of its members with the backing of the collectively-owned capital, a "credential" which entitles them to credit, in the various senses of the world"*. From Bourdieu's perspective, the richness of social capital depends on the size of the network an agent can effectively mobilize and on the volume of the capital (e.g., economic or cultural) commanded by the agent. Adopting a similar view, Nahapiet and Ghoshal (1998, p. 243) defined social capital as "*the sum of the actual and*

potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit." Putnam (1995) observes that social capital is not a "unidimensional concept" and Nahapiet and Ghoshal (1998) assert that it is useful to consider social capital along three dimensions, i.e., structural, relational and cognitive.

2.3.2 Structural Social Capital

Structural social capital refers to the overall pattern of connections between network actors, i.e., it involves the network of ties and the relationships possessed by actors. The factors in this structural dimension measure include the network pattern, density, connectivity and hierarchy (Nahapiet & Ghoshal, 1998). Close social relationships and interactions enable team members to know each other better, encourage collaborative behavior, facilitate the flow and exchange of important resources, create a common understanding of key objectives hence contributing to the realization of team outcome (e.g., ambidextrous behavior).

There are many ways to conceptualize and measure structural social capital, but in this study, I view it as a function of "structural connectedness" (i.e., how connected are the team members, say who knows who well") and "structural intensity" (i.e., the extent to which the teams utilize their available ties to interact"). According to Robert Jr, Dennis, and Ahuja (2008), teams that are high in structural intensity will exhibit greater interactions among team members and interactions among individuals have been shown to be an important determinant of knowledge sharing and use in both traditional and digital teams. The authors further assert that higher structural capital increases the likelihood that more team members will contribute, share, and use information from all members. Hence, I posit that

structural social capital plays a key role in supporting team ambidexterity by benefiting both exploratory learning and exploitative learning processes. Furthermore, structural social capital will likely mediate the relationship between team diversity (surface- and deep-level) and team ambidexterity.

2.3.3 Relational Social Capital

Relational social capital concerns the nature and quality of the relationship ties actors have with their contacts (with their structural network) which have developed through a history of interactions. In the context of work teams, relational social capital is a shared resource available to all team members and serves to guide members' ongoing interaction and communication. Relational social capital could encourage team members to become more willing to share their knowledge, skills, and abilities to accomplish any given tasks or solve any business challenges collectively. Nahapiet and Ghoshal (1998) viewed relational social capital as consisting of four subdimensions: identification, trust, obligations, and norms and trust appears to be the most discussed sub-dimension of relational social capital (Zheng, 2010). Mayer, Davis, and Schoorman (1995, p. 712) defined trust as "*the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party*".

In the context of this study which focuses on the team diversity-ambidexterity relationship, I propose that team psychological safety is a more appropriate sub-dimension of relational social capital than trust. Team psychological safety is defined as a shared belief that the team is safe for interpersonal risk-taking (A. Edmondson, 1999). Also, according to the author, for

the most part, this belief tends to be tacit – taken for granted and not given direct attention either by individuals or by the team as a whole. Although both trust and team psychological safety constructs describe psychological states involving perceptions of risk or vulnerability, as well as making choices to minimize negative consequences, they are conceptually and theoretically distinct in some ways. In particular, psychological safety is centrally tied to learning behavior, while trust lowers transactions costs and reduces the need to monitor behavior. Trust often pertains primarily to a dyadic relationship while team psychological safety is proposed to characterize groups, rather than describing an individual or temperamental differences (A. C. Edmondson, Kramer, & Cook, 2004). Past studies have shown the effect of team psychological safety on team learning behavior and its moderating role in the relationship between team diversity on team performance (A. Edmondson, 1999; A. C. Edmondson & Lei, 2014; Kostopoulos & Bozionelos, 2011; Martins, Schilpzand, Kirkman, Ivanaj, & Ivanaj, 2013).

Team identification is defined as the extent to which members "are psychologically identified with a group" (C. R. Scott, 1997) or "perceive themselves to belong to the team" (Luan, Rico, Xie, & Zhang, 2016). Members of teams which exhibit high levels of team identification generally see the team's success as their success, hence they will likely be motivated to help maintain a positive team identity. They will be likely to encourage each other to accomplish tasks, promote one another's success and engage in productive behavior such as the sharing of knowledge, skills, and information to facilitate the execution of the team's priorities. Collective team identification has been shown to affect team external learning (Luan, Rico, et al., 2016).

Taken together, team members are more likely to exchange resources, share information and drive collective actions within a team when they can identify with the team and, at the same time, feel psychologically safe. Hence, relational social capital in this study comprises two principal components, i.e., psychological safety and team identification and their existing measures will be combined to form a measure of relational social capital (see Table 37).

2.3.4 Cognitive Social Capital

Cognitive social capital refers to those resources that provide shared representations, interpretations, systems of meaning and shared goals between network members (Nahapiet & Ghoshal, 1998). Tsai and Ghoshal (1998) suggest having a "common perspective" (e.g., shared vision) among team members serve as a "bonding mechanism" and helps team members more easily integrate and combine resources and provide better support to each other leading to innovative outcomes. Interestingly, Nahapiet and Ghoshal (1998) pointed out that cognitive social capital is the weakest dimension discussed in social capital (Zheng, 2010).

According to Turniansky and Hare (1998, p. 90), "*Vision is an idea of a valued outcome that represents a higher order goal and motivating force at work. Work groups with clearly defined objectives are more likely to develop new goal-appropriate methods of working because their efforts have focus and direction. Vision has four parts: clarity (readily understandable), visionary nature (describes a valued outcome that engenders commitment), attainability (practical likelihood of achieving goals) and sharedness (the vision gains acceptance."*. In other words, if the vision is clear (to the team members), goals are visionary and perceived as attainable, team members will likely feel committed to and motivated to work

towards achieving these goals. According to Katzenbach and Smith (1993), a team is "more than the sum of its parts," and the essence of a team is a common commitment - "*without it, groups perform as individuals and, with it, they become a powerful unit of collective performance*."

In this study, cognitive social capital will assess the "team shared vision" which is the extent to which team members have a common understanding of vision/goals and display a high commitment to those team goals (see Table 37).

Hypothesis 3a: The team relational capital mediates the positive relationship between team cognitive capital and team ambidexterity.

Hypothesis 3b: The team relational capital mediates the positive relationship between team structural capital and team ambidexterity.

Hypothesis 3c: There is a non-linear positive relationship between team relational capital and team ambidexterity such that when team relational capital is high (vs. low), the positive relationship is stronger.

Hypothesis 3d: The team structural capital mediates the positive relationship between team cognitive capital and team ambidexterity

Hypothesis 3e: The team structural capital mediates the positive relationship between team relational capital and team ambidexterity

Hypothesis 3f: There is a non-linear positive relationship between team structural capital and team ambidexterity such that when team structural capital is high (vs. low), the positive relationship is stronger.

2.3.5 Interrelationships among Relational, Structural and Cognitive Capital

Past research has highlighted the importance of examining the interrelationships among the three dimensions in future research (Nahapiet & Ghoshal, 1998, p. 261; Zheng, 2010). Many of the studies focus either on one or two dimensions of social capital and/or have examined their effects on team outcomes independently. In his review of extant literature, Zheng (2010, pp. 156-162) found that majority of the studies on social capital have focused on the structural dimension, some on the relational dimension and only a handful on the cognitive dimension. Zheng (2010, p. 177) suggested treating relational dimension as the outcome of the structural dimension as interactional patterns lead to relational development. However, the author also proposed a feedback loop from the relational back to the structural as it is assumed that relational qualities might shape the configuration of network structure. According to the author, more research needed to validate the "bi-directional" propositions. There are limited empirical studies which examined how the dynamic interrelationships among the three different dimensions might influence the effect of diversity on team-level outcomes. For illustrations, I have listed a few related studies conducted at the firm-level, individual-level and team-level.

1. Carey, Lawson, and Krause (2011) studied 163 UK based manufacturing companies and concluded that relational social capital fully or partially mediates the effect of the cognitive social capital on performance, and partially mediates the link between the structural social capital, operationalized as social interaction ties, and innovation performance (*single country, multiple industry sectors and firm-level analysis*).
2. Muniady, Mamun, Mohamad, Permarupan, and Zainol (2015) examined the effect of relational and cognitive social capital on structural social capital and

the effect of structural social capital on the performance of micro-enterprises owned and managed by women in Peninsular Malaysia. The authors analyzed the data collected from a sample of 417 women micro-entrepreneurs using PLS SEM approach and concluded that cognitive social capital has a significant positive effect on structural social capital while relational social capital did not show any significant effect on structural social capital. The structural social capital built from the configuration has a significant and large effect on micro-enterprise performance (*single country, multiple industry sectors, and firm-level analysis*)

3. P.-C. Chen and Hung (2014) examined how environmental collaboration across organization boundaries affects green innovation from the social capital. The study used SEM covariance-based approach (AMOS 16.0) to analyze innovation performance of 237 Taiwanese firms and results showed that structural social capital and cognitive social capital have a positive effect on relational social capital which plays a significant role in green management and, in turn, leads to greater innovation (*single country, multiple industry sectors and firm-level analysis*)
4. In a recent study to understand what and how social capital affects two types of innovations (exploratory and exploitative) at the researcher level, Yan and Guan (2018) analyzed a panel patent dataset from a large US biotechnology company between 1976 and 2013 using Negative Binomial (NB) model and robust tests (e.g., Sobel test and 2SLS model). Results indicated that individual's relational capital has a negative effect on exploratory innovation, but a positive effect on exploitative innovation. Structural capital positively affects both types of innovation. Cognitive capital has a positive impact on exploratory innovation

but not exploitative innovation. The findings further show how ego-network stability and ego-network expansion mediate the relationships between social capital and two types of innovations (*single country, single industry sector and individual level analysis*).

5. In their study on the moderating role of strategic human resource management using PLS-SEM variance-based approach, López-Fernández and Sánchez-Gardey (2010) shown that cognitive capital mediates the positive effect of human capital diversity on group innovation, and relational capital mediates the negative effect of demographic diversity on group innovation based on a sample of 53 R&D groups across multiple companies in the Spanish chemical industry (*single country, single industry sector, and team level analysis*)
6. According to Li (2013), TMT social capital (relational, cognitive and structural) can moderate the link between TMT diversity and organizational ambidexterity. The author concluded after analyzing the data collected from 113 manufacturing companies in Shenzhen China. In this study, the author the three dimensions of social capital independently and not the interrelationships among the three dimensions (*single country, multiple industry sectors and team level analysis*)

In response, this study examines team social capital as both a mediator and a moderator and the interrelationships among the three different dimensions of social capital to gain insights on how to effectively manage the effect of team diversity on team ambidexterity. I am unaware of any pan-APAC study (with work teams across spanning across fourteen different countries) which empirically examined the relationship between team diversity and team ambidexterity and the mediating and moderating roles of social capital (considering the interrelationship of the three dimensions), hence making the findings noteworthy.

Hypothesis 4a: The positive relationship between team surface-level diversity and team ambidexterity is sequentially mediated first, by team cognitive capital; and second, by team relational capital.

Hypothesis 4b: The positive relationship between team deep-level diversity and team ambidexterity is sequentially mediated first, by team cognitive capital; and second, by team relational capital.

Hypothesis 4c: The positive relationship between team surface-level diversity and team ambidexterity is sequentially mediated first, by team cognitive capital; and second, by team structural capital.

Hypothesis 4d: The positive relationship between team deep-level diversity and team ambidexterity is sequentially mediated first, by team cognitive capital; and second, by team structural capital.

2.4 Control Variables

2.4.1 Team size

In this study, I will include team size as a control variable. The larger the team, the more likely it can obtain more resources and information (both quantity and variety) to support both exploitative and exploratory learning activities. Team size has been shown to be of great importance for team processes and outcomes (Goodman, Ravlin, & Argote, 1986; Jehn & Bezrukova, 2004; Stewart, 2006). Prior studies have also shown that team size affects team dynamics and team innovation (Curral, Forrester, Dawson, & West, 2001) and larger firms may have slack resources to pursue exploratory and exploitation activities (Alexiev, Jansen, Van den Bosch, & Volberda, 2010). The study collected data from a total of 211 work

teams. The team size ranges between 3 and 33 members; mean = 8.9 and standard deviation = 5.3. For calculation purposes, I have taken the Log_{10} (Team size).

2.4.2 Average team tenure

Team tenure reflects the length of time the team members have worked together and interacted with one another. Team tenure has found to be linked to increased performance in diverse teams (Watson, Kumar, & Michaelsen, 1993) and correlated to work attitudes and performance (Berger & Cummings, 1979). However, in this study, I expect the average team tenure to be negatively related to team ambidexterity. As the average team tenure increases, they learn more about each other and become more cohesive with stronger ties. The attraction–selection–attrition (ASA) framework (Schneider, 1987) posits that team members tend to become more homogeneous over time. On the one hand, homogenous team members might share common or overlapping frameworks, resulting in greater depth on some specific issues. On the other hand, they might become increasingly isolated from other important sources of information hence lack of depth on many other issues as predicted by social capital theory (e.g., team members with strong ties tend to have redundant connections/information and the lack structural holes lead to less access to novel ideas). This might have negative consequences regarding the team's ability to deal with an uncertain environment or any unexpected change hence explains why higher average team tenure might lead to lower team ambidexterity.

2.4.3 Average organization tenure

Average organization tenure refers to is the average length of time in months that the team members have been with the company. Like team tenure, I expect this

variable to have a relationship with team ambidexterity hence I control for it. There is a likelihood that this variable might correlate with the team tenure if many of the team members have been working in the same team as long as they have been in the company.

2.4.4 Company-Industry

This is a categorical variable to control for the two target companies, i.e., one in the IT industry and the other in the Logistics industry, hence 0 = SoftCo-InfoTech; 1 =LogCo-Logistics.

CHAPTER 3. RESEARCH METHODS

3.1 Research Settings

This study focuses on two large foreign MNCs with operations spanning multiple countries in the APAC region. Both companies wish to remain anonymous hence they will be referred to as "SoftCo" and "LogCo" in this dissertation. As discussed in Section 1.7, MNCs are ideal for this particular research as they operate in multiple countries and their employees are likely to have academic backgrounds, functional experiences, cognitive templates and biases, values and beliefs.

Self-reported questionnaires might subject to potential common method bias risks. Following the recommendations of Podsakoff, MacKenzie, Lee, and Podsakoff (2003), I have used two separate group of respondents to collect data to reduce potential biases. Team members were expected to complete a survey comprises of questions related to team diversity and team social capital while team managers were required to complete a shorter survey on team ambidexterity. As the unit of analysis is a team, we need both team managers and at least three of their subordinates to participate in the survey (Hinds & Mortensen, 2005).

In the following section, I will provide a brief overview of each company and the sampling approach.

3.1.1 SoftCo: A leading software technology company

SoftCo is one of the largest software technologies with operating subsidiaries across the globe including the APAC region. Headquartered in the US, SoftCo is known to its customers and industry peers as one of the most

innovative technology companies. For this study, I have obtained the approval from SoftCo's APAC Senior Vice President (SVP) & General Manager (GM) and Corporate Human Resources (HR) Leader to target all employees based in the APAC region. The HR department was responsible for generating the list of target team managers and team members for the study. To draw meaning inferences from the data, this study excluded teams with less than three team members from the sample. The final list provided by SoftCo's HR comprises of 311 team managers and 2708 team members across 14 countries, i.e., Australia, China, Hong Kong, India, Indonesia, Japan, Malaysia, Philippines, New Zealand, Singapore, South Korea, Taiwan, Thailand, and Vietnam.

3.1.2 LogCo: A leading logistics and supply chain company

LogCo is a global leader in logistics, offering a broad spectrum of services including express logistics, freight transportation, warehousing and distribution and supply chain solutions. As a thought and innovative leader in the logistics industry, LogCo structurally invests in trend research and solutions development to stay ahead of the competition and effectively address clients' business needs. This study was supported by LogCo's APAC Chief Executive Officer (CEO) and SVP for APAC HR. Similarly, LogCo's HR department was responsible for gathering the basic demographic information of the target team managers and team members to facilitate the survey administration. The final list provided by LogCo's HR comprises of 449 team managers and 2896 team members across seven countries, i.e., China, Hong Kong, Malaysia, Singapore, South Korea, Thailand, and

Vietnam. A few of LogCo's subsidiaries (e.g., Australia and Japan) have opted out of this study citing privacy concerns. Similar to SoftCo, we have excluded all teams with less than three team members from the sample.

3.2 Survey Instrument Design

I first drafted the English version of the survey questionnaire based on the constructs and measurement items adapted from the extant literature to preserve the content validity. The survey questionnaire has to be translated into Simplified Chinese and Japanese to cater for participants based in China and Japan respectively. The survey was first translated from English to Simplified Chinese and English to Japanese by an external agency specialized in survey design/execution and marketing communication nominated by SoftCo. Next, the Simplified Chinese and Japanese surveys are then "back-translated" (Brislin, 1970) by two SoftCo's native and effective bilingual employees (i.e., Simplified Chinese to English and Japanese to English). Based on the feedback and discussions with the two SoftCo employees, we have made minor changes to some wordings to enhance their understanding while preserving the content validity. Please refer to Appendix A for the three sets of survey questionnaires.

The survey questionnaires were administered via two different survey platforms to comply with SoftCo's internal process and confidentiality requirement. For SoftCo, the survey was administered by its Customer Advocacy Group using MaritzCX while the survey for LogCo was administered by me using Qualtrics. The questions for both companies are the same. There are slight variations in some of the demographic variables' taxonomy. E.g., SoftCo has a considerable population of "systems engineers" but not LogCo hence "system engineering" was an option

for “functional background” for SoftCo but not for LogCo. On the other hand, LogCo has a big proportion of “customer service agents” but not SoftCo so “customer service” is listed as an option for LogCo but not for SoftCo. The change in options does not present any issues as “functional experience diversity” is operationalized as “variety” using a bias-corrected Blau index (Biemann & Kearney, 2010).

3.3 Data Collection

1. SoftCo: The survey (in three different language options) was administered via the online platform MaritzCX and ran from March 12, 2018, through March 30, 2018. At the end of three weeks, we have collected 199 responses from team managers and 1128 responses from team members. This represents a response rate of 64% and 42% for team managers and team members respectively. As mentioned in the earlier section, this study required both team managers and team members to complete their respective surveys. After matching the team manager-members’ responses, we ended with 129 teams which comprise of one manager with at least three subordinates.
2. LogCo: The survey for LogCo was launched one week after SoftCo’s and was administered via a different online platform Qualtrics. Both the questionnaires are the same but we had only offered two language options given that LogCo’s Japan operations have opted out of this study. The LogCo survey was supposed to run for three weeks from March 19, 2018, to April 6, 2018. However, after discussing with LogCo’s HR SVP, we have decided to extend the survey by another week through April 13, 2018, in

light of few public holidays between March 30 and April 5 which might likely affect the response rate. The survey officially closed on April 13, 2018, and we have collected 175 responses from team managers and 710 responses from team members. This represents a response rate of 39% and 25% for team managers and team members respectively, and the final tally ended up being 82 complete teams (i.e., one manager with at least three subordinates).

3.4 Data Preparation

3.4.1 Data Screening

After data collection, the very first step is to "purify" the data so that they will eventually provide meaningful and reliable insights and this step is often known as "data screening" (Fidell & Tabachnick, 2003). The raw data collected will be subjected to completeness check, coding, and editing. Some of the most common issues related to web-based survey include "missing data" (i.e., if the respondents failed to answer one or more questions either intentionally or unintentionally), "straightlining" (i.e., if the respondents chose the same response option for each item of a scale) or "fast completion" (i.e., if the respondents completed a 15-minute questionnaire in less than 3 minutes, it is unlikely that they have actually read the questions and answers).

3.4.2 Data Correction

One of the most prevalent issues in data analysis researchers need to manage is "missing data." As suggested by Hair Jr et al. (2016, p. 25), most missing value treatment procedures including mean replacement, pairwise deletion, expectation-

maximisation (EM) and nearest neighbour, can be used for reasonable levels of missing data (less than 5% missing per indicator) with limited effect on the analysis results. I would add that the choice of the treatment procedures should take the research context and data availability into considerations as well. E.g., pairwise deletion might have an adverse impact on the sample size or mean replacement might introduce biases the study on diversity considers the dispersion or standard deviation of the data. Both data sets collected from SoftCo and LogCo contain less than 2% missing data for each variable. Little's MCAR test shows that the data were missing completely at random, hence the missing values were corrected using the SPSS EM method (IBM, 2017).

3.4.3 Test of Non-response Bias

Non-response bias might impact the generalizability of the results. According to Weiss and Heide (1993, p. 226), one approach to test for non-response bias is to compare the early with the late respondents. Early responses were defined as the first 75% of returned questionnaires while the last 25% were considered late responses and were deemed representative of the target population that did not ultimately respond to the survey. Using an independent t-test, early and late respondents can be compared on some chosen attributes. The Levene's test can be used to test for homogeneity of variances (if $p > 0.05$ hence not significant).

3.5 Research Methodology

Structural Equation Modeling (SEM) is a particularly useful multivariate analysis method for developing and testing theories, and it has become a quasi-standard in research (Joe F Hair et al., 2011; Joseph F Hair, Sarstedt, Pieper, & Ringle, 2012). Much of the SEM's success can be attributed to the method's ability

to simultaneously estimate direct, mediating, and moderating effects of multiple (latent) constructs while accounting for measurement error has enabled researchers to examine relationships that would otherwise be difficult to disentangle and study (F. Hair Jr, Sarstedt, Hopkins, & G. Kuppelwieser, 2014; Christian M. Ringle, Sarstedt, Mitchell, & Gudergan, 2018). There are two primary approaches to estimating the relationships in a structural equation model, i.e., covariance-based SEM (CB-SEM) and variance-based partial least squares (PLS-SEM) (Joseph F Hair et al., 2012). The following table outlines some of the major types of statistical methods associated with multivariate data analysis (Hair Jr et al., 2016, p. 2)

Table 5 – Organization of Multivariate Methods

Multivariate analysis	Primarily Exploratory	Primarily Confirmatory
First-generation techniques	• Cluster analysis • Exploratory factor analysis • Multi-dimensional scaling	• Analysis of variance • Logistic regression • Multiple regression • Confirmatory factor analysis
Second-generation techniques	• Partial least squares structural equation modelling (PLS-SEM)	• Covariance-based structural equation modelling (CB-SEM)

PLS-SEM is particularly appealing if the goal is predicting target constructs or identifying key "driver" constructs. PLS-SEM has gained popularity over the years due to its robustness and has been used across different disciplines including strategic management research (Joseph F Hair et al., 2012), human resources management research (Christian M. Ringle et al., 2018), marketing research (Joe F Hair, Sarstedt, Ringle, & Mena, 2012), management accounting research (Nitzl, 2016), psychological research (Willaby, Costa, Burns, MacCann, & Roberts, 2015), information systems research (J. Hair, Hollingsworth, Randolph, & Chong, 2017), operations management research (Peng & Lai, 2012) and supply chain

management research (Kaufmann & Gaeckler, 2015). PLS has also been used to address business problems across different sectors including automotive (Lobschat, Zinnbauer, Pallas, & Joachimsthaler, 2013), banking (Necmi K Avkiran, 2018), hospitality (F. Ali, Rasoolimanesh, Sarstedt, Ringle, & Ryu, 2018), healthcare (Necmi Kemal Avkiran, 2017), telecommunications (Wang, Lo, & Yang, 2004) and manufacturing and services (Oliveira, Thomas, & Espadanal, 2014).

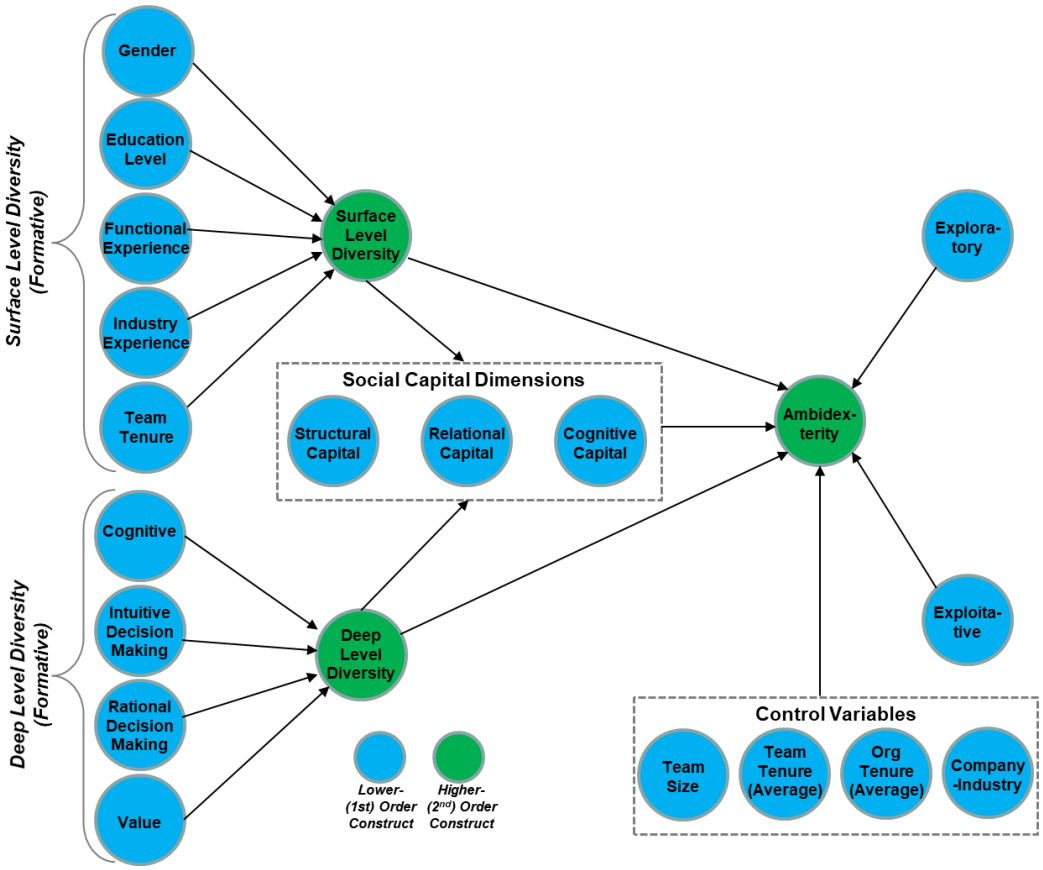

Figure 2 – The relationships of team diversity, social capital and ambidexterity (structural model)

These advantages of using PLS-SEM include its ability to (1) handle very complex models with many indicators and constructs, (2) estimate formatively specified constructs, (3) handle small sample sizes and/or non-normally distributed data, and (4) derive determinate latent variable scores, which can be applied in subsequent analyses e.g., two-step approach for the hierarchical component model

(HCM) analysis (F. Hair Jr et al., 2014; Hair Jr et al., 2016, p. 23; Hair Jr et al., 2017, pp. 38 - 62). PLS-SEM overcomes several restrictive assumptions of the CB-SEM model, particularly in research settings characterized by complex research model specification, non-normal data distribution, and limited sample data.

For this study, I will adopt the PLS-SEM approach to simultaneously examine the complex relationships among multi-dimensional constructs including cognitive diversity (first-order; reflective) value diversity (first-order; reflective), decision making style diversity (first-order; reflective); surface-level diversity (second-order; formative), deep surface diversity (second-order; formative), relational capital (first-order; reflective), structural capital (first-order; reflective), cognitive capital (first-order; reflective), exploratory learning (first-order; reflective), exploitative learning (first-order; reflective), and ambidexterity (second-order; formative). This study will contribute to the PLS-SEM literature as there are limited research and practical examples on the relationship of team diversity, social capital, and ambidexterity in the Asian and MNC context.

3.5.1 Structural Model Specification & Assessment Criteria

PLS path models comprise of two major components: (1) the structural model (also known as the inner model in the PLS-SEM; see Figure 2 for illustration), which describes the relationships between the latent variables, and (2) the measurement model models, which explains the relationships between the latent variables and their measures (i.e., the indicators). In the structural model, researchers establish links between constructs through a set of paths, which usually reflects the hypotheses. The relationships between the latent constructs can capture either direct, indirect (mediated), and interaction (moderated) effects. PLS-SEM is

also capable of investigating high- (second-) order construct (HOC) formed by lower- (first-)order construct (LOC). For example, in this study, team ambidexterity is defined as a HOC with two LOCs namely exploratory learning and exploitative learning (see section 2.1.3). The assessment of the structural model includes examining the (1) coefficient of determination (R^2); (2) absolute size, sign and significance (p-value) of path coefficients (β) and (3) f^2 effect size which is used to evaluate if the omitted construct has a substantive impact on the endogenous constructs (Joe F Hair et al., 2011, p. 145; Hair Jr et al., 2016, pp. 190 - 202).

$$f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}}$$

Where $R^2_{included}$ and $R^2_{excluded}$ are the R^2 values of the endogenous latent variable when a selected exogenous latent variable is included in or excluded from the model. Technically, the change in the R^2 values is calculated twice. General guidelines for assessing f^2 suggest the values of 0.02, 0.15 and 0.35 represent small, medium, and large effect sizes, respectively (Cohen, 1992). However, Aguinis, Beaty, Boik, and Pierce (2005); Aguinis and Pierce (2006) have shown that the average effect size in tests of moderation is only 0.009. Kenny (2015) suggested that a more realistic standard for effect sizes might be 0.005, 0.01, and 0.025 for small, medium, and large, respectively and assert that even these values are "optimistic" given the Aguinis et al. (2005)'s review.

3.5.2 Measurement Model Specification & Assessment Criteria

The PLS path model estimation delivers empirical measures of the relationships between the indicators and the constructs (measurement models), as

well as between the constructs (structural model) (Hair Jr et al., 2016). The goal of PLS-SEM is maximizing the explained variance (i.e., R^2 value) of the endogenous latent variables in the PLS path model.

1. The reflective measurement model is evaluated using three main criteria (a) *individual item reliability* ≥ 0.7 (note: rather than automatically eliminating indicators when their outer loading is below 0.7, researchers should examine the effects of item removal on the composite reliability and the content validity especially those fall between 0.4 and 0.7); (b) *internal consistency: Cronbach's alpha > 0.7 and composite reliability > 0.7 (but 0.6 – 0.7 is deemed acceptable);* (c) *convergent validity: average variance extracted ≥ 0.5*) and (d) *discriminant validity: Heterotriat-Monotrait ratio or HTMT < 0.9* (note: HTMT is said to be a better approach as recent research found that neither cross-loadings nor Fornell-Larcker criterion approach reliably detects discriminant analysis) (Hair Jr et al., 2016, pp. 111 - 122)
2. The formative measurement model is assessed based on (a) *convergent validity* (note: validate if indicators are highly correlated); (b) *collinearity between indicators: VIF ≤ 5* (note: VIF > 5 indicates collinearity problem); (c) significance (p-value < 0.05) and relevance of outer weights (Hair Jr et al., 2016, pp. 139 - 146).

3.5.3 Sample Size Recommendation in PLS-SEM

Joseph F Hair et al. (2012) reviewed the research published in 1981 and 2010 in eight leading journals in management and identified 37 studies which contain practical applications of PLS-SEM. The four most frequently cited reasons

for using PLS-SEM are, in the following order of importance: non-normal, small sample size, formative measures and focus on prediction. According to (Hair Jr et al., 2016, pp. 22 - 25), the small sample size is probably the most often abused argument with some researchers using PLS-SEM with unacceptably low sample sizes. It is important to ensure there is sufficient sample size to safeguard that the results of the PLS-SEM have adequate statistical power and are robust and the model is generalizable. Some researchers have advocated the use of the following "10 times rule" to determine the minimum sample size.

1. 10 times the largest number of formative indicators used to measure a single construct, or
2. 10 times the largest number of structural paths directed at a particular construct in the structural model.

While the 10 times rule offers a rough guideline for the minimum sample size requirements, PLS-SEM, like any statistical techniques, requires researchers to consider the sample size against the background of the model and data characteristics. In this study, instead of adopting the "10 times rule", I will calculate the minimum sample size using power analysis based on the part of the model with the largest number of predictors. As recommended by Hair Jr et al. (2016, p. 25), I will leverage the G*Power, i.e., a general stand-alone power analysis program for statistical tests commonly used in social and behavioral research to determine the appropriate sample size (Franz Faul, Erdfelder, Lang, & Buchner, 2007). Cohen (1988) and Hair Jr et al. (2016) recommended a statistical power of 0.80, a significance level of 0.05 and 0.15 of effect size (f^2). The output of the G*Power 3.1 program (F Faul, Erdfelder, Lang, & Buchner, 2017) suggested a minimum sample size of 150 (see Figure 3). C. Ringle, Da Silva, and Bido (2014) suggested

that “to have a more consistent model, it is beneficial to double or triple the value of G*Power.” For this study which focuses only on two companies, it will be difficult and costly to achieve the 2 to 3 times recommendation, especially given that the unit of analysis is a team. Nevertheless, the sample of 211 teams for this study is still higher than the sample size of 150 recommended by the G*Power 3.1 program (see Figure 3)

3.5.4 Analytical Tools and Applications

For this study, I have made use of the following tools and applications:

1. SPSS version 25 for descriptive statistics and missing values (IBM, 2017)
2. SmartPLS 3 for PLS path model estimation, measurement model and structural model assessments (Becker, Klein, & Wetzels, 2012; Hair Jr et al., 2016; Christian M Ringle, Wende, & Becker, 2015)
3. Excel for calculating rWG, ICC(1) and ICC(2) (Biemann, Cole, & Voelpel, 2012; Biemann & S. Cole, 2014) and plotting the moderating and quadratic effects (Dawson, 2014, 2018)
4. G*Power for calculating the minimum sample size needed for the PLS-SEM analysis (Franz Faul, Erdfelder, Buchner, & Lang, 2009; Franz Faul et al., 2007; F Faul et al., 2017)

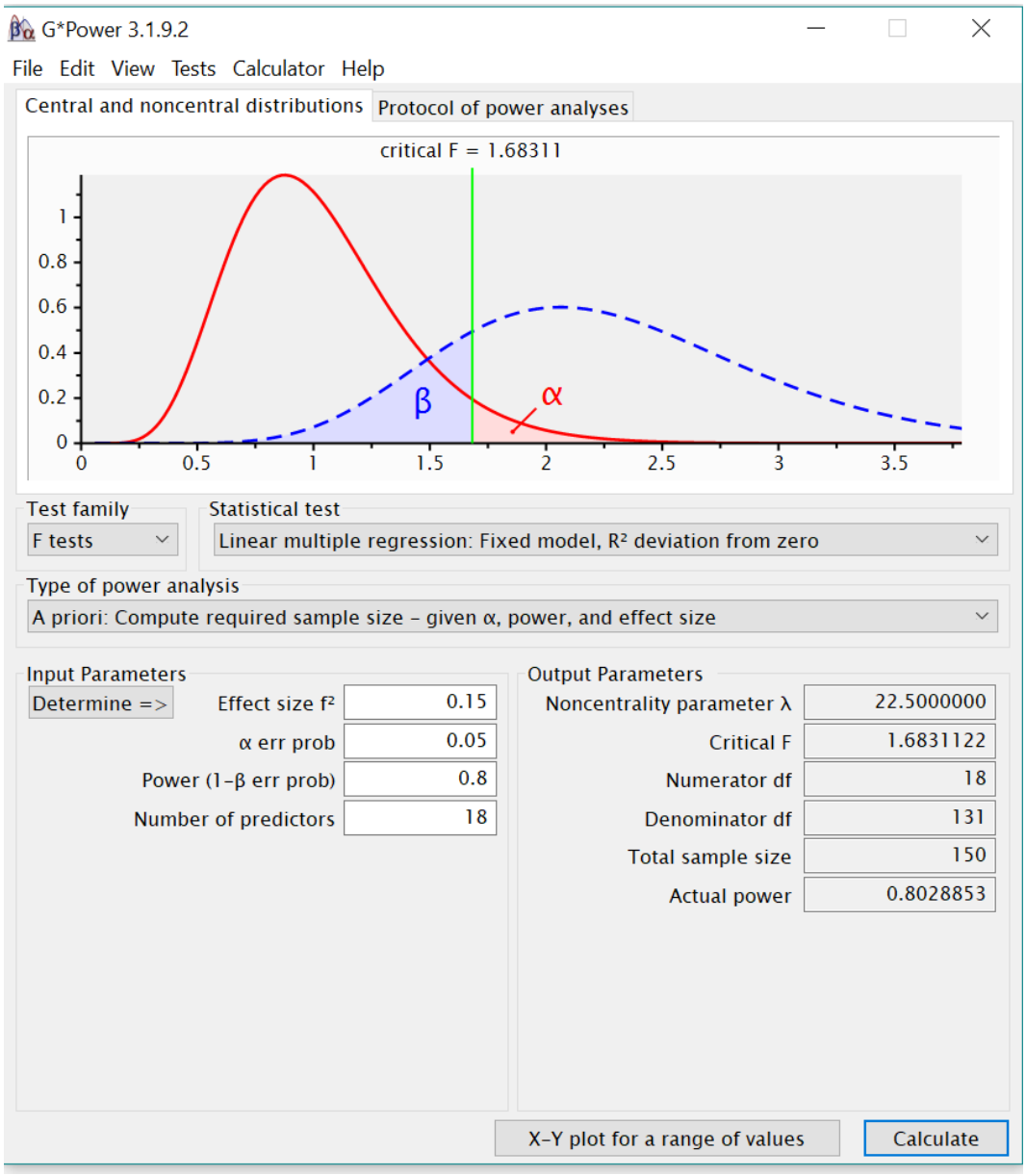

Figure 3 – Output of G*Power 3.1.9.2 on minimum sample size

CHAPTER 4. RESULTS

4.1 Introduction

The purpose of this study is to understand further the impact of team diversity on building ambidextrous teams in the MNCs context. The inconsistent findings of the effects of diversity on various outcomes as shown in the extant literature suggest that there are potential contextual factors at play. In this study, I posited that team social capital (i.e., cognitive, relational and structural) plays a critical role in fostering the relationship between team diversity and team ambidexterity. The results of this study contribute to research on teams, diversity, social capital, and ambidexterity ("multi-disciplines") by disentangling the complex relationships of team diversity and team social capital on team ambidexterity. As highlighted in Chapter 1.3, the central research question for this study was: "Does social capital foster the relationships between diversity and ambidexterity at a team level?" along with the following the following secondary research questions:

1. To what extent does the composition of a team, along surface-level or deep-level individual attributes, relate to team ambidexterity?
2. Is there sufficient evidence to suggest a curvilinear relationship (in addition to a linear relationship) between team diversity and team ambidexterity?
3. How do the three different dimensions of social capital relate to each other in explaining the effect on team ambidexterity?
4. Among the varied forms of social capital, which kind of embeddedness influence the relationship between team diversity and team ambidexterity?
5. Does social capital produce a greater direct impact or influence on team ambidexterity than team diversity?

4.2 Data Collection

4.2.1 SoftCo

Following the SMU IRB approval (IRB-17-124-A105(917)) on Sep 18, 2017, for data collection, I approached SoftCo's APAC SVP & GM to request for his support to conduct the study targeting its managers and employees across 14 APAC countries. I was granted the "in-principle approval" to proceed to discuss the survey execution process and expectations with APAC HR leader. The HR organization has expressed huge concerns with the approach of the study citing data privacy and confidentiality as two primary reasons as I was an employee of SoftCo at the time of the study. HR directed me to discuss the "data access" issues with the Legal counsel who also shared HR's concerns around data privacy and confidentiality, e.g., an employee is not allowed to collect demographic information of other employees unless otherwise approved by HR.

I was subsequently made to discuss the approach of the study, potential risks involved and the concerns raised by HR and Legal with at least ten other people within SoftCo. After more than six months of deliberation and socialization, I was finally able to convince the Customer Advocacy (CA) organization to help administer the survey on my behalf via their chosen online platform MaritzCX. CA is responsible for all kinds of surveys SoftCo runs both internally and externally hence they had the expertise, credibility and established process to execute the survey with anonymized data. The involvement of CA helps alleviate HR and Legal concerns, and I was allowed to proceed with the survey which ran from March 12 to March, 30, 2018.

There was a total of 199 team managers, and 1128 team members responded to the survey. Of which, 70 of the team managers have less than three team members responded, so they were excluded from the sample. On the other hand, the managers of 369 team members either did not participate or opted out of the survey so I have to remove the team members from the data set. The final usable dataset comprises of 129 teams, i.e., 129 team managers and 759 team members. Dawson (2003)'s selection rate was used to identify teams with low team-level response rates from further analysis. Selection rate is a formula that assesses the accuracy of incomplete group data in predicting true scores as a function of the number of responses per team (n) and team size (N). The cut-off point chosen was a selection rate ($[N-n]/Nn$) of 0.32. All of the SoftCo teams scored a value of less than 0.32, which are generally correlated with true scores at 0.95 or higher. Hence all teams were included in the analysis.

Table 6 – SoftCo Survey Target and Responses

SoftCo	Survey Sent	Responded	No Response / Opt-Out	Response Rate %	Usable Response
Team Managers	311	199	112	64%	129
Team Members	2708	1128	1580	42%	759
Total	3019	1327	1692	44%	888

4.2.2 LogCo

In December 2017, I met with LogCo's APAC CEO and shared the research idea and potential benefits of the study with him. He was very supportive of having teams with his APAC organizations participate in the survey and, subsequently, introduced me to his APAC HR leader to discuss the approach and process forward. The process of working with LogCo is much smoother (relative to SoftCo) as they

have no concerns with me collecting employee demographic information. I was asked to sign a Non-Disclosure Agreement which helps safeguard LogCo's interest.

After a few months' discussions and preparation including working with the HR teams to compile information like employee names, email addresses, team tenure, organization tenure, country and functional group, I finally released the LogCo's survey on March 19, 2018, via another online platform used by SMU, i.e., Qualtrics. It is important to highlight that the survey administration processes were similar and the survey questions were the same. While it might be easier working with LogCo from conceptualization to execution, the overall response rates were lower than SoftCo.

There was a total of 175 team managers, and 710 team members responded to the survey. Of which, 93 managers (with less than three team members responded) were dropped from the sample. Also, the managers of 338 team members either did not participate or opted out of the survey and they were discarded as well. The final usable dataset comprises of 82 teams, i.e., 82 team managers and 372 team members. Likewise, based on Dawson (2003)'s selection rate, all of the LogCo teams scored a value of less than 0.32. Hence no team was excluded from the analysis.

Table 7 – LogCo Survey Target and Responses

LogCo	Survey Sent	# Responded	# No Response / Opt Out	Response Rate %	Usable Response
Team Manager	449	175	274	39%	82
Team Member	2896	710	2186	25%	372
Total	3345	885	2460	26%	454

4.3 Measures

The measurement model assessment (please refer to section 4.5) substantiates that all the construct measures are reliable and valid (convergent validity and discriminant validity).

4.3.1 Surface-level Diversity

Surface-level diversity is a second order formative construct comprises five components namely gender diversity, educational level diversity, functional experience diversity, industry experience diversity and team tenure diversity. The first four components were operationalized as "variety" while the last was operationalized as "disparity" according to the framework proposed by Harrison and Klein (2007). To calculate the heterogeneity index, I used the bias-correct formulae outlined in Table 4.

4.3.2 Deep-level Diversity

Deep-level diversity is a second order formative construct comprises four components namely cognitive diversity, intuitive decision-making style diversity, rational decision-making style diversity and value diversity. All four elements are operationalized as "separation," and diversity scores were computed using the bias-corrected formulae outlined in Table 4. Cognitive diversity was assessed by with a four-item scale adapted from Mitchell et al. (2017) and Van der Vegt and Janssen (2003). A sample item was, "To what extent do members of your team raise issues which suggest that they have a different way of looking at the task?". Cognitive diversity items were assessed using a seven-point Likert scale ranging from 1 = to an extremely small extent to 7 = to an extremely large extent.

Intuitive decision-making style and rational decision-making style were both assessed by a four-item and a five-item scale from S. G. Scott and Bruce (1995). A sample item for intuitive decision-making style was, “When I make decisions, I tend to rely on my intuition.”, and a sample item for rational decision-making style was, “I make decisions in a logical and systematic way.”

Finally, value items (i.e., collectivistic orientation -- belief about the effects of personal pursuits on team productivity) were assessed using a three-item scale adapted from Wagner (1995). A sample item was, “A team is most efficient when its members do what they think is best rather than doing what the team wants them to do.”. All items (except cognitive diversity) were assessed using a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree.

4.3.3 Team Ambidexterity

Team ambidexterity is a second order formative construct with team exploratory learning and team exploitative learning each representing a distinct and non-substitutable component (orthogonal). Team exploratory learning and team exploitative learning were each assessed with a five-item scale from Jansen et al. (2016). The team managers were asked to evaluate their teams using a seven-point Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree), the extent of their team’s exploratory and exploitative learnings. A sample item for exploratory learning was “Team members were systematically searching for new possibilities” and, for exploitative learning, “Team members improved and refined their existing knowledge and expertise while accomplishing work.”

4.3.4 Relationship Social Capital

This measure was assessed with a twelve-item scale adapted from A. Edmondson (1999)'s psychological safety and Mael and Tetrick (1992)'s team identification. All the items were assessed using a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. As demonstrated in section 4.6, all twelve items were loaded into one factor, but three of the items were subsequently dropped from the analysis as the loadings fell below 0.6 and caused AVE to drop below 0.5 thresholds. After removing the three items (two from the original psychological safety measure and one from the original team identification measure), overall Cronbach's alpha and composite reliability were above 0.9 and AVE was above 0.6. Sample items include, "Members of this team were able to discuss problems and tough issues openly," "It is safe to take a risk on this team," "The team's successes are my successes," and "My team is an important reflection of who I am."

4.3.5 Structural Social Capital

This measure was assessed with a six-item scale adapted from Jaworski and Kohli (1993) and (Madhavaram & Hunt, 2017). All the items were assessed using a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. All the six items loaded nicely into a single factor with all loadings above 0.7, Cronbach's alpha and composite reliability were above 0.9 and the AVE was above 0.7. Sample items include, "Team members feel comfortable calling each other when the need arises," "It is easy to talk to anyone on the team you need to, regardless of their position or seniority," and "Team members frequently interact in social setting."

4.3.6 Cognitive Social Capital

This measure was assessed with a four-item scale adapted from Sinkula, Baker, and Noordewier (1997). A sample item was, "There is a commonality of purpose in my team". All the items were assessed using a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. As shown in section 4.6, one of the items' loading fell below 0.6 and was subsequently removed from the measurement model before proceeding forward with the structural model assessment.

4.4 Data Aggregation

The within-group interrater reliability (or Interrater agreement, IRA) statistic for multi-item measures $r_{WG(J)}$ (James, Demaree, & Wolf, 1984) was used to determine whether adequate congruence existed among team members' perceptions to justify aggregating relational social capital, structural social capital and cognitive social capital scores to the team level. Table 8 shows that, for cognitive social capital variable, mean interrater agreement was moderate, $r_{WG(J)}$ = 0.51–0.70. Both relational and structural social capital variables show strong agreement $r_{WG(J)}$ = 0.71–0.90 (LeBreton & Senter, 2008, p. 836).

Biemann et al. (2012) suggest that $r_{WG(J)}$ should not be used as the sole index to justify aggregating lower level data to a higher level of analysis. In fact, the authors call for researchers to examine both the interrater agreement (i.e., r_{WG}-based indices) and interrater reliability (i.e., intraclass correlation coefficients or ICCs) statistics, which emphasize the relative consistency in multiple raters' scorings of multiple targets, as well. ICC(1) demonstrates the amount of variance in a variable that is attributable to group membership and is calculated as the ratio of between-group mean square (MSB) variance to total variance (sum of MSB and within-group

mean square [MSW] variance). E.g., $ICC(1) = MSB/(MSB + MSW) = 0.14$ suggests that group membership explains fourteen percent of the variance in individual group-members' scorings. Consequently, ICC(1) is typically considered an estimate of effect size so if ICC(1) is statistically different from zero, there is evidence to justify making the group the focal unit of analysis (Bliese, 2000; G. Chen, Mathieu, & Bliese, 2005). ICC(2) assesses the reliability of the group-level means, indicating how reliably the aggregate mean scoring (across group members) distinguishes between groups. Bliese (1998, 2000) has suggested ICC(2) provides evidence of emergent properties and is calculated using $MSB - MSW/MSB$. Table 8 shows that ICC(1) and ICC(2) are above the commonly advised threshold ICC(1) > 0.10, ICC(2) > 0.50 (Bliese, 2000). In summary, the rWG(J), ICC(1) and ICC(2) are above the thresholds, hence aggregation was justified.

Table 8 – Interrater Agreement and Interrater Reliability

Variable	$r_{WG(J)}$ Mean	$r_{WG(J)}$ SD	$r_{WG(J)}$ Median	F ratio	p-value	ICC(1)	ICC(2)
Structural Social Capital	0.85	0.23	0.92	2.05	0.000	0.14	0.51
Relational Social Capital	0.90	0.18	0.95	2.61	0.000	0.20	0.62
Cognitive Social Capital	0.68	0.27	0.77	2.02	0.000	0.14	0.51

Notes: SD = standard deviation of $r_{WG(J)}$ values;
**p < 0.01; Uniform null distribution

4.5 Descriptive Statistics

The following table summarizes the team compositions of the two target companies.

Table 9 – Basic Demographic Profile of Two Participating Companies

Variables	SoftCo	LogCo

Gender		
Male	599 (79%)	159 (43%)
Female	138 (18%)	213 (57%)
Others	22 (3%)	-
Tenure		
Organization – Mean [Min : Max]	2.9 [0.1 : 13.1]	10.0 [0.1 : 36.9]
Team – Mean [Min ; Max]	1.6 [0.1 : 6.6]	9.3 [0.1 : 36.9]
Team Size		
Mean [Min : Max]	9.6 [3 : 33]	7.7 [3 : 27]
Standard Deviation	5.4	5.1

The following table shows the correlations between all latent variables.

Table 10 – Latent Variables Correlations – Part 1

	AMB	CSC	CD	COY	DLD	ED	EXPT
AMB	1.00	0.16	0.18	-0.10	0.16	-0.13	0.87
CSC	0.16	1.00	0.20	-0.01	0.35	0.03	0.09
CD	0.18	0.20	1.00	-0.10	0.77	-0.06	0.14
COY	-0.10	-0.01	-0.10	1.00	-0.01	-0.12	-0.02
DLD	0.16	0.35	0.77	-0.01	1.00	-0.02	0.14
ED	-0.13	0.03	-0.06	-0.12	-0.02	1.00	-0.06
EXPT	0.87	0.09	0.14	-0.02	0.14	-0.06	1.00
EXPR	0.92	0.16	0.17	-0.12	0.15	-0.15	0.64
FD	0.05	0.01	0.14	0.01	0.08	0.06	0.09
GD	-0.13	0.05	0.03	0.36	0.09	0.01	-0.10
IDMSD	0.08	0.29	0.47	0.13	0.80	-0.03	0.05
IND	0.07	-0.02	0.02	-0.41	0.02	0.19	0.04
OTM	-0.13	-0.14	-0.18	0.58	-0.12	-0.03	-0.08
RDMSD	-0.03	-0.28	-0.15	0.07	-0.28	-0.10	-0.06
RSC	0.23	0.82	0.26	-0.12	0.39	0.02	0.13
SSC	0.23	0.75	0.24	-0.13	0.33	0.05	0.16
SLD	-0.05	0.04	0.01	-0.14	0.04	0.66	-0.02
TS	0.19	0.07	0.01	-0.24	-0.10	-0.10	0.14
TTD	0.01	0.08	-0.15	-0.05	-0.15	0.15	-0.08
TTM	-0.17	-0.16	-0.17	0.72	-0.12	-0.13	-0.09
VD	0.12	0.27	0.36	-0.03	0.78	0.01	0.12

Table 11 – Latent Variables Correlations – Part 2

	EXPR	FD	GD	IDMSD	IND	OTM	RDMSD
AMB	0.92	0.05	-0.13	0.08	0.07	-0.13	-0.03

CSC	0.16	0.01	0.05	0.29	-0.02	-0.14	-0.28
CD	0.17	0.14	0.03	0.47	0.02	-0.18	-0.15
COY	-0.12	0.01	0.36	0.13	-0.41	0.58	0.07
DLD	0.15	0.08	0.09	0.80	0.02	-0.12	-0.28
ED	-0.15	0.06	0.01	-0.03	0.19	-0.03	-0.10
EXPT	0.64	0.09	-0.10	0.05	0.04	-0.08	-0.06
EXPR	1.00	0.01	-0.13	0.08	0.09	-0.12	-0.02
FD	0.01	1.00	0.18	0.02	0.10	-0.07	0.09
GD	-0.13	0.18	1.00	0.11	0.01	0.12	0.08
IDMSD	0.08	0.02	0.11	1.00	-0.09	-0.01	-0.02
IND	0.09	0.10	0.01	-0.09	1.00	-0.18	-0.08
OTM	-0.12	-0.07	0.12	-0.01	-0.18	1.00	0.01
RDMSD	-0.02	0.09	0.08	-0.02	-0.08	0.01	1.00
RSC	0.22	0.03	-0.03	0.27	0.03	-0.21	-0.30
SSC	0.22	0.02	-0.03	0.25	-0.01	-0.14	-0.30
SLD	-0.06	0.51	0.42	-0.03	0.61	-0.12	-0.02
TS	0.17	-0.07	-0.13	-0.17	0.04	-0.21	-0.03
TTD	0.08	-0.11	0.05	-0.09	0.01	-0.20	0.05
TTM	-0.18	-0.11	0.17	0.00	-0.30	0.87	0.04
VD	0.09	0.08	0.11	0.49	0.09	-0.09	-0.16

Table 12 – Latent Variables Correlations – Part 3

	RSC	SSC	SLD	TS	TTD	TTM	VD
AMB	0.23	0.23	-0.05	0.19	0.01	-0.17	0.12
CSC	0.82	0.75	0.04	0.07	0.08	-0.16	0.27
CD	0.26	0.24	0.01	0.01	-0.15	-0.17	0.36
COY	-0.12	-0.13	-0.14	-0.24	-0.05	0.72	-0.03
DLD	0.39	0.33	0.04	-0.10	-0.15	-0.12	0.78
ED	0.02	0.05	0.66	-0.10	0.15	-0.13	0.01
EXPT	0.13	0.16	-0.02	0.14	-0.08	-0.09	0.12
EXPR	0.22	0.22	-0.06	0.17	0.08	-0.18	0.09
FD	0.03	0.02	0.51	-0.07	-0.11	-0.11	0.08
GD	-0.03	-0.03	0.42	-0.13	0.05	0.17	0.11
IDMSD	0.27	0.25	-0.03	-0.17	-0.09	0.00	0.49
IND	0.03	-0.01	0.61	0.04	0.01	-0.30	0.09
OTM	-0.21	-0.14	-0.12	-0.21	-0.20	0.87	-0.09
RDMSD	-0.30	-0.30	-0.02	-0.03	0.05	0.04	-0.16
RSC	1.00	0.81	0.03	0.11	0.01	-0.25	0.33
SSC	0.81	1.00	0.02	0.07	-0.01	-0.20	0.21
SLD	0.03	0.02	1.00	-0.08	0.22	-0.23	0.09
TS	0.11	0.07	-0.08	1.00	0.09	-0.17	-0.10
TTD	0.01	-0.01	0.22	0.09	1.00	-0.19	-0.12

TTM	-0.25	-0.20	-0.23	-0.17	-0.19	1.00	-0.10
VD	0.33	0.21	0.09	-0.10	-0.12	-0.10	1.00

4.6 Measurement Model Assessment

4.6.1 Internal Consistency Reliability

From Table 13 below, we can see that the majority of the outer loadings of the reflective latent constructs are above 0.7, and there are six items with outer loadings between 0.6 and 0.7 which are deemed reasonable. Three of the items belonging to the Relational Social Capital latent construct, i.e., PS4, PS5, and IDEN1 fell below 0.6 and, more importantly, caused the AVE to drop below 0.5 thresholds. They will be removed from the model along with CSC3 of the Cognitive Social Capital latent construct which is also below 0.6. The model will be re-run and results will be reported in Table 14 below.

Table 13 – Measurement Model Evaluation 1

Constructs/Items	Loadings	CA	rho_A	CR	AVE
Exploratory Learning		**0.898**	**0.902**	**0.925**	**0.711**
EXPR1	0.791				
EXPR2	0.861				
EXPR3	0.869				
EXPR4	0.873				
EXPR5	0.820				
Exploitative Learning		**0.854**	**0.873**	**0.894**	**0.629**
EXPT1	0.828				
EXPT2	0.827				
EXPT3	0.805				
EXPT4	0.812				
EXPT5	0.685				
Relational Social Capital		**0.877**	**0.929**	**0.901**	**0.479**
PS1	0.772				
PS2	0.743				
PS3	0.646				
PS4	-0.178				
PS5	0.345				

PS6	0.777				
IDEN1	0.421				
IDEN2	0.674				
IDEN3	0.836				
IDEN4	0.795				
IDEN5	0.832				
IDEN6	0.880				
Structural Social Capital		**0.917**	**0.968**	**0.935**	**0.707**
SSC1	0.780				
SSC2	0.855				
SSC3	0.921				
SSC4	0.855				
SSC5	0.859				
SSC6	0.763				
Cognitive Social Capital		**0.831**	**0.842**	**0.895**	**0.687**
CSC1	0.908				
CSC2	0.548				
CSC3	0.915				
CSC4	0.887				
Cognitive Diversity		**0.726**	**0.731**	**0.828**	**0.547**
CD1	0.691				
CD2	0.742				
CD3	0.751				
CD4	0.773				
Intuitive Decision-Making Style Diversity		**0.821**	**0.827**	**0.875**	**0.586**
IDMS1	0.755				
IDMS2	0.777				
IDMS3	0.655				
IDMS4	0.794				
IDMS5	0.834				
Rational Decision-Making Style Diversity		**0.775**	**0.799**	**0.852**	**0.591**
RDMS1	0.768				
RDMS2	0.699				
RDMS3	0.813				
RDMS4	0.791				
Value Diversity		**0.732**	**0.741**	**0.850**	**0.655**
VD4	0.811				
VD5	0.887				
VD6	0.722				
Gender Diversity	1.000	1.000	1.000	1.000	1.000

Educational Level Diversity	1.000	1.000	1.000	1.000	1.000
Functional Experience Diversity	1.000	1.000	1.000	1.000	1.000
Industry Diversity	1.000	1.000	1.000	1.000	1.000
Team Tenure Diversity	1.000	1.000	1.000	1.000	1.000
Organization Average Tenure (Log)	1.000	1.000	1.000	1.000	1.000
Team Average Tenure (Log)	1.000	1.000	1.000	1.000	1.000
Team Size (Log)	1.000	1.000	1.000	1.000	1.000
Company	1.000	1.000	1.000	1.000	1.000

From Table 14, the Cronbach's Alpha (CA) of all the reflective latent constructs range from 0.726 to 0.933, and the corresponding composite reliability ranged from 0.828 to 0.957, which all exceeded the benchmark of 0.7.

4.6.2 Convergent Validity

Convergent validity is the extent to which a measure correlates positively with alternative measures of the same construct (Hair Jr et al., 2016, p. 112). After removing four items and re-running the model, the AVE for Relational Social Capital latent construct increased from 0.459 to 0.609 i.e., well above the 0.5 threshold. Also, the AVE for Cognitive Social Capital increased from 0.687 to 0.882 after removing CSC2. Overall, AVE ranged from 0.547 to 0.882, i.e., all above the recommended level of 0.5 (Hair Jr et al., 2016, p. 122), hence confirming convergent validity.

Table 14 – Measurement Model Evaluation 2

Constructs/Items	**Loadings**	**CA**	**rho_A**	**CR**	**AVE**
Exploratory Learning		**0.898**	**0.902**	**0.925**	**0.711**
EXPR1	0.791				
EXPR2	0.861				
EXPR3	0.869				
EXPR4	0.873				

EXPR5	0.820				
Exploitative Learning		**0.854**	**0.873**	**0.894**	**0.629**
EXPT1	0.828				
EXPT2	0.827				
EXPT3	0.805				
EXPT4	0.812				
EXPT5	0.685				
Relational Social Capital		**0.919**	**0.942**	**0.933**	**0.609**
PS1	0.784				
PS2	0.755				
PS3	0.660				
PS6	0.787				
IDEN2	0.663				
IDEN3	0.845				
IDEN4	0.798				
IDEN5	0.826				
IDEN6	0.877				
Structural Social Capital		**0.917**	**0.969**	**0.935**	**0.707**
SSC1	0.780				
SSC2	0.855				
SSC3	0.921				
SSC4	0.855				
SSC5	0.859				
SSC6	0.763				
Cognitive Social Capital		**0.933**	**0.940**	**0.957**	**0.882**
CSC1	0.930				
CSC3	0.951				
CSC4	0.937				
Cognitive Diversity		**0.726**	**0.731**	**0.828**	**0.547**
CD1	0.691				
CD2	0.742				
CD3	0.751				
CD4	0.773				
Intuitive Decision-Making Style Diversity		**0.821**	**0.827**	**0.875**	**0.586**
IDMS1	0.755				
IDMS2	0.777				
IDMS3	0.655				
IDMS4	0.794				
IDMS5	0.834				
Rational Decision-Making Style Diversity		**0.775**	**0.799**	**0.852**	**0.591**
RDMS1	0.768				

RDMS2	0.699				
RDMS3	0.813				
RDMS4	0.791				
Value Diversity		**0.732**	**0.741**	**0.850**	**0.655**
VD4	0.811				
VD5	0.887				
VD6	0.722				
Gender Diversity	1.000	1.000	1.000	1.000	1.000
Educational Level Diversity	1.000	1.000	1.000	1.000	1.000
Functional Experience Diversity	1.000	1.000	1.000	1.000	1.000
Industry Diversity	1.000	1.000	1.000	1.000	1.000
Team Tenure Diversity	1.000	1.000	1.000	1.000	1.000
Organization Average Tenure (Log)	1.000	1.000	1.000	1.000	1.000
Team Average Tenure (Log)	1.000	1.000	1.000	1.000	1.000
Team Size (Log)	1.000	1.000	1.000	1.000	1.000
Company	1.000	1.000	1.000	1.000	1.000

4.6.3 Discriminant Validity

Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards. Extant literature suggests that the cross-loadings are typically the first approach to assess discriminant validity of the indicators, i.e., check an indicator's outer loading on the associated construct should be greater than any of its cross-loadings (i.e., its correlation) on other constructs. Alternatively, some researchers prefer to use the Fornell-Larcker criterion which compares the square root of AVE values with latent variable correlations, i.e., the square root of each construct's AVE should be greater than its highest correlation with any other construct. As mentioned in Chapter 3.5.2, recent research found that neither cross-loadings nor Fornell-Larcker criterion approach reliably detects discriminant analysis) (Hair Jr et al., 2016, pp. 115 - 122).

To overcome the shortcomings of the two approaches above, Henseler, Ringle, and Sarstedt (2015) suggested researchers use the HTMT or Heterotriat-Monotrait criterion to assess discriminant validity in PLS-SEM instead. Based on prior research and their study results, Henseler et al. (2015) suggest an HTMT threshold of 0.9 especially if the PLS path model contains constructs that are conceptually very similar. In short, an HTMT value of 0.9 and above suggest a lack of discriminant validity. From Table 13-15, all HTMT are less than 0.9 hence confirming discriminant validity.

Table 15 – Matrix of HTMT Ratios - Part 1

HTMT	CSC	CD	COY	ED	EXPT	EXPR
CD	0.237					
COY	0.029	0.132				
ED	0.029	0.082	0.120			
EXPT	0.096	0.182	0.112	0.069		
EXPR	0.174	0.212	0.128	0.161	0.683	
FD	0.032	0.157	0.007	0.060	0.104	0.023
GD	0.051	0.180	0.363	0.011	0.100	0.139
IDMSD	0.323	0.593	0.145	0.049	0.090	0.104
IND	0.023	0.065	0.410	0.186	0.046	0.099
OTM	0.145	0.219	0.578	0.029	0.087	0.126
RDMS	0.296	0.199	0.100	0.109	0.094	0.074
RSC	0.888	0.311	0.128	0.063	0.147	0.233
SSC	0.809	0.279	0.128	0.083	0.167	0.220
TS	0.068	0.047	0.235	0.098	0.159	0.177
TTD	0.079	0.173	0.047	0.149	0.087	0.081
TTM	0.169	0.210	0.718	0.133	0.099	0.184
VD	0.321	0.486	0.039	0.061	0.139	0.114

Table 16 – Matrix of HTMT Ratios - Part 2

HTMT	FD	GD	IDMSD	IND	OT	RDMSD
CD						
COY						
ED						
EXPT						
EXPR						

FD						
GD	0.180					
IDMSD	0.035	0.122				
IND	0.097	0.007	0.131			
OTM	0.068	0.119	0.055	0.184		
RDMS	0.102	0.113	0.130	0.104	0.073	
RSC	0.050	0.038	0.305	0.091	0.209	0.347
SSC	0.051	0.079	0.282	0.060	0.145	0.354
TS	0.068	0.130	0.185	0.043	0.212	0.083
TTD	0.115	0.045	0.099	0.010	0.203	0.126
TTM	0.110	0.166	0.067	0.305	0.874	0.088
VD	0.091	0.123	0.621	0.127	0.107	0.207

Table 17 – Matrix of HTMT Ratios - Part 3

HTMT	RSC	SSC	TS	TTD	TTM
CD					
COY					
ED					
EXPT					
EXPR					
FD					
GD					
IDMSD					
IND					
OTM					
RDMS					
RSC					
SSC	0.883				
TS	0.114	0.073			
TTD	0.022	0.043	0.093		
TTM	0.256	0.210	0.169	0.194	
VD	0.396	0.267	0.116	0.137	0.118

The measurement model assessment substantiates that all the construct measures are reliable and valid. Based on these findings, I will now proceed to evaluate the structural model focusing on the hypothesized relationship between the constructs.

4.7 Structural Model Assessment

The assessment of the structural model entails examining the variance explained by R^2 in the dependent construct (i.e., team ambidexterity), the path coefficients (β) for the model, which indicates the relative strength of relationships between constructs as well as the effect size (f^2).

4.7.1 Structural Model 1 (control variables)

Table 18 – Structural Model Assessment of Model 1 (Control Variables)

Endogenous constructs		**R^2**	**Adj R^2**		
Team Ambidexterity		0.063	0.045		
Relation (Direct Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**		**f^2 effect size**
Company -> Ambidexterity	0.108	0.294	-0.095	0.306	0.006
Org Tenure (Log) -> Ambidexterity	0.151	0.257	-0.100	0.426	0.005
Team Size (Log) -> Ambidexterity	0.184	0.005**	0.054	0.307	0.033
Team Tenure (Log) -> Ambidexterity	-0.349	0.019*	-0.640	-0.056	0.021

** p < 0.05; ** p < 0.01*

Model 1 is the base model which contains only the control variables. Table 18 shows that team size has a positive effect on team ambidexterity which is consistent with my expectation suggested by the information/decision making perspective. From the information processing perspective, the larger the team, the more likely it can obtain more resources and information (both quantity and variety) to support both exploitative and exploratory learning activities; hence higher level of team ambidexterity. Average team tenure is negatively related to team ambidexterity, which is also not surprising. From a managerial perspective, this might suggest that teams with members who have worked together over a long

period might not lead to team ambidexterity. Hence it is critical to facilitate job rotations, encourage cross-pollination or refresh teams with new blood regularly.

4.7.2 *Structural Model 2 (diversity variables)*

Table 19 – Structural Model Assessment of Model 2 (Diversity Variables)

Endogenous constructs		**R^2**	**Adj R^2**		
Team Ambidexterity		0.133	0.103		
Relation (Direct Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**		**f^2 effect size**
Company -> Ambidexterity	0.097	0.325	-0.092	0.290	0.005
Deep-level -> Ambidexterity	0.163	0.018*	0.027	0.301	0.030
Org Tenure (Log) -> Ambidexterity	0.136	0.334	-0.147	0.406	0.005
Surface-level -> Ambidexterity	-0.072	0.298	-0.208	0.065	0.005
Surface-level Diversity ^2 -> Ambidexterity	0.155	0.001**	0.063	0.247	0.042
Team Size (Log) -> Ambidexterity	0.212	0.001**	0.084	0.331	0.046
Team Tenure (Log) -> Ambidexterity	-0.338	0.038*	-0.647	-0.002	0.020

** $p < 0.05$; ** $p < 0.01$*

Table 19 shows that there is a negative relationship between team surface-level diversity and team ambidexterity however the relationship is not significant (i.e., β = -0.072, $p > 0.05$, $f^2 < 0.02$). The relationship between surface-level diversity turned out to be non-linear (quadratic effect) as predicted (i.e., $\beta = 0.155$, $p < 0.01$, $f^2 > 0.02$). As discussed in section 3.5.1, for moderation variables, an effect size of $f^2 > 0.025$ is considered large (Aguinis et al., 2005). Team deep-level diversity has a positive and significant direct effect on team ambidexterity (i.e., β = 0.163, $p < 0.05$, $f^2 > 0.02$). Hence, Hypotheses 1b and 2 are both empirically

substantiated but not Hypothesis 1a. Overall, this model explained 13.3% of the team level variance in team ambidexterity, up from 6.3% in Model 1.

Contrary to many past studies (e.g., M. Ali et al., 2011; Chi et al., 2009; Dahlin et al., 2005; Li et al., 2018; Luan, Ling, et al., 2016), which suggested that a moderate level of diversity being most conducive to team outcomes or inverted U-shaped, this study provides evidence for a U-shaped relationship between surface-level diversity and team ambidexterity, such that both low and high surface-level diversity will exhibit high levels of team ambidexterity. Hence, Hypothesis 2 is empirically substantiated, and the arguments for the U-shaped relationship can be found in Section 2.2.4.

This study deviates from past studies as it considered surface-level diversity as a second-order construct which comprises of five dimensions of diversity (i.e., gender, education level, functional experience, industry experience and team tenure) and this is deemed to be a more realistic approach. In any given organization, work teams typically comprise of members with similarities and differences across multiple attributes, so studies which examine the effect of a single dimension of diversity in insolation (e.g., Güver & Motschnig, 2017, pp. 24-34; Joshi & Roh, 2009, pp. 601-604; Milliken & Martins, 1996, pp. 425-433 capture list of studies with limited diversity dimensions) on team outcomes do not reflect the reality. Hence, organizations should be somewhat more cautious in their enthusiasm for and remain skeptical about the findings from studies which examined only one single diversity dimension.

The findings of this study appear to be consistent with C. Gibson and Vermeulen (2003) who showed that the relationship between team's demographic

heterogeneity and team learning behavior follows a U-shaped, such that both homogeneous and highly heterogeneous teams would exhibit higher levels of team learning behavior than moderately heterogeneous team, when controlled for the strength of subgroups. They concluded after studying 113 teams across five pharmaceutical and medical products firms, and their measure of heterogeneity was based on five demographic variables: sex, ethnic background, functional background, team tenure, and age. C. Gibson and Vermeulen (2003) computed the total team heterogeneity by considering the extent of overlaps between team members' attributes such that the more overlap there is between a team's members, the more homogeneous the team. However, this study extends the adoption of the diversity operationalization framework proposed by Harrison and Klein (2007) and the bias-corrected formula proposed by Biemann and Kearney (2010).

Based on the U-shaped findings, one might be tempted to completely "rule out" moderately heterogeneous teams, which is impractical as surface- and deep-level diversity are realities for organizations and teams today. Instead, I urged managers to interpret the findings as "reminders" (i.e., something to bear in mind) as they build diverse work teams and institute appropriate mechanisms to encourage subgroups within teams to operate more effectively leading to team ambidexterity.

4.7.3 *Structural Model 3 (relational capital as mediator/moderator)*

Table 20 – Structural Model Assessment of Model 3 (Relational Capital as Mediator/Moderator) – Part 1

Endogenous construct		**R^2**	**Adj R^2**	
Team Ambidexterity		0.118	0.092	
Relation (Direct Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**	**f^2 effect size**

Cognitive Capital -> Relational Capital	0.493	0.000**	0.378	0.601	0.436
Company -> Ambidexterity	0.086	0.385	-0.111	0.281	0.004
Org Tenure (Log) -> Ambidexterity	0.090	0.495	-0.164	0.354	0.002
Relational Capital -> Ambidexterity	0.239	0.002**	0.084	0.393	0.053
Relational Capital ^2 -> Ambidexterity	0.119	0.026*	0.012	0.224	0.029
Structural Capital -> Relational Capital	0.436	0.000**	0.320	0.552	0.341
Team Size (Log) -> Ambidexterity	0.179	0.005**	0.054	0.303	0.033
Team Tenure (Log) -> Ambidexterity	-0.246	0.108	-0.545	0.058	0.011

** p < 0.05; ** p < 0.01*

Table 21 – Structural Model Assessment of Model 3 (Relational Capital as Mediator/Moderator) – Part 2

Endogenous construct	**R^2**	**Adj R^2**		
Team Relational Social Capital	0.756	0.754		
Relation (Specific Indirect Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**	
Cognitive Capital -> Relational Capital -> Ambidexterity	0.118	0.004**	0.043	0.206
Structural Capital -> Relational Capital -> Ambidexterity	0.104	0.006**	0.037	0.189

** p < 0.05; ** p < 0.01*

Table 22 – Structural Model Assessment of Model 3 (Relational Capital as Mediator/Moderator) – Part 3

Endogenous construct	**R^2**	**Adj R^2**		
Team Ambidexterity	0.118	0.092		
Relation (Total Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**	
Cognitive Capital -> Ambidexterity	0.118	0.004**	0.043	0.206

Cognitive Capital -> Relational Capital	0.493	0.000**	0.378	0.601
Company -> Ambidexterity	0.086	0.385	-0.111	0.281
Org Tenure (Log) -> Ambidexterity	0.090	0.495	-0.164	0.354
Relational Capital -> Ambidexterity	0.239	0.002**	0.084	0.393
Relational Capital ^2 -> Ambidexterity	0.119	0.026*	0.012	0.224
Structural Capital -> Ambidexterity	0.104	0.006**	0.037	0.189
Structural Capital -> Relational Capital	0.436	0.000**	0.320	0.552
Team Size (Log) -> Ambidexterity	0.179	0.005**	0.054	0.303
Team Tenure (Log) -> Ambidexterity	-0.246	0.108	-0.545	0.058

** $p < 0.05$; ** $p < 0.01$*

Hypothesis 3a, 3b and 3c are all empirically substantiated. Model 3 explained (R^2) 11.8% of the team level variance in team ambidexterity. The findings are consistent with Nahapiet and Ghoshal (1998)'s assertion that the three dimensions of social capital are highly interrelated. Model 3 examined the relationship between cognitive and structural on relational social capital and subsequently on team ambidexterity. Consistent with Hypothesis 3a and 3b, the empirical results indicate that both cognitive social capital (i.e., $\beta = 0.493$, $p < 0.01$, $f^2 > 0.35$) and structural social capital (i.e., $\beta = 0.436$, $p < 0.01$, $f^2 > 0.15$) have positive and significant effects on relational social capital (refer to Table 20). Furthermore, as predicted by Hypothesis 3c, the relationship between relational social capital and team ambidexterity is non-linear, in fact, when relational social capital is high (vs. low), the positive relationship gets stronger (i.e., RSC: $\beta = 0.239$, $p < 0.01$, $f^2 > 0.02$; RSC^2: $\beta = 0.119$, $p < 0.05$, $f^2 > 0.025$).

In the context of ambidexterity, teams are expected to develop or acquire new knowledge and, at the same time, refine or optimize existing knowledge. Structural social capital offers opportunities for exchanging both novel and existing information, knowledge and resources through the structural "network ties" (i.e., connectedness and intensity). As the team strengths its structural social capital, its members will likely have more open and participative team discussions. The more easily its team members can interact and share knowledge, information, and resources, the more opportunities for them to develop relational social capital (i.e., able to identify with the team and feel psychologically safe). Likewise, as the team members develop a shared understanding of its vision/goals and display a high commitment to the vision/goals, they will be motivated to build and strengthen their team relational social capital. Relational social capital is critical to building ambidextrous teams it offers the necessary environmental condition and support to allow team members to debate and reflect on complex and paradoxical issues or to deliberate on the potential and creative alternatives to problem-solving.

The three dimensions of social capital have significant effects on team ambidexterity (both directly and indirectly) suggests that importance for managers to invest in the development of team social capital which is critical for building ambidextrous teams. The creation and maintenance of social capital, especially relational and cognitive, can be costly, so managers need to carefully evaluate the return on investment accordingly (Nahapiet & Ghoshal, 1998).

4.7.4 Structural Model 4 (structural capital as mediator/moderator)

Table 23 – Structural Model Assessment of Model 4 (Structural Capital as Mediator/Moderator) – Part 1

Endogenous construct		**R^2**	**Adj R^2**		
Team Ambidexterity		0.123	0.097		
Relation (Direct Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**		**f^2 effect size**
Cognitive Capital -> Structural Capital	0.272	0.000**	0.117	0.423	0.074
Company -> Ambidexterity	0.077	0.446	-0.130	0.268	0.003
Org Tenure (Log) -> Ambidexterity	0.109	0.428	-0.155	0.386	0.003
Relational Capital -> Structural Capital	0.583	0.000**	0.427	0.730	0.341
Structural Capital -> Ambidexterity	0.259	0.001**	0.103	0.407	0.062
Structural Capital ^2 -> Ambidexterity	0.116	0.045*	-0.005	0.220	0.027
Team Size (Log) -> Ambidexterity	0.176	0.006**	0.045	0.295	0.032
Team Tenure (Log) -> Ambidexterity	-0.265	0.085	-0.565	0.039	0.013

** p < 0.05; ** p < 0.01*

Table 24 – Structural Model Assessment of Model 4 (Structural Capital as Mediator/Moderator) – Part 2

Endogenous construct		**R^2**	**Adj R^2**	
Team Structural Social Capital		0.674	0.671	
Relation (Specific Indirect Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**	
Cognitive Capital -> Structural Capital -> Ambidexterity	0.071	0.012*	0.026	0.139
Relational Capital -> Structural Capital -> Ambidexterity	0.151	0.004**	0.059	0.264

** p < 0.05; ** p < 0.01*

Table 25 – Structural Model Assessment of Model 4 (Structural Capital as Mediator/Moderator) – Part 3

Endogenous construct	**R^2**	**Adj R^2**		
Team Ambidexterity		0.123	0.097	
Relation (Total Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**	
Cognitive Capital -> Ambidexterity	0.071	0.012*	0.026	0.139
Cognitive Capital -> Structural Capital	0.272	0.000**	0.117	0.423
Company -> Ambidexterity	0.077	0.446	-0.130	0.268
Org Tenure (Log) -> Ambidexterity	0.109	0.428	-0.155	0.386
Relational Capital -> Ambidexterity	0.151	0.004**	0.059	0.264
Relational Capital -> Structural Capital	0.583	0.000**	0.427	0.730
Structural Capital -> Ambidexterity	0.259	0.001**	0.103	0.407
Structural Capital ^2 -> Ambidexterity	0.116	0.045*	-0.005	0.220
Team Size (Log) -> Ambidexterity	0.176	0.006**	0.045	0.295
Team Tenure (Log) -> Ambidexterity	-0.265	0.085	-0.565	0.039

** $p < 0.05$; ** $p < 0.01$*

Hypothesis 3d, 3e. 3f are all empirically substantiated. Model 4 explained (R^2) 12.3% of the team level variance in team ambidexterity. Similar to Model 3, the findings based on Model 4 are also consistent with Nahapiet and Ghoshal (1998)'s suggestion that three dimensions of social capital are highly interrelated. Model 4 examined the relationship between cognitive and relational on structural social capital and subsequently on team ambidexterity. As predicted by Hypothesis 3d and 3e, both cognitive social capital (i.e., $\beta = 0.272$, $p < 0.01$, $f^2 > 0.02$) and relational social capital (i.e., $\beta = 0.583$, $p < 0.01$, $f^2 > 0.15$) have positive and significant effects on structural social capital (refer to Table 20). Consistent with Hypothesis 3f, the relationship between structural social capital and team

ambidexterity is also non-linear, in fact, when structural social capital is high (vs. low), the positive relationship gets stronger (i.e., SSC: $\beta = 0.259$, $p < 0.01$, $f^2 > 0.02$; SSC^2: $\beta = 0.116$, $p < 0.05$, $f^2 > 0.025$).

The empirical results of Models 3 and 4 suggested that the interrelations among the three dimensions are complex and dynamic especially between relational and structural social capital. On the one hand, the strength of the structural mechanism offers opportunities for team members to build and nurture their relational social capital. On the other hand, the strength of the relational social capital which reflects the quality of the relationships among actors can help strengthen the "ties" (i.e., connectedness and intensity) among the actors within the structural network. The empirical findings point to the importance for managers to focus on the development of team social capital if they are keen to build ambidextrous teams.

4.7.5 Structural Model 5 (mediated through cognitive-relational capital)

Table 26 - Structural Model Assessment of Model 5 (Cognitive-Relational Capital as Mediator) – Part 1

Endogenous construct		**R^2**	**Adj R^2**		
Team Ambidexterity		0.170	0.133		
Relation (Direct Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**		**f^2 effect size**
Cognitive Capital -> Relational Capital	0.493	0.000**	0.383	0.604	0.436
Company -> Ambidexterity	0.087	0.370	-0.099	0.279	0.004
Deep-level -> Ambidexterity	0.080	0.268	-0.057	0.227	0.006
Deep-level -> Cognitive Capital	0.347	0.000**	0.237	0.443	0.137
Org Tenure (Log) -> Ambidexterity	0.070	0.606	-0.189	0.345	0.001

Relational Capital -> Ambidexterity	0.213	0.009**	0.057	0.379	0.036
Relational Capital ^2 -> Ambidexterity	0.108	0.036*	0.007	0.210	0.024
Structural Capital -> Relational Capital	0.436	0.000**	0.318	0.548	0.341
Surface-level -> Ambidexterity	-0.062	0.384	-0.198	0.080	0.004
Surface-level -> Cognitive Capital	0.025	0.655	-0.087	0.135	0.001
Surface-level Diversity ^2 -> Ambidexterity	0.164	0.001**	0.069	0.256	0.048
Team Size (Log) -> Ambidexterity	0.200	0.001**	0.076	0.320	0.042
Team Tenure (Log) -> Ambidexterity	-0.252	0.119	-0.573	0.065	0.011

** p < 0.05; ** p < 0.01*

Table 27 – Structural Model Assessment of Model 5 (Cognitive-Relational Capital as Mediator) – Part 2

Endogenous constructs	**R^2**	**Adj R^2**		
Team Cognitive Social Capital	0.122	0.113		
Team Relational Social Capital	0.756	0.754		
Relation (Specific Indirect Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**	
Deep-level -> Cognitive Capital -> Relational Capital -> Ambidexterity	0.036	0.030*	0.010	0.078
Surface-level -> Cognitive Capital -> Relational Capital -> Ambidexterity	0.003	0.685	-0.009	0.018
Structural Capital -> Relational Capital -> Ambidexterity	0.093	0.014*	0.027	0.176
Deep-level -> Cognitive Capital -> Relational Capital	0.171	0.000**	0.112	0.241
Surface-level -> Cognitive Capital -> Relational Capital	0.013	0.660	-0.044	0.069

** p < 0.05; ** p < 0.01*

Table 28 – Structural Model Assessment of Model 5 (Cognitive-Relational Capital as Mediator) – Part 3

Endogenous constructs	**R^2**	**Adj R^2**		
Team Ambidexterity	0.170	0.133		
Team Cognitive Social Capital	0.122	0.113		
Team Relational Social Capital	0.756	0.754		
Relation (Total Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**	
Cognitive Capital -> Ambidexterity	0.105	0.014*	0.029	0.198
Cognitive Capital -> Relational Capital	0.493	0.000**	0.383	0.604
Company -> Ambidexterity	0.087	0.370	-0.099	0.279
Deep-level -> Ambidexterity	0.117	0.084	-0.012	0.252
Deep-level -> Cognitive Capital	0.347	0.000**	0.237	0.443
Deep-level -> Relational Capital	0.171	0.000**	0.112	0.241
Org Tenure (Log) -> Ambidexterity	0.070	0.606	-0.189	0.345
Relational Capital -> Ambidexterity	0.213	0.009**	0.057	0.379
Relational Capital ^2 -> Ambidexterity	0.108	0.036*	0.007	0.210
Structural Capital -> Ambidexterity	0.093	0.014*	0.027	0.176
Structural Capital -> Relational Capital	0.436	0.000**	0.318	0.548
Surface-level -> Ambidexterity	-0.059	0.404	-0.196	0.083
Surface-level -> Cognitive Capital	0.025	0.655	-0.087	0.135
Surface-level -> Relational Capital	0.013	0.660	-0.044	0.069
Surface-level Diversity ^2 -> Ambidexterity	0.164	0.001**	0.069	0.256
Team Size (Log) -> Ambidexterity	0.200	0.001**	0.076	0.320
Team Tenure (Log) -> Ambidexterity	-0.252	0.119	-0.573	0.065

** $p < 0.05$; ** $p < 0.01$*

Hypothesis 4b is empirically supported but not Hypothesis 4a. Model 5 is essentially a combination of Models 2 and 3. Deep-level diversity attributes are not immediately observable and are noticeable only through interactions over time (see section 1.6 for definition). From information/ decision-making perspective, teams with a high level of deep-level diversity, by definition, possess a greater variety of knowledge, task-related skills, cognitive abilities, unique perspectives and complementary decision-making style and the differences will likely influence the patterns of on-going interactions. As team members interact more with each other, they will better appreciate each other's capabilities (both common and unique) and their mental models of how to work more effectively together as a team might converge, e.g., *Who is good at visualizing different ways of dissecting the problems? Who is strong in interpreting relevant data needed to generate alternatives for trade-off discussions? Or How to divide and conquer when confronted with several possibilities to tackle the opportunities or challenges?* This will invariably influence the development of team cognitive social capital, i.e., shared vision and goals. Hence, this explains the positive effect of deep-level diversity on cognitive social capital (i.e., $\beta = 0.347$, $p < 0.01$, $f^2 > 0.02$).

Like Model 3, Model 5 also found that relational social capital mediates the positive relationship between cognitive social capital and team ambidexterity. A closer examination of the specific indirect effect (i.e., $\beta = 0.036$, $p < 0.05$; see Table 27) of deep-level diversity on team ambidexterity suggests that the positive relationship is sequentially mediated first, by team cognitive social capital; and subsequently, by team relational social capital, as predicted by Hypothesis 4b.

Hypothesis 4a is not empirically supported. One possible explanation could be, from an information/decision making perspective, surface-level diversity is found to be less critical versus deep-level diversity as teams continued to interact over time and deep-level diversity will likely outweigh surface-level diversity in explaining team outcomes (e.g., Harrison et al., 1998; Harrison et al., 2002; Yeager & Nafukho, 2012). Furthermore, as discussed in the earlier section, surface- and deep-level diversity may not always be congruent, as widely believed by many researchers and managers alike (Phillips & Loyd, 2006).

Yeager and Nafukho (2012) proposed that companies should work to give diverse teams adequate time to build relationships with each other, to get to know one another's deep-level differences and to capitalize on the value-in-diversity through greater cooperation over time. In the study, I have not only disentangled the complex influences of team diversity on team ambidexterity (e.g., via multiple-mediation) but also demonstrated the importance of team social capital (e.g., non-linear J-shaped effect) in building ambidextrous teams.

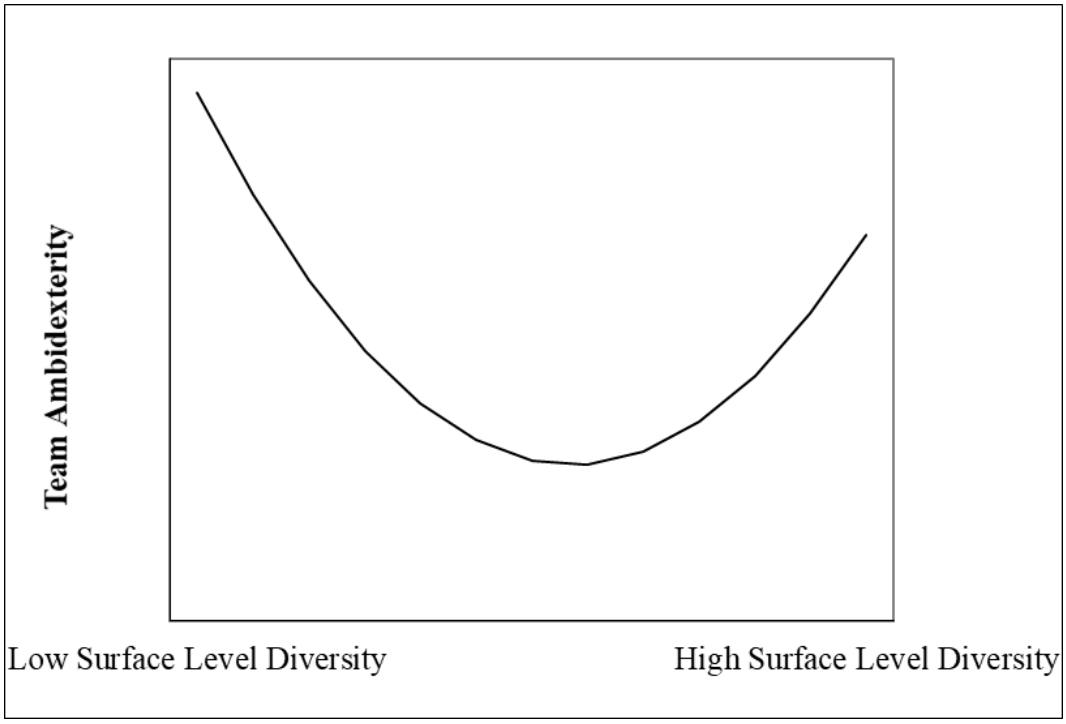

Figure 4 – The quadratic relationship between team surface-level diversity and team ambidexterity (Model 5)

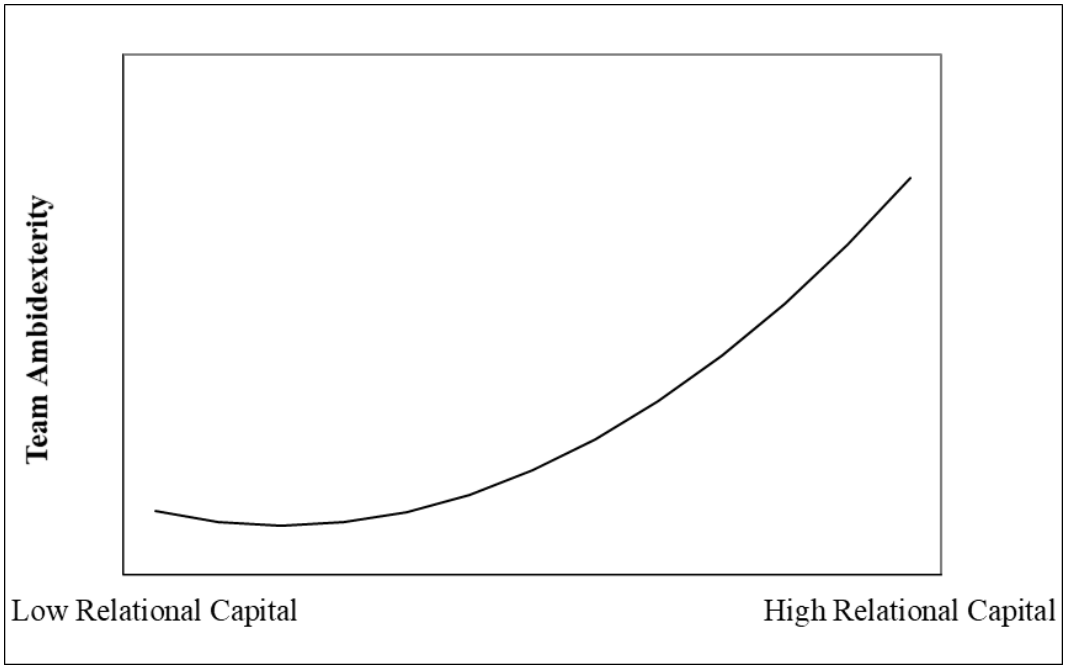

Figure 5 - The quadratic relationship between team relational social capital and team ambidexterity (Model 5)

4.7.6 *Structural Model 6 (mediated through cognitive-structural capital)*

Hypothesis 4d is empirically supported but not Hypothesis 4c. Similarly, Model 6 is a combination of Models 2 and 4. According to Table 30, the specific indirect effect (i.e., $\beta = 0.022$, $p < 0.05$) of deep-level diversity on team ambidexterity suggests that the positive relationship is sequentially mediated first, by team cognitive social capital; and subsequently, by team structural social capital, as predicted by Hypothesis 4d. The explanation presented in section 4.7.5 also applies here.

Table 29 – Structural Model Assessment of Model 6 (Cognitive-Structural Capital as Mediator) – Part 1

Endogenous construct		**R^2**	**Adj R^2**		
Team Ambidexterity		0.177	0.141		
Relation (Direct Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**		**f^2 effect size**
Cognitive Capital -> Structural Capital	0.272	0.000**	0.122	0.419	0.074
Company -> Ambidexterity	0.075	0.448	-0.122	0.269	0.003
Deep-level Diversity -> Ambidexterity	0.093	0.172	-0.036	0.229	0.009
Deep-level Diversity -> Cognitive Capital	0.347	0.000**	0.239	0.445	0.137
Org Tenure (Log) -> Ambidexterity	0.083	0.550	-0.182	0.361	0.002
Relational Capital -> Structural Capital	0.583	0.000**	0.433	0.725	0.341
Structural Capital -> Ambidexterity	0.229	0.003**	0.079	0.376	0.045
Structural Capital ^2 -> Ambidexterity	0.118	0.036*	0.004	0.222	0.029
Surface-level Diversity -> Ambidexterity	-0.045	0.516	-0.183	0.091	0.002
Surface-level Diversity -> Cognitive Capital	0.025	0.653	-0.086	0.136	0.001
Surface-level Diversity ^2 -> Ambidexterity	0.169	0.000**	0.078	0.263	0.052

Team Size (Log) -> Ambidexterity	0.202	0.001**	0.074	0.320	0.044
Team Tenure (Log) -> Ambidexterity	-0.260	0.107	-0.573	0.055	0.012

** p < 0.05; ** p < 0.01*

Table 30 – Structural Model Assessment of Model 6 (Cognitive-Structural Capital as Mediator) – Part 2

Endogenous constructs	**R^2**	**Adj R^2**		
Team Cognitive Social Capital	0.122	0.113		
Team Structural Social Capital	0.674	0.671		
Relation (Specific Indirect Effect)	**Path coefficient**	**p-value**	**Bias corrected 95% CI**	
Deep-level Diversity -> Cognitive Capital -> Structural Capital -> Ambidexterity	0.022	0.031*	0.007	0.048
Surface-level Diversity -> Cognitive Capital -> Structural Capital -> Ambidexterity	0.002	0.675	-0.005	0.011
Relational Capital -> Structural Capital -> Ambidexterity	0.133	0.008**	0.046	0.244
Deep-level Diversity -> Cognitive Capital -> Structural Capital	0.095	0.001**	0.044	0.158
Surface-level Diversity -> Cognitive Capital -> Structural Capital	0.007	0.665	-0.023	0.042

** p < 0.05; ** p < 0.01*

Table 31 – Structural Model Assessment of Model 6 (Cognitive-Structural Capital as Mediator) – Part 3

Endogenous constructs	**R^2**	**Adj R^2**
Team Ambidexterity	0.177	0.141
Team Cognitive Social Capital	0.122	0.113
Team Structural Social Capital	0.674	0.671

Relation (Total Effect)	Path coefficient	p-value	Bias corrected 95% CI	
Cognitive Capital -> Ambidexterity	0.062	0.018*	0.021	0.127
Cognitive Capital -> Structural Capital	0.272	0.000**	0.122	0.419
Company -> Ambidexterity	0.075	0.448	-0.122	0.269
Deep-level Diversity -> Ambidexterity	0.115	0.085	-0.015	0.246
Deep-level Diversity -> Cognitive Capital	0.347	0.000**	0.239	0.445
Deep-level Diversity -> Structural Capital	0.095	0.001**	0.044	0.158
Org Tenure (Log) -> Ambidexterity	0.083	0.550	-0.182	0.361
Relational Capital -> Ambidexterity	0.133	0.008**	0.046	0.244
Relational Capital -> Structural Capital	0.583	0.000**	0.433	0.725
Structural Capital -> Ambidexterity	0.229	0.003**	0.079	0.376
Structural Capital ^2 -> Ambidexterity	0.118	0.036*	0.004	0.222
Surface-level Diversity -> Ambidexterity	-0.043	0.530	-0.182	0.091
Surface-level Diversity -> Cognitive Capital	0.025	0.653	-0.086	0.136
Surface-level Diversity -> Structural Capital	0.007	0.665	-0.023	0.042
Surface-level Diversity ^2 -> Ambidexterity	0.169	0.000**	0.078	0.263
Team Size (Log) -> Ambidexterity	0.202	0.001**	0.074	0.320
Team Tenure (Log) -> Ambidexterity	-0.260	0.107	-0.573	0.055

** $p < 0.05$; ** $p < 0.01$*

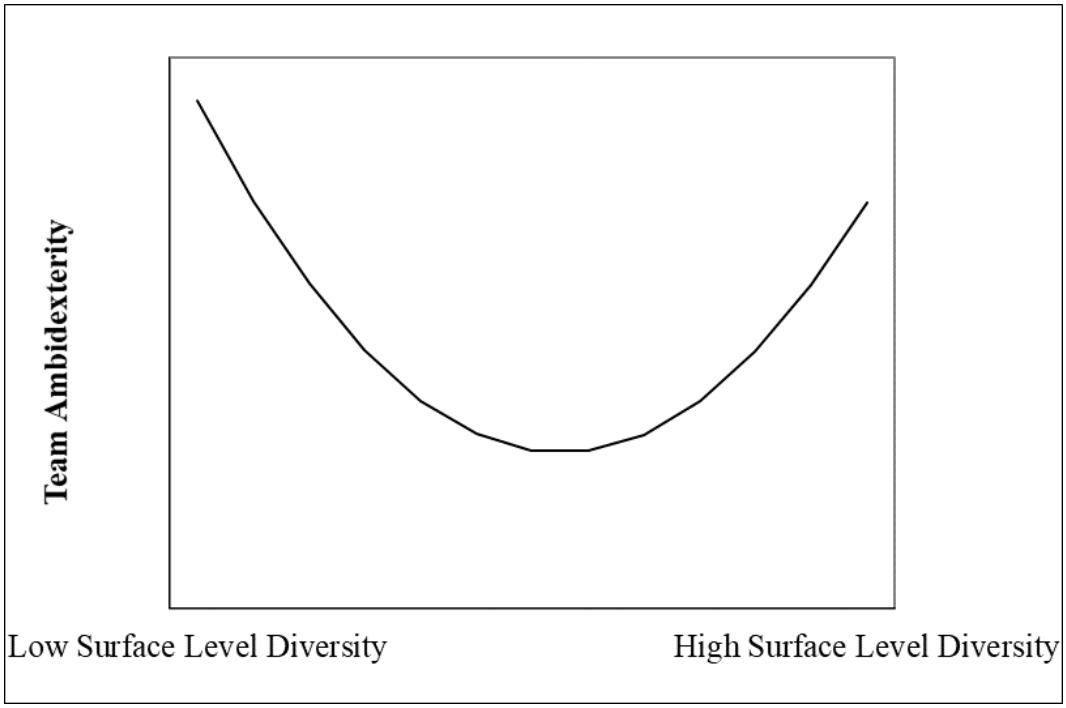

Figure 6 - The quadratic relationship between team surface-level diversity and team ambidexterity (Model 6)

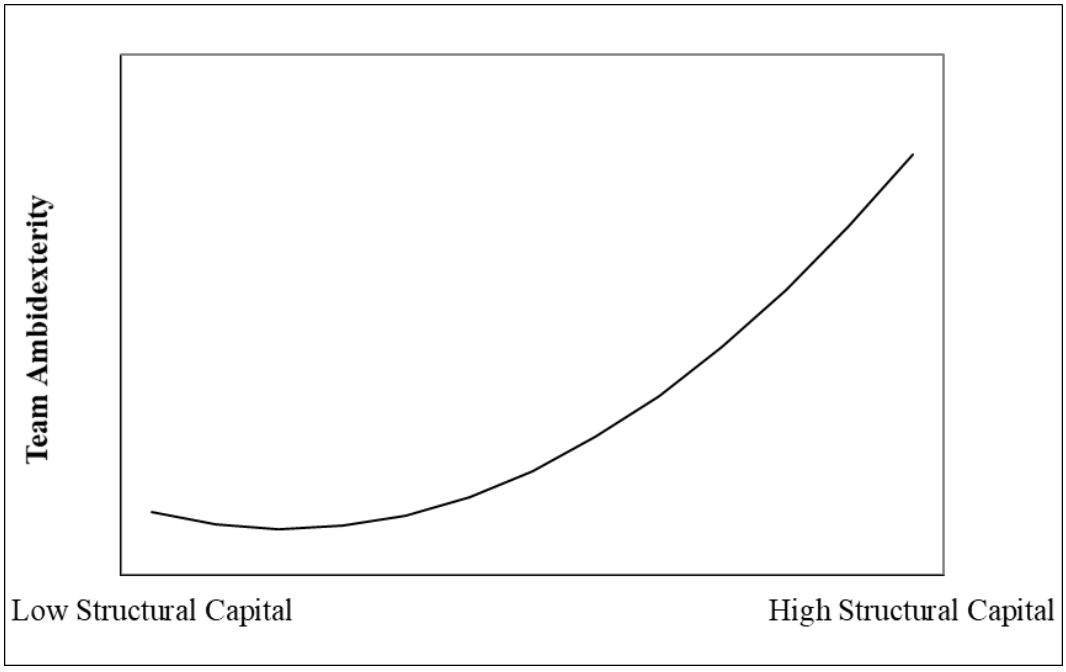

Figure 7 – The quadratic relationship between team structural social capital and team ambidexterity (Model 6)

4.8 Hypothesis Testing

Table 32 provides a summary of the hypotheses testing results based on the measurement and structural model analyses in sections 4.6 and 4.7 respectively. Ten of the thirteen hypotheses are empirically substantiated.

Table 32 – Summary of Hypothesis Testing

Hypothesis		**Model**	**Supported**	**p-value**
H_{1a}	Surface-level Diversity -> Ambidexterity	2	No	0.298
H_{1b}	Deep-level Diversity -> Ambidexterity	2	Yes	0.018*
H_2	Surface-level Diversity ^2 -> Ambidexterity	2	Yes	0.001**
H_{3a}	Cognitive Capital -> Relational Capital -> Ambidexterity	3	Yes	0.004**
H_{3b}	Structural Capital -> Relational Capital -> Ambidexterity	3	Yes	0.006**
H_{3c}	Relational Capital ^2 -> Ambidexterity	3	Yes	0.026*
H_{3d}	Cognitive Capital -> Structural Capital -> Ambidexterity	4	Yes	0.012*
H_{3e}	Relational Capital -> Structural Capital -> Ambidexterity	4	Yes	0.004**
H_{3f}	Structural Capital ^2 -> Ambidexterity	4	Yes	0.045*
H_{4a}	Surface-level Diversity -> Cognitive Capital -> Relational Capital -> Ambidexterity	5	No	0.685
H_{4b}	Deep-level Diversity -> Cognitive Capital -> Relational Capital -> Ambidexterity	5	Yes	0.030*
H_{4c}	Surface-level Diversity -> Cognitive Capital -> Structural Capital -> Ambidexterity	6	No	0.675
H_{4d}	Deep-level Diversity -> Cognitive Capital -> Structural Capital -> Ambidexterity	6	Yes	0.032*

** $p < 0.05$; ** $p < 0.01$*

4.9 Summary

The purpose of this study is to develop an understanding of how team diversity and social capital dimensions relate to team ambidexterity. PLS-SEM

was used to evaluate the relationships among the first- and second-order exogenous and endogenous constructs. This section captured the details about the two participating companies, data collection process, construct measures, data aggregation test and followed by the analysis of measurement and structural models using the PLS-SEM approach.

The measurement model required very slight modifications by removing three items belonging to Relational Social Capital and one item belonging to the Cognitive Social Capital constructs as their outer loadings fell below 0.6. The measurement model assessment substantiates that all the construct measures are reliable (i.e., Cronbach Alpha and Composite Reliability both > 0.70) and valid (i.e., Convergent validity, AVE > 0.5 and Discriminant validity, HTMT < 0.9).

The structural model assessment identified that all three dimensions of social capital are reliable predictors of team ambidexterity (either directly or indirectly) even after controlling for team size and average team tenure which were found to have positive and negative effects on team ambidexterity respectively. Furthermore, relational and structural social capital both exhibit a non-linear J-shaped relationship with team ambidexterity such that when the relational (or structural) social capital is high (vs. low), the positive relationship between relational (or structural) social capital and team ambidexterity gets stronger. The relationship between surface-level diversity and team ambidexterity was found to be non-linear U-shaped, i.e., teams with low and high surface-level diversity will exhibit high levels of team ambidexterity vs. teams with moderate surface-level diversity due to the formation of subgroups. Deep-level diversity was found to have a positive and significant effect on team ambidexterity in

Model 2 which includes only team diversity and control variables. When the social capital variables were introduced into Models 5 and 6, deep-level diversity's effect on team ambidexterity remains positive but not significant. However, an evaluation of the specific indirect effect unveiled that deep-level diversity is sequentially mediated first, by team cognitive social capital; and subsequently, by team relational social capital.

Table 33 – Summary of the Total Effects of Exogenous/Moderating Variables on Team Ambidexterity

Variables	Team Ambidexterity					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control variables						
Team Size (Log)	0.184**	0.212**	0.179**	0.176**	0.200**	0.202**
Team Tenure (Log)	-0.349*	-0.338*	-0.246	-0.265	-0.252	-0.260
Org Tenure (Log)	0.151	0.136	0.090	0.109	0.070	0.083
Company-Industry	0.108	0.097	0.086	0.077	0.087	0.075
Exogenous variables						
Surface-level		-0.072			-0.059	-0.043
Deep-level		0.163*			0.117	0.115
Relational Social Capital			0.239**	0.151**	0.213**	0.133**
Structural Social Capital			0.104**	0.259**	0.093*	0.229**
Cognitive Social Capital			0.118**	0.071*	0.105*	0.062*
Moderating variables						
Surface-level^2		0.155**			0.164**	0.169**
Relational Social Capital^2			0.119*		0.108*	
Structural Social Capital^2				0.116*		0.118*
R^2	0.063	0.133	0.118	0.123	0.170	0.177
Adjusted R^2	0.045	0.103	0.092	0.097	0.133	0.141

** $p < 0.05$; ** $p < 0.01$*

Table 34 – Comparison of the Total Effects of Team Diversity and Team Social Capital on Team Ambidexterity

Model 5	Path Coefficient
Team Diversity	
Surface-level	-0.059
Surface-level^2	0.164**
Team Social Capital	
Relational Social Capital	0.213**
Relational Social Capital^2	0.108*

Model 6	Path Coefficient
Team Diversity	
Surface-level	-0.043
Surface-level^2	0.169**
Team Social Capital	
Structural Social Capital	0.229**
Structural Social Capital^2	0.118*

The empirical findings summarized in Table 34 suggest that team social capital (particularly relational and structural) has a stronger influence on team ambidexterity than team diversity, essentially answering the 5th research question outlined in Section 1.3.

CHAPTER 5. DISCUSSIONS AND CONCLUSIONS

5.1 Interpretation of Findings

Many empirical studies on work teams have shown that team diversity can have either positive, negative or null effect on team processes and outcomes (Jackson et al., 2003; Van Knippenberg et al., 2004; Van Knippenberg & Schippers, 2007; K. Y. Williams & O'Reilly III, 1998). The inconsistent findings suggest the difficulty in achieving the right balance between the costs and benefits of "social categorization" and information/decision making" perspectives in practice. Given the inconsistent findings of the effects of diversity to date, the effect (if any) will likely be mediated and/or moderated by contextual factors. This study recognizes the critical role of team social capital in fostering the relationship between team diversity and team ambidexterity and its importance in fostering ambidextrous teams in managing the paradoxical demands of "exploiting the present" and "exploring the future."

In the next few sections, I will cover the theoretical implications, managerial implications and the limitations of this study and propose some future research considerations.

5.2 Theoretical Implications

This study aims to address some of the gaps identified in the extant literature and makes novel contributions to the team diversity, social capital and ambidexterity literature in at least three important ways: (1) empirically and simultaneously examines the effects of multi-dimensional surface- and deep-level diversity and go beyond simple main effects (Van Knippenberg & Schippers, 2007);

(2) demonstrates the concept of ambidexterity is not exclusive to TMT, contributes to an emerging body of literature on studying the non-linear effects of the antecedents of ambidexterity (especially at meso- or team-level) and helps to extend the application of the measures for team exploratory and exploitative learnings construct developed by Kostopoulos and Bozionelos (2011) to other team settings; and (3) examines the interrelationships among the three dimensions of social capital and shows that, beyond its mediating role, its influence on team ambidexterity is stronger than team diversity.

This study contributes to an emergent group of studies that simultaneously examines the effects of surface- and deep-level diversity on team outcomes (e.g., Bell, 2007; Harrison et al., 1998; Harrison et al., 2002; Mohammed & Angell, 2004; Phillips & Loyd, 2006; Phillips et al., 2006). An important question was whether surface-level diversity would become less critical and deep-level diversity more critical in predicting group outcomes as team members increased their interactions over time. The recent empirical research found that surface-level attribute differences (e.g., gender) became less critical and deep-level attributes became more critical as groups continued to interact over time (Harrison et al., 1998; Harrison et al., 2002) and supported by evidence from the socio-psychological literature which suggests differential contributions of surface- and deep-level diversity over time (Amir, 1969). The argument here is that as people interact and get to know each another more, their perception of each other (e.g., stereotyping) might change as they gain deeper-level information about their similarity to or dissimilarity from each other, hence resulting in reduced team conflict and increased team cohesiveness. This study provided evidence to suggest that deep-level diversity has an indirect effect on team ambidexterity (via social capital) and

surface- and deep-level characteristics may not always be congruent. The empirical findings suggested the relationship between surface-level diversity and team ambidexterity is non-linear (or U-shaped). This is contrary to many diversity studies, which indicated that a moderate level of diversity being most conducive to team outcomes, i.e., inverted U-shaped (e.g., M. Ali et al., 2011; Chi et al., 2009; Dahlin et al., 2005; Li et al., 2018; Luan, Ling, et al., 2016).

This study contributes to the ambidexterity literature by showing that ambidexterity does not occur only at the firm level and, more importantly, not something exclusive to only TMT, judging from the number of ambidexterity research focusing on firm, organization, business unit and TMT (Cantarello et al., 2012, pp. 30-33; Simsek, 2009, pp. 600-601). In other words, ambidexterity can be influenced by the "contextual factors" at the team level. This study departs from previous works of studying a monotonic, linear relationship between team diversity and ambidexterity and examined the curvilinear relationships between surface-level diversity (i.e., U-shaped) and social capital (relational and structural dimensions; J-shaped) and team ambidexterity.

This study examined the interrelationships of the three dimensions of social capital (i.e., relational, structural and cognitive concurrently) and demonstrated that they are reliable predictors of team ambidexterity, both directly and indirectly. Furthermore, based on a sample of 211 work teams from two multi-national companies spanning fourteen countries, I have showed that social capital not only act as an essential mediator between team diversity and team ambidexterity but also inferred that social capital has a stronger influence on team ambidexterity than team diversity by assessing their total effects using the PLS-SEM approach. As social

capital, is deemed to increase rather than decrease with ongoing "usage" (Nahapiet & Ghoshal, 1998), the findings of this study point to the imperative need for organizations and managers alike to pay equal, if not more, attention on building and nurturing team social capital.

5.3 Managerial Implications

While both surface- and deep-level diversity are realities for organization and teams but there appears to be far more management articles presenting business case or economic justification for surface-level diversity (especially gender diversity) in recent years (Garcia-Alonso, Krentz, Taplett, Tracey, & Tsusaka, 2017; Gompers & Kovvali, 2018; Hunt et al., 2015; Krentz, Wierzba, Abouzahr, Garcia-Alonso, & Taplett, 2017; Lyon & Yousif, 2017; Rock & Grant, 2016; J. C. Williams, 2014). There are probably at least two reasons for the disproportionate focus on surface-level diversity (especially gender diversity). Having spent more than two decades working in MNCs in various leadership roles, I will assert that many practitioners and managers alike tend to assume that surface-level characteristic (e.g., gender) is a good proxy for the deep-level characteristic (e.g., cognitive ability in decision making). Moreover, it would be easier to conduct studies using surface-level attributes as they can be reasonably estimated after brief exposure hence easier to collect the data. I urge managers to be careful with such studies as, in reality, the surface- and deep-level attributes may not always be congruent.

This study offered evidence which suggests that composing team based on deep-level attributes can lead to a positive effect of team diversity on team ambidexterity (either "directly" per Model 2 or "indirectly" via social capital per

Model 5 and 6). Also, it is important to highlight that many academic and managerial studies failed to simultaneously examine the joint effects of several of the dimensions of heterogeneity (Jackson & Joshi, 2004; Jackson et al., 2003; Van Knippenberg & Schippers, 2007). Hence, I strongly urge managers to be prudent in interpreting results from studies which prescribed only single or few diversity dimensions in isolation as the findings might lead them to a wrong conclusion on the actual effect of diversity on team outcomes.

The real challenge for managers is to manage the team diversity paradox effectively, i.e., maximizing the benefits (e.g., leverage the differences in knowledge, skills, and abilities) while minimizing the costs (e.g., effectively neutralize adverse effects like relational conflict due to social categorization process). As pointed out by researchers, managing the balance is difficult in practice. There is no doubt that more can be done to improve gender diversity at the workplace (Thakker, 2017) but managers should avoid overemphasizing the need to hire female talent or over-rotating the focus by instituting arbitrary gender diversity targets. It might be unproductive to determine the optimal gender balance male-female ratio as extant literature suggests that deep-level diversity becomes more important over time.

Instead, as suggested by the findings of this study, managers should make the appropriate investment in helping teams build and nurture collective social capital which has a strong non-linear (J-shaped) effect on team ambidexterity. Organizations and managers can fully capitalize on team's deep-level diversity (i.e., breadth of knowledge, skills, abilities, values and decision-making style) by offering a work environment which fosters social connectedness and engagement

intensity (*"structural social capital"*) and promotes collective team identity and psychological safety (*"relational social capital"*) while still working towards the team's shared vision and goals (*"cognitive social capital"*). It is important to recognize that team social capital is not something which can be developed within a short period. It needs to be developed over time with strong organizational support and appropriate managerial interventions, similar to organizational culture.

5.3.1 Structural Social Capital

As discussed in section 2.3.2, in this research, the structural dimension of social capital is manifested as "structural connectedness" (i.e., how connected are the team members, say who knows who well") and "structural intensity" (i.e., the extent to which the teams utilize their available ties to interact"). The following are some ideas on how organizations and managers can help build and nurture team structural social capital.

- Organizations can create and promote their social workspaces which allow people to congregate, share ideas and build rapport. Google Cafés, which is designed to encourage employee within and across teams to interact, socialize, or bounce ideas off each other, is a good example (Schawbel, 2017). Microsoft and Facebook also have very innovative facilities in Singapore designed to promote interpersonal relationships, idea sharing and collaboration among team members (Oh, 2017). For remote workers, organizations can leverage workstream collaboration solutions (e.g., Slack, Microsoft Teams, Workplace by Facebook, Cisco WebEx Teams or IBM Watson Workspace) which are designed to promote collaboration and facilitate persistent conversations among team members easily, quickly and

even simultaneously (Gotta, Dewnarain, & Preset, 2018; Gotta, Elliot, & Preset, 2017).

- Managers can help create opportunities for their team members to network with others within or outside the organization to gather novel ideas and best practice knowledge. Managers can work with their teams to map the existing organizational social network which helps identify who is who with their network, if there are concentrations in specific individuals or functional teams, how strong are these relationships or if there are weak connections with stakeholders critical to their success. Managers can guide the teams to create engagement plans with specific activities that the team members can do with or for their important stakeholders, leverage appropriate forums to engage their opinions, share best practices or engage in team learnings more broadly.

5.3.2 Relational Social Capital

In section 2.3.3, I have posited that team members are more likely to exchange resources, share information and drive collective actions within a team when they can psychologically identify with a team and feel psychologically safe. Hence, in this study, relational social capital in manifested as "collective team identification" and "psychological safety". The following are some suggestions on what organizations and managers can do to build and foster team relational social capital.

- Managers can create a "safe environment" for team members to share differing views, raise objections, actively debate alternatives, be contrarian, to experiment with ideas, or encourage "innovation in

everything" without negative ramifications. Managers should first establish the expectation that respect is non-negotiable; encourage open and honest communication, encourage team to ask questions or contribute their thoughts, encourage active listening, encourage out of the box ideas which can lead to radical innovation, encourage healthy conflict and debate ideas rather than making issues personal, and coach team to become comfortable giving and receiving feedback.

- Managers can leverage "team coaching" to share experiences, thoughts and reflections in order to stimulate one another or begin each meeting with a short discussion around recent "innovative ideas" someone on the team is exploring or "challenges" certain parts of the organization might be facing. This offers opportunities for team members to promote the open sharing of thoughts and ideas and to get to know others' perspectives better. It is important to encourage team members to share information that will make others on the team or their projects successful as this helps to strengthen team identity. Managers can underscore the value of curiosity and ensure that mistakes or failures are consistently viewed as opportunities for on-going learning and problem-solving. By being authentic about the fact that we do not always have all the answers, managers are sending a powerful message to the team members that this is an acceptable way to do business. Managers should encourage teams to recognize each other's contributions and celebrate and make every small success count by saying "congratulations" or 'thank you' until it becomes part of what the organization does automatically.

5.3.3 Cognitive Social Capital

Cognitive social capital refers to those resources that provide shared representations, interpretations, systems of meaning and shared goals between network members. As highlighted in section 2.3.4, cognitive social capital is manifested as "team shared vision" i.e., the extent to which team members have a common understanding of vision/goals and display a high commitment to those team goals. The following are thoughts on how organizations and managers can shape the cognitive social capital.

- Managers need to ensure the vision is clear. When team members share a common vision, they will likely feel committed to and motivated to work towards achieving the collective success. For employees to be truly inspired, the shared vision (i.e., "the destination") needs to be something that seems compelling. Once managers have settled on a shared vision, the next step is to construct measurable and specific goals to bring a sense of practicality to the compelling vision. Managers need to ensure each team member knows the critical role they play in driving collective team success and beyond their individual success. Sometimes it might be more effective for managers to articulate the "vision for success" and, allow team members to try to stretch and figure out some of the "how" themselves, instead of being entirely prescriptive. Finally, with the appropriate metrics or measure of success in place, the team will know how they are progressing concerning the vision.
- Managers need to make a conscious effect to learn about the unique motivations, skills, and aspirations of his/her team members and understand the type of work or assignments they are drawn to or seem to be more engaged in. This will help managers to assign projects or tasks to help team members understand of each other's "mental models" or "frames of

reference." As the team members interact through joint projects, they will better appreciate each other's capabilities and their mental models of "how to work more effectively together as a team" might converge. E.g., Who is good at visualizing different ways of dissecting the problems? Who is capable in interpreting relevant data needed to generate alternatives for trade-off discussions? How to divide and conquer when confronted with several possibilities to tackle the opportunities or challenges? This will help foster team's cognitive social capital.

5.4 Limitations and Directions for Future Research

This research has several limitations that must be taken into consideration when interpreting the findings.

1. The most significant limitation is the cross-sectional nature of the data which constrains our ability to make any causality claims. Team constructs and phenomena are generally not static as most teams go through some form of "developmental lifecycle" and team composition may evolve. For example, teams may be newly formed where all team members are new to each other with no prior engagements or teams might have some history together but team dynamic and characteristics might change as a result of attrition ("outflow") or new addition ("inflow") (Kozlowski & Bell, 2013). Future research should consider conducting longitudinal studies as we might uncover new insights at a different stage of the team developmental lifecycle.
2. It was extremely challenging and complex to secure the data needed for this study. The study targeted 6,364 managers and employees (or 760 work teams) across two large MNCs spanning fourteen countries, of which 2,212 of

managers and employees (or 374 work teams) responded. The final usable sample was 1,342 managers and employees or 211 work teams. I urge future research to replicate the studies using other MNCs' data spanning multiple industries to further generalize the results.

3. Instead of using objective measures for the constructs (e.g., team ambidexterity), this study made use of survey-based measures. Given the variety of work teams (e.g., sales, operations, marketing, finance, customer service, etc.) included in this study, it was impossible to find common measures of team ambidexterity. To minimize the common method bias risks due to self-reported questionnaires or associated with survey-based measures, I have eliminated the single-source concerns by using data collected from two different group of respondents, i.e., having team managers respond to the survey on team ambidexterity while team members answer the questions related to team social capital and diversity.
4. Team diversity can be operationalized in terms of separation, variety, and disparity (Harrison & Klein, 2007). I have conceptualized gender, functional experience, industry experience and education level diversity as "variety", team tenure diversity as "disparity" and cognitive, decision-making style and value diversity as "separation". The operationalization approach might have influenced the results, so future research should consider other forms of operationalization, e.g., mean, minimum or maximum or other composition like the proportion of overlapping attributes. In two separate meta-analysis on surface- and deep-level diversity attributes, Bell and colleagues found that (1) team mean of organization tenure (surface-level) has a stronger relationship with team performance compared to that of Harrison and Klein (2007)'s

diversity operationalizations (Bell, Villado, Lukasik, Belau, & Briggs, 2011) and (2) team mean of collectivism composition (deep-level) has the most substantial effect on team performance especially in studies conducted in field versus lab settings (Bell, 2007).

5. This study control for only a limited set of possible variables like team size, average team tenure, and average organizational tenure and company-industry because of data availability and model complexity. The empirical findings have consistently shown that team size has a positive and significant effect on team ambidexterity across all the models evaluated. In reality, organizations have a limited resource pool and cannot possibly create and sustain large sized teams. Furthermore, based on the theory of diminishing returns, future research could more accurately capture the relationship between team size and team ambidexterity by testing the effect using functional forms such as $y = 1 - 1/x$. Future research might also wish to consider other control variables like (1) types of teams or (2) stages of team development to gain more insights. There are various ways to classify teams ranging from general topologies to more specific classification, e.g., general topologies suggest classifying teams according to (i) production, (ii) service, (iii) management, (iv) project, (v) action and performing, and (vi) advisory (Kozlowski & Bell, 2013). Teams might operate or function differently at different stage of their development lifecycle so it might be interesting to study if the effects indeed vary by team developmental stage. Future research might consider leveraging Tuckman's model of small group development with its sequential stages of forming, storming, norming, performing and adjourning (Bonebright, 2010; Tuckman, 1965; Tuckman & Jensen, 2010)

6. Several researchers have pointed out the need to ensure measurement equivalence especially in cross-national comparative studies (Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014; Mullen, 1995). In this research, I have collected data from fourteen different countries, but I did not test the assumption that the scales measured equivalent constructs across national settings (Kostopoulos & Bozionelos, 2011). Future research should conduct the needed confirmatory factor analyses across all possible pairs of the fourteen countries to provide evidence of measurement equivalence across countries.
7. Most teams today are digitally enabled, and team members do not work in a fixed space and time but instead work at various points on the space-time continuum. Apart from face-to-face communication, they can leverage a host of collaboration technologies like audio conferencing, video conferencing, social chat, or other comparable platform. Future research should examine if the findings hold true for both primarily co-located ("conventional") work teams vs. digitally enabled work teams (Kozlowski & Bell, 2013).

5.5 Conclusions

This study contributes to extant research by disentangling the complex relationships of team diversity and social capital on team ambidexterity. More specifically, it offered insights into how teams may be composed to foster the dimensions social capital (relational, structural and cognitive) that lead to team ambidexterity (i.e., ability to balance between team exploratory and exploitative learning). The interrelationships among the three social capital dimensions are particularly intriguing. This study showed that social capital (especially relational and structural dimensions) exhibited a non-linear J-shaped effect on team

ambidexterity. Furthermore, the positive relationship between deep-level diversity and team ambidexterity is sequentially mediated first, by team cognitive capital; and second, by team relational social capital (or structural social capital). The formation of diverse teams will not automatically lead to team ambidexterity. Unlike many other forms of capital, social capital increases rather than decreases with use. So, it is important for organizations to pay equal, if not more, attention on building and nurturing team social capital. These conclusions were drawn from the study of 1,342 managers and employees or 211 work teams from two MNCs and two different industries spanning fourteen countries using the PLS-SEM approach.

APPENDIX A. SURVEY INSTRUMENT

The first four questions ask participants to provide basic demographic information. The remaining questions are indicators for respective latent constructs and measured on a 7-point Likert scales (anchored by 1 = strongly disagree and 7 = strongly agree).

ENGLISH VERSION

Table 35 – Surface-Level Attributes Survey Questions (English)

Indicator	Questions
Gender	What is your gender? (categorical: “Male”, “Female”, “Do not wish to be associated with either gender” or “Do not wish to disclose”)
Educational Level	Please indicate the highest academic level that you have reached (ordinal: 1. “Elementary school graduate”, 2. “High school graduate”, 3. “Some college but no degree”, 4. “Bachelor's degree”, 5. “Master's degree”, 6. “Doctoral degree”, 7. “Professional degree (JD, MD)”, 8. “Others (Please specify):”
Functional Experience	In which of the following functional areas would you say that you have developed your career? (categorical) 1. Sales 2. Business Development 3. Channel (or Customer Service*) 4. Marketing 5. Systems Engineering (or Information Technology*) 6. Professional Services 7. Strategy & Planning (Product Management*) 8. Business Operations (or Operations*) 9. Finance 10. Human Resources 11. Legal 12. Research & Development (or Administration*) 13. Others (Please specify):

	* Options applicable to LogCo e.g. in the LogCo survey, I have replaced "Channel" with "Customer Service" and "Systems Engineering" with "Information Technology"
Industry Experience	In which of the following industry sectors would you say that you have developed your career? (categorical) 1. Mining, Quarrying, and Oil and Gas Extraction 2. Utilities 3. Manufacturing 4. Retail Trade 5. Transportation and Warehousing 6. Information & Communication Technology 7. Finance and Insurance 8. Real Estate and Rental and Leasing 9. Professional, Scientific, and Technical Services 10. Educational Service 11. Health Care and Social Assistance 12. Accommodation and Food Services 13. Public Administration 14. Others (Please specify):

Deep-Level Diversity (Independent Variable): Cognitive diversity, decision-making style diversity and value diversity, team members will be asked to respond to the following sets of questions.

Table 36 – Deep-Level Attributes Survey Questions (English)

Indicators	**All the items will be measured with 7-point Likert scales.**	**Adapted from existing literature**
Cognitive Diversity	Please indicate to your response to the following statements (1 = to an extremely small extent and 7 = to an extremely large extent) 1. To what extent do members of your team raise issues which suggest that they have a different way looking at the task? 2. To what extent do members of your team raise issues that have not been thought of by other members but are relevant to the team's work?	Mitchell et al. (2017); Van der Vegt and Janssen (2003)

	3. To what extent do members of your team differ in their knowledge and skills relevant to the tasks? 4. To what extent do members of your team differ in their beliefs about what is right and wrong?	
Decision Making Style Diversity	Please indicate to your agreement with the following statements (1 = strongly disagree and 7 = strongly agree) *Rational Decision-Making Style:* 1. I double-check my information sources to be sure I have the right facts before making decisions. 2. I make decisions in a logical and systematic way. 3. My decision making requires careful thought. 4. When making a decision, I consider various options in terms of a specific goal. *Intuitive Decision-Making Style:* 5. When making decisions, I rely upon my instincts. (reverse coded) 6. When I make decisions, I tend to rely on my intuition. (reverse coded) 7. I generally make decisions that feel right to me. (reverse coded) 8. When I make decision, it is more important for me I feel the decision is right than to have a rational reason for it. (reverse coded) 9. When I make decision, I trust my inner feelings and reactions. (reverse coded)	S. G. Scott and Bruce (1995)
Values Diversity	Please indicate to your agreement with the following statements (1 = strongly disagree and 7 = strongly agree) 1. I prefer to work with others in a team rather than working alone. 2. Given the choice, I would rather do a job where I can work alone rather	Wagner (1995)

	than doing a job where I have to work with others in a team (reverse coded) 3. Working with a team is better than working alone. 4. A team is more productive when its members do what they want to do rather than what the team wants them to do. (reverse coded) 5. A team is most efficient when its members do what they think is best rather than doing what the team wants them to do. (reverse coded) 6. A team is more productive when its members follow their own interests and concerns. (reverse coded) 7. People should be made aware that if they are going to be part of a team then they are sometimes going to have to do things they don't want to do. 8. People who belong to a team should realize that they are not always going to get what they personally want. 9. People in a team should realize that they sometimes are going to have to make sacrifices for the sake of the team as a whole. 10. People in a group should be willing to make sacrifices for the sake of the team's well-being.	

Team Social Capital (Mediating/Moderating Variables): According to Nahapiet and Ghoshal (1998), structural social capital refers to the overall pattern of connections between network actors (e.g., connectedness and intensity), relational social capital concerns the nature and quality of the relationship ties (e.g., psychological safety and identification) and cognitive social capital refers to

resources that provide shared language and shared vision/goals between network members.

Table 37 – Team Social Capital Survey Questions (English)

Indicators	**All the items will be measured with 7-point Likert scales.**	**Adapted from existing literature**
Structural Social Capital	Please indicate to your agreement with the following statements (1 = strongly disagree and 7 = strongly agree) *Structural Connectedness:* 1. Team members have ample opportunity for informal "hall talk". 2. Team members feel comfortable calling each other when the need arises. 3. Team members are often quite accessible to each other. 4. It is easy to talk with anyone on the team you need to, regardless of their position or seniority. *Structural Intensity:* 5. Team members have frequent business interactions with each other. 6. Team members frequently interact in social settings.	Jaworski and Kohli (1993); Madhavaram and Hunt (2017)
Relational Social Capital	Please indicate to your agreement with the following statements (1 = strongly disagree and 7 = strongly agree) *Team Psychological Safety:* 1. Members of this team were able to discuss problems and tough issues openly. 2. Members of this team accepted each other's differences. 3. No one on this team deliberately acted in a way that undermined our efforts.	A. Edmondson (1999); Mael and Tetrick (1992)

	4. If you make a mistake on this team, it is often held against you. (reverse coded) 5. It is safe to take a risk on this team. 6. Working with members of this team, my unique skills and talents are valued and utilized. *Team Identification:* 7. When someone criticizes this team, it feels like a personal insult. 8. I'm very interested in what others think about this team. 9. When I talk about this team, I usually say "we" rather than "they". 10. This team's successes are my successes 11. When someone praises this team, it feels like a personal compliment. 12. My team is an important reflection of who I am.	
Cognitive Social Capital	Please indicate to your agreement with the following statements (1 = strongly disagree and 7 = strongly agree) *Team Shared Vision:* 1. There is a commonality of purpose in my team. 2. There is no agreement on our team vision. (reverse coded) 3. All the team members are committed to the goals of this team. 4. Members on my team view ourselves as partners in charting the direction of the team.	Sinkula et al. (1997)

Team Ambidexterity (Dependent Variable): Both exploratory and exploitative learning measures were originally developed by Kostopoulos and Bozionelos (2011).

Table 38 – Team Ambidexterity Survey Questions (English)

Indicators	All the items will be measured with 7-point Likert scales.	Adapted from existing literature
Team Exploratory Learning	Please indicate to your agreement with the following statements (1 = strongly disagree and 7 = strongly agree) 1. Team members were systematically searching for new possibilities. 2. Team members offered new ideas and solutions to complicated problems. 3. Team members experimented with new and creative ways for accomplishing work. 4. Team members evaluated diverse options regarding the course of their work. 5. The members of our team developed many new skills while performing their tasks.	Jansen et al. (2016)
Team Exploitative Learning	Please indicate to your agreement with the following statements (1 = strongly disagree and 7 = strongly agree) 1. The members our team recombined existing knowledge for accomplishing work. 2. Team members performed routine activities while carrying out their tasks. 3. Our team implemented standardized methodologies and regular work practices. 4. Team members improved and refined their existing knowledge and expertise while accomplishing work. 5. Team members mainly used their current knowledge and skills for performing their tasks.	Jansen et al. (2016)

SIMPLIFIED CHINESE VERSION

Table 39 – Surface-Level Attributes Survey Questions (Simplified Chinese)

Indicator	Questions
Gender	您的性别是？(“男性”, “女性”, “其他”, “不希望揭露”
Educational Level	您毕业的最高院校或获得的最高学位是？ 1. 小学毕业 2. 高中毕业 3. 部分无学位院校 4. 本科学位 5. 硕士学位 6. 博士学位 7. 专业学位（法学博士、医学博士) 8. 其他（请说明）：
Functional Experience	您的事业可归类为下列哪个功能区域？ 1. 销售 2. 业务拓展 3. 渠道 (or 客户服务*) 4. 市场营销 5. 销售工程师 (or 信息技术*) 6. 专业服务 7. 战略与策划 (or 产品管理*) 8. 商业运营 (or 运营*) 9. 财务 10. 人力资源 11. 法务 12. 研发 (or 行政*) 13. 其他（请说明）： * Options applicable to LogCo e.g. in the LogCo survey, I have replaced “渠道” with “客户服务” and “销售工程师” with “信息技术”
Industry Experience	您的事业可归类为下列哪个行业？ 1. 采矿、采石及石油与天然气开采 2. 公共事业/效能 3. 制造业 4. 零售业 5. 运输和仓储 6. 信息与通信技术

	7. 金融保险 8. 房地产与租赁服务 9. 专业、科学和技术服务 10. 教育服务 11. 医疗和社会保障 12. 餐饮住宿业 13. 公共管理 14. 其他（请说明）：

Team Diversity (Independent Variable):

Table 40 – Deep-Level Attributes Survey Questions (Simplified Chinese)

Indicators	**All the items will be measured with 7-point Likert scales.**
Cognitive Diversity	请选择数字 1（代表程度极小）至 7（代表程度极大），表明您对下列陈述的回答： 1. 您的团队成员会在多大程度上提出问题以表明他们对任务存在不同看法？ 2. 您的团队成员会在多大程度上提出其他成员未想到但与团队工作相关的问题？ 3. 您的团队成员在与任务执行相关的知识与技能掌握方面存在多大差别？ 4. 您的团队成员对正确与否的判断上存在多大差别？
Decision Making Style Diversity	请选择数字 1（代表非常不赞同）至 7（代表非常赞同），表明您对下列陈述赞同或不赞同的程度： 1. 我会反复检查我的信息来源，以确保我做出的决定基于正确事实。 2. 我会以具有逻辑性或系统性的方式做出决定。 3. 我做决定时必须经过仔细考虑。 4. 我做决定时，会针对具体目标思考多种选择。 5. 我做决定时依赖本能。（反向编码） 6. 我做决定时倾向于依赖直觉。（反向编码） 7. 我通常会做出我认为正确的决定。（反向编码） 8. 我做决定时，更重要的是自己认为这个决定很正确，而不需要合理的原因。（反向编码）

	9. 我做决定时，更相信自我感觉和反应。（反向编码）
Values Diversity	请选择数字 1（代表非常不赞同）至 7（代表非常赞同），表明您对下列陈述赞同或不赞同的程度： 1. 我更愿意和团队其他成员协作，而不是独自完成工作。 2. 如果可以选择，我更愿意独自完成工作而不是和团队其他成员合作（反向编码） 3. 团队合作比单打独斗更好。 4. 如果团队成员可以做他们想做的事情而不是团队要求的事情，团队效率会更高。（反向编码） 5. 如果团队成员可以做他们认为最好的事情而不是团队要求的事情，团队效率会达到顶点。（反向编码） 6. 如果团队成员可以按照自己的兴趣和关注点做事，团队效率会更高。（反向编码） 7. 人们应该意识到，如果他们即将成为团队的一部分，那么他们有时必须去做一些他们不想做的事。 8. 团队成员应该意识到，他们不会总能得到自己想要的东西。 9. 团队成员应该意识到，他们有时必须为团队整体利益做出自我牺牲。 10. 团体成员应该自愿为团队整体利益做出自我牺牲。

Team Social Capital (Mediating/Moderating Variable):

Table 41 – Team Social Capital Survey Questions (Simplified Chinese)

Indicators	**All the items will be measured with 7-point Likert scales.**
Structural Social Capital	请选择数字 1（代表非常不赞同）至 7（代表非常赞同），表明您对下列陈述赞同或不赞同的程度： 1. 团队成员有充足的机会进行非正式的“现场谈话”。 2. 如果有需要，团队成员很乐意互相打电话。 3. 团队成员之间相处融洽。 4. 无论对方职位或级别，您都可以轻松与团队任何成员进行交流。

	5. 团队成员之间经常有业务上的沟通。 6. 团队成员之间经常进行社交互动。
Relational Social Capital	请选择数字 1（代表非常不赞同）至 7（代表非常赞同），表明您对下列陈述赞同或不赞同的程度： 1. 团队成员能够公开讨论难题和棘手问题。 2. 团队成员能够接纳彼此之间的差异。 3. 团队任何成员都不会故意破坏团队努力。 4. 如果您在团队中犯错，经常会受到追究。（反向编码） 5. 在这个团队中，冒一定风险也是安全的。 6. 与团队成员合作时，我的独特技能和才能得到有效利用，个人价值得到体现。 7. 如果有人批评团队，每位成员都感到受到象是人身攻击。 8. 我对其他人对我的团队的看法很感兴趣。 9. 当我提及团队时，我通常会说“我们”而不是“他们”。 10. 团队成就即个人成就 11. 如果有人赞扬此团队，每位成员都与有荣焉。 12. 我的团队是对自我的重要体现。
Cognitive Social Capital	请选择数字 1（代表非常不赞同）至 7（代表非常赞同），表明您对下列陈述赞同或不赞同的程度： 1. 我们的团队目标一致。 2. 我们的团队没有达成一致的团队愿景。（反向编码） 3. 所有的团队成员都向着同一个目标而努力。 4. 我的团队成员会把自己看作是制定团队方向的合作伙伴。

Team Ambidexterity (Dependent Variable):

Table 42 – Team Ambidexterity Survey Questions (Simplified Chinese)

Indicators	**All the items will be measured with 7-point Likert scales.**
Team Exploratory Learning	请选择数字 1（代表非常不赞同）至 7（代表非常赞同），表明您对下列陈述赞同或不赞同的程度：

	1. 我们的团队成员会系统地寻找新的可能性。 2. 我们的团队成员会就复杂问题提出新的想法和解决方案。 3. 我们的团队成员会尝试用新颖、具有创造性的方式完成工作。 4. 我们的团队成员会评估他们工作进程中的各种选择。 5. 我们的团队成员会在执行任务期间掌握许多新技能。
Team Exploitative Learning	请选择数字 1（代表非常不赞同）至 7（代表非常赞同），表明您对下列陈述赞同或不赞同的程度： 6. 我们的团队成员会重新整合现有知识以完成工作。 7. 我们的团队成员会在执行任务期间完成日常工作。 8. 我们的团队会应用标准化方法和常规工作实践。 9. 在完成任务时，我们的团队成员会提高及改进他们的现有知识和专业技能。 10. 我们的团队成员主要利用他们现有的知识和技能来完成任务。

JAPANESE VERSION

Table 43 – Surface-Level Attributes Survey Questions (Japanese)

Indicator	**Questions**
Gender	性別は何ですか? (“男”, “女”, “それ以外”, “開示したくない”)
Educational level	最高位の学歴または取得した最高位の学位は何ですか? 1. 小学校卒業 2. 高等学校卒業 3. 大学、学位なし 4. 学士号 5. 修士号 6. 博士号 7. 専門職学位（法務博士、医学博士） 8. その他（入力してください）：

Functional Experience	ご自身のキャリアを発展させたのは次のどの部門ですか? 1. セールス 2. 事業開発 3. チャネル 4. マーケティング 5. システムエンジニアリング 6. 専門サービス 7. 業務支援＆企画 8. ビジネス業務 9. 財務 10. 人事 11. 法務 12. 研究開発 13. その他（入力してください）:
Industry Experience	ご自身のキャリアを発展させたのは次のどの業界分野ですか? 1. 採鉱、採石、石油およびガス採取 2. 公共設備 3. 製造 4. 小売取引 5. 運輸および倉庫管理 6. 情報通信技術 7. 金融保険 8. 不動産および賃借、リース 9. 専門的、科学的、技術的サービス 10. 教育サービス 11. ヘルスケアおよび社会扶助 12. 宿泊および食品サービス 13. 公共行政 14. その他（入力してください）:

Team Diversity (Independent Variable):

Table 44 – Deep-Level Attributes Survey Questions (Japanese)

Indicators	**All the items will be measured with 7-point Likert scales.**
Cognitive Diversity	次の各項目への回答として、1（非常に低い割合）から7（非常に高い割合）までの数字を選んでお答えください。 1. 所属チームのメンバーは、業務に対して別の見方があることを、どの程度問題として提起しますか? 2. 所属チームのメンバーは、他のメンバーが考慮していなかったチームの業務に関係する問題について、どの程度提起しますか? 3. 所属チームのメンバーには、業務に関係する知識やスキルについてどの程度の差がありますか? 4. 所属チームのメンバーには、何が正しく何が誤りかの考え方についてどの程度の差がありますか?
Decision Making Style Diversity	次の各項目にどの程度同意するかを、1（まったく同意しない）から7（きわめて同意する）までの数字を選んでお答えください。 1. 私は意思決定の前に正しい事実を把握していることを確認するため、情報源を二重にチェックする。 2. 私は論理的、系統的に意思決定を行う。 3. 意思決定を行うには、慎重に考える必要がある。 4. 意思決定を行うとき、特定の目標に対してさまざまな選択肢を考慮する。 5. 意思決定を行うとき、自分の本能に頼る。（コード反転） 6. 意思決定を行うとき、自分の直感に頼る傾向がある。（コード反転） 7. 基本的に、正しいと感じた意思決定を行う。（コード反転） 8. 意思決定を行うとき、決定の合理的な理由よりも決定が正しいと感じることが重要になる。（コード反転） 9. 意思決定を行うとき、自分の内面的な感受性と反応を信じる。（コード反転）
Values Diversity	次の各項目にどの程度同意するかを、1（まったく同意しない）から7（きわめて同意する）までの数字を選んでお答えください。

	1. 一人で仕事を行うよりも、チームの他者と共同で行いたいと考える。 2. 選ぶとすれば、チームの他者と行う必要がある仕事よりも、一人で遂行できる仕事を選ぶ。（コード反転） 3. 一人で作業するよりチームで作業する方が良い。 4. チームの要望に従ってメンバーが仕事を行うよりも、メンバー自身が望む仕事を行うほうが、チームの生産性が高まる。（コード反転） 5. チームの要望に従ってメンバーが仕事を行うよりも、メンバー自身がベストと考える仕事を行う場合に、チームの効率性が最大化される。（コード反転） 6. チームのメンバーが各自の興味や関心に従う場合に、チームはより生産的になる。（コード反転） 7. 人はチームの一員として仕事するかどうかを意識すべきであり、そうであれば場合により気が進まない仕事も行う必要がある。 8. チームに所属する人は、個人的に望む仕事に就けるとは限らないことを認識すべきだ。 9. チームに所属する人は、チーム全体のために場合によっては犠牲を払う必要があることを認識すべきだ。 10. グループに所属する人は、チームの安泰のために進んで犠牲を払うべきだ。

Team Social Capital (Mediating / Moderating Variable):

Table 45 – Team Social Capital Survey Questions (Japanese)

Indicators	**All the items will be measured with 7-point Likert scales.**
Structural Social Capital	次の各項目にどの程度同意するかを、1（まったく同意しない）から7（きわめて同意する）までの数字を選んでお答えください。 1. チームのメンバーには、気軽なおしゃべりの機会が十分にある。 2. チームのメンバーは、必要に応じて互いに気軽に声を掛け合うことができる。 3. チームのメンバーは、多くの場合互いに声をかけやすい。

	4. 地位や年齢の上下に関わらず、どのチームメンバーにも必要に応じて声をかけやすい。 5. チームのメンバーには、仕事のことで頻繁に相互交流がある。 6. チームのメンバーは、社交的な場で頻繁に交流している。
Relational Social Capital	次の各項目にどの程度同意するかを、1（まったく同意しない）から7（きわめて同意する）までの数字を選んでお答えください。 1. このチームのメンバーは、問題や難しい課題をオープンに話し合うことができた。 2. このチームのメンバーは、互いの違いを受容した。 3. このチームでは、誰かの努力を意図的に中傷する言動は誰も行っていない。 4. このチームでミスを犯すと、チームから非難されることが多い。（コード反転） 5. このチームでリスクを取っても安全だ。 6. このチームのメンバーとともに作業することで、自分の固有のスキルや才能が評価され活かされる。 7. 他者がこのチームを批判すると、私個人への侮辱として感じられる。 8. 私は他の人がこのチームについてどう考えているか非常に興味がある。 9. このチームについて語るとき、「彼らは」とは言わず「私たちは」と言う。 10. このチームの成功は私の成功だ。 11. 他者がこのチームを賞賛すると、私自身への賛辞として感じられる。 12. 私のチームは、自分自身を反映する重要な存在だ。
Cognitive Social Capital	次の各項目にどの程度同意するかを、1（まったく同意しない）から7（きわめて同意する）までの数字を選んでお答えください。 1. 私のチームでは目的が共有されている。 2. チームのビジョンについて合意がない。（コード反転） 3. チームメンバー全員が、チームの目標に尽力している。

	4. 私のチームのメンバーは、チームの方向性を計画する中で、我々自身をパートナーと見なしている。

Team Ambidexterity (Dependent Variable):

Table 46 – Team Ambidexterity Survey Questions (Japanese)

Indicators	**All the items will be measured with 7-point Likert scales.**
Team Exploratory Learning	次の各項目にどの程度同意するかを、1（まったく同意しない）から7（きわめて同意する）までの数字を選んでお答えください。 1. チームのメンバーは、新たな可能性を系統的に模索した。 2. チームのメンバーは、複雑な問題に対して新たな発想や解決策を提供した。 3. チームのメンバーは、業務達成のために新しい創造的な方法を試みた。 4. チームのメンバーは、業務上で多様な選択肢を評価検討した。 5. 自分のチームのメンバーは、業務を行う中で多くの新たなスキルを開発した。
Team Exploitative Learning	次の各項目にどの程度同意するかを、1（まったく同意しない）から7（きわめて同意する）までの数字を選んでお答えください。 6. 自分のチームのメンバーは、既存の知識を再構築して業務を達成した。 7. チームのメンバーは、各自のタスクを遂行する中で日常の活動を行った。 8. 自分のチームは、標準化された方法論と通常の実務を実践した。 9. チームのメンバーは、既存の知識や専門性を強化、刷新しながら業務を達成した。 10. チームのメンバーは、主に現在の知識やスキルを利用して業務を実行した。

APPENDIX B. INFORMED CONSENT FORM (ONLINE)

Research Question: Does social capital help diverse work teams better foster ambidextrous behavior?

Principal Investigator: Ng Hock Seng, PhD Candidate, Lee Kong Chian School of Business, Singapore Management University

1. Introduction:

This study seeks to better understand team social capital and its role in helping diverse work teams better foster ambidextrous behavior. The term “ambidexterity” refers to an individual’s ability to "use both hands equally well" and has been widely used as a “metaphor” to describe an organization's or a team's ability to pursue two disparate things at the same time, such as efficiency vs flexibility, low cost vs differentiation, short-term bookings attainment vs long-term pipeline generation or incremental improvement vs radical innovation.

2. Study Procedures:

You will be asked to answer a set of questions via an online Qualitrics-created survey. You can choose not to answer any question or withdraw from the study at any time without penalty.

3. Benefits of Study:

This study will offer researchers a better understanding of barriers, which exist at a team level, that prevents teams from achieving better ambidextrous behavior. The results of the study will provide additional insights for Executives and/or HR will

then be able to design/construct more targeted approach (including incentives, policy changes, enablement activities, etc.) to enhance diverse work teams' effectiveness and, in turn, lead to higher employee productivity and satisfaction.

4. Possible Risks of Study:

There are no anticipated risks or adverse effects in this study beyond what one would typically experience in daily life.

5. Confidentiality and Privacy of Research Data:

Your confidentiality is assured. All personal data and responses will be kept strictly confidential and will be used solely for research purposes. All the responses obtained from the team managers will not be shared with their subordinates and vice versa. All the data collected using the Qualtrics (i.e., web-based survey tool) are stored in a single secure data center and are safeguarded using industry best security practices that prevent unlawful disclosure. The research results will be disseminated, e.g., presented or published in aggregated form and/or with individual data anonymized or disguised.

6. Contact Details:

For questions/ clarifications on this study, please contact the Principal Investigator, Ng Hock Seng, at email address hsng.2012@phdgm.smu.edu.sg, and/or mobile number: +65 9679 5798. Also, you may wish to contact the Principal Investigator's

Supervisor, Dr. Saumya Sindhwani, at email address saumyas@smu.edu.sg and/or office number: +65 6828 0720.

If you have any questions or concerns regarding your rights as a participant in this research study and wish to contact someone unaffiliated with the research team, please contact the SMU Institutional Review Board Secretariat at irb@smu.edu.sg or +65 6828 1925. When contacting SMU IRB, please provide the title of the Research Study and the name of the Principal Investigator, or quote the IRB approval number: IRB-17-124-A105(917).

Do you consent to participate in this research study?

- ○ I agree
- ○ I disagree

APPENDIX C. SMARTPLS 3.0 SETUP

Bootstrapping is a nonparametric procedure that allows testing the statistical significance of various PLS-SEM results such path coefficients, Cronbach's alpha, HTMT, and R^2 values (Christian M Ringle et al., 2015).

Table 47 – SMARTPLS Bootstrapping Settings

Data file Settings	
Data metric	Mean 0, Var 1
Initial Weights	1.0
Max. number of iterations	300
Stop criterion	7
Use Lohmoeller settings?	No
Weighting scheme	Path
Bootstrapping Settings	
Complexity	Complete Bootstrapping
Confidence interval method	Bias-Corrected and Accelerated (BCa) Bootstrap
Parallel processing	Yes
Samples	10000
Sign changes	No Sign Changes
Significance level	0.05
Test type	Two Tailed

Basic Settings

1. Subsamples: In bootstrapping, subsamples are created with observations randomly drawn (with replacement) from the original set of data. To ensure stability of results, the number of subsamples should be large. For an initial assessment, one may use a smaller number of bootstrap subsamples (e.g., 500). For the final results preparation, however, one should use a large number of bootstrap subsamples (e.g., 5,000). Note: Larger numbers of bootstrap subsamples increase the computation time.

2. Do Parallel Processing: This option runs the bootstrapping routine on multiple processors (if your computer device offers more than one core). Using parallel computing will reduce computation time.
3. Sign Changes: Sets the method for dealing with sign changes during the bootstrap iterations. The following options are available: No Sign Changes (default)
4. Complete Bootstrapping: All available results for bootstrapping are assembled. For example, this includes: Path Coefficients, Indirect Effects, Total Effects, Outer Loadings, Outer Weights, R Square, Average Variance Extracted (AVE), Composite Reliability, Cronbach's Alpha, and Heterotrait-Monotrait Ratio (HTMT).
5. Confidence Interval Method: Sets the bootstrapping method used for estimating nonparametric confidence intervals. The following bootstrapping procedures are available (see bootstrapping @ wikipedia.org): Bias-Corrected and Accelerated (BCa) Bootstrap (default)
6. Test Type: Specifies if the creation of bootstrap confidence intervals uses a one-sided or two-sided significance test.
7. Significance Level: Specifies the significance level of confidence interval computations.

APPENDIX D. SMARTPLS 3.0 OUTPUTS

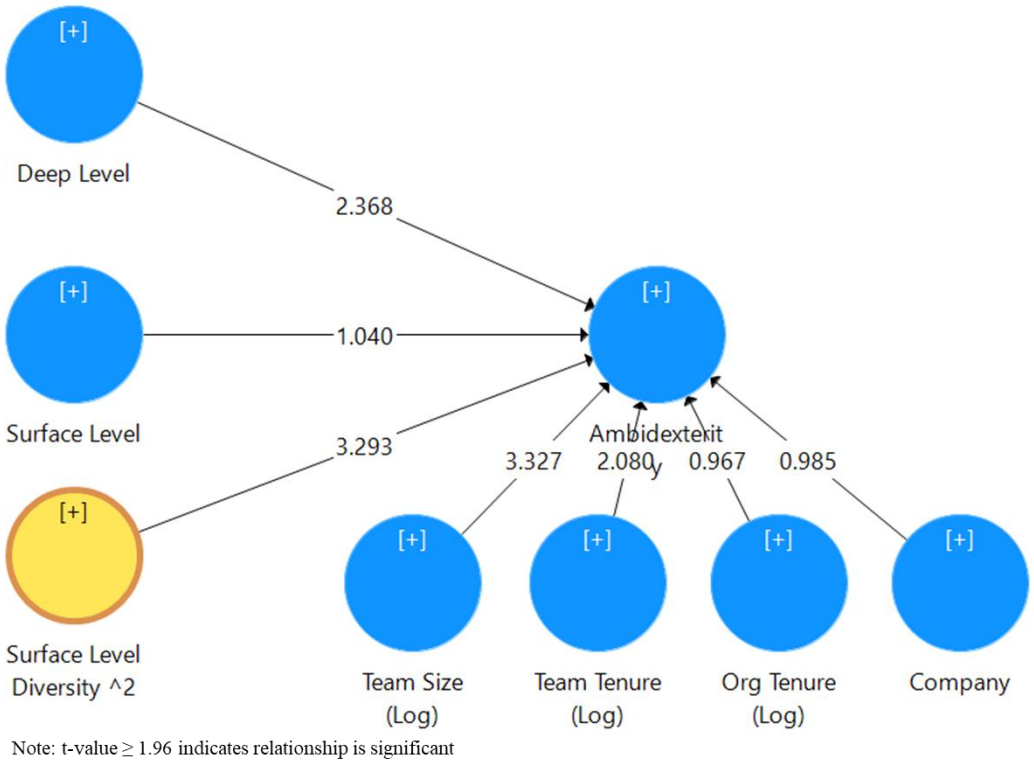

Figure 8 – SmartPLS 3.0 Output Model 2 (Bootstrapping 10,000 samples)

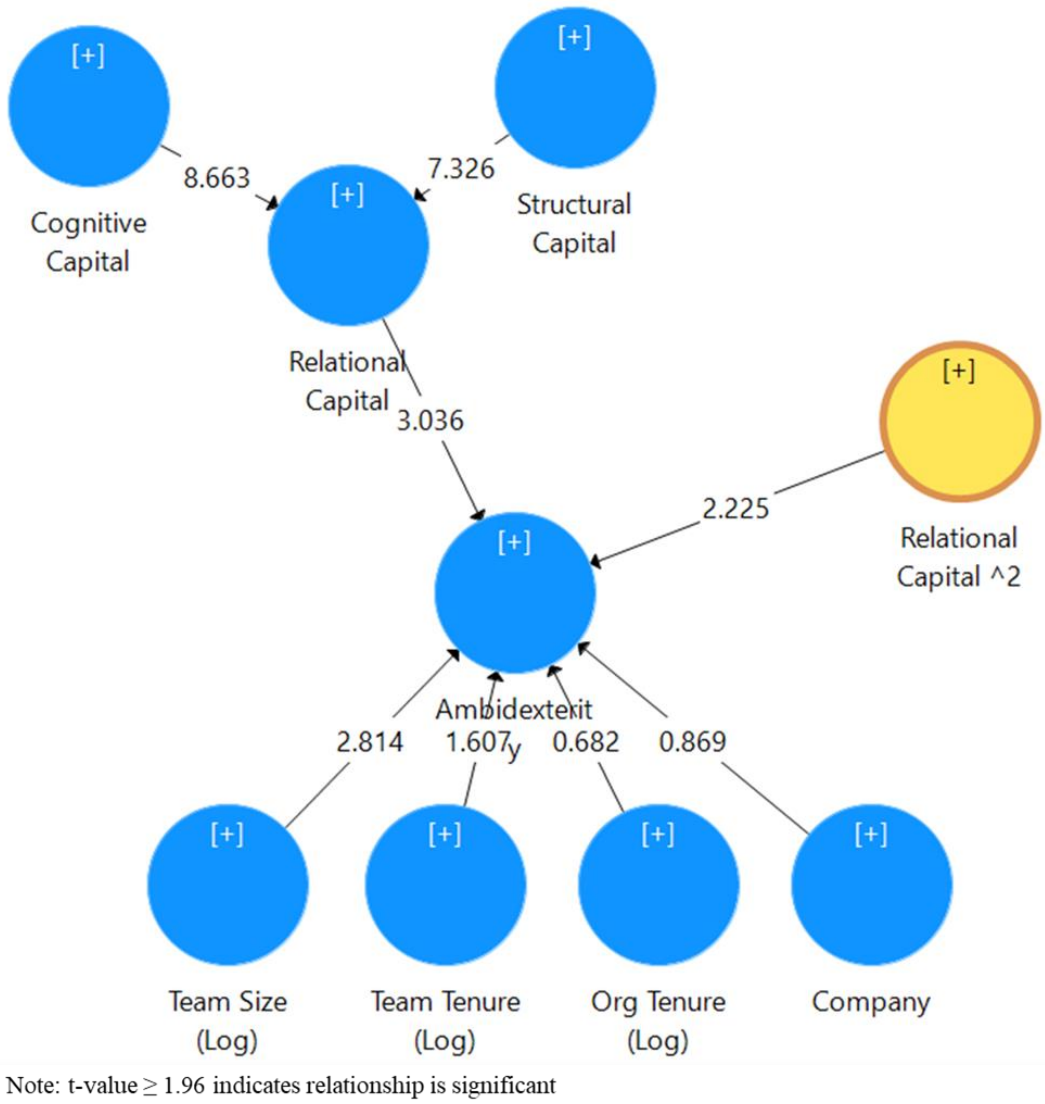

Figure 9 – SmartPLS 3.0 Output Model 3 (Bootstrapping 10,000 samples)

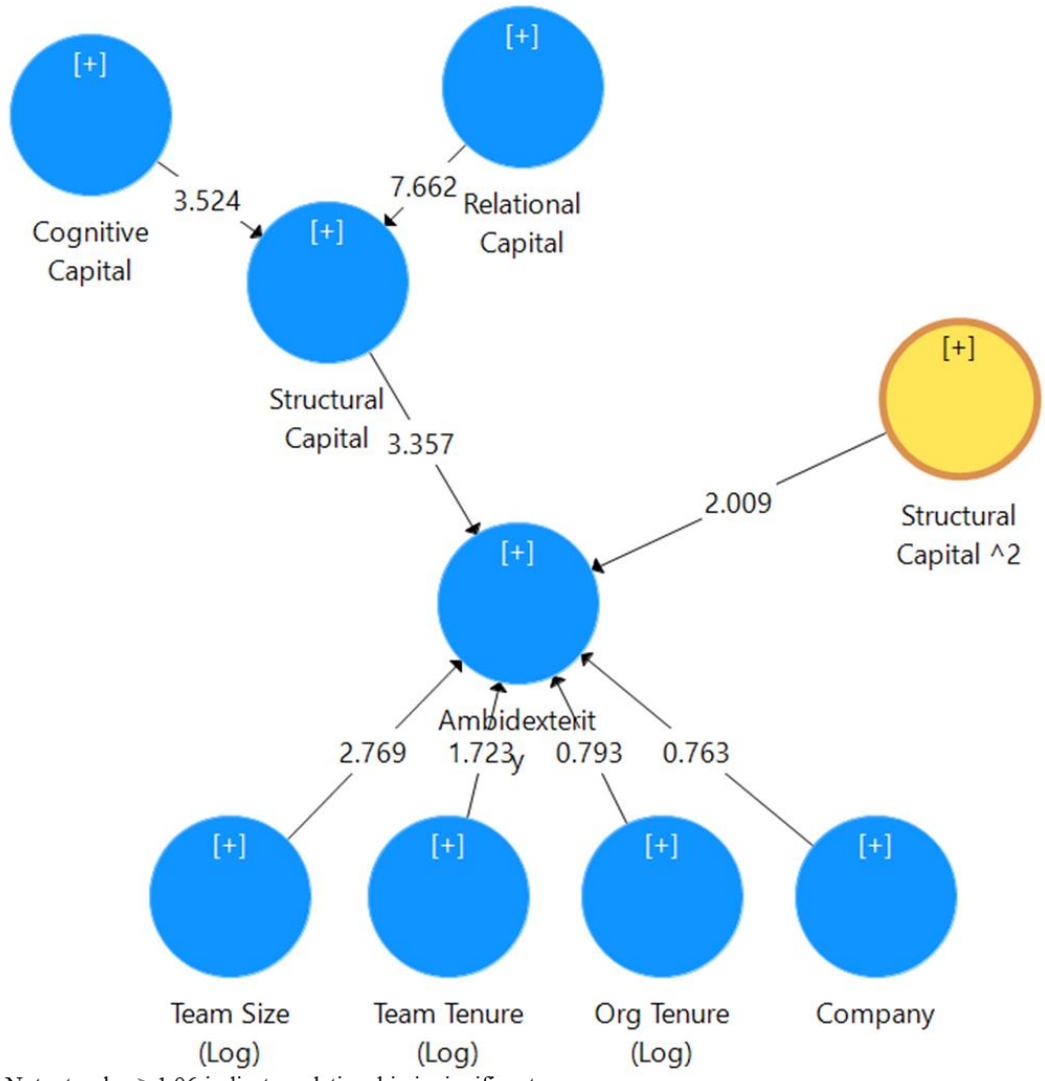

Figure 10 – SmartPLS 3.0 Output Model 4 (Bootstrapping 10,000 samples)

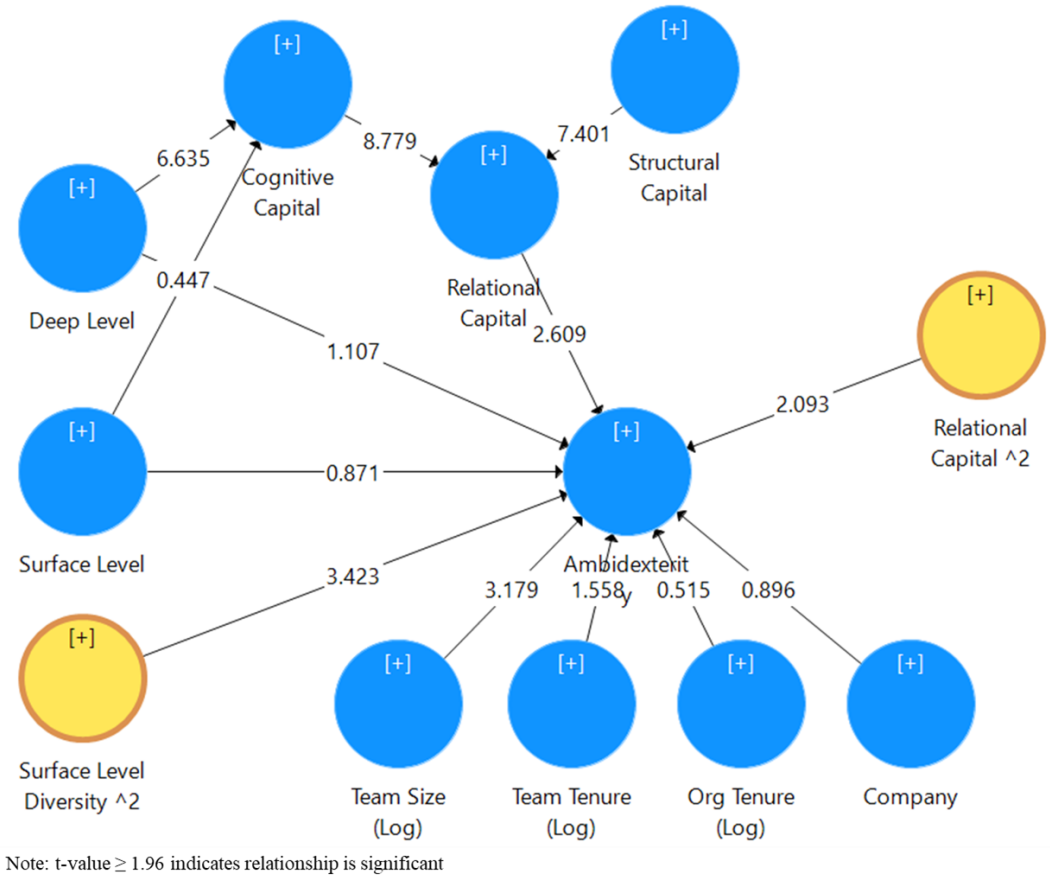

Figure 11 – SmartPLS 3.0 Output Model 5 (Bootstrapping 10,000 samples)

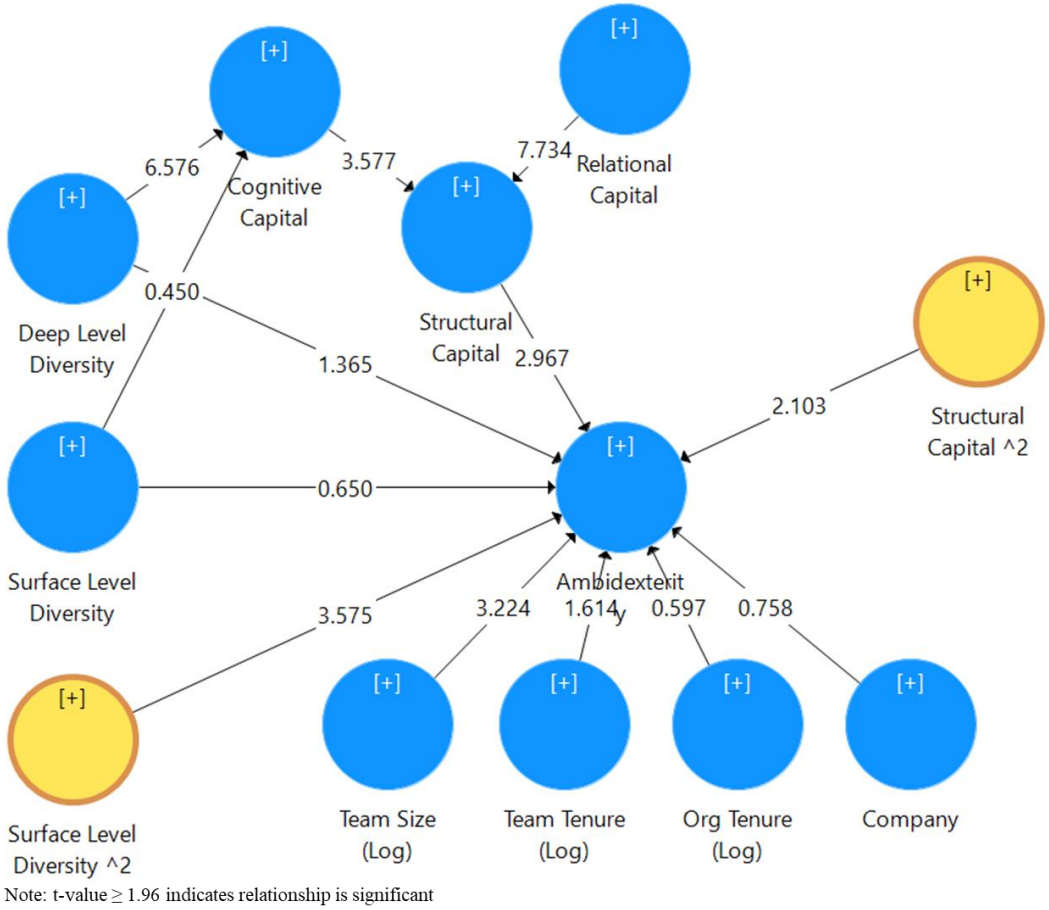

Figure 12 – SmartPLS 3.0 Output Model 6 (Bootstrapping 10,000 samples)

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