



Influences of Inter-organisational Team Identification on Team Effectiveness and Logistics Outsourcing Performance: A *Boundary Spanning Perspective*

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Doctor of Philosophy

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I, **Shiyu Liu**, declare that this thesis is submitted in fulfilment of the requirements for the award of **Doctor of Philosophy** in the Management Discipline Group at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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ABSTRACT

Triggered by the fierce competition and substantial changes in worldwide markets during the past two decades, an increasing number of firms have adopted a logistics outsourcing strategy to maintain core competencies and gain competitive advantages. Accordingly, the relevant research has achieved both practical and academic attention, ranging from the type of logistics activities outsourced, the motivation for such operations, and the positive and/or negative results of the actions. Nevertheless, the relevant supply chain management (SCM) literature is sparse and scattered and thus considerable opportunities remain for further exploration, especially in logistics outsourcing relationship management (LORM). Unfortunately, due to various reasons such as the dominant focus on organisational level issues, the difficulty of evaluating people issues and the lack of a comprehensive theoretical foundation, the literature thus far has not adequately explored this phenomenon.

Focusing on this research gap, the present study extends LORM research into inter-organisational team identification (IOTI) research by investigating the perspectives of boundary-spanning employees (BSEs) from logistics service providers (LSPs) and their customers (Logistics service customers, LSCs). Specifically, this study investigates and justifies how and to what extent IOTI of BSEs affected team effectiveness and, ultimately, inter-organisational performance within the context of the logistics outsourcing industry:

- IOTI does not directly affect team effectiveness but there are mediated relationships between IOTI and team effectiveness with variables in aspects of team affect, cognition and behaviour;
- Home organisation identification (HOI) moderated the relationship between IOTI and Team behaviour variable;
- HOI does not moderate any mediated relationship between IOTI and team effectiveness;
- Team performance has a significant direct influence on logistics outsourcing performance.

Lastly, the findings from the study provides theoretical and practical implications to academic researchers and industry practitioners.

- Theoretical implications: first, this study broadened the basis of further study by introducing and integrating three theories that have never been used in the study of LORM: Social Identity Theory, Self-Categorisation Theory and Common Ingroup Identity Model. Second, this study extended our understanding of LORM in a novel perspective with multiple considerations on micro-foundations, meso-level interactions, and inter-organisational relationships. Last, this study initiated and tested a comprehensive framework comprised of three mediating mechanisms to explain the association between IOTI and team effectiveness.
- Practical implications: first, knowing that BSEs' effect, behaviour, and cognition potentially contribute to a higher level of logistics outsourcing performance, managers should actively cultivate and maintain IOTI in dual group membership settings. Furthermore, when setting up and staffing an IOT, managers should be mindful of employees' satisfactory or negative experience with certain colleagues. At the same time, it is also crucial to consider the prior coordinating experience of own employees with BSEs from the partnering firm. Managers should reconfigure the team whenever needed to avoid contamination of current IOT coordination and further strengthen inter-organisational relationships.

Keywords: logistics outsourcing; supply chain relationship management; boundary spanning employee; inter-organisational team identification; home identification; team process; team emergent states

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ABBREVIATIONS

3PL	Third-party logistics
ABCs	Affective states, behavioural processes, and cognitive states
AVE	Average variance extracted
BSE	Boundary spanning employee
BSR	Buyer-supplier relationship
CB-SEM	Covariance-based structural equation modelling
CCA	Confirmatory composite analysis
CI	Confidence interval
CIIM	Common Ingroup Identity Model
CMV	Common method variance
CR	Composite reliability
CSCMP	Council of Supply Chain Management Professionals
CSR	Corporate social responsibility
ES	Effect size
HOI	Home identification
HRM	Human resource management
HTMT	Heterotrait-monotrait ratio of correlations
IMO	Input–Mediator–Output
IOT	Inter-organisational team
IOTI	Inter-organisational team identification
IPO	Input-process-output
IRA	Inter-rater agreement
LOP	Logistics outsourcing performance
LOP_GA	Logistics outsourcing performance (goal achievement)
LOP_GE	Logistics outsourcing performance (goal exceedance)
LORM	Logistics outsourcing relationship management
LSC	Logistics service customer
LSP	Logistics service provider
OI	Organisational identification
PLS-SEM	Partial least squares structural equation modelling
PSM	Purchasing and supply management
SC	Supply chain
SCI	Supply chain integration
SCM	Supply chain management

SCT	Self-Categorisation Theory
SD	Standard deviation
SEM	Structural equation modelling
SIT	Social Identity Theory
TCMN	Team communication
TCMT	Team commitment
TMM	Team mental model
TO	Temporary organisation
TPM	Team performance
TTA	Team trust (affective)
TTC	Team trust (cognitive)
UTS	University of Technology Sydney
VIF	Variance inflation factor

CHAPTER ONE: INTRODUCTION

This chapter briefly overviews the research background, including research context and needs. Based on the research questions, this chapter further introduces the research methodology used in the study. Moreover, the research objectives are explained, and the boundary and delimitation of the study are clarified. To provide a complete picture of the study, the chapter presents the research procedure and the organisation of the thesis.

1.1 Research context

In today's highly competitive business climate, creating sustained competitive advantage is crucial to a firm's success. It is thus essential to perform activities differently or to perform different activities than rivals (Porter, 1996). When essential resources such as knowledge, technologies and innovation are available outside traditional firm boundaries, most companies adopt an outsourcing strategy to save costs, strengthen core competencies, and achieve competitive advantages (Freytag, Clarke, & Evald, 2012). Outsourcing is "a viable activity that shifts an internally governed transaction to an external supplier through a long-term contract" (Qureshi, Kumar, & Kumar, 2007, p. 648). Firms will outsource activities from which the benefit obtained is greater than the costs incurred. For example, the manufacturing firm might outsource its non-core business (e.g., logistics activities) to external business partners to improve its cost efficiency and service quality (Power, Sharafali, & Bhakoo, 2007). Among multiple outsourcing options, logistics outsourcing has received much attention (e.g. E. J. Anderson, Coltman, Devinney, & Keating, 2011; David M. Gligor & Holcomb, 2013).

During the past two decades, logistics outsourcing has become a potential solution to helping firms focus on core business and gain a competitive advantage. As illustrated by a survey covering the nine most prominent industries in the US, 70% of those who use logistics services (buyers) and 85% of suppliers said logistics outsourcing has contributed to overall logistics cost reductions, and 83% of buyers and 94% of suppliers said the use of third-party

logistics services has contributed to improved customer service quality (Capgemini Consulting & Langley, 2016). Nevertheless, the research also found that 35% of logistics service users indicate they are returning to insource many of their logistics activities, which is higher than the 26% reported the previous year. This implies a trend that, whilst many companies have successfully benefited from logistics outsourcing, others have struggled or even failed to do so. Therefore, further exploring relevant issues of logistics outsourcing is essential for firms to develop rigorous and implementable solutions applicable to their reality (Dess & Markoczy, 2008).

1.2 Research needs

Schorsch, Wallenburg, and Wieland (2017) indicate that SCM is heavily related to the management of relations between and across business functions, within and across organisational boundaries. Nevertheless, most SCM studies focused more on logistics-centred operational issues while overlooking the social and psychological aspects of SCM (Chelariu, Kwame Asare, & Brashear-Alejandro, 2014). As indicated by previous comprehensive reviews of the literature (e.g. Gómez-Cedeño, Castán-Farrero, Guitart-Tarrés, & Matute-Vallejo, 2015; Shub & Stonebraker, 2009; Tokar, 2010), much research was done solely on organisation-level phenomena, and the research community has not widely recognised the importance and necessity of including person-level factors in the study. As a sub-field of SCM discipline, the extant literature on logistics outsourcing has indicated the same trend. Only recently have some researchers begun to explore the interpersonal relationships and boundary spanning activities that may influence logistics outsourcing effectiveness. Due to various reasons, such as the dominant focus on (cross-) organisational phenomena, the difficulty of evaluating people issues, and the lack of a comprehensive theoretical foundation, the SCM literature has not adequately dealt with the issue of multilevel interactions in logistics outsourcing relationship management (LORM).

In this research context, the study links with recent calls to extend LORM research into human factors and behaviour SCM (e.g. David M Gligor & Autry, 2012; David M. Gligor & Holcomb, 2013; Grawe, Daugherty, & Ralston, 2015;

Schorsch et al., 2017), as well as multilevel interaction that calls for meso-level theories in LORM (e.g. Grawe, Autry, & Daugherty, 2014), and recent calls for multi-disciplinary investigation of LORM (Daugherty, 2011). To further explain, the study was motivated by the following four identified research needs.

1.2.1 Human factors in logistics outsourcing

Compared with rich studies on hard factors such as processes, technologies and measurement systems, research on SCM often needs to pay more attention to the non-structural or soft factors (human behaviour, corporate culture, interpersonal relationship, etc.). Recently, Wieland, Handfield, and Durach (2016) revealed this imbalance of SCM research agenda, showing that among 35 scholars' perceptions of emerging research themes in the next five years, the "people dimension of SCM" is the most underrepresented topic, with both "Human capital/talent management" and "Behavioural issues" additionally clarified as underestimated topics. Similarly, Huo, Liu, Kang, and Zhao (2015) explicitly indicated that managing the behavioural dimension should be a pivotal theme in the supply chain.

Moreover, the human factor research from a micro-foundational perspective can advance our understanding of collaborative partnerships (Barney & Felin, 2013). Centring on interpersonal cooperation across traditional organisational boundaries, a micro-level exploration of human interaction potentially broadens insights into the processes and outcomes of collaborative partnerships (e.g., logistics outsourcing collaboration) at the macro level (Felin & Foss, 2005; Y. Liu, Sarala, Xing, & Cooper, 2017). Daugherty (2011) indicated that the people issue is the key to creating a service climate. Thus, further exploring the attributes of people successfully creating such a service climate, the role of corporate leadership, the impacts of supervisors and the integrating mechanism of creating and maintaining a service climate is worthwhile. Reviewing the logistics outsourcing literature, Marasco (2008) specified the need for research on developing interpersonal relationships between the buyer and provider of logistics services. In a following qualitative study, the findings of interviews illustrated that such personal-level interactions embedded within interorganisational relationships potentially affect both behavioural processes in

this context and the outcomes of logistics outsourcing performance (David M. Gligor & Holcomb, 2013).

From a boundary spanning perspective, BSEs are the people who engage in significant transactions with external business partners (Adams, 1976). Acting as organisational representatives, they facilitate inter-organisational transactions and alleviate conflicts (Richter, West, Van Dick, & Dawson, 2006) (Refer to Section 2.2.2 for more details). In logistic outsourcing contexts, BSEs also play a critical role in shaping those partnerships based on interpersonal relationships they build with their counterparts in external partnering firms (Grawe et al., 2015). Though the consensus is that BSE interactions are important, our understanding of those boundary spanning relationships still needs to be improved. In the existing literature, there is no theoretical lens that can be used to understand the topics related to these cross-boundary interpersonal relationships, including the characteristics of these relationships, the psychological mechanism of interpersonal interactions, and the effects on collaborative performance.

1.2.2 Meso-theorisation

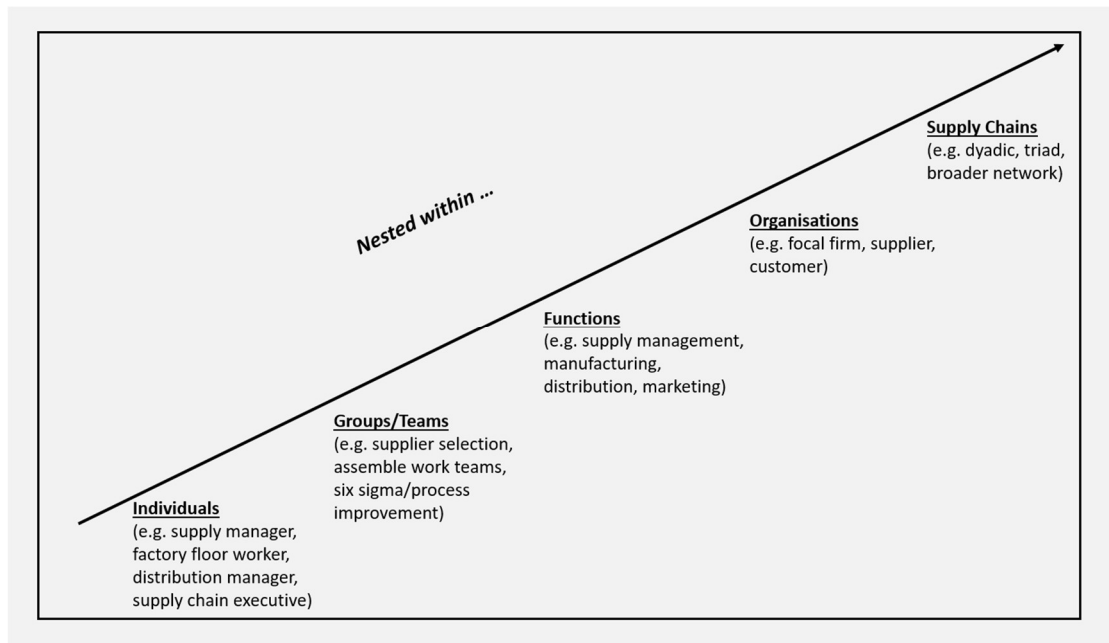
Regarding the studies in subdomains of management discipline, there are apparent divides between scholarship on micro- and macro- entities (Appendix 1). Consistent with the relevant disciplines of this study (SCM, Organisational behaviour and Psychology), in this thesis, “micro” refers to the individual, “meso” refers to the team, and “macro” refers to the organisation and higher levels (Refer to Section 2.3.2 for more details).

In supply chain management field, there is also a need for micro-level research, rather than the traditional firm-to-firm view, to explore the social elements of inter-organisational relationships (David M. Gligor & Holcomb, 2013). For example, Schorsch et al. (2017) recognised the importance of cross-level interaction within a supply chain and acknowledged the need for more multi-level studies in the literature. More specifically, they called for a future study to develop and apply meso-level theories to “explicitly formalise the relationship between variables from different micro and macro-levels” (p. 255).

The term “meso” (a Greek word translated as “in between”) engages in today’s SCM research, covering and linking the relevant factors to cross-level interactions. To address cross-level interactions and advance theoretical research, it is also valuable for SCM scholars to adopt a meso-level perspective on those topics regarding the hierarchical nesting of SCM phenomena and various sources of influence (C. R. Carter, Meschnig, & Kaufmann, 2015). As shown in Figure 2, the overall nesting logic is that individuals are nested in groups or teams, which in turn are nested in larger organisational function units such as manufacturing, warehousing or distribution, which are nested in organisations. Furthermore, organisations are nested in supply chains, which are nested in overall environments (C. R. Carter et al., 2015). For specific SCM phenomena, a certain amount of studies have considered meso-theorisation a valuable tool in determining the exact nature of nesting layers and the influences across the layers, such as the effect of guanxi on inter-organisation collaboration and conflict (Cai, Jun, & Yang, 2017), the role of interpersonal connections in managing supply chain disruptions (Durach & Machuca, 2018), and the way that BSEs’ capabilities share inter-organisational trust development (C. Zhang, Viswanathan, & Henke, 2011).

Figure 1.1

Hierarchical Nesting of SCM Phenomena



Note. From “Moving to the next Level: Why our discipline needs more multilevel theorization”, by C. R. Carter, G. Meschnig, and L. Kaufmann, 2015, *The Journal of Supply Chain Management*, 51(4), 94-102.

<https://doi.org/10.1111/jscm.12083>

Meanwhile, SCM literature illustrated with evidence that logistics outsourcing arrangements are cross-boundary and do not exist within the vacuum of a single level (David M Gligor & Autry, 2012; Grawe et al., 2015). Some authors agreed that interpersonal relationships impact interorganisational relationships and outsourcing performance as well (David M Gligor & Autry, 2012; Grawe, Daugherty, & McElroy, 2012). Beyond that, a series of underexplored questions in logistics outsourcing practice underscores the call for further examination on multiple levels. The typical questions include: are there BSEs that exhibit a greater influence on the outcomes of outsourcing activities? What are the optimal team dynamics on each side of the relationship to improve logistics outsourcing performance? (Leuschner, Carter, Goldsby, & Rogers, 2014).

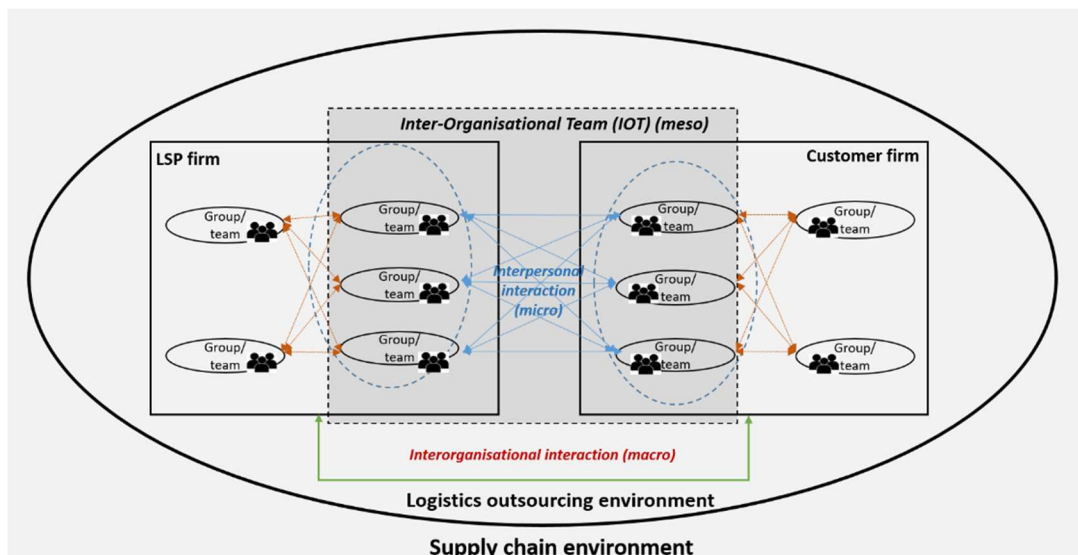
Notably, an important defining characteristic of contemporary situations is that BSEs often must align with a temporary organisation, i.e., an inter-organisational team (IOT) for the outsourcing project. From a systematic viewpoint, those individuals do not act separately but are embedded in a “relational system of

interaction between individuals and collectivities” (Kroeber & Parsons, 1958, p. 583). Therefore, it is time to explore the logistics outsourcing phenomenon in a broader context instead of mere focus on macro-level organisations or micro-level individuals. In other words, achieving a more in-depth understanding of meso-level interaction incurred within a logistics outsourcing context is preferable, i.e., how BSEs from both LSP and customer sides collaborate in an IOT.

Combining IOR and logistics outsourcing literature, studies to date have failed to comprehensively elaborate and testify the elements of boundary spanning collaboration, the relationships between BSEs, and how these are manifested and developed in an inter-organisational team. Little is known about how LORM works from a meso-level perspective (a micro-level interaction at the inter-organisation interface). Extending the nesting framework in Figure 1.2 to a boundary spanning dimension, this study developed a meso-level framework depicting multiple linkages involved in logistics outsourcing collaboration (Figure 1.3).

Figure 1.2

Multi-level insights of logistics outsourcing collaboration



1.2.3 Inter-organisational team & dual identification

In a logistics outsourcing partnership, there is always a team in charge of boundary spanning activities which can be conceived as an “inter-organisational team” (IOT) (Refer to Section 2.4 for more details). Such a team is usually formed by integrating individuals with a wide range of expertise from all partnering organisations. Therefore, those team members must interact effectively and cooperate efficiently to accomplish joint goals. Despite the lack of formal individual or team-level incentive plans in this temporary organisation, academic scholars and industrial professionals argue that IOTs function similarly to traditional teams and can broadly be seen as teams. Thus, there is a potential need to explore team-centred phenomena, e.g., team membership, team identity, team effectiveness, etc.

Originating from group or organisational memberships, social identities play a key role in developing intergroup relations (Alderfer & Smith, 1982; Hogg, van Knippenberg, & Rast, 2012; Kramer, 1991). Therefore, inter-organisational collaboration, a particular type of intergroup relation, is very much an issue of identity. Although the phenomena in areas of mergers and acquisitions (e.g. Bartels, Douwes, Jong, & Pruyn, 2006; Weber & Drori, 2011), multinational firms (e.g. Reade, 2001; Vora & Kostova, 2007) and franchising systems (e.g. Ullrich, Wieseke, Christ, Schulze, & van Dick, 2007; Wieseke, Kraus, Ahearne, & Mikolon, 2012) imply the existence of identities spanning traditional organisation boundaries, the literature on the characteristics and influences of such identities is still scant and scattered (Ashforth, Harrison, & Corley, 2008). From a dual identification perspective, BSEs will likely identify with IOT and their home organisation concurrently. Nevertheless, research has not, to my knowledge, investigated the interaction of these two foci of identification or the effects on IOT effectiveness (the only exception is Rockmann, Pratt, & Northcraft, 2007). Beyond examining any particular identification focus, researchers in organisational identity also call for studies exploring how multiple identities interact in an inter-organisational collaboration context (Horstmeier, Boer, Homan, & Voelpel, 2017; Miscenko & Day, 2016).

In the context of supply chain management, the present study will focus on two types of identification: inter-organisational team identification (IOTI) and home organisational identification (HOI) (refer to Section 2.4 and Section 2.7.1 for more details). Although it is tempting to infer research of multiple identities inside an organisation to the boundary-spanning context, it is insufficient to “borrow” existing evidence in social identity literature to fully explain when IOTI and organisational identification (OI) interact with each other and how BSEs coordinate with each other under the scenario of “combination of intimacy and separateness” (Bartel, 2001). Regarding logistics outsourcing collaboration, BSEs often coordinate with external IOT members with diverse objectives and values. Such complexity implies the need to develop a framework to help articulate IOT phenomena and predict the consequences of BSEs’ dual identity in this setting.

1.2.4 Inter-disciplinary study

SCM, a relatively young discipline, has yet to advance the research as quickly as other social science disciplines. Consequently, research in this field now relies heavily on borrowed concepts and theories from neighbouring disciplines such as strategic management, organisational behaviour, marketing and psychology (see for a review, Clifford, Williams, Randall, & Thomas, 2010). This practice is becoming more and more common, fostering solid ties between the study of supply chain and core disciplines and thus enhancing the interdisciplinary richness of SCM scholarship.

Regarding logistics outsourcing, a sub-field of SCM discipline, it should be noted that there are few explorative studies on the meso-level interaction on LORM; thus, the theoretical foundation of the mechanism of this phenomenon could be stronger. Concerning adequate research rigour, Daugherty (2011) encouraged scholars to adopt a multi-disciplinary approach in future studies because many logistics outsourcing issues have been extensively examined in other disciplines. Broadening the research scope can generate new knowledge across different disciplines, build a solid theoretical basis, and contribute progressively to LORM research.

Given that meso-level context is frequently at the heart of theorising on various topics in different disciplines (e.g., management, psychology and sociology), conducting LORM research based on meso-philosophy and theories borrowed from other disciplines is essential. By delineating its boundaries and/or scope conditions in a logistics outsourcing setting, the systematic process of utilising a specific theory in other fields is supposed to facilitate explanations of LSP-customer collaboration and provide suggestions for improving managerial practice.

1.3 Research purposes and questions

The primary motivation of this research is to expand the knowledge of logistics outsourcing relationship management. As basic research, this study has several purposes concerned with the types of knowledge it aims to produce:

- **Description:** to provide a detailed account of the relationships between team identification and team effectiveness under the scenarios of inter-organisational collaboration.
- **Exploration:** to develop an understanding of such relationships and relevant elements from boundary spanning perspective in the context of the logistics outsourcing industry.
- **Explanation:** to establish and test the mechanisms responsible for such relationship's effectiveness.

Given those research purposes and guided by the research needs (Section 1.2), three questions were finalised that promise interesting insights into how IOTs function and what makes them effective in logistics outsourcing collaboration.

The first was concerned with how BSEs' IOTI affects team effectiveness. While it would be acceptable to neglect the mechanism underlying such a relationship and, alternatively, conduct empirical research in a simplified way, doing so fails to provide an innovative and rigorous contribution to the literature of LORM. Therefore, the first question answered in the study is initiated as follows:

RQ-1: To what extent, and in what ways, is IOTI related to team effectiveness?

In addition, the validity of the answers to Research question 1 must be analysed. Since the research contexts and scenarios may vary depending on specific situations of individual organisations and/or supply chain systems, the casual linkages developed throughout the study should be moderated by contingency factors. Failure to consider this may result in incomplete conceptual models, insufficient theory testing or biased/invalid conclusions (Johns, 2006; Maloney, Bresman, Zellmer-Bruhn, & Beaver, 2016). Specifically, home organisation identification (HOI) was identified as a crucial factor that could affect the team's functioning. This is reflected in the second question:

RQ-2: To what extent, and in what ways, does HOI influence the effectiveness of IOTI?

Furthermore, it is particularly interesting to see how team effort might influence the outcome of logistics outsourcing collaboration. Through a cross-level scope, this research focuses on team boundary spanning activities and its influence on higher-level logistics outsourcing performance. The third research question therefore is:

RQ-3: To what extent, and in what ways, is team effectiveness related to logistics outsourcing performance?

1.4 Research methodology

To answer the research questions (Section 1.3), the theoretical findings achieved from the literature review must be challenged and justified based on empirical data and adequate methodology. Therefore, the traditional way of differentiating quantitative research from qualitative research, i.e., numeric (e.g., numbers) vs non-numeric data (e.g., words, images, video clips, etc.), must be revised for the research design. Therefore, the present study employed two logics of inquiry (induction and deduction) as the combined approach to theory development. As seen from Table 1.1, the inductive approach is used to develop a rich theoretical perspective, while the deductive approach focuses on theory testing.

Table 1.1*Approaches to theory development*

Category	Induction	Deduction
Purpose	To test explanations, to eliminate false ones and corroborate the survivor	To establish descriptions of characteristics and regularities
Logic	Known premises are used to generate untested conclusions	When the premises are true, the conclusion must also be true
Generalisability	From the specific to the general	From the general to the specific
Use of data	To explore a phenomenon, identify themes and patterns and create a conceptual framework	To evaluate propositions or hypotheses related to an existing theory
Theory	Theory generation and building	Theory falsification or verification
Applied to the research question	RQ-1, -2, -3	RQ-1, -2, -3

Note. Compiled from *Research methods for business students* (9th ed.), by M. N. K. Saunders, P. Lewis and A. Thornhill, 2023, Pearson and *Designing social research: The logic of anticipation* (3rd ed.), by N. W. H. Blaikie and J. Priest, 2019, Polity press.

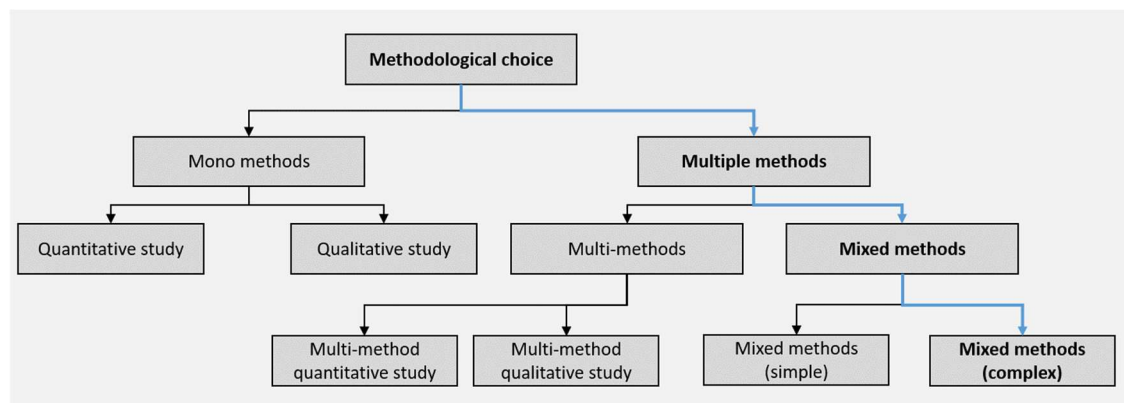
From a methodological perspective, this study adopted mixed methods (complex) under the category of multiple methods (Figure 1.3). The mixed method approach enables the simultaneous use of inductive and deductive techniques to accurately answer the study's research questions and ultimately fulfil research objectives (Gray, 2021). As for the present study, the quantitative method is predominant, while the qualitative method is adopted to facilitate the measurement development and contextualise the findings from the quantitative study.

From a research design perspective, this study has two characteristics related to collecting and analysing data:

- **A fixed mixed methods design:** pre-determining the use of both quantitative and qualitative methods at the very beginning of the research and then implementing the research processes as initially planned.
- **A typology-based approach:** designing the research in accordance with Creswell and Clark (2018)'s terminology and classification typology.

Figure 1.3

Methodological concern for research design



Note. From *Research methods for business students* (9th ed.), by M. N. K. Saunders, P. Lewis and A. Thornhill, 2023, Pearson.

Guided by the methodological choice and for the research triangulations (Boyer & Swink, 2008; C. R. Carter, Sanders, & Dong, 2008), the present study adopts the following set of research methods: first, the research model was conceptualised by a comprehensive literature review; second, a qualitative study (semi-structured interviews) was used to validate the findings of literature review and gave insights to the development of both conceptual model and measurement scales; third, a survey was conducted to obtain data related to the variables in the model; finally, a quantitative analysis based on Partial Least Squares Structural Equation Modelling (PLS-SEM) and PROCESS macro approach was implemented to test the research hypotheses. An overview of the research methods and activities throughout the doctoral period is shown in Table 1.2.

Table 1.2*Overview of research activities*

Category	Activity	Brief description
Qualitative	Literature review	Thematic synthesis and systematic reviewing of a multiple of themes of literature in logistics outsourcing, supply chain relationship management and mixed research methods
	Semi-structured interviews	Interview with samples of academics and industrial practitioners, aiming to evaluate measurement items and substantiate the conceptual model
	Instrument expert review	Validity check of the measurements by samples of academics and industrial practitioners
Quantitative	Pilot study (questionnaire)	Questionnaire test to potential research participants and IRA analysis to be conducted
	Survey	Online questionnaire published to collect data
Qualitative & Quantitative	Data integration, data analysis and result discussion	Integration of interview and survey results; PLS-SEM analysis on measurement model; PROCESS macro approach to testing the hypotheses, together with the support from synthesis and interpretation of interview results; Further discussion on the results in aspects of academic and practical implication and future research recommendation

1.5 Research boundary and delimitation

Focusing on BSEs in logistics outsourcing collaboration in China, this study is both explorative and explanatory. In the past decade, growing amounts of empirical studies co-authored by Chinese researchers (e.g. Huo, Ye, Zhao, & Shou, 2016; Yang & Zhao, 2016) have investigated Chinese companies'

logistics and supply chain activities. The literature indicates that data gathering in China for this research field does not provide generalisability limitations.

Under this geographical scenario, this study was delimited to BSEs from organisations operating in China. The research was set within a context where individuals were assigned by their employer (rather than self-decided) to work in IOTs. Perspectives on IOTI were delimited to BSEs' daily experiences in logistics outsourcing operations. Furthermore, daily experiences were delimited to those relevant to the most important partnership that the respondent actively participated as a BSE.

Because this study will investigate boundary-spanning activities involved in logistics outsourcing collaboration, the targeted participants were specified as BSEs from either partnering firms (LSP or LSC). From a theoretical point of view, it would be desirable to collect dyadic data and measure pairs of participants in this study. However, collecting dyadic data means increasing research costs, reducing the number of valid responses and creating greater effort for research implementation (Kashy & Kenny, 2000). Alternatively, this study would collect non-dyadic data from both parties for further data analysis. Besides the initial interview for revising the contents of the questionnaire, the primary data gathering method was an online survey with a random sampling technique. The questions centred on IOT-level variables in interpreting respondents' perspectives of IOTI in logistics outsourcing collaboration.

Finally, this study was conducted with limited financial resources and a limited time framework.

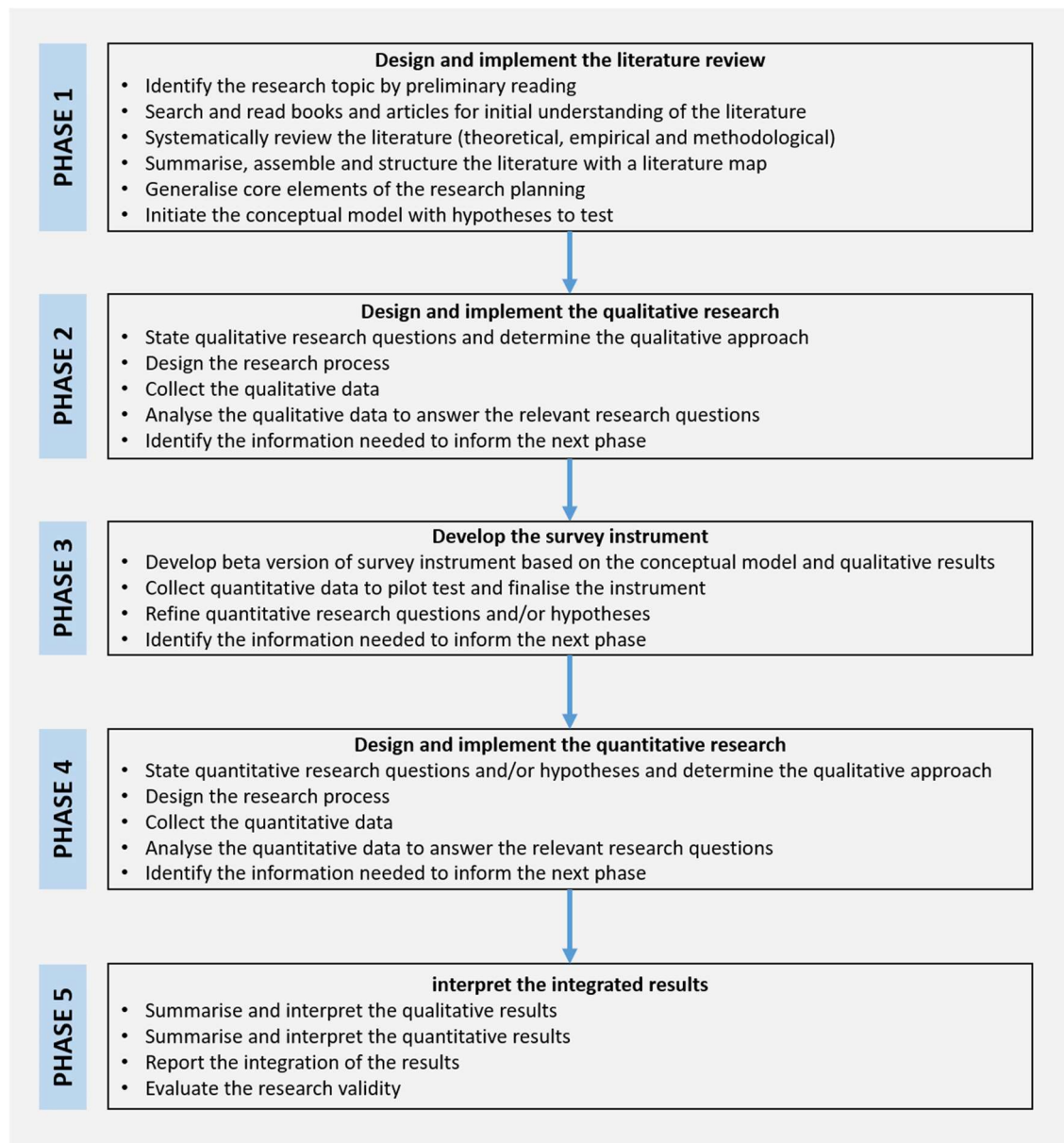
1.6 Research procedure

It is a prerequisite to systematically design and clarify the process of planning a “real world” research project (Gray, 2021). Based on the perspectives of research onion in business and management research (Saunders, Lewis, & Thornhill, 2023), alignment in SCM survey research (Krause, Luzzini, & Lawson, 2018), logic of anticipation in research planning (Blaikie & Priest, 2019), and mixed methods design (Creswell & Clark, 2018), the present study develops a research framework (Figure 1.4) to guide the research activities throughout the period.

Figure 1.4 presents the process flow of implementing the research. As illustrated in the figure, the study first reviewed the literature in three aspects of theoretical foundation, empirical evidence and methodological advancement; multiple survey items were then generated and categorised into respective constructs in the conceptual framework (Phase 1); after the collection and analysis of qualitative data (Phase 2), a beta survey instrument was developed and then pilot-tested in Phase 3 to finalise the survey instrument for further tests; Phase 4 aimed to quantitatively test the hypotheses with a new sample of participants. Finally, qualitative and quantitative results were integrated and interpreted with the evaluation of research validity and reliability (Phase 5). See Section 4.6 for details.

Figure 1.4

Flowchart of research procedures of the study



Note. Adapted from *Designing and conducting mixed methods research* (3rd ed.), by Creswell, and Clark, 2018.

1.7 Summary and organisation of the thesis

Intrigued by the research needs in aspects of meso-level investigation on logistics outsourcing relationship management, the present study initiates three questions to answer during the doctoral research period. Based on the research purposes detailed in Section 1.4, a mixed-method approach is adopted to

implement the research project. Furthermore, the research boundary is clarified, and then the research procedure is introduced.

Focusing on the identified research gap in the literature, the present study extends LORM research into inter-organisational team identification (IOTI) research. From BSEs' perspective, this study investigates and justifies how and to what extent IOTI of BSEs affected team effectiveness and, ultimately, inter-organisational performance within the context of the logistics outsourcing industry.

Furthermore, the findings from the study provides both theoretical and practical implications to academic researchers and industry practitioners:

- **Theoretical implications:**

- Introducing three theories that have never been used in the study of LORM: Social Identity Theory, Self-Categorisation Theory and Common Ingroup Identity Model.
- Exploring LORM from a novel perspective with multiple considerations on micro-foundations, meso-level interactions, and inter-organisational relationships.
- Initiating and testing a comprehensive framework (mediation and moderation) to explain the association between IOTI and team effectiveness.

- **Practical implications:**

- Managers should actively cultivate and maintain IOTI in dual group membership settings to achieve higher level of team performance;
- When setting up and staffing an IOT, managers should be mindful of employees' satisfactory or negative experience with certain colleagues;
- Managers should reconfigure the team whenever needed to avoid contamination of current IOT coordination and further strengthen inter-organisational relationships.

Regarding the organisation of the thesis, the manuscript is organised into seven main chapters. Chapter One introduces the fundamentals of the thesis, including research background, research purposes and questions, and other background information. The second chapter presents and maps the literature review systematically to achieve a theoretical framework. Chapter Three elaborates on the relevant theories to the research topic and then develops a series of hypotheses to test. Chapter Four outlines and explains the research design and methodology used. Specifically, the research philosophy, scenario, procedure and measurements are discussed in detail. Then, the analysing results of qualitative interviews, instrument development and quantitative survey are summarised in Chapter Five. Chapter Six discusses the findings and theoretical and practical contributions of the study. Chapter Seven comprehensively summarises the research, introduces limitations of the study and concludes with recommendations for future research. Finally, the references and appendices are provided.

CHAPTER TWO: LITERATURE REVIEW

To fulfil the research objectives illustrated in Section 1.5, it is a prerequisite to investigate how, when, and why IOTI influences team effectiveness and logistics outsourcing performance. Within the framework of research needs (Section 1.2), this study conducted a multi-step literature review that integrates multi-disciplinary research on team effectiveness with studies on logistics outsourcing relationship management. This chapter synthesised the relevant findings from previous studies to build a theoretical basis for the following empirical research.

2.1 Inter-organisational relationships

Inter-organisational relationships (IORs) have been widely investigated in existing literature between and among business partners. For instance, by linking the manufacturer, its customer and the service supplier, Karatzas, Johnson, and Bastl (2017) testified that relational relationships within this service triad and servitisation improve supply chain performance. Building on the literature on multi-tier supply chains, Wilhelm, Blome, Wieck, and Xiao (2016) identified three main factors — supply chain complexity, the sustainability management capabilities of the first-tier supplier, and the type of sustainability in focus — that determine when and how buying firms extend their sustainability strategies to their sub-suppliers.

Meanwhile, a variety of studies centre on a certain type of inter-organisational relationships, i.e., buyer-supplier relationships (BSRs). Makkonen, Vuori, and Puranen (2016) indicated that attractiveness and adaptations performed by the buyer and the supplier are interlinked and thus able to form a mechanism that catalyses relationship development. Focusing on financial collaboration in the supply chain, Wandfluh, Hofmann, and Schoensleben (2016) examined the role of collaboration in the context of financing a buyer-supplier dyad and its effect on the resulting financing performance.

Furthermore, recent studies have provided many insights into the nature and mechanism of BSRs. Autry and Golicic (2010) developed a relationship strength–performance spiral model and then tested a multiyear sample of 323 BSRs in the construction industry. Their results indicated that relationships tend

to spiral following relationship initiation, and that positive relationship spirals would self-correct following multiple associations of alternating increases. Beyond traditional governance structures (i.e., market and hierarchy) in buyer-supplier relations, Ebers and Oerlemans (2016) developed a typology of hybrid governance structures, suggesting that embeddedness and transaction cost concerns explained different types of hybrid governance structures the firms adopted. In addition, other researchers have developed various approaches and frameworks in this field, such as arm's length versus close cooperative relationships, transaction-relational continuum and buyer-supplier power classifications (Tangpong, Michalisin, Traub, & Melcher, 2015).

By developing a BSR typology with three dimensions: supplier dependence, buyer dependence and relationalism, Tangpong et al. (2015) indicated that each of the eight BSR types they proposed has its own characteristics and mechanisms of influencing the performances of both buyers and suppliers. Similarly, Vesalainen and Kohtamäki (2015) developed a three-dimensional (economic, structural, and social) framework to distinguish BSRs and to demonstrate the link between relational configurations and performance. Kim and Choi (2015) proposed an expanded BSR typology extending from the traditional cooperative-adversarial dichotomy in the literature. By concurrently considering two orthogonal aspects — relational posture and relational intensity, they proposed four types of BSRs. Being labelled as deep, sticky, transient, and gracious, respectively, each individual relationship type is associated with different relational outcome trade-offs.

In brief, firms' behaviours and actions coexist in BSR dynamics. It is important to differentiate relationship management strategies and activities to guide the efficient interaction between buyers and suppliers (Liu, Luo, & Liu, 2009; Oosterhuis, Molleman, & van der Vaart, 2013).

2.2 Interpersonal relationships

2.2.1 The human factors in SCM

In the SCM discipline, the human dimension of the supply chain and the high impact of human factors on firm and supply chain performance are widely acknowledged (Hohenstein, Feisel, & Hartmann, 2014; Keller & Ozment, 2009).

Firstly, from the operations perspective, the “right talent” should be addressed, ensuring the effective execution of either cross-functional or cross-organisational collaboration (Stank, Paul, & Autry, 2011). For instance, Essex, Subramanian, and Gunasekaran (2016) identified that supply chain managers are supposed to use their skills and past experiences during daily work effectively, and there is a sequential relationship between the three constructs of personal capabilities, individual, and firm performance. With regards to manager skills, Thornton, Esper, and Autry (2016) examined the influence of organisational politics and concluded that, if a top supply chain manager is politically skilled, the level of supply chain orientation can increase because this executive can efficiently navigate the firm’s organisational politics and thus reduces barriers of resistance to the needs of the SCM department. Focusing on the factors related to employees, Vivares-Vergara, Sarache-Castro, and Naranjo-Valencia (2016) found that firm performance can be improved in two ways: by involving individual features such as motivations, personal goals, and abilities in operations strategy decision-making, or by helping employees reach a higher level of satisfaction and job performance. Similarly, to understand how human capital impacts supply chain performance, Keller and Ozment (2009) analysed both frontline and management-level issues from a comprehensive perspective of recruiting, developing, supervising and retaining high-quality logistics personnel.

Secondly, from a strategic perspective, combining the management of the supply chain and human resources is considered a firm’s capability enabling the strategic fit between supply chain structure and strategy and, ultimately, the improvement of supply chain performance (González-Loureiro, Dabic, & Puig, 2014). For example, Huo et al. (2015) pointed out that human resource

management (HRM) plays a strategic role in supply chain integration (SCI) to achieve sustainable growth. By categorising employee skills, incentives and participation into one group — high-involvement HRM practices — the authors examined the strategic alignment between HRM and SCI. They recommended that a firm aiming to achieve a unique competitive advantage should adopt a relational approach to HRM and SCM, i.e., the co-development of human-related strategies and actions within and across firm boundaries.

Lastly, from a competence perspective, talented human resources can offer a unique source of sustainable competitive advantage by improving supply chain performance (Ding, Kam, Zhang, & Jie, 2015; Thornton, Esper, & Morris, 2013). For example, Huo et al. (2016) empirically investigated the impacts of human capital on SCI and firm performance. They found that both managers' and employees' multi-skilling positively affect the firm's internal integration and, ultimately, its competitive performance. In purchasing and supply management (PSM), Schulze, Bals, and Johnsen (2019) explored the influences of individual competencies on organisational sustainability. Based on a literature review and qualitative interview, they proposed a comprehensive model, highlighting various forms of competencies (functional-, cognition-, social- and meta-oriented) and the necessity of training programs for those competencies.

Among all research efforts in this interdisciplinary field, several authors concurred that the human factor is a critical element in SCM: the logistics process within a supply chain is essentially "human-centric" (Myers, Griffith, Daugherty, & Lusch, 2004); the supply chain is a "human chain", and SCM is all about the people who manage supply chains (Sweeney, 2013); the competitive advantage can be achieved by aligning organisations' human capital needs and their supply chain strategies (Harvey, Fisher, McPhail, & Moeller, 2013). Therefore, it is evident that human factors are significantly important as they have great potential to influence the inter-organisational interactions and the total supply chain effectiveness.

2.2.2 Boundary-spanning employees (BSEs) and boundary-spanning activities

Boundary spanning theory indicates that BSEs facilitate intergroup transactions and strengthen relationships (Adams, 1976; Aldrich & Herker, 1977). To be more specific, four factors may affect the behaviour of the individuals and/or the organisations involved in inter-organisational collaboration: 1) the nature of a BSE's relationship with his/her home organisation; 2) the interaction between BSE and external organisation; 3) BSE's personal characteristics; and 4) the relationship between BSE's home organisation and the external organisation (Adams, 1976).

Acting as organisational representatives with multiples roles in different contexts (Table 2.1), BSEs receive and distribute information to internal actors and harmonise the relationship between flexibility demand from the environment and stability needs within the home organisation (Colman & Rouzies, 2019; Leifer & Delbecq, 1978). In the literature, scholars have examined the role of BSEs between teams (Somech & Khalaili, 2014), between organisational function and external environments (Russ, Galang, & Ferris, 1998), between domestic partner firms (Huang, Luo, Liu, & Yang, 2016), and between global partner firms (Søderberg & Romani, 2017).

Table 2.1

Roles of boundary-spanning employees (BSEs)

Role	Description	References
Gatekeeper	Protects an organisation against external threats	Adams (1976)
Broker	Improve knowledge management across boundaries	Dyer and Nobeoka (2000)
Bridge builder	Connects organisations and people by negotiating and managing potential conflicts through careful interventions	K. L. Johnson and Duxbury (2010)

Translator	Assists in interpreting a lesser known context (e.g., between business users and IT experts)	Mahnke, Wareham, and Bjorn-Andersen (2008)
Cultural liaison / Transnational intermediary	Establishes a common cognitive ground depending on foreign language skills	Barner-Rasmussen, Ehrnrooth, Koveshnikov, and Mäkelä (2014)

Note. Adapted from “Boundary spanners in global partnerships: A case study of an Indian vendor’s collaboration with western clients”, by A.-M. Söderberg and L. Romani, 2017. *Group & Organization Management*, 42(2), 237-278. <https://doi.org/10.1177/1059601117696618>

On the other hand, there are numerous studies on boundary-spanning activities, “activities of members or agents of an organisation that serve to functionally relate the organisation to its environment” (Adams, 1980, p. 326). BSEs influence collaboration by performing various boundary-spanning functions, such as processing information, maintaining an organisational image, using expertise to influence external partners, etc. (Zhang et al., 2011). In the context of inter-organisational relationships, boundary-spanning activities have been investigated from different perspectives and contexts. This diversity is exemplified in many topics, such as the effects of BSEs’ identification on intergroup relations (Richter et al., 2006), BSE’s role in servitised supply chains (Chakkol, Karatzas, Johnson, & Godsell, 2018), BSEs’ interpersonal relationship and interfirm conflict (Cai et al., 2017), and boundary-spanning activities and inter-organisational trust (Zhang et al., 2011).

From a systematic perspective, Palus, Chrobot-Mason, and Cullen (2014) further explored those activities by categorising and synthesising them into three boundary-spanning strategies (Table 2.2).

In summary, the extant literature has extensively addressed that BSEs play a critical role in inter-organisational relations. In performing boundary-spanning activities, they manage inter-organisational interactions and facilitate collaborations across organisational boundaries.

Table 2.2*Boundary spanning strategies and activities*

Form of collaboration	Boundary spanning strategy	Boundary spanning activity
Transactional	Managing the boundaries, by acknowledging and respecting differences	<i>Buffering</i> : defining and clarifying group identities within each group and then creating intergroup safety and protection
		<i>Reflecting</i> : seeing each side of a boundary and sensitizing each group to the other's values and expertise to develop an intergroup respect that paves the way for collaborative work
Transformative	Forging common ground, by connecting and mobilizing parties to go beyond their differences	<i>Connecting</i> : creating person-to-person linkages and building trust
		<i>Mobilizing</i> : developing a community and an understanding of common purpose
Transformative	Discovering new frontiers, by transforming the relationship into one that is new and inclusive.	<i>Weaving</i> : advancing interdependence and integrating each distinct group into a larger collective
		<i>Transforming</i> : uniting multiple groups to enable reinvention

Note. Compiled from “A field-of-practice view of boundary-spanning in and across organizations: Transactive and transformative boundary-spanning practices”, by N. Levina and E. Vaast, In J. L. F. C. L. Cooper (Ed.), *Boundary-spanning in organizations: Network, influence and conflict* (pp. 295-317), 2013, Routledge and “Boundary-spanning leadership in an interdependent world”, by C. J. Palus, D. L. Chrobot-Mason and K. L. Cullen, In J. L. F. C. L. Cooper (Ed.), *Boundary-spanning in organizations: Network, influence and conflict* (pp. 216-239), 2014, Routledge. <https://doi.org/10.4324/9780203488058-18> and “Boundary spanners in global partnerships: A case study of an Indian vendor's collaboration with western clients”, by A.-M. Sørderberg and L. Romani, 2017. *Group & Organization Management*, 42(2), 237-278. <https://doi.org/10.1177/1059601117696618>

2.3 Meso-level interactions

2.3.1 Micro-Macro divides

The management discipline has different conceptualisations of the micro-macro divide among scholars in different sub-domains (Appendix 1). For example, in Strategy Management, micro entities refer to firms, and macro-entities are generally industries, regional clusters or even economies. In contrast, in the subdomain of Organisational Behaviour, individuals are considered micro and organisational are considered macro (Molloy, Ployhart, & Wright, 2011). To explore the linkage between those two levels of entities, the scholars have come to a consensus that there are two fundamental processes across the hierarchical systems: 1) top-down, contextual effects whereby higher-level phenomena constrain, shape, and influence different lower-level phenomena and 2) bottom-up emergence whereby dynamic interaction processes among lower-level entities yield phenomena that manifest at higher, collective levels (Kozlowski, Chao, Grand, Braun, & Kuljanin, 2013). However, conceptual and methodological separations still exist between micro- and macro-level studies (Barney & Felin, 2013). The resulting lack of coherence in theoretical implications and empirical evidence implies that a critical causal link may need to be added in this process (Devinney, 2013).

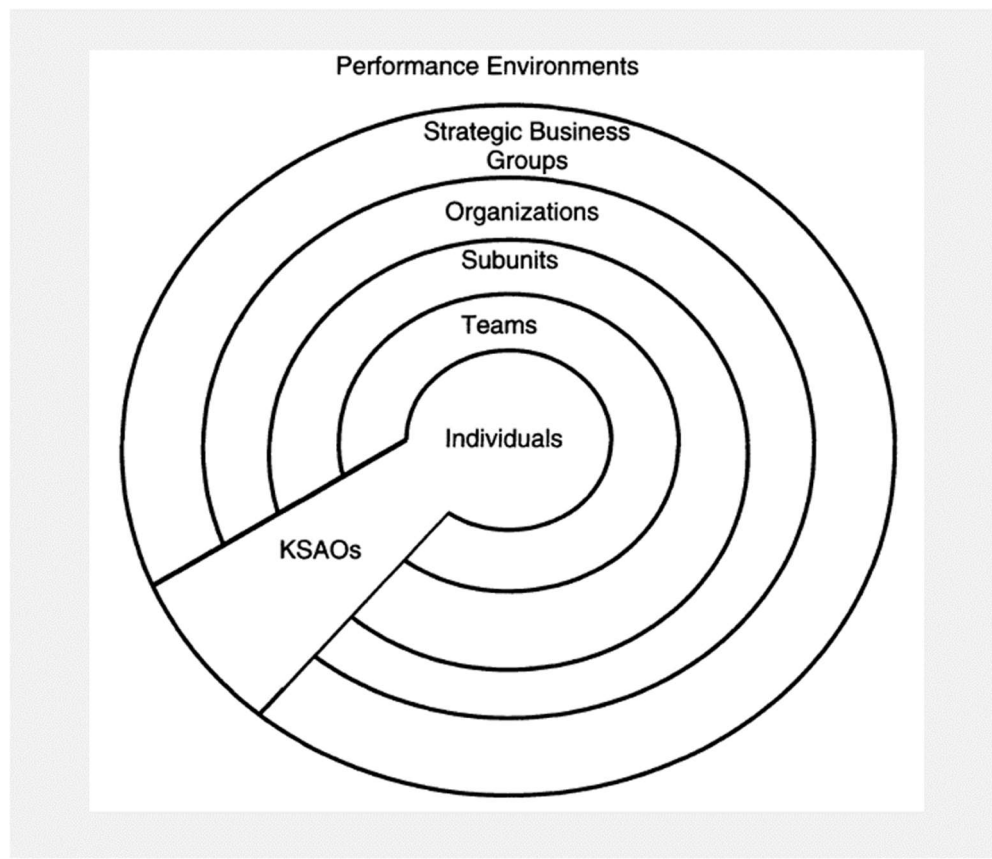
To bridge the micro-macro divides and better understand diverse phenomena within a broader supply chain hierarchical system, House, Rousseau, and Thomashunt (1995) suggested the use of “meso” to integrate micro and macro perspectives in the research.

2.3.2 Micro-Meso-Macro-level mechanism

As introduced in Section 1.2.2, in this thesis, “micro” refers to the individual, “meso” refers to the team, and “macro” refers to the organisation and higher levels. The meso-theorising integrates micro- and macro- level variables to define and elucidate their relationship in one model (Schorsch et al., 2017).

Figure 2.1

Meso-theory nesting of organisational entities



Note. From “An examination of the effects of organizational district and team contexts on team processes and performance: A meso-mediational model” by J. E. Mathieu, M. T. Maynard, S. R. Taylor, L. L. Gilson and T. M. Ruddy, 2007, *Journal of Organizational Behavior*, 28(7), 891-910.
<https://doi.org/10.1002/job.480>

As illustrated in Figure 2.1, any effect or consequence of those phenomena is conceived of as the result of “a confluence of influences emanating from different levels of analysis” (Mathieu, Maynard, Taylor, Gilson, & Ruddy, 2007, p. 897).

This nested layering arrangement of organisational entities is pivotal to meso-frameworks in the research (e.g. Barden & Mitchell, 2007; Gupta, Ho, Pollack, & Lai, 2016; Kim, Wennberg, & Croidieu, 2016). In recent years, the topic of work teams has been emerging as a focus of research interest on various organisational phenomena. In this context, the meso-thinking approach facilitates the study of diverse mechanisms in specific scenarios of either cross-level influences or emergent phenomena (e.g. Ambivalence in organisations,

Ashforth, Rogers, Pratt, & Pradies, 2014; interpersonal citizenship behaviour, Chung, Park, Moon, & Oh, 2011; intergroup leadership and relational identity, Hogg et al., 2012).

To explain mechanisms spanning micro and macro levels of phenomena, Coleman (1990) proposed the bathtub model with three types of mechanisms (Figure 2.2.a):

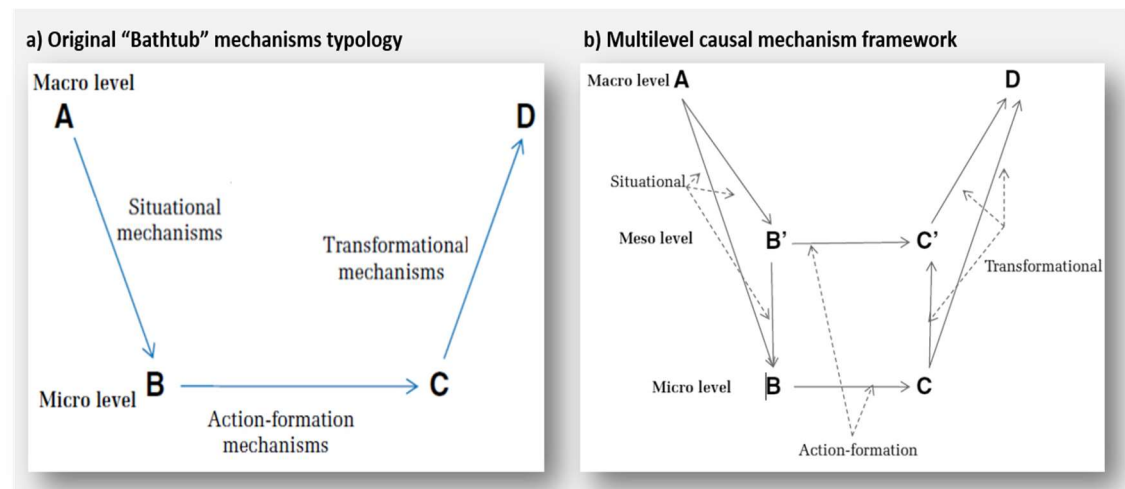
- situational mechanisms (AB) that address how macro environments have an impact on actors' opportunities, goals and beliefs.
- Action-formation mechanisms (BC) that illustrate how those opportunities, goals, and beliefs affect actors' behaviour.
- Transformational mechanisms (CD) that explain how actors' joint behaviours generate macro-level outcomes.

For a comprehensive model with meso-level concern, Kim et al. (2016) extend the range of this mechanism by introducing B' and C' as meso-level casual and outcome constructs, respectively.

As shown in Figure 2.2.b, this three-level framework links all possible pathways among three causal units (A, B' and B) and then illustrates all causal pathways for situational, action-formation, and transformational mechanisms (e.g., BB', B'C' and C'D). Within this framework, contextual factors (macro-level) constrain different lower-level phenomena (meso- or micro-level) embedded in the organisational system. For example, environmental uncertainties influence team cohesion at the meso level, which has implications for individual perceptions of psychological safety. Conversely, individual interaction (micro-level) brings about bottom-up emergent phenomena that manifest as collectives at a higher level (meso- or macro-level) (S. W. J. Kozlowski & Klein, 2000). For example, team members may collaborate over time and develop emergent cognition, affect and/or behaviour at the team (meso-) level, sometimes influencing organisational or even supply chain level performance (macro-level).

Figure 2.2

Bathtub Model



Note. Compiled from "Rational action, social networks, and the emergence of norms" by J. S. Coleman In C. Calhoun, M. W. Meyer, & W. R. Scott (Eds.), *Structures of Power and Constraint* (pp. 91-112), 1990, Cambridge University Press and "Untrapped riches of meso-level applications in multilevel entrepreneurship mechanisms" by P. H. Kim, K. Wennberg and G. Croidieu, 2016, *Academy of Management Perspectives*, 30(3), 273-291. <https://doi.org/10.5465/amp.2015.0137>

To apply the meso-mediation logic in the above bathtub framework, conducting micro-foundations research is essential to build up a theoretical basis for achieving "empirical corroboration" (Felin, Foss, & Ployhart, 2015, p. 579).

2.3.3 Micro-foundations of supply chain interaction

In general, micro-foundations refer to organisational members' activities and practices. Microfoundational thinking enables researchers to explore supply chain interaction across levels of analysis (Devinney, 2013). Fugate, Thomas, and Golicic (2012) testified to the role of human judgment and decision-making in managing BSRs. Their research showed that if supplier employees are willing to cope with time pressure, employees from buying firms would not actively engage in collaborative behaviours and, in high-magnitude relationships, such willingness from the supplier side would lead to intensified negative effects on closer BSRs.

Moreover, the micro-foundational approach aims to decompose collective concepts with their lower-level components, explore how the interaction of individuals leads to emergent and collective outcomes, and investigate how relations between macro variables are mediated by micro-actions and interactions (Felin et al., 2015). Felin and Foss (2005) pointed out that any research topic at an organisational level (capabilities, knowledge, learning, identity) should be fundamentally based on the understanding of the individuals in terms of their underlying nature, abilities, heterogeneity, expectations and motivations. The main reason is that “organisations are made up of individuals, and there is no organisation without individuals” (p. 441).

In the supply chain literature, micro-foundations research clearly identified that interpersonal interaction has a large impact on the IORs (e.g. Cai et al., 2017; Durach & Machuca, 2018). As exemplified by Ireland and Webb (2007), trusting working relations rely on the individuals who regularly interact with one another across firm boundaries. Similarly, González-Loureiro et al. (2014) noted that the organisation reflects the managers’ attitudes, skills, abilities and personality traits; thus, firm performance can be partly predicted by the characteristics of the managerial team. Therefore, it can be seen that a micro-level understanding of individuals, their behaviours, and their social interactions with other individuals in the supply chain is supposed to facilitate the explanation of higher-level behaviours and outcomes. While at the same time, the social-psychological consequences of those behaviours can reversely affect an individual’s social cognition and motivation, which are closely relevant to the formation and development of multilevel relationships (Geen, 1991).

As for interorganisational relations and BSEs, it is valuable to utilise the variables that explain the formation of interpersonal interaction to explain the creation of inter-organisational partnerships (Brass, Galaskiewicz, Greve, & Tsai, 2004). For example, Thornton et al. (2013) explored such interaction by extending the concept of counterproductive work behaviours in a SC context. Building on this insight, they developed a new term for supply chain counterproductive work behaviours that occur across firm boundaries and pointed out that BSEs’ such behaviours (avoiding, withholding, confounding, shifting, and emoting) would

deteriorate interfirm trust, undermine interfirm relationships, and negatively impact the supply chain performance. In the context of a mobile phone distribution network, Cai et al. (2017) investigated a unique type of interpersonal relationship between BSEs, namely *guanxi* (connection), in China. Their research results indicated that the frequency of BSEs' interactions and developing interpersonal *ganqing* (relations) between the manufacturer and its retailers would influence interfirm favour exchanges and, in turn, conflicts. Focusing on interorganisational conflict and related behaviour in industrial buyer-seller relationships in China, Z. Zhang and Zhang (2013) argued that the *guanxi* between representatives of business partners is negatively related to the manifest conflict at the organisational level. Furthermore, several other authors also noted this phenomenon and explored relevant topics such as supply chain citizenship (Esper, Bradley, Thomas, & Thornton, 2015), managerial ties, trust and opportunism (Wang, Ye, & Tan, 2014), organisational implants and innovation (Grawe et al., 2014), and key contact employees and collaboration (Charvet & Cooper, 2011). Nevertheless, the literature is fragmented in aspects of the meso-mechanism through which BSEs' engagement with external counterparts affects IORs and, ultimately, outsourcing performance. In other words, it is potentially innovative to explore the functions of inter-organisational teams that implement logistics outsourcing practices in the business reality.

2.4 Inter-organisational team identification

In the context of logistics outsourcing collaboration between LSPs and their customers, inter-organisational arrangements (e.g., inter-organisational teams, IOTs) are widely implemented, through which BSEs and their organisations come together for confined tasks within a limited period of temporary alliance (Bakker & Knoblen, 2015).

Specifically, IOTs were defined as a group that "composed of members, representing origin organisations and community constituencies, who meet periodically to make decisions relevant to their common concerns, and whose behaviour is regulated by a common set of expectations" (Schopler, 1987, p. 703). Unlike intra-organisational teams, IOTs consist of members with distinct organisational identities and obligations, engage in diverse interactions with

external partners/environments, and encounter considerable conflict and pressure (Drach-Zahavy, 2011). Therefore, identification in such an inter-organisational team, i.e., Inter-organisational Team Identification (IOTI), has been identified as a critical criterion in team functioning research. If team members share the common feeling of belonging, this process is defined as team identification (Ashforth & Mael, 1989; Turner, 1984). Accordingly, such a psychological bond between an individual and his/her team increases this member's desire to maintain membership and results in greater loyalty to the team (Bishop & Scott, 2000). In contrast, a lower level of identification with the team reduces their inclination to act in the interest of the collective and leads to frustration that results in a negative team experience (Ashforth & Mael, 1989). In other words, a team with a shared sense of collective identification will be better able to achieve common goals. At the collective level, prior research has found that team identification implies the improvement of team effectiveness with regard to team performance (Bayazit & Mannix, 2003), organisational citizenship behaviours (Bergami & Bagozzi, 2000), and team effectiveness (Henttonen, Johanson, & Janhonen, 2014).

Compared with traditional teams, IOTs engage more often and intensively in boundary-spanning activities. The team consists of representatives from the partnering organisations with distinct or even conflicting organisational identities (Drach-Zahavy, 2011). According to Social Identity Theory (SIT), team members categorise themselves as an ingroup and define members of other teams as outgroups (Ashforth & Mael, 1989; Hogg & Terry, 2000). On the contrary, if IOT members recategorise those groups into higher-order ones, then they would potentially transform their perceptions from "us" and "them" to "we", leading to the emergence of a superordinate, inclusive group identity (Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993). Extending the arguments of Gaertner et al. (1993) and Hogg and Terry (2000) into IOT contexts, it is reasonable to conclude that BSEs who identify strongly with both home organisations and IOTs would possess harmonious and effective relationships with their counterparts from the partnering organisations. Such teams may be joint new-product-development teams (Stock, 2014), buyer-supplier teams (Knoppen & Sáenz, 2017),

manufacturing and marketing teams (Hu, Wu, & Gu, 2019) and infrastructure project teams (Aaltonen & Turkulainen, 2018). As a result, the team members have dual identities, i.e., home organisation identification (HOI) and inter-organisational team identification (IOTI). In SCM and operations management field, previous research has examined the relevant topics such as the effects of supplier-to-buyer identification on operational performance (Corsten, Gruen, & Peyinghaus, 2011), buyer-supplier team characteristics and its impact on supply chain performance (Knoppen & Sáenz, 2017) and knowledge transfer between buyer and supplier partners (Hernández-Espallardo, Rodríguez-Orejuela, & Sánchez-Pérez, 2010).

In the extant literature on SCM, there is consensus that both team identification and organisational identification lead to a significant number of behavioural and psychological consequences such as BSEs in servitised supply chains (Chakkol et al., 2018), supply chain citizenship (Esper et al., 2015), supply chain orientation (Robinson, Manrodt, Murfield, Boone, & Rutner, 2018) and team psychological safety (Knoppen & Sáenz, 2017). Likewise, it is reasonable to derive that IOTI directly or indirectly influences interorganisational behaviours and processes and ultimately drives collective performance.

2.5 Team effectiveness and Input-Mediator-Outcome (IMO) Model

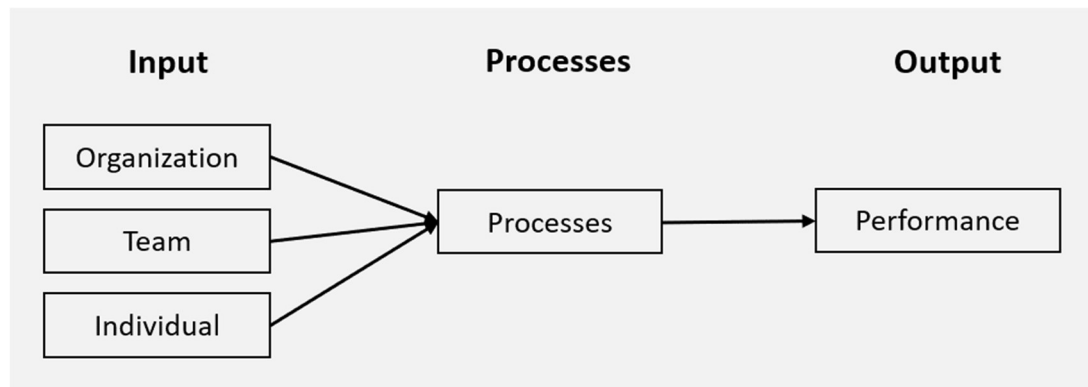
In the literature, team effectiveness was generally defined as the output of team behaviour (Gladstein, 1984). In most cases, it was perceived as another name for team performance (Guzzo & Dickson, 1996; Kozlowski & Ilgen, 2006). The overwhelming evidence suggests that, though most studies focused on the who, how and what that promotes teamwork, there is no formal definition or unique measures of team effectiveness (Driskell, Salas, & Driskell, 2018; Mathieu, Maynard, Rapp, & Gilson, 2008). However, team performance is still the most widely studied in the extant literature.

Given the growing importance of team/group-based organisation structure in today's business world, scholars from a variety of disciplines have implemented extensive research on team functioning and effectiveness (e.g. Adamovic, 2018

in Human Resource Management; Christian, Christian, Pearsall, & Long, 2017 in Organisational Behaviour; Driedonks, Gevers, & van Weele, 2010 in Supply Chain Management; Gibson, Cooper, & Conger, 2009 in Applied Psychology; Grote, Kolbe, & Waller, 2018 in Organisational Psychology; Semrau, Steigenberger, & Wilhelm, 2017 in Managerial Psychology). To systematically investigate the process and identify the relevant factors, most studies tested their proposed integrated model based on the IMO (Input–Mediator–Output) framework, which is the most popular foundational model in the team effectiveness literature (Ilgen, Hollenbeck, Johnson, & Jundt, 2005).

Figure 2.3

Input-Process-Output (IPO) Model



Note. From *Social psychology: A brief introduction* by J. E. McGrath, 1964, Holt, Rinehart and Winston.

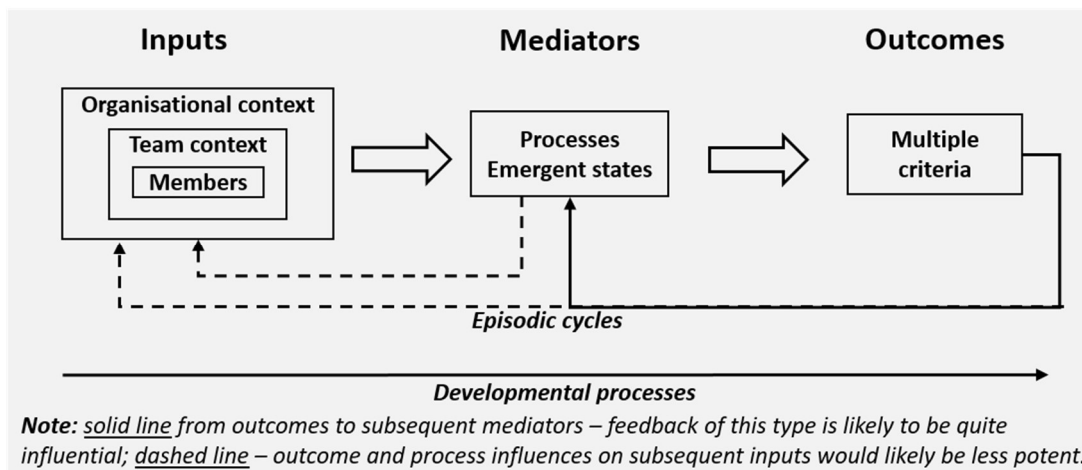
In the 1960s, McGrath (1964) initiated Input-Process-Output (IPO) framework for team effectiveness study (Figure 2.3). This model defines how input affects team outcomes by enabling and facilitating the interaction (i.e., process) among team members. By addressing that this framework cannot distinguish between factors that are genuinely behavioural processes or those that are psychological properties of the team, Marks, Mathieu, and Zaccaro (2001) proposed the concepts of “emergent states” as mediating mechanisms within the model.

Based on these research contributions, Mathieu et al. (2008) developed an Input-Mediator-Outcome (IMO) model to holistically test a variety of scenarios of team effectiveness (Figure 2.4).

In this model: 1) inputs represent the initial conditions of a group; 2) mediators can be either processes that demonstrate interactions among team members or emergent states illustrating “cognitive, motivational, and affective states of teams” (Marks et al., 2001, p. 357); 3) outcomes might be task or non-task related consequences of a group’s functioning; 4) two approaches to illustrate temporal dynamics in team function: developmental processes (the influences of various factors on teams over time) and episodic cycles (different team process at different times in a cyclical fashion).

Figure 2.4

Input-Mediator-Outcome (IMO) Team Effectiveness Framework



Note. Adapted from “Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future” by J. E. Mathieu, M. T. Maynard, T. Rapp and L. Gilson, 2008, *Journal of Management*, 34(3), 410-476. <https://doi.org/10.1177/0149206308316061>

Covering the period of past two decades, a significant number of empirical studies have validated different versions of this model (see Table 2.3 for a summary). For example, Jessica R Mesmer-Magnus, Asencio, Seely, and DeChurch (2018) examined how organisational identity affects team functioning in aspects of team affect, behaviour and performance; from a multilevel perspective, Michinov and Juhel (2018) tested the mediating effect of transactive memory between team identification and team effectiveness; Rego et al. (2019) testified a heterogeneous effect of leader humility (input), which facilitates the

development of team psychological capital (emergent state) and task allocation (process) and ultimately improves team performance (outcome).

To summarise, the IMO model facilitates the predictive reasoning of the magnitude of effects in the proposed causal relationship: inputs can affect the processes and emergent states and — depending on the contextual factors within or outside of the team — the resulting outcomes may include various levels of team effectiveness. Concerning the conceptual distance among variables in the model, it is apparent that inputs are distal to outcomes, which may indirectly affect the latter through malleable mechanisms. Under specific functioning episodes, those distal inputs (e.g., team personality) can exert effects on proximal mechanisms (e.g., team psychological safety) and, in turn, build up weaker relationship outcomes (e.g., team performance at a lower level and the firm's operational performance at a higher level).

Table 2.3*Brief review of components in the IMO Model*

Category	Components	Definition	Sampling variables	References
Input	Team composition	<p>“The configuration of member attributes” (Bell, Brown, Colaneri, & Outland, 2018, p. 349);</p> <p>“Can be categorised as team internal context” (Maloni & Carter, 2006, p. 26)</p>	Surface-level attributes (demographic diversity; age, sex, role); Deep-level attributes (personality, knowledge; ability; attitude diversity; functional diversity; teamwork; leader humility)	Bell et al. (2018)
	Team-level input		Team training; Shared leadership; Network density; Leader behaviours; Team responsibility; Goal orientation; Expert inclusion; Social loafing; Collective orientation	Eaidgah, Abdekhodae, Najmi, and Arab Maki (2018); Michinov and Juhel (2018)
	Organisational context	“Sources of influence that are external to the team, yet emanate from the larger organisational system within which they are nested” (Mathieu et al., 2008, p. 454)	Openness climate; Technology uncertainty; Team-based HR policies; Contextual performance pressure; Routine/nonroutine	J. E. Mathieu, Gilson, and Ruddy (2006)
	Environmental context	“Sources of influence that emanate from outside of the organisation yet	Culture (individualism – collectivism); Environmental	Maloney et al. (2016)

		influence team functioning” (Mathieu et al., 2008, p. 454)	stability; Internationalisation; Global integration; Local responsiveness	
Mediator	Process (behaviour)	“Functions that individuals must perform to accomplish the team’s task (taskwork) or the interaction between team members (teamwork)” (Mathieu et al., 2008, p. 420)	Transition process; Action process; Interpersonal process; Cooperation; Team processes; Team member monitoring; Aiding; Giving instructions; Information exchange; Conflict management; Collaborative planning; Teambuilding; Team adaption; Team implicit coordination; Self-managing behaviours; Boundary-spanning behaviours; Task debate; Team goal monitoring; Information sharing; Communication; Team-member exchange	Banks et al. (2014); Christian et al. (2017)
	Emergent states	Team affect “The extent to which members are emotionally engaged with the collective” (Jessica R Mesmer-Magnus et al., 2018, p. 1536)	Team psychological safety; Team trust; Team cohesion; Team potency; Service climate; Group atmosphere; Team commitment; Team efficacy; Team trustworthiness; Psychological collectivism	Bishop and Scott (2000); Costa, Fulmer, and Anderson (2018)

	Team cognition	“The manner in which knowledge important to team functioning is mentally organized, represented, and distributed within the team and allows team members to anticipate and execute actions” (DeChurch & Mesmer-Magnus, 2010, p. 33)	Team mental model; Transactive memory system; Strategic consensus; Team declarative knowledge; Interaction patterns	Cannon-Bowers and Salas (2001); Dao, Strobl, Bauer, and Tarba (2017)
	Blended	A hybrid of processes and emergent states	Team learning; Behavioural integration	Kostopoulos, Spanos, and Prastacos (2013)
Outcome	Team performance	Team-level	Team process improvement; Team innovativeness; Team performance	Bushe and Coetzer (2007)
		Organisational	Profitability; Financial ratio; Customer satisfaction	Bunderson and Sutcliffe (2002)
		Role-based	Decision accuracy; Decision speed;	G. Chen, Kirkman, Kanfer, Allen, and Rosen (2007)
	Member's affect & viability		Job satisfaction; Team/organisational commitment; Team viability	Barrick, Bradley, Kristof-Brown, and Colbert (2007)

Note: Compiled from “Team effectiveness 1997-2007: A review of recent advancements and a glimpse into the future” by Mathieu, M. T. Maynard, T. Rapp and L. Gilson, 2008, *Journal of Management*, 34(3), 410-476.

<https://doi.org/10.1177/0149206308316061> and “Team performance archetypes: Toward a new conceptualization of team performance over Time” by N. R. Quigley, C. G. Collins, C. B. Gibson and S. K. Parker, 2018, *Group & Organization Management*, 43(5), 787-824. <https://doi.org/10.1177/1059601118794344>

2.6 Logistics outsourcing

2.6.1 Logistics outsourcing relationship management (LORM)

The definition of logistics outsourcing first appeared in academic literature in the late 1980s. Most of the early conceptualisations in this field were general and broad. For example, Ellram and Cooper (1990) define LSPs as “outside parties who provide functions not performed by the firm” (p. 1). Besides that, a typical description of logistics outsourcing is “the use of a third-party provider for all or part of an organisation’s logistics operations” (Lambert, Emmelhainz, & Gardner, 1996, p. 7). After the initial stage of exploring and justifying the usage of “logistics outsourcing”, the concept evolved toward complex service offerings, resulting in greater complexity in relationships with the emphasis on alliance and long-term commitments, as opposed to traditional arm’s-length arrangements (e.g. Brekalo & Albers, 2016; Leuschner et al., 2014). Over the last years, the outsourcing trend has been continuously growing and thus promoted the evolution of the concept. To emphasise the close relationship between service supplier and buyer, Hsiao, van der Vorst, Kemp, and Omta (2010) defined logistics outsourcing as “a process that involves the use of external logistics companies to perform activities that have traditionally been performed within an organisation, where the shipper and logistics company enter into an agreement for delivering services at specific costs over some identifiable time horizon” (p. 396). Given the incredible complexity of services offered and high level of inter-organisational commitments, logistics outsourcing can be seen as “a relationship between a shipper and third-party which, compared with basic services, has more customised offerings, encompasses a broader number of service functions, and is characterised by a longer term, more mutually beneficial relationship”(Leahy, Murphy, & Poist, 1995, p. 5).

As suggested by Capgemini Consulting and Langley (2016), although increased use of outsourcing continues to outpace moves to insourcing, it might still be necessary to explore the effective mechanism of relationship management through which logistics outsourcing influences mutual benefits of both LSPs and their customers.

It is well-accepted that relationship management is a pivotal determinant for successfully implementing various SCM initiatives (Gadde & Hulthén, 2009). Specifically, LORM focuses on the relationships between LSPs and their customer firms, where logistics services are offered within a certain period, aiming to improve the effectiveness and efficiency of logistics operations (Bask, 2001). Over the past two decades, academic research in SCM, purchasing and marketing has examined how relationship management has facilitated the implementation of logistics outsourcing to create value and improve firm performance. For example, Hartmann and de Grahl (2012) examined how customer partnering behaviours — operational information exchange, planning, sharing of benefits and burdens, and extendedness — influence logistics outsourcing performance and provided valuable advice to the firms on how to manage the relationship with their LSPs successfully. Centring on distinct aspects of culture and its influences on relationship management, Wallenburg, Cahill, Goldsby, and Knemeyer (2010) examined how goal achievement and goal exceedance influence the aspects of loyalty (retention, extension and referral) in logistics outsourcing relationships.

In recent years, LORM has received considerable attention (refer to the literature reviews by Aguezzoul, 2014; Daugherty, 2011; Maloni & Carter, 2006; Marasco, 2008). Notably, a few relevant topics also draw particular attention, including supply chain risk management (König & Spinler, 2016; Manuj, Esper, & Stank, 2014), relationship sustainability and loyalty (Cahill, Goldsby, Knemeyer, & Wallenburg, 2010; Kudla & Klaas-Wissing, 2012), inter-organisational learning (Panayides, 2007) and knowledge management and innovation (Grawe et al., 2015; Wagner & Sutter, 2012). Moreover, it is worth noting that a multitude of different terms are being used to describe logistics outsourcing relationships between a buyer and a supplier (e.g., 3PL relationship, shipper-LSP relationship, logistics outsourcing partnership, logistics collaboration, etc.), indicating a reflection of the complexity and diversity of LORM in practice. A reasonable explanation is that the firms' requirements for outsourced logistics services have evolved to higher levels of complexity and precision. Consequently, their LSPs can potentially be engaged in multi-dimensional relationships with different

partners at different levels (Daugherty, 2011). For example, Hofer, Smith, and Murphy (2014) explored the spill-over effects within a triadic relationship that involves three participants — a firm, its customer, and an LSP. On the one hand, a firm's strategic orientation towards its customer will affect its relationship with other business partners (e.g., the LSP that operates between the firm and its customers); on the other hand, working closely with the LSP is an efficient and effective means to increase customer value in aspects of improved delivery performance, quick logistics system responsiveness, and reduced logistics costs. Such interlinked relationships imply the importance and enormous potential of LORM in improving supply chain performance (Hofer, Knemeyer, & Murphy, 2015).

Another emerging trend of LORM is that LSPs are commonly engaged in strategic coordination of their customer's supply chain activities and therefore starting to play an orchestration role. For example, Zacharia, Sanders, and Nix (2011) pointed out that leading supply chains requires 3PLs to play an advanced role more than merely providing traditional logistics capabilities. From a multi-theoretical perspective, they further proposed a governance-centred model and empirically testified the evolution of the LSPs' role, i.e., becoming orchestrators of supply chains that create and sustain a competitive advantage (Zacharia et al., 2011).

In addition to those unique characteristics of LORM, it is also gradually recognised that if outsourcing relationship is not clearly defined and practiced logistics outsourcing can threaten corporate failure and disappointment (Qureshi et al., 2007). However, in contrast with the growing trend of topics on material goods relationship management such as relational capital (Roden & Lawson, 2014), power asymmetry (Nyaga, Lynch, Marshall, & Ambrose, 2013), supplier reputation (Wagner, Coley, & Lindemann, 2011), and value co-creation (González-Loureiro et al., 2014), there is a significant lack of similar level of research on service relationship management, of which LORM is a typical and neglected one. More specifically, individual behaviour and interpersonal relationships, i.e., human factors, are becoming increasingly critical in managing a successful logistics outsourcing relationship (Daugherty, 2011).

2.6.2 Boundary spanning activities in LORM

The key role of interorganisational relationship management in managing collaborative activities has been well established in the literature (e.g. Boyson, Corsi, Dresner, & Rabinovich, 1999; Deepen, Goldsby, Knemeyer, & Wallenburg, 2008; Ellram & Cooper, 1990; Wallenburg et al., 2010). Meanwhile, the importance and distinctiveness of interpersonal relationship management have been widely recognised and tentatively explored (Ellinger, Keller, & Baş, 2010; Grawe et al., 2015). In logistics outsourcing, Fulmer and Gelfand (2012) indicated that interpersonal relationships facilitate interfirm communications through four emergent processes — message conveyance, message integrity, environmental interaction and communication performance. Expanding to a more extensive scope, Gligor and Holcomb (2013) further explored how interpersonal relationships between LSPs and their customers influence behaviour. Focusing on social elements of the relationship, they concluded that personal friendships would enhance trust and communication, facilitate personal and business understanding, and increase collaborative business volume. However, the human factors involved in the interaction between LSPs and their customers still lack sufficient research. Therefore, it is important to acknowledge the weakness in the extant logistics outsourcing research and recognise the pivotal role of social elements in the relationship (David M. Gligor & Holcomb, 2013).

Regarding boundary-spanning activities, Ellinger et al. (2010) investigated the phenomenon of logistics service recovery by frontline employees of market-oriented LSPs who interact with customers daily. With complementary HRM practices such as internal communication and employee development, frontline employees are empowered to respond immediately to customers, thus successfully alleviating the negative influence on customer satisfaction. Focusing on the micro-foundations of customer knowledge acquisition, Pedrosa, Blazevic, and Jasmand (2015) explored the role of LSP's boundary-spanning employees (BSEs) in developing logistics innovation initiatives. Their research results implied that, throughout the innovation process, BSEs deepen and

broaden customer knowledge via one-to-one interactions and diverse customer firm members, respectively.

Given the speciality of logistics outsourcing collaboration, it is common that LSPs assign on-site representatives for timely communication and a quicker response. Such organisational implantation leads to greater relational capital, responsiveness, and interdependence in collaboration (Grawe et al., 2015). Focusing on the role of organisational implants, (Grawe et al., 2012) investigated the potential results of working together in developing innovative business approaches and solutions. They found that BSEs achieving higher external support are likely to develop an effective commitment to the customer, thus driving knowledge exchange, logistics innovation and logistics outsourcing performance. Furthermore, Grawe et al. (2015) also analysed the paired dyadic relationships between LSPs and their customers, concluding that successful implantation leads to greater commitment to each other.

Therefore, we can see that BSEs play a bridging role and actively act as the micro-foundations of meso-level interactions in LORM. However, there are also barriers to developing interpersonal relationships across the firms. A typical concern is that combining friendship and business in the same relationship can be beneficial but can also create conflict due to incompatible relational expectations (Grayson, 2007). It is a common understanding that BSEs from the suppliers are typically encouraged to develop interpersonal relationships, and the employees from the buyers' side are typically discouraged from doing so.

Furthermore, strong interpersonal relationships might negatively affect the partnering firms (Gligor & Holcomb, 2013). How does relational behaviour affect contractual behaviour in different levels of interaction? Is there a turning point when the interpersonal relationship becomes dangerous to the firms? Which external factors might influence the outcomes of meso-level interactions? Based on the literature review in previous sections, some indications have been achieved that a balanced perspective on the role of interpersonal relationships is needed In LORM research. Understanding meso-level effects should enable us to answer the questions listed above. Hence, it is of great importance to

investigate both boundary-spanning activities implemented by BSEs and the mechanism through which BSEs interact with each other.

2.6.3 Logistics outsourcing performance

Traditionally, the performance management literature emphasised financial measures to quantify the efficiency and/or effectiveness of action. Throughout the use of performance management system (e.g. the supply chain operations reference (SCOR) model, Dweekat, Gyusun, & Jinwoo, 2017; supply chain balanced scorecard, Ferreira, Silva, & Azevedo, 2016), both tangible and intangible measures (e.g., profit, return on investment, financial viability, supplier-related costs, etc.) can be used to realise supply chain strategy implementation, decision making and control (Gopal & Thakkar, 2012). However, the use of performance measurement varies in different contexts and even within single large organisations (Jääskeläinen & Thitz, 2018). Furthermore, performance measures are not just measuring objective performance but are also embedded with politics, emotions and other subjective issues (Gopal & Thakkar, 2012). As a result, non-financial measures (e.g., customer service level, environmental stability, service performance, etc.) have gained attention for benchmarking and performance evaluation (Gunasekaran, Irani, Choy, Filippi, & Papadopoulos, 2015).

In line with this trend, numerous measurements are used in SCM studies to evaluate performance. For example, Chelariu et al. (2014) developed a four-category framework of performance measures to explore interorganisational relationships:

- **Relationship** – the quality and the strength of the relationship between supply chain partners.
- **Operational** – the extent to which a firm fulfils the operational requirements of its partners.
- **Strategic** – the extent to which a firm is fulfilling its long-term strategic plans and the comparison of a firm's performance with its competitors.

- **Economic** – the extent to which a firm receives or provides its partners with economic value.

Within this broad framework, several measurements have been used with specific concerns and objectives (Table 2.4).

Table 2.4

Brief review of performance measurements in the SCM field

Type	Focus	Sources
Logistics performance	<ul style="list-style-type: none"> • Logistics effectiveness • Logistics efficiency • Logistics differentiation 	Fugate, Mentzer, and Stank (2010)
Organisational performance	<ul style="list-style-type: none"> • Delivery; Flexibility • Inventory; Quality • Customer satisfaction 	Alfalla-Luque, Marin-Garcia, and Medina-Lopez (2015)
Firm performance	<ul style="list-style-type: none"> • Market share; Return on assets • Overall product quality • Overall competitive position • Overall customer service levels 	Tan, Kannan, Hsu, and Keong Leong (2010)
Operational performance	<ul style="list-style-type: none"> • Cost performance • Performance volatility • Operational failures 	Corsten et al. (2011)
Financial performance	<ul style="list-style-type: none"> • ROA; Profit margin • Asset turnover; Cash cycle 	Lanier, Wempe, and Zacharia (2010)
Relationship performance	<ul style="list-style-type: none"> • Dominant market position • Attractive financial gains • Increased customer traffic • Improved process efficiency 	Liu, Huang, Luo, and Zhao (2012)

Competitive performance	<ul style="list-style-type: none"> • Performance of our final products • Speed of deliveries • Volume or capacity flexibility • Degree of product variety • Production costs 	Prajogo, Oke, and Olhager (2016)
Supply chain performance	<ul style="list-style-type: none"> • Plan process • Source process • Make process • Delivery process 	Sangari, Hosnavi, and Zahedi (2015)

Regarding logistics outsourcing, empirical research with specific criteria is scarce due to the complexity of outsourcing logistics services. Though some traditional measurements are transformed/modified to evaluate performance outcomes (Table 2.5), a well-constructed framework that provides valid and reliable measurements for thoroughly investigating logistics outsourcing collaboration still needs to be developed. To solve this issue, Deepen (2007) proposed a new approach based on the concept of “customer delight” in the services research literature (McNeilly & Feldman Barr, 2006). He studied the outcomes of logistics outsourcing collaboration by evaluating whether the goals of such partnership were merely achieved (i.e., goal achievement) or even exceeded to a level beyond initial expectation (i.e., goal exceedance). As shown in the literature, this bi-dimensional construct is now used in logistics outsourcing research (e.g. Deepen et al., 2008; Hartmann & de Grahl, 2012; Hofer et al., 2015).

Table 2.5*Brief review of performance measurements used in logistics outsourcing research*

Category	Perspective	Measurement items used	Sources
Customer firm logistics improvement	LSC	<ul style="list-style-type: none"> • We have enhanced our logistics service provision competency • We have increased control of logistics expenses • We have increased access to state-of-art logistics technologies • We have been able to refocus on our core business 	Tian, Ellinger, and Chen (2010)
Operational performance	LSC	<ul style="list-style-type: none"> • We have higher delivery reliability • We have higher customer satisfaction • We can respond to changes in customer demand in a timely way • We have more flexibility in dealing with customers' special requirements • We are capable of meeting customers' urgent orders 	Yang and Zhao (2016)
Financial performance	LSC	<ul style="list-style-type: none"> • Growth in sales volume • Growth in profit • Growth in market share • Growth in return on sales 	Yang and Zhao (2016)
Buyer firm logistics performance	LSC	<ul style="list-style-type: none"> • We have reduced total logistics costs • We have reduced lead time 	Chen, Tian, Ellinger, and

		<ul style="list-style-type: none"> • We have improved delivery reliability • We have enhanced overall logistics management capability 	Daugherty (2010)
Logistics performance	LSC	<ul style="list-style-type: none"> • Our major 3PL provides us with high value-added logistics service • Our major 3PL provides us with high-quality logistics service • Our major 3PL provides us with speedy delivery • Our major 3PL provides us with highly reliable delivery • Our major 3PL has a high level of responsiveness to our needs • Our major 3PL has a high level of flexibility to meet our changing needs • Our major 3PL provides services that result in the lowest total logistics costs 	Chu and Wang (2012)
Logistics provider performance	LSC	<ul style="list-style-type: none"> • My firm's association with this international logistics provider has been a highly successful one • This international logistics provider leaves a lot to be desired from an overall performance standpoint • If I had to give this international logistics provider a performance appraisal for the last year, it would be outstanding • Overall, I would characterize the results of my firm's relationship with this logistics provider as having exceeded our expectations 	Stank, Daugherty, and Ellinger (1996)
3PL performance	LSC	<ul style="list-style-type: none"> • Logistics operations performance • Marketing channel performance • Asset reduction 	Knemeyer and Murphy (2004)

Logistics outsourcing performance	LSC	<ul style="list-style-type: none"> • Our LSP completely fulfills the goals and expectations we jointly set prior to this logistics outsourcing relationship (Goal achievement) • We are very satisfied with our LSP (Goal achievement) • The relationship with this LSP is very good (Goal achievement) • LSP delivers its service always with the required quality (Goal achievement) • The goals and expectations we jointly set prior to this arrangement were significantly exceeded (Goal exceedance) • We are significantly more satisfied with the quality of the LSP services than we expected (Goal exceedance) • The relationship between actual costs for this project and the overall service performance is much better than expected (Goal exceedance) 	Deepen (2007)
Firm performance	LSP	<ul style="list-style-type: none"> • Improvements in market share • Profitability • Sales growth • Return on investment • Overall performance 	Panayides (2007)
Financial performance	LSP	<ul style="list-style-type: none"> • QoQ growth • Operating profit margin (by season) 	Liu and Lai (2016)

Logistics performance	LSP and LSC	<ul style="list-style-type: none">• Scheduled collection fulfillment• Deliveries in period of high demand• Route planning/optimization• Condition/cleaning of vehicles• Lead time• On-time delivery	Aharonovitz, Vidal, and Suyama (2018)
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2.7 The conceptual framework of the study

Based on the results achieved from an extensive literature review, this study further extends the IMO logic and develops the conceptual framework for the study (Figure 2.5).

During the past decades, researchers in various fields have explored the characteristics of team identification and its effect on team effectiveness (see two literature reviews, Mathieu et al., 2008 for the period of 1997-2007; Quigley, Collins, Gibson, & Parker, 2018 for the period of 2007-2017). Notably, it is infeasible to examine all of them, which is also beyond the scope of this study. Instead, this framework links and bridges key concepts under the umbrella research interest of LORM. To be more detailed, it proposes IOTI as the team input that shapes the team behavioural process (team communication), affective states (team affective trust) and cognitive states (team cognitive trust and team mental model), leading to the outcome of team effectiveness (team performance and team commitment) and, in turn, logistics outsourcing performance (goal achievement and goal exceedance). IOTI was selected because it plays a vital role in achieving team success. Likewise, all emergent states and processes were selected because they have been justified as critical for positive team effectiveness. To reflect the components of IMO modelling and focus on the factors most relevant to logistics outsourcing IOTs, team performance and logistics outsourcing performance were selected as outcome variables at different levels.

Additionally, the casual linkages in the model are presumably moderated by some contextual factors whose effects must be identified and analysed (see Table 2.6 for the selection criteria). Overall, the framework oriented the process of both theme identification for qualitative data analysis and instrument development for quantitative data collection.

Figure 2.5

The conceptual framework of the study

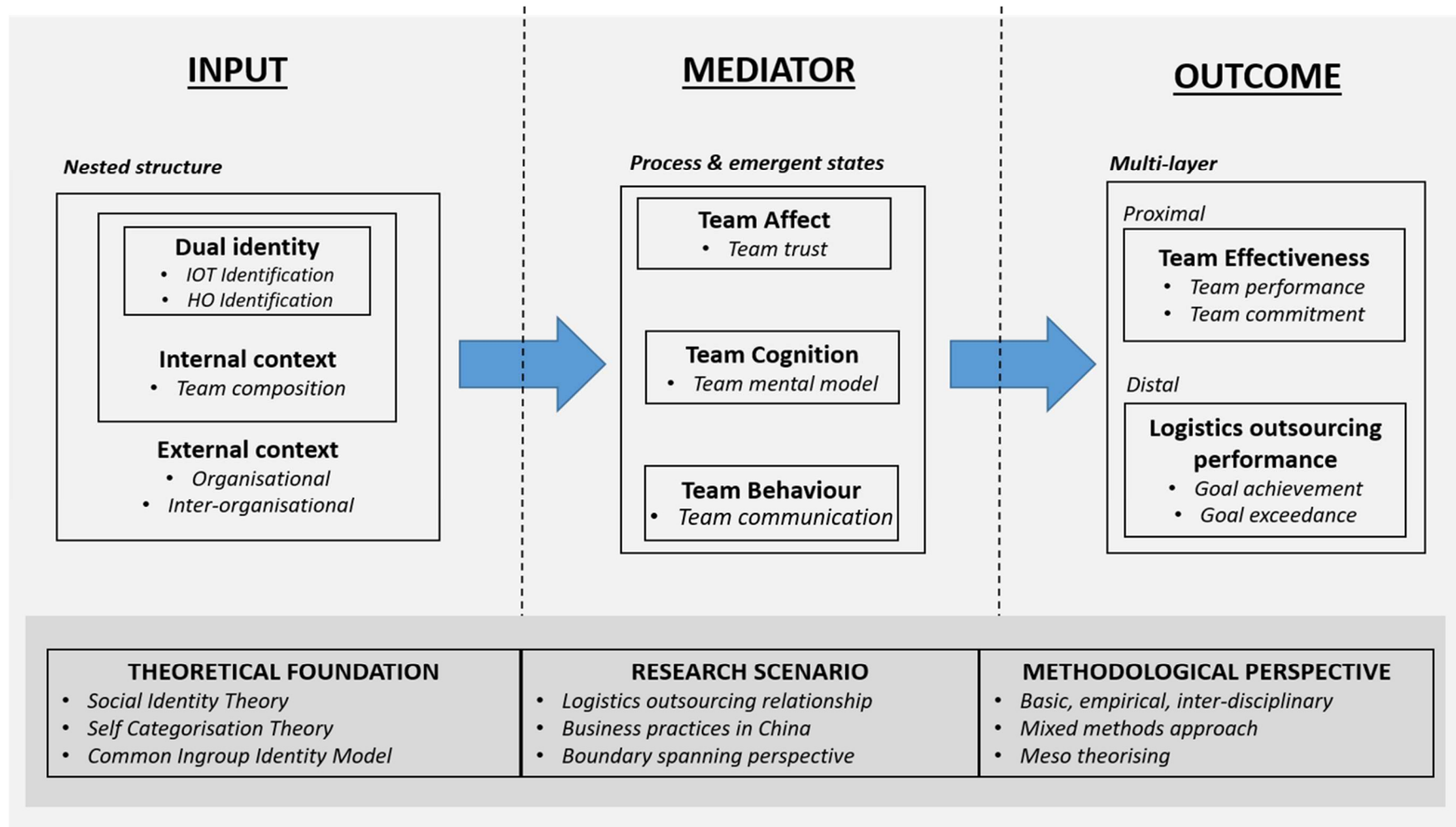


Table 2.6*Explanation on variable selection in the conceptual framework*

Category	Components	Variables	Rationale and criteria of variable selection
Input	Team identity	<ul style="list-style-type: none"> • Interorganisational Team Identification (IOTI) • Home Organisational Identification (HOI) 	<ul style="list-style-type: none"> • Solid theoretical evidences of SIT, SCT and CIIM • The concept of theory borrowing in organisational studies (Whetten, Felin, & King, 2009)
	Team composition	<ul style="list-style-type: none"> • Demographic factors (age, position, team tenure) 	<ul style="list-style-type: none"> • Defined as team internal context (Maloney et al., 2016)
	Contextual factors	<ul style="list-style-type: none"> • Team tenure (team level) • Firm size (organisational level) • Ownership type (organisational level) • Relationship duration (inter-organisational level) 	<ul style="list-style-type: none"> • External team context concerns about the dual role that a specific team play in a nesting structure: embedding individuals and being embedded in large systems (Maloney et al., 2016) • As explained by Bell et al. (2018) and Benishek and Lazzara (2019), team context can affect the salience of a particular team attribute, modify the relevance and importance of an attribute, and determine which attributes are of value

Mediator	Behavioural process	<ul style="list-style-type: none"> • Team communication 	<ul style="list-style-type: none"> • According to ABC's of teamwork (Salas, Cooke, & Rosen, 2008), four mediators were selected because they are particularly relevant to explain the effects of IOTI on team outcomes. Each of them is important regarding own respective function, but they are more meaningful when combined together (for similar reasoning, see Guenter, Gardner, Davis McCauley, Randolph-Seng, & Prabhu, 2017; Hoch & Kozlowski, 2014) • Furthermore, processes and emergent states are tightly related and co-evolve over time (J. E. Mathieu, Luciano, D'Innocenzo, Klock, & LePine, 2020). Considering the research background (IOTs), timing of the investigation (implied by "team tenure" in the survey) and extant measurements in the literature, all are parallel here, i.e. affection and cognition are defined as correlates of process • Finally, emergence occurs across different targets and context areas simultaneously. Therefore, investigating these emergent properties of these mediators together helps better understand their relative and, more importantly, joint effects (Fulmer & Ostroff, 2016)
	Affective state	<ul style="list-style-type: none"> • Team trust 	
	Cognitive state	<ul style="list-style-type: none"> • Team mental model 	
Outcome	Team effectiveness	<ul style="list-style-type: none"> • Team performance • Team commitment 	<ul style="list-style-type: none"> • Multidimensional construct (Mathieu et al., 2008)

Logistics
outsourcing
performance

- Goal achievement
- Goal exceedance

- Decomposed, bi-dimensional perspective (Deepen, 2007)
-

2.7.1 Definitions of the key components

The following section conceptualised relevant variables in the conceptual framework based on the achievements from theoretical and empirical reviews.

Inter-organisational team identification

Identification refers to “the perception of oneness or belongingness to some human aggregate” (Ashforth & Mael, 1989, p. 29). Accordingly to Brewer (2001), social identification represents “the extent to which the in-group has been incorporated into the sense of self, and at the same time, that the self is experienced as an integral part of the in-group” (Brewer, 2001, p. 121). Similarly, Zhang, Chen, Chen, Liu, and Johnson (2014) argue that a social referent in one’s identity can be relationships, an in-group, or an organisation.

In an organisational environment, individuals sometimes define themselves as a member of a work team or an organisation (Dietz, van Knippenberg, Hirst, & Restubog, 2015). Accordingly, team identification captures “the extent to which the individual defines the self in terms of his/her membership in a particular team” (van Knippenberg & van Schie, 2000, p. 139).

Nevertheless, IOT is a phenomenon that spans traditional team and organisational boundaries. According to SIT, people define themselves in terms of group membership (“we” rather than “I”), and identification is commonly conceived of as an individual-level construct (Mael & Ashforth, 1992). Therefore, the present study conceptualises inter-organisational team identification (IOTI) as “the extent to which boundary spanning employees from supply chain partners perceived themselves to belong to the inter-organisational team”. Perceiving a sense of oneness with such boundary-spanning team, individual members put significant effort towards collaborative goals by forming cognitions or attitudes and interacting in a collectivistic way that benefits the team and the whole supply chain (Brickson, 2000; Han & Harms, 2010).

Home organisation identification

As a specific form of social identification, organisational identification can be defined as “the perception of oneness with or belongingness to an organisation, where the individual defines him or herself in terms of the organisation(s) in which he or she is a member” (Mael & Ashforth, 1992, p. 104).

From a social identity perspective, people can develop collective identification with their employing organisation (Ashforth & Mael, 1989; Hogg & Terry, 2000). The concept of organisational identification addresses the extent to which an employee defines themselves according to individual organisational membership (Ashforth & Mael, 1989; He & Brown, 2013). Following the widely-accepted conceptualisation of organisational identification by Mael and Ashforth (1992), home organisational identification (HOI) in this study is defined as “the boundary spanning employees’ perception of oneness with or belongingness to his/her employing organisation” (p. 105).

Team mental model

A mental model is an explanatory mechanism through which individuals describe, explain and predict environmental events (Mathieu, Goodwin, Heffner, Salas, & Cannon-Bowers, 2000). Based on their observations of expert teams, Cannon-Bowers, Salas, and Converse (1993) originally introduced the concept of team mental model (TMM) – “knowledge structures held by members of a team that enable them to form accurate explanations and expectations for the task, and in turn, to coordinate their actions and adapt their behaviour to demands of the task and other team members” (Cannon-Bowers et al., 1993, p. 228). From an individual perspective, a well-developed TMM helps team members to understand the key elements of the relevant environment and thus develop a standard view of what is happening (description), why it is happening (explanation), and what is likely to happen next (prediction) (Mohammed & Dumville, 2001; Mohammed, Ferzandi, & Hamilton, 2010).

Based on cognitive psychology, Cannon-Bowers et al. (1993) proposed four types of TMM contents: an equipment model (knowledge about job tools and technology), a task model (awareness of work procedures, strategies, and

contingency plans), a team interaction model (knowledge about individual responsibilities, working interdependencies, and communication styles), and a team model (recognition of members' skills, abilities and habits). In the literature, the models above have been categorised into two groups: a task-focused mental model (work goals and performance concerns) and a team-focused mental model (teammate interaction and associated skill requirements) (Mathieu et al., 2000; Mohammed et al., 2010). As Mathieu et al. (2000) indicated, TMMs describe the shared knowledge that team members achieve through teamwork in aspects of their work tasks and/or social processes.

Team trust

During the past decades, trust has been predominantly examined concerning individuals and organisations they belong to (e.g. Williams, 2016; Zaheer, McEvily, & Perrone, 1998). At interpersonal level, trust has been studied for its interactions with trustworthiness (Colquitt, Scott, & LePine, 2007; Dirks & Ferrin, 2002), citizenship behaviour (Walumbwa, Luthans, Avey, & Oke, 2011), communication processes (Murrell, Blake-Beard, Porter, & Perkins-Williamson, 2008; Naquin & Paulson, 2003), individual reputation (Li, Poppo, & Zhou, 2008), leadership (Jung, Yammarino, & Lee, 2009; van Dierendonck, 2011), and relational embeddedness (Wong & Boh, 2010; Yamagishi, Cook, & Watabe, 1998). At an organisational level, trust has been linked to a range of its antecedents and outcomes, such as corporate social responsibility (CSR) (Castaldo, Perrini, Misani, & Tencati, 2009; Deery, Iverson, & Walsh, 2006), organisational justice (Bernardin, Richey, & Castro, 2011), ethical work climate (Ireland, Hitt, & Vaidyanath, 2002), and strategic alliances (Fryxell, Dooley, & Vryza, 2002).

As a consequence, a large variety of definitions of trust have been offered in the literature, and several reviews have focused on these definitions and the measures of trust (e.g. Castaldo, Premazzi, & Zerbini, 2010; Korsgaard, Brower, & Lester, 2015; McEvily & Tortoriello, 2011; Zhong, Su, Peng, & Yang, 2017). Decades of research have illustrated that trust is more likely to be considered a multidimensional construct. For example, various research has proposed that

trust consists of competency-based and emotional-based trust (Cook & Wall, 1980; D. Johnson & Grayson, 2005). Following the multidimensional trust research ideas, Cummings, Bromiley, Kramer, and Tyler (1996) identified three dimensions of trust: affective, cognitive, and intended behaviour. More specifically, the psychological tradition emphasises cognitive and affective states of trust (e.g. Jones & George, 1998). This bi-dimensional trust was also developed through the work of Chua, Ingram, and Morris (2008), suggesting that task and career advice increase cognitive trust, while interpersonal friendship promotes affective trust.

As for the level of analysis, a variety of trust studies at the team level has been steadily growing (e.g. Costa et al., 2018; Grossman & Feitosa, 2018). In the team setting, the extant studies mainly focus on two distinct levels of analysis: trust at the team level, which is collectively shared among team members, and trust at the individual level, referring to the interpersonal dyadic relationships between pairs of members in the team (Costa et al., 2018). A few empirical studies measured and analysed trust at the team level (e.g. Chang, Sy, & Choi, 2012; Prichard & Ashleigh, 2007). Furthermore, Fulmer and Gelfand (2012) proposed a multilevel-multireferent framework for future trust-centred research, of which team trust is defined as “a shared psychological state among team members comprising willingness to accept vulnerability based on positive expectations of a specific other or others” (Fulmer & Gelfand, 2012, p. 1174).

Adapting the multidimensional measure by McAllister (1995) to the team level, several studies examined the characteristics of cognitive and/or affective trust (Jones & George, 1998; Parayitam & Dooley, 2009; Qiu & Peschek, 2012). For example, the results of Webber (2008) demonstrated that cognitive and affective trust are separate components. Each of them has its antecedents, while affective trust imposed a greater positive influence on team performance than cognitive trust. A recent meta-analytical review by Feitosa, Grossman, Kramer, and Salas (2020) argued that cognitive and affective trust have similar relationships with team performance. It also showed that the trust–performance relationship is robust regardless of how trust is operationalised. Due to the limit of lumping items in research precision and interpretation, the scholars called for

conceptualising and operationalising team trust with its multidimensional nature in mind (Feitosa et al., 2020).

Collectively, this study conceptualised team trust as having two distinctive dimensions: team affective trust and team cognitive trust. The former encompasses the emotional bond between team members in reciprocated care and concern, while the latter focuses more on team members' shared beliefs and judgments about peer reliability and dependability (McAllister, 1995; Tomlinson, Schnackenberg, Dawley, & Ash, 2020).

Team communication

In a team context, communication can be a useful way of exchanging task-related and relational information (Liao, Jimmieson, O'Brien, & Restubog, 2012). Effective team communication leads to more benefits of information sharing of individual knowledge and expertise among team members.

Consistent with Marks, Zaccaro, and Mathieu (2000), Liao et al. (2012) differentiated two aspects of communication: quantity and quality. Communication quantity is "a combination of volume and frequency to reflect the notion that teams can frequently or infrequently have large or small amounts of interactions with each other" (Liao et al., 2012, p. 215). Team quantity can be analysed by self-report of communication frequency (e.g. Boerner, Schöffner, & Gebert, 2012; Malhotra & Majchrzak, 2014) or objective assessment of overall communication volume (e.g. Gorman & Cooke, 2011; Jarvenpaa, Shaw, & Staples, 2004). In contrast, communication quality is defined as "the extent to which the communication is perceived as informative, helpful, important, and meaningful for the task at hand (i.e., quality pertaining to the information exchange) as well as whether the experience of the interaction was evaluated as positive and enjoyable (i.e., quality regarding the relational aspects of communication)" (Liao et al., 2012, p. 215). It has been widely accepted that high-quality communication enables individuals to clarify information exchanged with team members and reduce any redundant efforts towards task completion (Aubé, Brunelle, & Rousseau, 2014; González-Romá & Hernández, 2014). Considering both communication quantity and quality, previous findings also

suggested that team communication may affect the effectiveness of team performance (e.g. Marks et al., 2000; Scholten, van Knippenberg, Nijstad, & de Dreu, 2007).

Consistent with previous studies within team literature (e.g. Marks et al., 2000; Mesmer-Magnus, DeChurch, Jimenez-Rodriguez, Wildman, & Shuffler, 2011), team communication is defined as “an exchange of information, occurring through both verbal and nonverbal (e.g., email) channels, between two or more team members” (Marlow, Lacerenza, Paoletti, Burke, & Salas, 2018, p. 146).

Team performance

Team performance indicates the degree that a team fulfils its operation requirements and the extent to which it accomplishes anticipated goals. Team performance is the most frequently used criterion of team effectiveness (see for a review, Quigley et al., 2018). In team identity research, the performance evaluation criteria can be objectively measured (e.g. Millward & Postmes, 2010), team leader rated (e.g. Polzer, Milton, & Swann, 2002), or member rated (e.g. Mortensen & Hinds, 2001).

Previous research has conceptualised and measured team outputs in three different aspects (e.g. Algesheimer, Dholakia, & Gurău, 2011; Jehn, Chadwick, & Thatcher, 1997):

- **Organisational-level performance**, emphasising the correlation of the top management team’s performance to organisational performance. This approach neglects other factors influencing team effectiveness and organisational performance (Mathieu et al., 2008).
- **Role-based performance**, measuring the extent to which individuals can perform their tasks in the team. This measure, similar to team demographic analysis, is insufficient to measure the outcome of work teams (Welbourne, Johnson, & Erez, 1998).

- **Subjective team performance outcomes**, perceived as the final expected outcome of team process performance (Mathieu et al., 2008).

Instructed by the research objectives, the measure of performance in the study aims to capture the overall sense of how effective the team is rather than whether specific goals have been achieved. Thus, Option I above is adopted, with the concept of team performance as “the perceptions of team members of their team’s productivity and performance” (Guenter et al., 2016, p. 570).

Team commitment

Commitment is “a force that binds an individual to a course of action of relevance to one or more targets” (Meyer & Herscovitch, 2001, p. 301). Depending on the differentiated basis of the psychological bond, the commitment exists in various forms, such as affective, continuance, or normative (Allen & Meyer, 1990; Wombacher & Felfe, 2017). Given the research target of IOTI, this study focuses on BSEs’ affective commitment, i.e., an identification-based attachment towards the group of their teammates (Johnson, Chang, & Yang, 2010; Meyer & Allen, 1991). Following Bishop and Scott (2000) in the team commitment literature, the present study labels affective team commitment simply as team commitment throughout the thesis.

Specifically, team commitment is “the relative strength of an individual’s identification with and involvement in a particular team” (Lee, Kwon, Shin, Kim, & Park, 2018, p. 1). As a specific type of team affects, affective commitment concerns “identification with, involvement in, and emotional attachment to the [collective]” (Allen & Meyer, 1996, p. 275) positively influences the team members’ beliefs in the collective goals and values, their inclination to act in ways consistent with teammates, and the willingness to sustain team membership (Bishop & Scott, 2000; Johnson et al., 2010).

Logistics outsourcing performance

As introduced in Section 2.6.3, there have been several ways in conceptualising logistics outsourcing performance. As stated by Wofford, Goodwin, and

Premack (1992), “the performance variable has been operationalised in two ways in goal setting literature: that is, 1) as the quantity or quality of output or productivity and 2) as the discrepancy between the goal level and the performance level (goal achievement)” (p. 600). Acknowledging that logistics outsourcing is a complicated phenomenon and thus requires sophisticated measurement, a group of empirical studies have investigated this topic by evaluating whether the goal of logistics outsourcing relationships is achieved or even exceeded (Deepen, 2007; Hartmann & de Grahl, 2012).

By decomposing logistics outsourcing performance into two dimensions, i.e., goal achievement and goal exceedance, Deepen (2007) pointed out that, beyond fulfilling contractual requirements, the LSP also has the potential to create additional value beyond the customers’ original expectations. This bi-dimensional conceptualisation distinguishes between the mere outcome achievement and the exceedance of the set goals and expectations. More specifically, goal achievement is defined as “logistics outsourcing performance that achieves expected outcomes *ex ante* agreed upon by a company and its logistics service provider” (Wallenburg et al., 2010, p. 581), while goal exceedance refers to “services that significantly exceed the goals and expectations set forth in the outsourcing arrangement, providing a degree of pleasant surprise espoused in the consumer concept of delight” (Wallenburg et al., 2010, p. 581).

Interorganisational relationship duration

Relationship duration, also known as relationship history, length, or age, refers to the period of cooperation (Zhong et al., 2017). During the business exchange period, a positive interaction experience enables the development of mutually beneficial relationships while unsatisfactory collaboration ends (Zhong et al., 2017). On the one hand, relationship duration might help improve relationship quality regarding commitment (Min et al., 2005), supply chain negotiation (Thomas, Manrodt, & Eastman, 2015), logistics performance (Aharonovitz et al., 2018) and supply chain performance (Prajogo & Olhager, 2012). On the other hand, empirical studies have also illustrated that relational duration might lead

to relational inertia, in which firms are reluctant to take corrective actions on performance deterioration (Fang, Palmatier, Scheer, & Li, 2008). Therefore, we can see that relationship duration may affect IORs dynamically.

Given prior research establishing the effects of relational duration on partners' trust, value creation, communication, and performance (e.g. Huang et al., 2016; Kim & Choi, 2018; Kotabe, Martin, & Domoto, 2003), this study also controls for this factor.

Team tenure

Team tenure refers to time the individuals have been associated with their team (J. I. A. Hu & Liden, 2015). It can positively affect member interaction and team performance (Algesheimer et al., 2011; Stewart, 2006). The longer the tenure of the team, the more the members achieve shared values and collaboration expertise (e.g. Edmondson, 1999; Schaubroeck, Lam, & Cha, 2007). Eisenhardt and Schoonhoven (1990) proposed that team members “who have a history together have probably learned how to get along and communicate with each other” (p. 509). Researchers in team boundary spanning also justified that team tenure influenced the relationship between team innovation and other team activities (Somech & Khalaili, 2014). Given the characteristics (temporary, cross-boundary and virtual) of IOTs in the study, team tenure is a relevant factor because the convergence of members' understanding in cognition, affect, and behaviour may require longer time than traditional teams (Algesheimer et al., 2011).

All the conceptualised constructs above are summarised in Appendix 2.

2.8 Summary

This chapter reviews various concepts in team effectiveness, relationship management and logistics outsourcing. The literature review map in Figure 2.6 visualises connections and relative relationships between different themes. Literature mapping shows key concepts such as BSE, IOTI and logistics outsourcing performance in the literature, and illustrates how each classic paper fits into the overall conceptual map. Notably, it is of particular interest to

recognise the three levels of social interactions affecting supply chain behaviours and performance: interpersonal, inter-organisational team and inter-organisational. Following Drach-Zahavy (2011) and Knoppen and Sáenz (2017), the team referent in this study (i.e., inter-organisational team) is different from co-workers or general groups of those people within one organisation (c.f. Carter, Carter, & DeChurch, 2018; Mathieu et al., 2008).

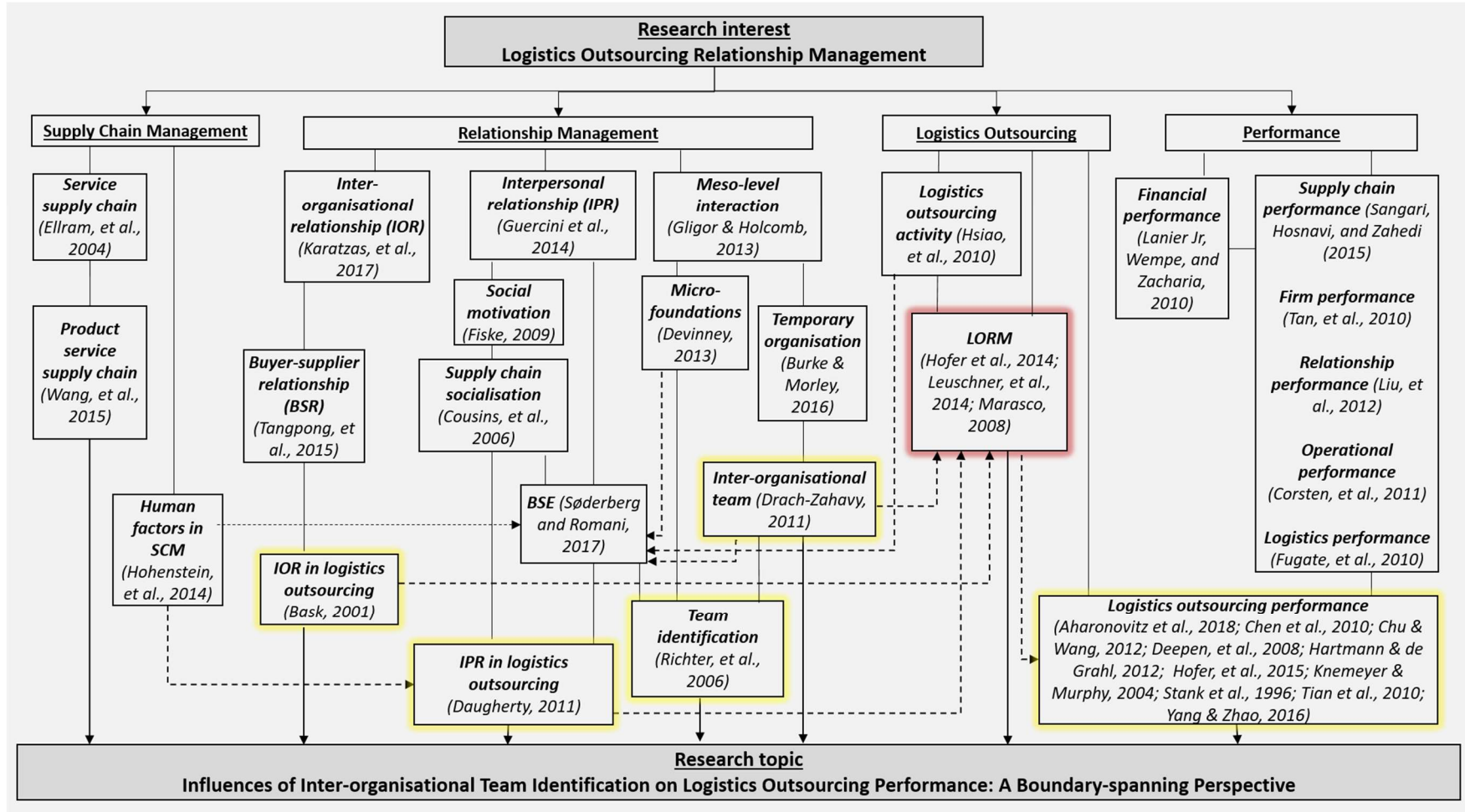
Although many studies on logistics outsourcing have focused on understanding the implication of relationship management, further research regarding interorganisational team-level characteristics that influence LOP is needed. As a reasonable consequence, the research gaps and needs were identified (Section 1.2), the research questions were initiated (Section 1.3), and the research topic was finalised as below:

Influences of inter-organisational team identification on team effectiveness and logistics outsourcing performance: A boundary-spanning perspective

In summary, this chapter has given an overview of the concepts of service supply chain, logistics outsourcing, LORM and multilevel understandings of relationship management. Meanwhile, it has, in detail, analysed the meso-level interaction in both fields of SCM and LORM and has given insights into the mechanism of such interaction. Consequently, the conceptual framework was developed after reviewing and synthesising the literature from multiple disciplines. Specifically, this study explores whether and how IOTI affects team functioning and logistics outsourcing performance through the mediators of team process (team communication) and emergent states (team mental model and team trust). The review also helped identify the potential roles of HOI, providing a theoretical foundation to explain how IOTI influences team effectiveness and, ultimately, logistics outsourcing performance.

Figure 2.6

Literature map of the study



CHAPTER THREE: THEORETICAL FOUNDATIONS AND HYPOTHESIS DEVELOPMENT

Team identification has been a focus of interest for many years across various disciplines and has been explored by a range of seminal works with differentiated theoretical perspectives. Because interorganisational teams are a relatively new context for research, more needs to be initiated or reported regarding the role of social identity in such teams. However, we can draw from some of the initial studies that have been done in this area and relevant conceptual and empirical work to get to know why social identity is relevant to the IOT context and, therefore, must be considered for future research. This chapter introduces the theories of SIT, SCT and CIIM and then justified the inherent logic of linking them to be the study's theoretical foundation. Addressing the necessity of such synthesis to fulfil the research objectives of the study, this chapter introduces a series of hypotheses that have been developed to further explore the relationship between IOTI and other variables related to boundary-spanning collaboration in the logistics outsourcing industry.

3.1 Social Identity Theory (SIT)

3.1.1 Brief overview of SIT

Since it was initially formulated in the 1970s as a theory of intergroup conflict, SIT has been considered a crucial theory in social psychology. It utilises the idea of social identity to depict and investigate how people identify and categorise themselves in intergroup contexts (Hogg, 2001; Tajfel, 1978; Tajfel & Turner, 1986). Besides that, SIT can also help define the contexts under which people are supposed to conceive of themselves as separate individuals or as part of a group (Ellemers, de Gilder, & Haslam, 2004). SIT is a viable approach to the study of group membership and group phenomena. Although SIT originated from the research on large-scale intergroup relations, it is applicable in more extensive scenarios covering large social categories and small task-oriented

groups (e.g., teams, organisations, inter-organisational teams, etc.) (Haslam, 2004).

As a result, SIT continues to have a considerable impact on the field of social psychology. In recent years, it has also been widely used in multiple disciplines to analyse individual behaviours based on perceived membership in a social group. For example, it has affected the study of organisation and management science (e.g. Ashforth & Mael, 1989; Hogg & Terry, 2000), political science (e.g. Huddy, 2001), and supply chain management (e.g. Corsten et al., 2011).

3.1.2 Core conceptual components of the theory

Identities are normally a combination of the perceived characteristics of the collective (e.g., values, goals) and its members (e.g., attitudes, feelings, behaviours) (Ashforth et al., 2008). Consequently, SIT, an identity-based theory, consists of multiple interrelated concepts, such as social identity, social comparison, social categorisation, intergroup relations, and motivation (Tajfel & Turner, 1979).

Self and identity

Traditionally, social identity research merely distinguished between two types of self and identity: self-defined and evaluated in terms of personal identity and in terms of social identity. Personal identity is “a person’s unique sense of self” (Postmes & Jetten, 2006, p. 260). Personal identity is a self-construal related to idiosyncratic personality attributes (“I”) or a dyadic relationship with a specific person (“me” and “you”). In contrast, social identity refers to “that part of an individual’s self-concept which derives from his knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that membership” (Tajfel, 1978, p. 63). Given their respective levels of self, personal identity is unique to the individual and has little to do with group processes, whereas social identity is shared by group members that distinguish between groups (Brewer & Gardner, 1996; John C. Turner, Oakes, Haslam, & McGarty, 1994). As illustrated by Ellemers (2012) and Haslam and Ellemers (2005), social identity expands one’s sense of self to the group level, sharing

attributes with other members of the group and thus motivating the people to act on behalf of that group (Dokko, Kane, & Tortoriello, 2014).

More explicitly, SIT emphasises that group identity, a group-level social identity, provides group members with the perception of belongingness and generates cognitive, evaluative and emotional components (Tajfel, 1978). For example, employees know that they are a member of a project team (cognitive component), and they evaluate this membership positively (evaluative component), and they feel proud of their membership (emotional component).

Psychological processes

When introducing SIT, Tajfel (1978) and Tajfel and Turner (1979) specified three psychological processes that underlie group-based interaction: social categorisation, social comparison, and social identification.

First, social categorisation is how individuals are categorised into groups. Focusing on collective attributes efficiently organises social information and understanding and predicts individual behaviours (Ellemers et al., 2004). For example, when people work in a team wherein they share some group-defining characteristics (e.g., everyday tasks, team goals), they are supposed to define themselves in terms of that group membership (Ellemers et al., 2004). Thus, such categorisation emphasises the similarities between individuals within the same group while neglecting individual traits (e.g., religion, nationality) that define their uniqueness and distinctness. At the same time, SIT points out that the differences between individuals from different categories would decide the meaning of the contextual situation (Tajfel, 1978).

Second, social comparison is how group characteristics are illuminated and valued. SIT assumes that comparing certain groups with others (e.g., salespersons versus operation employees in a logistics company) would decide what characteristics are suitable to define the group and evaluate the social status of that group in a special situation. These characteristics are distinctive to that group, thus distinguishing it from the comparison groups (e.g. Spears, Doosje, & Ellemers, 1997). Furthermore, a comparative and normative fit of a particular categorisation to a situation decides the salience of group membership

(Ellemers et al., 2004; Haslam & Turner, 1992). The comparative context and how group features compare with the features of other groups in that context determine the group membership (Barreto & Ellemers, 2003).

Last, social identification is the process through which different group features respectively reflect on the self. As defined by Tajfel (1974), social identification refers to the cognitive awareness that one can be included in a particular group and the emotional significance of that group membership for the self. That is, to the extent people perceive themselves as representatives of a particular group, they are inclined to emphasise the distinct identity of that group and, in turn, to maintain, defend, or enhance the values associated with the group memberships. On condition that people belong to multiple groups simultaneously, the relative degree to which each identity is conceived of as self-descriptive in a special situation or at a particular time will determine the extent to which people differentiate and care about each group in that context (Ellemers et al., 2004).

Following the “social categorisation–social identity–social comparison–positive distinctiveness” sequence (Tajfel, 1978), the psychological processes above can be summarised as below:

- **Social categorisation** instructs how individuals are classified.
- **Social comparison** determines how each group is distinguished from relevant other groups.
- **Social identification** demonstrates that the self is included in some social categories while excluded from others.
- Ultimately, individuals achieve **positive distinctiveness** for their group (compared with other groups). In certain contexts, the incentive for such positive distinctiveness led to ingroup favouritism and salient group identity.

Organisational identification

SIT emphasises that people perceive themselves regarding their memberships in social groups. The theory has been successfully used in organisational

contexts to conceptualise organisational identification (e.g. Ashforth & Mael, 1989). As indicated by Haslam and Ellemers (2005), “without social identity . . . there could be neither organisation nor organisations” (p. 87). As a specific form of social identification, organisational identification was defined as “the perception of oneness with or belongingness to an organisation, where the individual defines him or herself in terms of the organisation(s) in which he or she is a member” (Mael & Ashforth, 1992, p. 106). From the SIT perspective, employees in one organisation can define themselves according to their organisational membership and, as a result, organisational identification occurs (Ashforth & Mael, 1989; Haslam, 2004). As illustrated by Ashforth et al. (2008) and Riketta (2005), organisational identification has a great potential to improve employee-organisation relationships in aspects of low turnover intention, organisational citizenship behaviour and employee performance.

In today’s business world, people can identify with multiple group levels and thus achieve multiple identities (Porck et al., 2020; Ramarajan, 2014). For example, organisational identification is the most typical organisation-based identification. Others include identification with the work team, department, and regional branches in which most daily job activities are embedded (van Dick, van Knippenberg, Kerschreiter, Hertel, & Wieseke, 2008). Generally, people with a strong team identity tend to actively interact with team members (Dokko et al., 2014). However, they can simultaneously identify with multiple groups (e.g., to identify with a work team, proximal subordinated identification, and the organisation, distal superordinated identification) (Dovidio, Gaertner, & Saguy, 2009; Hornsey & Hogg, 2000).

3.1.3 Application of the theory in organisational contexts

Although SIT has its roots in social psychology, decades of research in identity and identification illustrated that it is ideally suited to studying organisational contexts (Haslam, 2004; van Dick, 2001). Classifying organisations as one kind of group, Ashforth and Mael (1989) work enables researchers to use the social identity approach (including SIT and SCT) as a grand theory for management research. The typical topics include worker turnover (e.g. Hogg, Abrams, Otten, & Hinkle, 2004), organisational merger (e.g. Terry, Carey, & Callan, 2001), and

sociocultural diversity in the workplace (e.g. Brewer & Gardner, 1996). Furthermore, SIT has been extended to other disciplines such as organisational behaviour (e.g. O'Reilly & Chatman, 1986), marketing (e.g. Bhattacharya & Sen, 2003), and strategy (e.g. Dyer & Nobeoka, 2000). Identification and SIT have recently been extended into operations and supply chain management research (e.g. Corsten et al., 2011).

3.2 Self-Categorisation Theory (SCT)

3.2.1 Brief overview of SCT

Extending from SIT's original focus on the process of social categorisation and the influence of social identity on intergroup behaviour, SCT presents a more elaborated and more general framework of psychological mechanisms that guide people to define themselves in terms of certain group memberships and to behave in accordance with those memberships (Turner, 1985; Turner, Hogg, Oakes, Reicher, & Wetherell, 1988).

SCT illuminates that the social categorisation process is the cognitive basis of group behaviour. Through understanding the differentiated levels of self and how and when people define themselves and others as ingroup or outgroup members, this theory proposes the concept of prototype and testify the process of depersonalisation (Hogg & Terry, 2000). John C. Turner et al. (1988) systematically summarised three core aspects of SCT:

- **Depersonalisation** of the self-produced inter-group behaviour and emergent group processes; on the other hand, individual behaviour can be achieved by defining oneself in terms of individual differences.
- **The self** can be defined differently at different times in different situations. For example, people can categorise themselves as an individual, or as a member of a particular group in contrast to others, or even a member of a high-order group.

- Consistent with their way of categorising and understanding the situation, people's self-perception and behaviour will determine the salience of their identity (identities).

SCT has excellent potential for explaining the psychological mechanism linking intergroup relations with individual functioning. Accordingly, it has been widely applied to research social problems and issues. Typical examples include social stability and social change (e.g. Turner & Reynolds, 2003), leadership (e.g. Hogg & Terry, 2000), and diversity in organisations (e.g. Rink & Ellemers, 2007).

3.2.2 Core conceptual components of the theory

Prototype

People cognitively represent groups' defining and stereotypical attributes in the form of prototypes (Hogg & Terry, 2000). One of the essential concepts of SCT is the prototype, referred to as "fuzzy sets of interrelated attributes that simultaneously capture similarities and structural relationships within groups and differences between the groups and prescribe group membership-related behaviour" (Hogg et al., 2004, p. 253).

According to the principle of metacontrast (maximisation of the ratio of perceived intergroup differences to intragroup differences), prototypes are constructed to describe ideal ingroup members rather than average or typical ones (Hogg & Terry, 2000). More specifically, there are two forms of prototypes: representations of exemplary members or an abstraction of group attributes, including beliefs, attitudes, feelings and behaviours (Hogg & Terry, 2000).

As the basis of social comparison, prototypes are context-specific and may vary from situation to situation. In turn, the change of prototypes will affect an individual's perceptions of and reactions to other group members (Hogg & Terry, 2000). Categorising someone through the lens of the prototype is the process of depersonalisation.

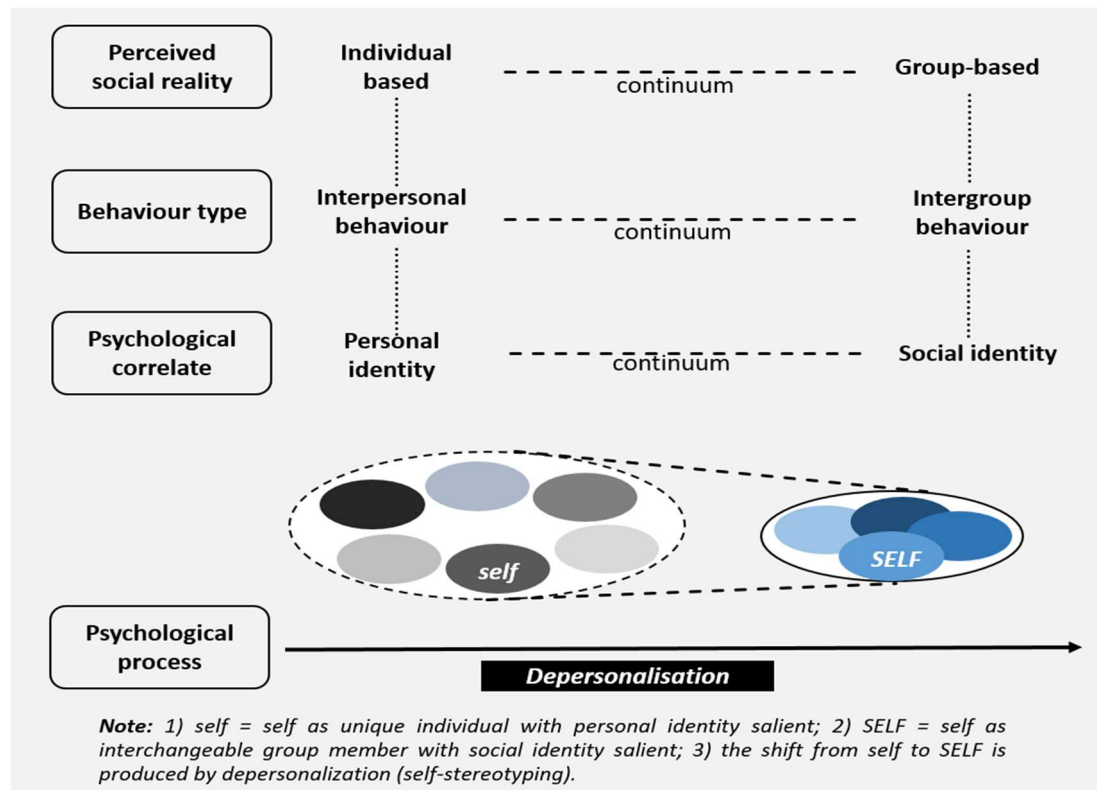
Depersonalisation

According to SCT, an individual's self-concept could be defined along a continuum (Figure 3.1). At one extreme of the continuum, a person categorises I into a certain group based on the shared characteristics of that group (i.e., social identity). At the other extreme, the individual is defined by their unique personality (i.e., personal identity). In this way, social-psychological scholars use the term salience to introduce how and when an identity is more likely activated in a situation (Stets & Burke, 2000). That is, the interaction between category accessibility and category fit leads to the emergence of a salient social identity in a specific situation. A salient social identity is "one which is functioning psychologically to increase the influence of one's membership in that group on perception and behaviour" (Oakes, 1987, p. 118).

In this way, depersonalisation, a product of the salience of social categories, can be seen as a psychological process associated with defining the self (Turner, 1982). As a result, depersonalisation was described as "a process of self-stereotyping by means of which the self comes to be perceived as categorically interchangeable with other ingroup members" (Haslam, 2004, p. 18). This concept introduced a cognitive process through which people define the self as an exemplar of a social category rather than a separate individual. In other words, the self is supposed to be defined in terms of social identity instead of personal identity (Turner, 1982).

Figure 3.1

Variation in self-categorisation as a function of depersonalisation



Note. From *Psychology in organizations* (2nd ed.) by S. A. Haslam, 2004, SAGE Publications.

Motivation of categorisation process

Self-categorisation reduces subjective uncertainty by linking self-definition and perception to prototypes in aspects of an individual's attitudes, feelings, behaviours and self-concept within certain social groups (Hogg & Terry, 2000). If a prototype is clear, highly focused, and cohesive and provides a powerful social identity, individuals within it would feel more confident about who they are, how to behave, who others are and how they might behave (Brewer & Gardner, 1996; Hogg, 1993). Such a prototype or group is attractive to individuals who are contextually uncertain about the social appropriateness of their attitudes and behaviours (Ullrich et al., 2007). Consequently, uncertainty is more likely to be reduced (Hogg & Terry, 2000).

3.2.3 Application of the theory in organisational contexts

Self-categorisation is a fundamental basis of social orientation, and the corresponding process is involved in a wide range of social and organisational behaviour (Haslam, 2004). In an organisational context, SCT, sometimes intertwined with SIT, has been used to elaborate the processes of leadership (Hogg & van Knippenberg, 2003), stereotyping (Oakes, Haslam, & Turner, 1994), communication (Postmes & Jetten, 2006), and work motivation and group performance (Ellemers et al., 2004).

3.3 Common Ingroup Identity Model (CIIM)

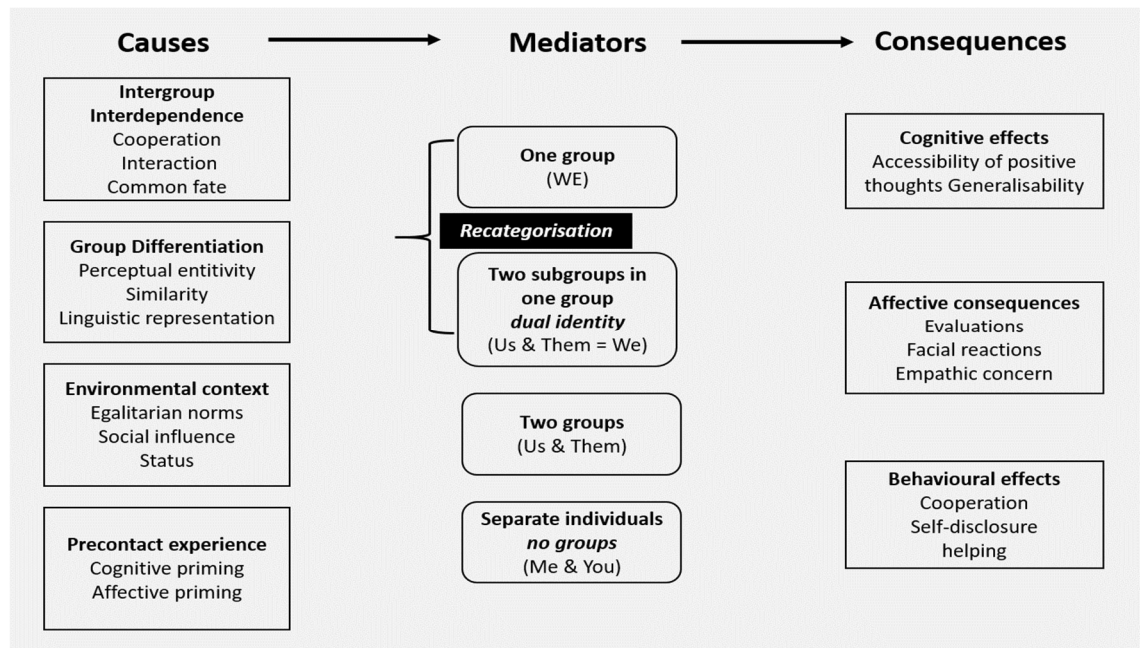
3.3.1 Brief overview of CIIM

Building upon the principles of social identity (Tajfel, 1969; Tajfel & Turner, 1979) and the cognitive process of social categorisation (John C Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), the Common Ingroup Identity Model (CIIM) articulates that when members of different groups change their representations of memberships from two separate groups — “us” and “them” — to a more inclusive “we”, it is possible to reduce intergroup bias and conflict, and ultimately promote harmonious intergroup relations (Crisp, Stone, & Hall, 2006).

Proposed by Gaertner, Mann, Murrell, and Dovidio (1989) and then reformulated by Dovidio, Gaertner, and Saguy (2007), CIIM not only elaborated the origins of intergroup bias but also proposed the potential remedies to the conflict. As shown in Figure 3.2, this integrated theoretical framework links potential causes and consequences through the mediating mechanism with multiple options for identification.

Figure 3.2

The Common Ingroup Identity Model



Note. From “Another view of “we”: Majority and minority group perspectives on a common ingroup identity”, by J. F. Dovidio, S. L. Gaertner and T. Saguy, 2007, *European Review of Social Psychology*, 18(1), 296-330. <https://doi.org/10.1080/10463280701726132>

CIIM predicted that intergroup boundaries could be eliminated by enhancing the salience of an existing common identity or enabling the recategorization of two subgroups into one inclusive group (Gaertner & Dovidio, 2014; Gaertner et al., 1993). More specifically, the process of recategorization, i.e., previous outgroup members categorising themselves into a common ingroup, would restrain the process of intergroup differentiation and ingroup favouritism with the original category. Such efforts facilitate the people to categorise themselves into a supercoordinate group rather than two different groups. The model has been justified in several experiments and field studies (e.g. Dovidio, Gaertner, Niemann, & Snider, 2001; Gaertner et al., 1989).

3.3.2 Core conceptual components of the theory

Recategorisation

Within the intergroup literature, CIIM initiated the concept of recategorisation. Compared with the decategorisation process, recategorisation aims to develop a new group categorisation to reduce intergroup bias and conflict rather than to eliminate categorisation (Gaertner et al., 1993). According to Brewer's work (1979) as well as SIT (Tajfel & Turner, 1979) and SCT (Turner, 1985), intergroup bias generally exists in the form of ingroup enhancement rather than outgroup devaluation. Moreover, it was clarified that formatting a single group brings ingroup members closer to the self and more positive attitudes towards former outgroup members, with the distance between the self and outgroup members relatively unchanged (Gaertner et al., 1993). These cognitive and motivational processes result in a more inclusive one-group identity in either of two ways: increasing the salience of existing superordinate group memberships (e.g., regional branch offices) or introducing new factors (e.g., everyday tasks) assumingly to be shared by the members from former differentiate groups. With recategorisation, members with common ingroup identities conceive of themselves as ingroup members (Riek, Mania, Gaertner, McDonald, & Lamoreaux, 2010).

Dual identity

As shown in CIIM (Figure 3.2), it is possible to categorise two sub-groups into one group through recategorisation, i.e., dual identity in the context of a superordinate identity. Gaertner and his colleagues argued that developing a common ingroup identity does not require sub-groups to abandon their previous group identity (Gaertner et al., 1993; Gaertner, Mann, Dovidio, Murrell, & Pomare, 1990). Instead, it can be more effective in encouraging positive interaction between groups while, at the same time, maintaining meaningful sub-group distinctiveness (Hogg, 2015; Vezzali, Hewstone, Capozza, Giovannini, & Wölfer, 2014).

Regarding the nature of intergroup relations, it was articulated that “groups typically react protectively if they feel their cherished and distinctive social identity’s existence is being threatened” (Hogg, Abrams, & Brewer, 2017, p. 574).

3.3.3 Application of the theory in organisational contexts

The fundamental propositions of the standard ingroup identity model for understanding intergroup bias have received support in research with enduring groups as well as with laboratory groups (e.g. González & Brown, 2006; Nier et al., 2001).

Additionally, empirical research showed that a strong collective identity orients team members toward collective (rather than individual) goal pursuit (Dietz et al., 2015), generates more cooperative working behaviours (Eckel & Grossman, 2005), and motivates members to act on behalf of their shared group membership (Bergami & Bagozzi, 2000).

3.4 Theory integration and synthesis in the study

In academic research, theoretical perspectives are important to describe, explore, and predict the nature of complex phenomena (Clifford et al., 2010). Considering the complexity of the study, no one theory exists that would either be suitable to address LORM or be sufficient to explain how IOTI should influence team effectiveness and, ultimately, logistics outsourcing performance. Furthermore, potentially suitable theories must be combined in a complementary way to adequately address which contingency factors affect the explanatory power of the conceptual model. Therefore, the present study draws from SIT, SCT and CIIM to ground the conceptual model (Figure 3.3). To be more detailed, the theories employed in this study have been specifically selected to answer the research questions introduced in Section 1.3: SIT and SCT are best suitable for conceptualising an explanatory model required by Research question 1; SIT, together with CIIM, is appropriate to justify the effect of team effectiveness on logistics outsourcing performance demanded in Research question 3; all these three theories provide comprehensive insights on the conditions and

environments that imply the external determinants included in Research question 1, 2 and 3.

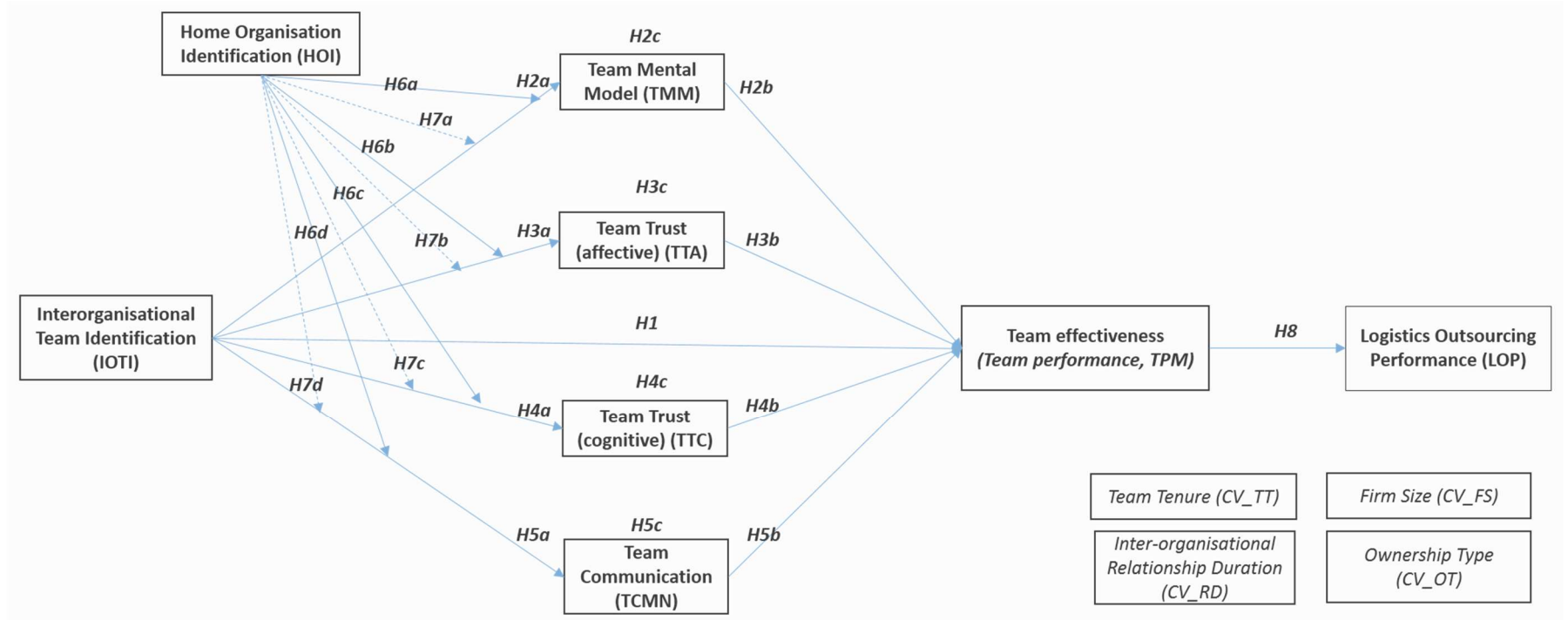
3.5 Hypothesis development

To fulfil the research purposes, this study chose organisation and IOT as reference points to develop the conceptual framework (Section 2.7). From an SIT perspective, the individuals define themselves in terms of salient group memberships (Tajfel, 1978). Group members are more likely to work towards collective goals “perceived to be prototypical for a salient self-category” (Wegge & Haslam, 2003, p. 52). In some cases, dual identities are to be considered in the patterns of co-existence of both superordinated and subordinated identities (Gaertner & Dovidio, 2000). As explained in previous chapters, the concepts of group identification in this study (HOI and IOTI) described only the cognition of oneness (Ashforth & Mael, 1989). Though group identification can exist without member interdependency and interaction, there is still a need to explore the consequences of this cognition further. Theoretically and empirically elevating the intra-organisational team concepts to the IOT level, this section further explores the direct/indirect associations among team function variables.

Integrating theories on team identification with team effectiveness, this study proposed a conceptual model that illustrated the links between IOTI, team process and emergent states, team effectiveness and logistics outsourcing performance (Figure 3.3). Team process was operationalised as Team communication (TCMN), and team emergent states are captured through Team mental model (TMM), Team affective trust (TTA) and Team cognitive trust (TTC). After the procedure of instrument development, Team performance (TPM) was used as the only measure of team effectiveness (See Section 5.2 for more details). By linking organisation identity to team constructs, this study also proposed the moderating effects of HOI on the association between IOTI and team functioning. Finally, the effect of team effectiveness on LOP was also hypothesised for further testing.

Figure 3.3

The conceptual model of the study



Note. Team performance (TPM) is the only indicator of Team effectiveness (See Section 5.2 for more details). Thus, except specifically mentioned in the thesis, TPM/Team performance refers to Team effectiveness.

3.5.1 Team identification and its direct effect on team effectiveness

Previous studies have shown that team identity can affect individuals' self-categorisation, i.e., to perceive themselves as member of a superordinate group, extending intergroup boundaries so that the previous "outgroup" becomes a category of a larger "ingroup" (Gaertner et al., 1993). Such team-based identity leads to positive attitudes towards all team members regardless of their previous group status (Dovidio et al., 2007). Through the process of team identification, ingroup favouritism occurs even when there is no link between self-interest and group reaction or no perceptions of interpersonal liking (Ashforth & Mael, 1989).

As exemplified in some cases (e.g. Billig & Tajfel, 1973; Locksley, Ortiz, & Hepburn, 1980), it is the emergence of psychological group memberships, rather than the interactions within or between groups, that make individual members feel "psychologically intertwined with a group's fate" (Mael & Ashforth, 1995, p. 310) and thus "exert themselves on behalf of the team" (Somech, Desivilya, & Lidogoster, 2009, p. 364) for the relevant collective goals.

Based on the premises of SIT (Hogg & Abrams, 1990; Tajfel, 1981) and SCT (Turner, 1985), identification is a powerful tool to justify potential performance differences between teams. First, individuals who strongly perceive their belongingness to a team are likely to develop a cognitive connection with the team and define themselves in terms of the team attributes and goals (Ashforth & Mael, 1989; van Dick, Wagner, Stellmacher, & Christ, 2005). van Der Veegt and Bunderson (2005) pointed out that a team's performance is contingent upon the "degree of collective team identification within a group" (p. 533). Specifically, Desivilya and Eizen (2005) argued that strengthening team identification promotes constructive efforts on performance gains. The stronger the team identification is, the more likely team members act on behalf of the team to achieve joint team goals (Somech et al., 2009). In organisation contexts, support is found in research into team motivation in which team identification is found to contribute to team effectiveness with the increase of employee motivation (Riketta & van Dick, 2005), job involvement (Tyler & Blader, 2001), and cooperative team-supporting behaviours (van Knippenberg & van Schie, 2000).

Second, SCT assumes that a social category (e.g., a team) becomes part of the psychological self when members define themselves in terms of that category (Ashforth & Mael, 1989; Lin, He, Baruch, & Ashforth, 2017). By categorising themselves into a certain group, people tend to experience a higher level of self (i.e., collective self), implying the close alignment of personal and team interests (Zhang et al., 2014). When it comes to behavioural outcomes, that means individuals are more helpful towards ingroup than towards outgroup members (Dovidio et al., 1997).

For BSEs working together in an IOT, it is reasonable to extend the conclusion above that the high level of collective identity and the resulting sense of IOTI motivate them to act in terms of their team membership to achieve collective goals, which in turn improves team performance (Ellemers et al., 2004; Richter et al., 2006).

Last, from the perspective of CIIM, a strong supercoordinate identity through the process of recategorisation can alleviate the potentially negative effect of subgroup identities (Gaertner & Dovidio, 2000). For example, the acceptance of superordinate identity in the minds of the members from two subgroups mitigates stereotyping and improves intergroup relations (Gaertner, Rust, Dovidio, & Bachman, 1996). Other empirical research supporting this includes such topics as an orientation to collective goal pursuit (Dietz et al., 2015), the emergence of collaborative behaviours (Eckel & Grossman, 2005), and efforts on remaining shared group membership (Bergami & Bagozzi, 2000). In this study, CIIM explicitly maintains that IOTI contributes to the relief of inter-organisational conflict and, what's more, the improvement of team performance (Dovidio et al., 2007).

All in all, IOTI, a cognition-based bond between BSEs and the team, strengthens the psychological connection between all team members, resulting in the achievement of team goals and, ultimately, the improvement of team performance (Gaertner & Dovidio, 2000).

Combining all reasoning and arguments above, it was hypothesised that

H₁: IOTI has a positive effect on team effectiveness.

3.5.2 Team identification and its indirect effect on team effectiveness

In the context of the present study, when BSEs identify with the IOT, there will be more attention on what they have in common rather than the differences between the two organisations. According to CIIM, introducing factors of common goals or fate (e.g., task interdependence) helps achieve the common ingroup identity (Gaertner & Dovidio, 2000). The resulting cognitive representation of dual identity, alternatively speaking IOTI, generates specific cognitive (e.g., TMM), affective (e.g., team trust) and behavioural (e.g., team communication) consequences (Gaertner & Dovidio, 2000). Empirically, Cousins, Handfield, Lawson, and Petersen (2006) demonstrated that the direct effect of formal TOs (e.g., IOTs) on proposed outcomes was not significant. Furthermore, Vijver, Vos, and Akkermans (2011) articulated that the impact of socialisation on desired performance was heavily dependent on the interaction processes.

Aiming to explore those consequences further, this section develops the following hypotheses within the conceptual framework.

Mediating role of team mental model

According to SIT, collective identification enhances a sense of “we”. The resulting superordinate identity makes team members aware of and accepting of the work approaches of individuals from other organisations (Ashforth et al., 2008). That is, team members with strong IOTI are induced to follow group norms, i.e., team mental model in this study, in their thoughts and behaviours. Existing research has demonstrated the positive effects of solid team identification on team mental models. For example, Eckel and Grossman (2005) addressed that collective identity generates the perception of shared goals within the team. By doing this, individuals are better positioned to understand the needs and actions of other members (Mohammed et al., 2010). Furthermore, the team mental model also facilitates information and knowledge sharing among team members and, as a result, benefit team effectiveness. DeChurch and Mesmer-Magnus (2010) justified a positive relationship between team mental model and team performance outcomes. Similarly, Maynard and

Gilson (2014) pointed out that a shared mental model is positively linked to virtual team performance. Additionally, a meta-analytic report proves the TMM-performance link across various team types (DeChurch & Mesmer-Magnus, 2010).

From the SCT perspective, decategorisation process enables team members to psychologically attach to the team (Cannon-Bowers & Salas, 2001). The resulting similar mental model motivates them to go beyond their home organisation and to work towards common goals (J. E. Mathieu et al., 2000). Cognitively, individuals are prone to more positive feelings about ingroup members (Howard & Rothbart, 1980) and greater interaction between the self and others in the team (Aron et al., 2004). Thus, it is reasonable to say that the strength of IOTI empowers team members to bind together to realise team goals and improve team performance (Lin et al., 2017).

These arguments suggest that the team mental model explains the association between team identification and team effectiveness. Thus, it was hypothesised that

H_{2a}: IOTI has a positive effect on team mental model.

H_{2b}: TMM has a positive effect on team effectiveness.

H_{2c}: IOTI is positively related to team effectiveness through team mental model.

Mediating role of team trust

According to SCT, decategorisation enables BSEs from different organisations to share a salient supercoordinate identity based on the shared team membership (e.g. Foddy, Platow, & Yamagishi, 2009). Transforming their goals from self-serving to group serving develops team trust (Hogg et al., 2017). Emotionally, individuals feel more positively towards ingroup members of this salient collective identity (Otten & Moskowitz, 2000). Furthermore, CIIM implies that a common ingroup identity leads to intergroup trust (Riek et al., 2010). In the context of this study, IOTI facilitates individuals' self-disclosing interactions with previous outgroup members and then positively influences team trust (Dovidio et al., 1997).

Scholars have found that team trust enhances team effectiveness. Based on 112 independent studies, de Jong, Dirks, and Gillespie (2016) concluded that team trust has an above-average effect on team performance. Similarly, Breuer, Hüffmeier, and Hertel (2016) supported the viewpoint that a strong positive association between team trust and team performance exists. Specifically, they elaborated and justified the positive effects of team trust on team attitudes (e.g., team commitment). Furthermore, a recent meta-analytic review revealed that cognitive and affective trust measures are similar in their relationships with team effectiveness (Feitosa et al., 2020). These results supplemented the findings of another previous review that each type of trust yields independent effects (de Jong et al., 2016).

Analogous to these previous findings, this study argued that team trust (both affective and cognitive) explains the association between team identification and effectiveness. Thus, it was hypothesised that

H_{3a}: IOTI has a positive effect on team trust (affective).

H_{3b}: Team trust (affective) has a positive effect on team effectiveness.

H_{3c}: IOTI is positively related to team effectiveness through team trust (affective).

H_{4a}: IOTI has a positive effect on team trust (cognitive).

H_{4b}: Team trust (cognitive) has a positive effect on team effectiveness.

H_{4c}: IOTI is positively related to team effectiveness through team trust (cognitive).

Mediating role of team communication

Team identification can guide individual members to behave and think in a way aligned with the group's goals. From the SCT perspective, the salience of particular group categorisation motivates team members to communicate and respond to each other in a manner consistent with being a prototypical in-group member (Turner, 1984). Further theoretical support for this proposal can be gained from SIT, suggesting that a shared sense of "we-ness" can motivate team members to exchange information provided by others within the team (Tajfel & Turner, 1979). Such a shift towards the perception of the collective self predicts

individual behaviours based on the individual's perceived membership in a social group (Tajfel & Turner, 1986).

There is an agreement that individuals are more willing to communicate and adopt suggestions from others when all team members share a common social identity (Kane, Argote, & Levine, 2005). In working on everyday tasks, enhanced interaction and information sharing in a team should improve working efficiency and, in turn, positively affect team performance. Moreover, cognitive and affective ties to the team can enhance the existing communication patterns among team members (Postmes, Haslam, & Swaab, 2005).

Team communication has been acknowledged to be critical to achieving higher performance levels (Marlow et al., 2018). For example, improved communication skills strengthened interpersonal relationships in virtual teams (Foster, Abbey, Callow, Zu, & Wilbon, 2015). Communication quality influences the performance of cross-functional project teams in new product development (R. T. Keller, 2001). In contrast, deficient team communication may lead to poor performance in routine and dynamic environments (Foushee, 1984).

Furthermore, theoretical studies showed that effective communication positively affects team performance. Investigating the meta-analytic relationship between team communication and performance, Marlow et al. (2018) argued that communication was positively and significantly related to team performance. Empirical studies also illustrated that communication with external partners is a team boundary-spanning activity that optimises decision-making and improves IOT effectiveness (Cummings, 2004).

Since identification with certain groups leads to the collective self, team communication should serve as a mechanism through which team identification can build and foster efficient interaction among team members. The resulting better coordination, in turn, improves team effectiveness (Postmes et al., 2005). Empirical evidence shows that team identification enhances interactive communication between team members, empowering them to achieve group goals (Worchel, Rothgerber, Day, Hart, & Butemeyer, 1998).

Combining all reasoning and arguments above, it was hypothesised that

H_{5a}: IOTI has a positive effect on team communication.

H_{5b}: Team communication has a positive effect on team effectiveness.

H_{5c}: IOTI is positively related to team effectiveness through team communication.

3.5.3 Factors moderating the relationships

This study also aims to explore the potential moderating effect of HOI on the relationship between IOTI and emergent states and processes. As for inter-organisation collaborations, BSEs act as the organisational representatives with counterparts from external partners. On the one hand, they speak and act in a way consistent with their home organisational identity; on the other hand, those BSEs are expected to “submerge variability and diversity in a single representation that characterises an entire human group” (Hogg & Reid, 2006, p. 10), resulting in the emergence of IOT identity. However, previous studies in organisation identification implied that the identity process of BSEs would be more complicated in the IOT context as they interact with individuals from other organisations (Korschun, 2015).

Moderating role of home organisation identification (HOI)

As explained in Section 3.5.2, SIT assumes that collective identification leads people to pursue respective goals in ways that are consistent with their identities (Ellemers et al., 2004). CIIM emphasises that recategorisation into IOTs transforms BSEs’ perceptions from “us” and “them” to a more inclusive “we”. Besides, people intend to define the self through the depersonalisation process for self-enhancement and uncertainty reduction. It is through the processes of depersonalisation and recategorisation that HOI and IOTI are linked.

In organisational behaviour literature, it has been widely accepted that people can identify with multiple collectives. At the same time, an individual’s identification with one identity target may influence the impact of identification with other foci (Hornsey & Hogg, 2000). For example, Chen, Chi, and Friedman (2013) found that sales representatives’ performance depended on both their identification with the subordinated entity (department store) and the superordinate one (the company). As reasoned by Nkomo, Cox, Clegg, Hardy,

and Nord (1999), “the study of one identity necessarily involves attending to its interaction with other identities” (p. 99).

Expanded to the context of IOT, this implies that IOT members may identify with the overarching IOT and their home organisation. If people recognise that they are a part of an IOT and their home organisation simultaneously, they would be expected to positively change their attitudes towards previous outgroup members after redefining who is perceived as an ingroup member (Glynn, Kazanjian, & Drazin, 2010). Furthermore, some researchers have theoretically disputed what type and under what conditions an interaction exists between IOTI and HOI (Korschun, 2015). Acting on behalf of and loyal to their home organisations, IOT members may have competing — sometimes even conflicting — organisational identities when balancing the desires for IOTI-based inclusiveness and HOI-based distinctiveness (Drach-Zahavy, 2011). Though an approach to creating a common identity (IOTI in this study), the recategorisation process potentially intensifies inter-group bias and thus leads to conflicting inter-group relations (Crisp et al., 2006). The dual identity model assumes that strongly identifying with the subgroup identity leads to adverse inter-group outcomes (Gaertner & Dovidio, 2000; Wieseke et al., 2012). As a result, BSE’s attempts to achieve differentiation result in the salience of HOI over IOTI would undermine team favouritism and, consequently, impair the positive relationships between IOTI and team emergent states or process (Drach-Zahavy & Somech, 2010).

Guided by the theoretical framework combining SIT, SCT and CIIM, this study proposed that the relationship between boundary spanners’ IOT identification and team functioning is contingent upon the moderator of HOI.

H_{6a}: IOTI has a stronger, more negative relationship with team mental model when HOI is high than when it is low.

H_{6b}: IOTI has a stronger, more negative relationship with team trust (affective) when HOI is high than when it is low.

H_{6c}: IOTI has a stronger, more negative relationship with team trust (cognitive) when HOI is high than when it is low.

H_{6d}: IOTI has a stronger, more negative relationship with team communication when HOI is high than when it is low.

The moderating role of HOI, in combination with the mediating role of the team mental model, team trust (affective), team trust (cognitive) and team communication, indicates the presence of a moderated mediation effect (Preacher, Rucker, & Hayes, 2007). HOI is a contingency factor that negatively influences the indirect connection between IOTI and TPM through the links via multiple mediators (see Section 3.5.2). Everyday tasks and benefits shared by all IOT members involved in the logistics outsourcing project, BSEs in such a team positively identify with their counterparts from the partnering firms (Gaertner et al., 1993). Nevertheless, prioritising their home organisation's benefits, a team member's IOTI may conflict with their HOI when they are unwilling to conceive of themselves as IOT members (Riek et al., 2010). Consequently, the interaction between IOTI and HOI weakens the mediation effects hypothesised in the present study.

Combing the reasonings above with the arguments for mediation and moderation effects, the following hypotheses were developed:

H_{7a}: The indirect relationship between IOTI and team effectiveness, through team mental model, is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.

H_{7b}: The indirect relationship between IOTI and team effectiveness, through team trust (affective), is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.

H_{7c}: The indirect relationship between IOTI and team effectiveness, through team trust (cognitive), is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.

H_{7d}: The indirect relationship between IOTI and team effectiveness, through team communication, is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.

3.5.4 Team effectiveness and its effect on logistics outsourcing performance

Proximal team outcomes, such as team performance, are supposed to intermediately predict the distal outcome of team effectiveness (Ilgen et al., 2005). This viewpoint is supported by the empirical findings of (Stank, Goldsby, Vickery, & Savitskie, 2003). In the study on logistics service performance, the authors argued that relational performance, which implicitly consists of the measures of team performance, positively influences logistics outsourcing performance in aspects of operation and cost efficiency (Stank et al., 2003). From a meso-theorising perspective, team effectiveness imposes a cross-level influence on higher-level outcomes (Kim et al., 2016). As illustrated in the extended Bathtub Model (Figure 2.2.b), there exists a causal relationship throughout transformational mechanisms, i.e. team outcome constructs affect supply chain performance (e.g. logistics outsourcing performance).

In alignment with related theoretical and empirical findings, the following hypothesis was developed:

H₈: Team effectiveness has a positive effect on logistics outsourcing performance.

All hypotheses above are listed in Table 3.1.

Table 3.1

List of hypotheses

Hypotheses	
H₁	IOTI has a positive effect on team effectiveness.
H_{2a}	IOTI has a positive effect on team mental model.
H_{2b}	Team mental model has a positive effect on team effectiveness.
H_{2c}	IOTI is positively related to team effectiveness through team mental model.
H_{3a}	IOTI has a positive effect on team trust (affective).
H_{3b}	Team trust (affective) has a positive effect on team effectiveness.

H_{3c}	IOTI is positively related to team effectiveness through team trust (affective).
H_{4a}	IOTI has a positive effect on team trust (cognitive).
H_{4b}	Team trust (cognitive) has a positive effect on team effectiveness.
H_{4c}	IOTI is positively related to team effectiveness through team trust (cognitive).
H_{5a}	IOTI has a positive effect on team communication.
H_{5b}	Team communication has a positive effect on team effectiveness.
H_{5c}	IOTI is positively related to team effectiveness through team communication.
H_{6a}	IOTI has a stronger, more negative relationship with team mental model when HOI is high than when it is low.
H_{6b}	IOTI has a stronger, more negative relationship with team trust (affective) when HOI is high than when it is low.
H_{6c}	IOTI has a stronger, more negative relationship with team trust (cognitive) when HOI is high than when it is low.
H_{6d}	IOTI has a stronger, more negative relationship with team communication when HOI is high than when it is low.
H_{7a}	The indirect relationship between IOTI and team effectiveness, through team mental model, is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.
H_{7b}	The indirect relationship between IOTI and team effectiveness, through team trust (affective), is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.
H_{7c}	The indirect relationship between IOTI and team effectiveness, through team trust (cognitive), is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.
H_{7d}	The indirect relationship between IOTI and team effectiveness, through team communication, is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.
H₈	Team effectiveness has a positive effect on logistics outsourcing.

3.6 Summary

This study employed a pluralistic approach to build a theoretical foundation for the research. Rooted in a synthesis of SIT (Section 3.1), SCT (Section 3.2) and CIIM (Section 3.3), theoretical foundations of the study is elaborated that can be used to explain the mechanism of relationship management in general and the interaction between LSPs and their customers. Based on the justification of theory integration and synthesis in Section 3.4, the conceptual model is finalised with a set of hypotheses to test the direct, mediated, moderated, and moderated mediated effects among the variables involved in the study (Section 3.5).

CHAPTER FOUR: METHODOLOGY

This chapter reviews the research philosophy, scenario, methodology and, most importantly, the design of the research. Specifically, it systematically details how the study was conducted throughout the five phases of research. Finally, ethical and risk considerations are reviewed in detail.

4.1 Research philosophy

Research philosophy is concerned with the development of knowledge and the nature of that knowledge (Saunders et al., 2023). To help researchers achieve a clear sense of reflexive role in research methods (i.e., researcher's stance that determines the types of relationship between the researcher and the researched), appropriate philosophical assumptions are deemed to underlie research design and evaluation (Easterby-Smith, Thorpe, Jackson, Jaspersen, & Smy, 2018; Gray, 2021). According to Easterby-Smith et al. (2018), a discussion of philosophy generally involves deliberations around ontology, epistemology and paradigm, which are three significant ways of thinking about research philosophy.

4.1.1 Ontology

Ontology refers to the study of being (the nature of existence and what constitutes reality) (Gray, 2021). Here, I briefly discuss the debates between the positions of internal realism, relativism and nominalism introduced by Easterby-Smith et al. (2018). Firstly, internal realists believe that truth exists but are obscure and that facts are concrete but cannot be accessed directly. From a relativist ontology, one issue might be defined and experienced differently, and thus there are many perspectives surrounding it. Moreover, the position of nominalism assumes that there is no truth and that all facts are human creations.

Considering the development of management strategy and uncertainties of the business environment, I chose the ontology of Relativism. From this perspective, the variety of responses is valuable to explore my research to draw persuasive conclusions. Moreover, my ontological perspective (Relativism) also informs the epistemology of the research.

4.1.2 Epistemology

Epistemology provides a philosophical background for deciding what knowledge is legitimate and adequate (Gray, 2021). As defined by Easterby-Smith et al. (2018), there are two contrasting views of how research should be conducted: positivism and constructionism. The key idea of the former is that the social world exists externally, and its properties can be measured through objective methods rather than being inferred in subjective ways. In contrast, constructionism emphasises that many aspects of societal reality are determined by people rather than objective and external factors. Based on the comparison and contrast of these two perspectives, I prefer to use constructionism as the epistemological guidance for my study. From the constructionist position, I have the same understanding that there may be many different realities in the social world and through the mixed use of quantitative and qualitative methods, that the researchers can understand and gather multiple experiences and views of each participant (Easterby-Smith et al., 2018).

It needs to be emphasised that although there has yet to be consensus on the classification and categorisation of ontology and epistemology, the combination of ontology and epistemology is still instructive for research design. More specifically, it provides theoretical perspectives of the research and the selection criteria of the research paradigm suitable to my study.

4.1.3 Paradigm

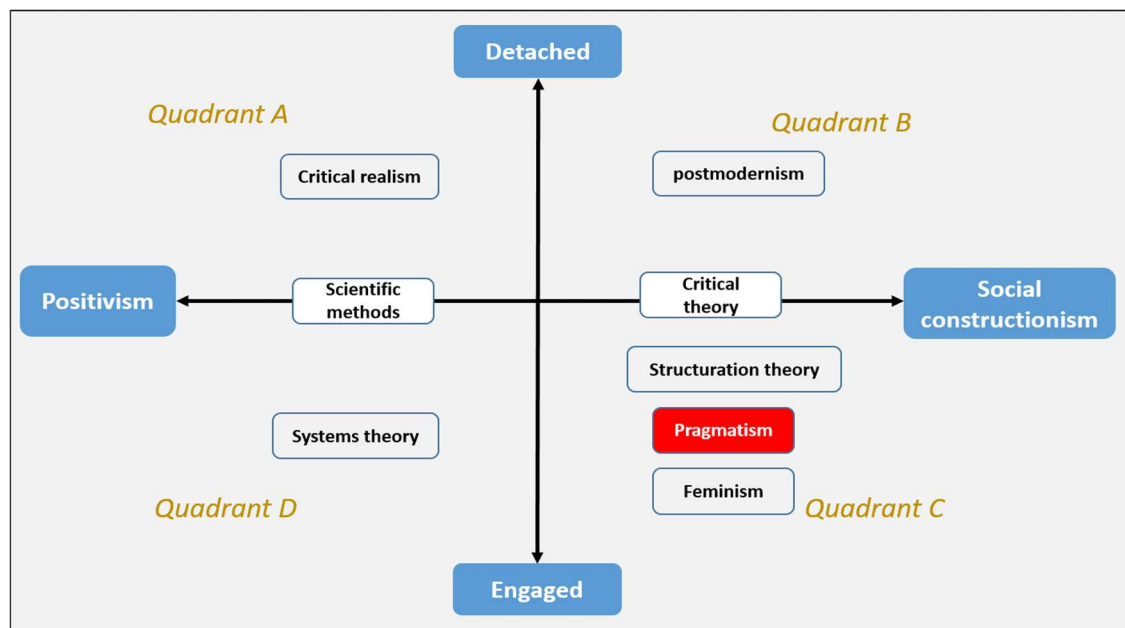
A research paradigm examines social phenomena, from which particular understandings of these phenomena can be achieved and explanations justified (Saunders et al., 2023). It is commonly accepted that paradigms are a pivotal guide for the researchers to ground their research and, what's more important, the choice of paradigm used in a particular study should be "at the discretion of the researcher(s)" (Shannon-Baker, 2016, p. 332).

To help build a solid philosophical foundation for one's research, Easterby-Smith et al. (2018) introduced a matrix to map philosophies and approaches against epistemologies (Figure 4.1). In this matrix, two dimensions illustrate how different paradigms relate to each other: the epistemological stance of "positivist-

constructionist” and the dimension of “detached-engaged,” illustrating if researchers are independent of or get close to the people or processes that they are studying. Based on ontological and epistemological perspectives, this study adopted the paradigm of pragmatism (located in Quadrant C of engaged constructionism). First, Pragmatists believe that there are many different ways of interpreting the world and undertaking research and that there may be multiple realities (Saunders et al., 2023). Second, pragmatism implies the utilisation of abduction (Morgan, 2007) and mixed methods (Onwuegbuzie, Johnson, & Collins, 2009). In this study, I consider the targeted respondents through combined interviews (qualitative) and a survey (quantitative). Ultimately, I agree with the pragmatic viewpoint that espouses that the most important determinant concerning the epistemology and ontology is the research question (M. N. K. Saunders et al., 2023).

Figure 4.1

Mapping philosophies and approaches against epistemologies



Note. From *Management & business research* (6 ed.) by M. Easterby-Smith, R. Thorpe, P. R. Jackson, L. J. Jaspersen and K. Smy, 2018, SAGE Publications.

Breaking down the dichotomy between the positivist and the constructivist, pragmatic researchers can balance subjectivity and objectivity, i.e., maintain both subjectivity in the reflections on research and objectivity in data collection

and analysis (Biesta, 2010; Shannon-Baker, 2016). Table 4.1 below provides a further reference for the research design in Section 4.5.

Table 4.1

The perspective of pragmatism

Category	Implications
Purpose for using	Determine practical solutions and meanings; useful for programmatic or invention-based studies
Approach to connecting theory to data	Connect theory before and after data collection
Researcher's relationship to the research	Can follow tenets of objectivity and/or subjectivity depending on research / researcher (referred to as intersubjectivity)
Inferences from data	Discuss transferability of results by determining level of context-specificity and study's generalisability
Implications for mixed methods research	Mixes characteristics of quantitative and qualitative approaches; identifies practical solutions

Note. Adapted from "Making paradigms meaningful in mixed methods research", P. Shannon-Baker, 2016, *Journal of Mixed Methods Research*, 10(4), 319-334.

4.2 Research scenario and foci

Rather than testing the dynamic characteristics of the team, this study utilises a static approach to emergence as the basis of the conceptual framework (Kozlowski & Chao, 2012). The predominant approach in organisational research is functionalist and quantitative, typically using surveys and questionnaires to explore the mediating and moderating relationships in the study of team identification (Atewologun, Kutzer, Doldor, Anderson, & Sealy, 2017)). From this perspective, the emergent state in this study refers to the stable state of a team at a particular moment, which is correlated with emergent processes (Fulmer & Ostroff, 2016). Considering the theoretical foundation, existing measurements and time horizon of the research, IOTI is a relatively

stable factor closely associated with identity-related phenomena (i.e., emergent states and process) and inter-organisational outcomes (i.e., IOT effectiveness).

As SIT implies, identity is generally conceived as a cognitive construct (John C. Turner, 1982). In organisational and even broader supply chain environments, identification illustrates various self-related motivations and needs, leading to a wide range of outcomes (e.g., individual, team, organisational, and cross-boundary) (Ashforth et al., 2008). In defining oneself in terms of the identity of the relevant collectives, an individual may hold multiple identities in the workplace (Riketta & van Dick, 2005). For example, responsible for bridging partnering firms with conflicting agendas, BSEs from an LSP can have multiple foci of identification with both IOT and their home organisation.

In particular, this study did not focus on personal identities or demographic attributes but group-level phenomena and relevant social identities. Meanwhile, the individual-level foci of identification were chosen to construct an individual's sense of self at work. In the organisational background, Cornelissen, Haslam, and Balmer (2007) categorised identity research as individual (personal sense of self within the organisation), group (shared identity of groups within an organisation), organisational (the identity of the organisation as a whole) and cultural (common identity across organisations and within a society). In a logistics outsourcing context, the present study investigates two collective identity targets in the conceptual model: cultural (IOTI) and organisational (HOI).

To conclude, the present study is cross-sectional research focusing on the dual identities of BSEs in logistics outsourcing collaboration. Under the static research scenario, this study aims to shed some light on individual-level identities of both IOT and home organisations that address how one's comprehensive sense of self can be derived from the intertwined collective senses.

4.3 Unit of analysis

Given the research questions answered, the unit of analysis in this study is inter-organisational teams in logistics outsourcing collaboration (see Figure 1.3). The hypotheses were tested using data achieved from the logistics outsourcing

industry. Selected as the most appropriate informants for the study, the members of such teams, i.e., BSEs, were from either LSP or LSC who worked collaboratively with dual identification (both of this team and their home organisation). The participants were required to review relevant IOT operations for a self-specified logistics outsourcing project. To accomplish joint goals, they interact in a coordinated way to perform daily work. Their perceptions towards collective identifications, team processes and states, team effectiveness and operational performance were at an overall team level; thus, these respondents are assumed to be qualified representatives of the IOTs.

4.4 Level of analysis

As clarified in Section 4.2 (research scenario), this study focuses on the individual-level identity of group-level phenomena. Though the concern about emergent states, the collective identity targets (i.e., IOTI and HOI) and even macro-level performance outcomes, this study did not consider the multilevel modelling and the relevant aggregation techniques. Firstly, the common practice of measuring and aggregating emergent states and processes is unsuitable for IOT-centred operation. According to Atewologun et al. (2017), there are three pre-conditions for the adoption of shared/compositional models: (a) the relatively homogeneous views on the construct of interest, (b) no substantial subgroups, and (c) the irrelevance of the construct of interest to the dyadic level interaction (Kozlowski & Klein, 2000). In the context of logistics outsourcing, BSEs have different identity orientations towards IOT and their home organisations; within an IOT, two hidden subgroups exist (an LSP and its customer); individuals of each subgroup interact with each other in the logistics operation.

Furthermore, there is a substantial difference between two concepts in the organisational identification research: level of analysis and level of self. The former refers to “the unit to which data are assigned for hypothesis testing and statistical analysis” (Rousseau, 1985, p. 4). As evidenced by the extensive literature, each unit has its own identity at such various levels of aggregation as personal identity (e.g. Randel & Jaussi, 2008), team identity (e.g. Shemla & Wegge, 2019) and organisational identity (e.g. Smith, 2011). On the other hand,

the level of self refers to individuals categorising themselves in line with the identities associated with the level of analysis (e.g., I am a unique person — individual, I am a member of this team — group). Therefore, it is reasonable to conclude that identification has been theorised and operationalised at various levels in both single- and multi- level studies. In the present research scenario (Section 4.2), the dual identification of BSEs in IOTs is considered: IOTI focuses on an individual-level perception of a supply chain-level characteristic, and HOI represents that perception of an organisational-level one. Guided by Klein, Dansereau, and Hall (1994) and Atewologun et al. (2017) and consistent with the approach of van Der Vegt and Janssen (2003), this study emphasised the organisationally situated individual foci on both IOT and home organisation.

As illustrated in Chapter Three, all constructs potentially involved in the conceptual model are team-level. To avoid ‘aggregation biases and drawing inappropriate conclusions from confusion over levels of analysis’ (Tesluk & Mathieu, 1999, p. 206), those constructs were measured as individual-level variables at either IOT or organisational level (i.e., the level of analysis is individual). To further explain, the meaning of certain team-level constructs originated from the shared quality of relevant individual-level perceptions. In social identity literature, a large number of studies have defined organisational identity from the perspective of individuals (de Jong & Elfring, 2010; Hogg & Terry, 2000), referred to as perceived organisational identity (Whetten et al., 2009). These shared perceptions may emerge from group membership and social categorisation processes, members’ shared experiences in the group, and contextual factors that affect their interactions. In this logic, this research conceptualised all variables as individuals’ perceptions: all IOT-level variables root in the BSE level and their meanings come from the shared perceptions that emerge from IOT or home organisational memberships and social categorisation processes.

The present study can be defined as a mesomorphic research, i.e., focusing on one level (IOT) to discover the influences of the other levels (individual, organisational and supply chain) within it.

4.5 Mixed methods research design

Research design aims to develop a blueprint for data collection, measurement, and analysis in a specific research context (Blaikie & Priest, 2019). The resulting framework of methods and techniques provides insights about how the research is to proceed to fulfil research objectives.

As explained in Section 4.1, pragmatism was adopted as the philosophical stance of the study, implying the use of a mixed methods approach throughout the whole research process. As shown in Table 4.2, a paradigmatically grounded mixed methods approach can support the use of multiple methods, different assumptions and different forms of data collection and analysis (Creswell & Creswell, 2023). Further evidence of this choice is related to research settings. Though the use of verified measurements in the literature, the phenomenon to investigate in the present study needs to be explored and understood because it involves an understudied sample (i.e., logistics outsourcing BSEs) in a new research context that has never been examined from a meso-level perspective. In other words, there is a need to specify existing quantitative measures/instruments in logistics outsourcing research.

Table 4.2

Pragmatism and its relevance to mixed methods approach

Philosophical assumptions	Reflection on mixed methods approach
Pragmatism is not committed to any one system of philosophy and reality	Researchers draw liberally from both quantitative and qualitative assumptions when they engage in their study
Individuals have a freedom of choice	Researchers are free to choose the methods, techniques, and procedures of research that best meet their needs and purposes
The world is not an absolute unity	There are many approaches for collecting and analysing data rather than subscribing to only one way

Truth is what works at the time

Quantitative and qualitative data work together for the best understanding of a research problem

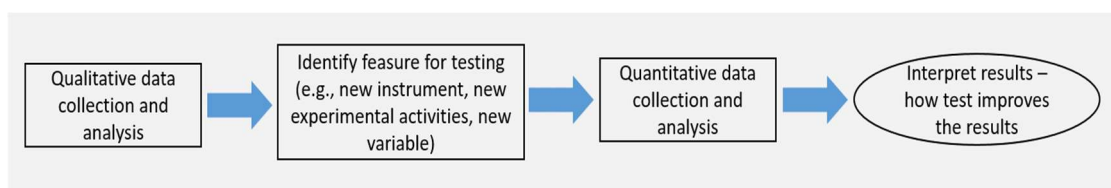
Note. Adapted from *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.) by J. W. Creswell and J. D. Creswell, 2023, SAGE Publications.

Finally, the study adopted the reasoning approach of an exploratory sequential mixed method (Creswell & Clark, 2018). Figure 4.2 shows the four phases of data collection and analysis: 1) a qualitative phase; 2) a quantitative feature phase; 3) a final quantitative test phase; and 4) interpretation of the results. Furthermore, there are key components related to this research design:

- The collection and analysis of quantitative and qualitative data in response to research questions and hypotheses.
- The integration of those data and their results.
- The use of the specific design on logic and procedures for conducting the study.
- The use of theory and philosophy for framing these procedures.

Figure 4.2

Diagram for a study with exploratory sequential design



Note. From *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.) by J. W. Creswell and J. D. Creswell, 2023, SAGE Publications.

In sum, the exploratory sequential design makes it possible to achieve both depth and breadth of understanding about the participants' thoughts and experiences in a comprehensive and integrated way. Considering the overall priority of quantitative data in the present study, the notation to describe the flow of quantitative and qualitative methods in Figure 4.4 was written as "**qual** →

development → QUAN = validate exploratory results by generalising findings through a context-specific instrument”.

4.6 Research procedure

As this research explores an inter-organisational phenomenon based on intra-organisational studies, it is critical to bridge this gap methodologically. Following Skinner, Autry, and Lamb (2009) closely, all IOT-centred constructs and corresponding measurement items were generated based on the extant team literature. In addition, the conceptual model and hypotheses were developed with support from team-focused theories. Because the IOT concepts yet to be measured in logistics outsourcing literature, it is reasonable to attempt to sufficiently contextualise the existing measurements and develop a new survey instrument for the research. As Creswell and Clark (2018) recommend, this study aligned DeVellis’ scale development steps with the research procedure (Figure 1.4). It is worth noting that the main aim of the qualitative phase below is to locate published measurements into the conceptual model rather than developing an entirely new survey instrument. Therefore, DeVellis’ steps will be modified and incorporated into the study.

4.6.1 Phase 1: Design and implement the literature review

After generating the broad research area, this study extensively reviewed the literature to build the research framework for the project. There are three types of review in the development of the study:

- **Review of theoretical literature:** the aim is to gain a detailed understanding of the research area and contextual knowledge about the research topic regarding existing theories, research models/frameworks, key concepts, etc. More importantly, the theories identified in previous works built a solid foundation in explaining the role of IOTI in logistics outsourcing collaboration and indicating a set of variables that affect team effectiveness (direct) and performance (indirect).
- **Review of empirical literature:** the aim is to identify and appraise the academic findings related to the subject of this study, to

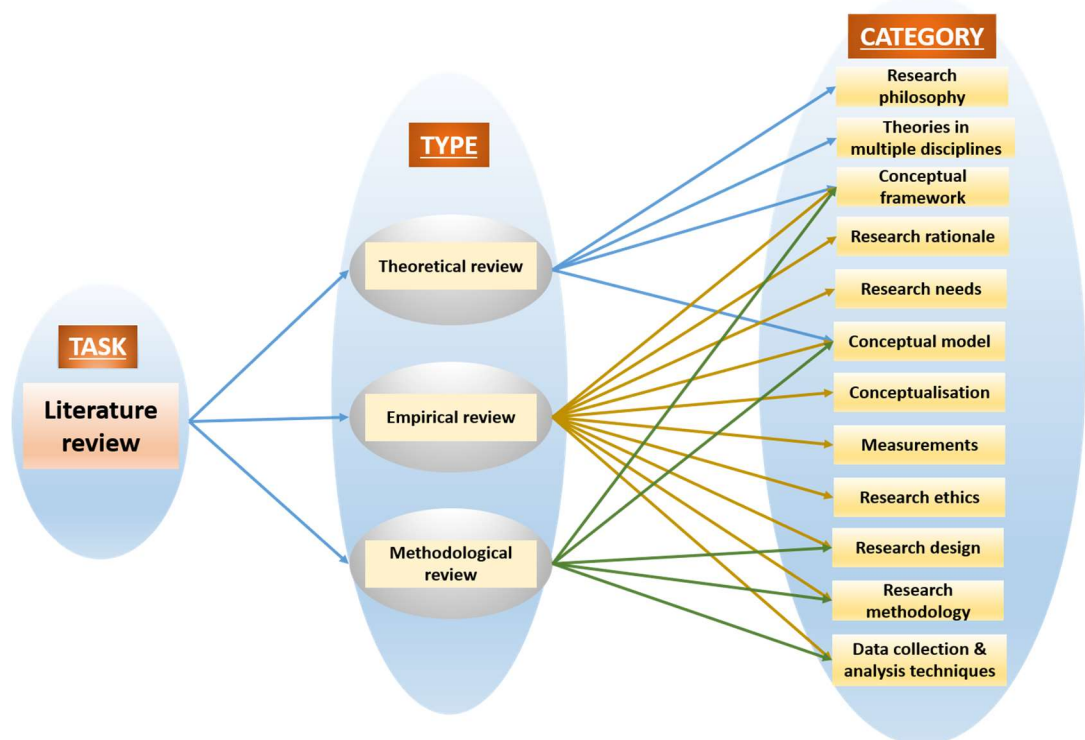
provide solid evidence on the research traditions in the targeted field, in aspects of supporting evidence to an argument, contradictory or ambiguous findings, application of various methodological approaches, etc.

- **Review of methodological literature:** the aim is to accumulate knowledge regarding research philosophy, research design, data collection and analysis techniques, research ethics and many other methodological concerns (Aguinis, Ramani, & Alabduljader, 2023).

As a result, the concrete foundation of this study was built by integrating what has been done in the literature, building bridges between related studies/topics, and identifying key issues in the research field (Figure 4.3).

Figure 4.3

Brief review of literature review results



Due to the lack of IOT study in the supply chain field, the present study had to investigate broadly and learn from other disciplines. Consequently, the online search covered several academic databases (e.g., EBSCO, ProQuest, Scopus,

Elsevier and PsycINFO). Specifically, three combinations of keywords were used to locate various sets of literature:

- Keywords for “Supply chain relationship management”: inter-organisational relationship and interpersonal relationship, alliance, partner, etc.
- Keywords for “Logistics outsourcing”: logistics outsourcing, logistics service provider, third-party and contract logistics, etc.
- Keywords for “Inter-organisational team identification”: inter-organisational team, dual identification and boundary spanning employee, etc.

Table 4.3 presents two examples of literature searches with search strings used in different databases with unique inclusion criteria (Table 4.4). Additionally, the study implemented the backward reference search to supplement seminal articles and vital cross-references. As the study progressed, the literature search was repeated with the same criteria updated and/or more relevant studies published to keep the study current.

Table 4.3

Examples of literature search record

Proposed research focus	Database	Search strings	Inclusion-exclusion criteria	# of Search results (initial)	# of Search results (revised)	Remarks
logistics outsourcing	Business Source Complete (EBSCO)	(TI ("contract logistics" OR "outsourc* logistics" OR "third party logistics" OR "third-party logistics" OR "distribution outsourcing" OR "logistic* outsourcing" OR "transportation outsourcing" OR "warehousing outsourcing" OR "logistics provider*" OR "logistics service provider*" OR "logistic* service*") OR AB ("contract logistics" OR "outsourc* logistics" OR "third party logistics" OR "third-party logistics" OR "distribution outsourcing" OR "logistic* outsourcing" OR "transportation outsourcing" OR "warehousing outsourcing" OR "logistics provider*" OR "logistics service provider*" OR "logistic* service*"))	Scholarly (peer reviewed) journals; Language: English; Publication type: Academic Journal	1,274	608	Search in TITLE and ABS-TRACT
logistics outsourcing	ABI/Informs (ProQuest)	(TI ("contract logistics" OR "outsourc* logistics" OR "third party logistics" OR "third-party logistics" OR "distribution outsourcing" OR "logistic* outsourcing" OR "transportation outsourcing" OR "warehousing outsourcing" OR "logistics provider*" OR "logistics service provider*" OR "logistic* service*") OR AB ("contract logistics" OR "outsourc*	Peer reviewed; Language: English;	2,646	1,258	Search in TITLE and ABS-TRACT

logistics" OR "third party logistics" OR "third-party logistics" OR "distribution outsourcing" OR "logistic* outsourcing" OR "transportation outsourcing" OR "warehousing outsourcing" OR "logistics provider*" OR "logistics service provider*" OR "logistic* service*"))

Source
type:
Scholarly
journals

Table 4.4*Inclusion criteria on literature search*

Inclusion criteria	Rationale
Article must demonstrate 1) relationship management, 2) logistics outsourcing, or 3) inter-organisational team identification as the clear focus of the research	As this research is not restricted to any journals, research on other subjects than logistics may occur
Article must be written in English	English is the dominating research language in the field of logistics and supply chain management
Article was published in a peer-reviewed journal with an impact factor above 1.0 in Thomson Reuters' Journal Citation Report (JCR) or if the article is not listed in the JCR, the journal was ranked in the ABS ranking in the third category or higher	Only peer-reviewed journal articles with a certain quality level can reliably shed light on the current state of research and simultaneously ensure the expected quality level
All types of articles to be included, e.g. literature review, conceptual, theoretical or empirical study.	The review is to cover all academic contributions in the fields.
Time span is not specified	Within a certain period, there is potential risk of discarding classical theories or studies published several decades ago

4.6.2 Phase 2: Design and implement qualitative research

This study aimed to collect data from the members of the Council of Supply Chain Management Professionals China (CSCMP China). Using this as the field setting was attributed to the logistics operation background of this organisation's members and the likelihood of obtaining relevant data from experienced participants. Headquartered in the US, CSCMP is a professional not-for-profit organisation in the logistics and supply chain industry. Since 1963, it has provided networking, career development, and educational opportunities to the logistics and supply chain management community around the globe. In 2002, CSCMP China Representative Office was established to develop, network

and manage local members' networking events. Today, it consists of five roundtables (Beijing, Shanghai, Shenzhen, He'nan and Zhejiang) with a nationwide membership database covering various organisations acting as either LSP or LSC in logistics outsourcing partnerships.

Population and Sampling strategy

The population of this study was BSEs from either LSPs or LSCs in an IOT for a logistics outsourcing project in China. Given the complexity of data collection and analysis, such a population was extremely difficult, or even impossible, to research. Thus, this study redefined the population to a relatively manageable targeted population (i.e. the actual focus of the research inquiry, Saunders et al., 2023) — the members of CSCMP China who have IOT work experience in the logistics outsourcing industry. Based on this sampling frame, different strategies were used to collect the samples for the qualitative and quantitative phases, respectively (Table 4.5). It is worth noting that two different samples from the same population must be identified separately, i.e., a small purposeful sample in Phase 2 and a large random sample of participants in Phase 4 (Creswell & Clark, 2018).

Table 4.5

Overview of sample selection

Population	Targeted population	Sampling frame	Sampling strategy (qualitative) for Phase 2	Sampling strategy (quantitative) for Phase 4
All BSEs who are from either LSPs or LSCs in an IOT for a logistics outsourcing project in China	The members of CSCMP China who have IOT work experience in logistics outsourcing industry	The complete membership list for CSCMP China	Non-probability based, heterogeneous purpose sampling (to choose participants with sufficiently diverse characteristics)	Probability based, stratified random sampling (to randomly choose participants from a subset of the target population)

to provide the maximum variation possible in the data collected)	based on one or more attributes)
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Note. Compiled from *Research methods for business students* (7 ed.) by M. Saunders, P. Lewis and A. Thornhill, 2016, Pearson and “Mixed methods sampling: A typology with examples” by C. Teddlie and F. Yu, 2007, *Journal of Mixed Methods Research*, 1(1), 77-100.
<https://doi.org/10.1177/1558689806292430>.

During this phase, a semi-structured interview was used to collect a detailed set of qualitative data. The interview consisted of direct questions about the interviewees’ working experience and additional questions exploring themes on their affective, cognitive, and behavioural concerns. This aligned with Saunders et al. (2023)’s view of semi-structured interviews identifying and exploring research themes in a systematic manner that allows for probing responses.

Specifically, the maximum-variation strategy was applied to find a breadth of interview participants with diverse characteristics (Creswell & Poth, 2018). The rules consist of 1) an even number of interviewees from LSPs and LSCs; 2) a mix representing firm types (foreign-owned, joint venture, state-owned or private); 3) a mix of geographical regions (location of the participants); and 4) an equal representation of male and female participants (optional).

Sample size

There are no rules for non-probability sampling techniques to determine the sample size. The sample in qualitative research should not be too large to extract rich and informative data. At the same time, it should not be too small to achieve saturation (Saunders et al., 2023). Although the insights achieved from the data are more relevant to the researcher’s data collection and analysis skills, there are five instructive rules for determining sample size: 1) the research purposes (Section 1.3); 2) the requirements of sampling strategy of this study (i.e., heterogeneous purpose sampling), 3) the extent to which interview data would be used alongside quantitative data (Section 4.5); 4) the practical experience in the literature (Table 4.6); and 5) the idea of saturation (Table 4.7).

Built on previous studies, this study was explicitly and intentionally driven by the literature review. Given the research gap identified in Section 1.2, a theoretical background was borrowed from intra-organisational team identification to contextualise the research (same logic as Drach-Zahavy, 2011; Hu et al., 2019; Rockmann et al., 2007). Unlike a traditional inductive approach that usually requires a large sample size, this study was characterised as a mixed method-based, theory-testing research. The approach at this phase was to integrate existing theory with primary data analysis, i.e., to consider empirical data alongside literature throughout the qualitative process. Therefore, the sample size was tentatively limited to 20 (considering two respective homogeneous sub-groups for semi-structured interviews in the targeted population), ten of which are from LSP, and the other ten are from LSC.

Table 4.6

Recommendations on sample size (qualitative)

Sources	Type/nature of study	Suggested sample size
John W Creswell and Creswell (2018)	• Narrative	1-2
	• Phenomenology	3-10
	• Ethnography	1
	• Case study	4-5
M. Saunders, Lewis, and Thornhill (2016)	• Semi-structured/in-depth interviews	5-25
	• Ethnographic	35-36
	• Grounded Theory	20-35
	• Considering a homogeneous population	4-12
	• Considering a heterogeneous population	12-30

Though there is no one-size-fits-all method to reach data saturation, it occurs when there is no new data, no new coding, no new themes, and the study is

replicable (Fusch & Ness, 2015). In the research scenario clarified in Section 4.2, extensive knowledge exists about the research phenomenon, whereas this study was conducted in a new context. In previous sections, the conceptual model and a series of hypotheses have been developed based on existing theories. Therefore, a limited structured, iterative process, instead of a traditional interpretive approach, was used to achieve data saturation. Guided by the three criteria illustrated in Table 4.7, the final sample size was determined as 12 through a set of saturation assessments. Refer to Step 4 of “Data collection procedure (qualitative)” for more details.

Table 4.7

Criteria for saturation assessment

Model	Description	Stage focus	Reference
A priori thematic saturation	Relates to the degree to which identified codes or themes are exemplified in the data	Sampling	Starks and Brown Trinidad (2007)
Data saturation	Relates to the degree to which new data repeat what was expressed in previous data	Data collection	Fusch and Ness (2015)
Inductive thematic saturation	Relates to the emergence of new codes or themes	Data analysis	Urquhart (2022)

Note. Adapted from *Research methods for business students* (9th ed.) by M. N. K. Saunders, P. Lewis and A. Thornhill, 2023, Pearson.

Data collection procedure (qualitative)

During this phase, theoretical semi-structured interviews were conducted to collect data (Cassell, 2015). The interview questions were thematically structured to explore various theoretical aspects of the IOT phenomenon in the logistics outsourcing industry. As a result, the forthcoming data analysis (Phase 3) would strengthen/modify theoretical insights into how IOTI is experienced or perceived by BSEs.

The process of collecting qualitative data followed Cassell (2015)'s interview guidance covering preliminary practicalities, interview implementation and post-interview tasks.

Step 1: Document preparation

- **Preparing research recruitment materials:** before an interview can take place, it is a prerequisite to recruit potential participants. To attract and select suitable candidates for the interview, a series of recruitment documents were prepared, including a research recruitment advertisement letter (Appendix 3), a follow-up letter after the recruitment advertisement (Appendix 4), and a participant information sheet and consent form (Appendix 5).
- **Preparing the interview protocol:** in accordance with Castillo-Montoya (2016)'s process, the interview protocol was developed to ensure consistent direction of all interviews (Appendix 6). The protocol was developed from my prior knowledge of areas of interest and the literature review. A set of questions were initiated and organised to align with the conceptual model (Jacob & Furgerson, 2012).
- **Document translation:** all documents were developed based on English written materials. Given the characteristics of the targeted participants, the English version was first translated into simplified Chinese, and another PhD student used the back-translated technique to check both versions for accuracy.

Step 2: Interview preparation

In terms of the constituency of relevance, the interviewees were purposively selected from CSCMP China members who participated in an internal training workshop. The event occurred in Shenzhen, China, 06-08, November, 2019.

- **Preparing the interviewee:** Before the workshop started, 20 participants were selected as the most suitable people to be interviewed (10 were from LSPs and 10 were from LSCs). The research recruitment advertisement letters were distributed to them

first, and a follow-up letter was sent to each person who expressed interest in the research. The participant information sheet and consent form were sent out to provide basic information and address potential concerns they may have. This process confirmed a potential sample of 16 interviewees who agreed to participate in the research, of which 2 would be selected for the pilot interview.

- **Arranging the interview:** to ensure the privacy protection of the participants, a closed wall conference room was booked in advance at a business centre next to the workshop site. Two factors were considered: the time demands of the interview and the need for a relatively quiet and calm location.
- **Piloting the interview:** the interview schedule should always be piloted, and it is better to seek someone who is a member of the target population (Cassell, 2015). In this study, two pilot interviews were conducted with two members of CSCMP China for the refinement of interview questions and techniques. The interview protocol was revised slightly for further use.
- **Recording the interview:** with participant consent and knowledge, a mobile phone was used for the audio recording during the interview. Meanwhile, the pen and notebook were prepared to note any follow-up questions that came to mind.

Step 3: Interview implementation

The following procedures were implemented: arrival and introductions, introducing the research, beginning the interview, implementing the interview, and ending the interview (Table 4.8). Addressed by Saunders et al. (2023), there were a variety of considerations when conducting the interview: time management (the amount of time required), interview scheduling (a need to maintain concentration, the tasks of initial data analysis) and process management (the objectives of the interview, the intensive nature of the discussion).

Table 4.8*Procedure for the interview*

Procedure	Essentials
Arrival and introductions	<ul style="list-style-type: none"> • Establish an initial rapport • Host the interaction by taking responsibility for making it friendly and positive
Introducing the research	<ul style="list-style-type: none"> • Seeking informed consent by signing Consent Form • Introducing scope of the interview • Hearing interviewee's perspectives in their own words
Beginning the interview	<ul style="list-style-type: none"> • Introducing background information to set the tone
Implementing the interview	<ul style="list-style-type: none"> • Controlling the breadth and depth of coverage
Ending the interview	<ul style="list-style-type: none"> • Giving some advance notice • Ending on a positive note with suggestions and recommendations • Expressing thanks for interviewee's contribution • Informing how the information will be treated and used and the result will be distributed to the interviewee for reference

Note. Adapted from *Conducting research interviews for business and management students*, by C. Cassell, 2015, SAGE Publications.

Table 4.9 shows the interview questions. The questions were open-ended, allowing any responses for each topic. First, two orientating questions provided background information about participants' roles and responsibilities. Questions 3-9 were extracted from the literature. All questions were derived from the conceptual framework and central to the qualitative phase. Finally, a probe question was added to explore anything relevant but not mentioned during the interview.

Table 4.9

List of semi-structured interview questions (English version)

Interview questions	
1	Could you please tell me about your position in your company and what your main responsibilities include?
2	Can you think of one specific inter-organisational team of which you are/were the member? That team should be composed of people from both LSPs and their customers (assuming yes). Please place your interactions with members from the partnering company clearly in your mind first.
3	Please share your understandings of inter-organisational team identification in logistics outsourcing collaboration.
4	Please share your understandings of team mental model in logistics outsourcing collaboration.
5	Please share your understandings of team trust in logistics outsourcing collaboration.
6	Please share your understandings of team communication in logistics outsourcing collaboration.
7	Please share your understandings of team performance in logistics outsourcing collaboration.
8	Please share your understandings of home organisation identification in logistics outsourcing collaboration.
9	Please share your understandings of logistics outsourcing performance in logistics outsourcing collaboration.
10	Any comments related to the topic but not mentioned above.

Step 4: Initial data transcript and analysis for data saturation

Following instructions on the iterative process, the interview was debriefed immediately after the first interview finished. Rather than verbatim transcripts, summary notes and broad categorisation are adequate for data saturation at this step. Specifically, the constant comparative method and debriefing technique were used to identify similarities and differences between interviews (Harding, 2019). The tools of the debriefing template (Table 4.10 and 4.11; Guest, MacQueen, & Namey, 2012) and saturation grid were used to determine whether

saturation is likely to have (or not) been reached (Brod, Tesler, & Christensen, 2009).

Throughout the period, I noticed participants shared cohesive and coherent opinions of the phenomenon of IOTI (Emmel, 2013). Although four new codes (“personal background”, “inter-organisational relationship”, “interpersonal relationship” and “logistics service provided/outsourced”) were added during the first five interviews, the other codes remained unchanged. Furthermore, the interviews afterwards generally supplemented further explanations of each category without adding any new concepts. Reflecting the iterative sampling process and guided by the criteria illustrated in Table 4.7, data saturation was achieved after debriefing 12 interviews.

Table 4.10

Excerpt of the interview debriefing (respondent based)

Item	Detail
Basic information (date and location, participant name, etc.)	Date: 06-Nov-2019; Location: Shenzhen, China; Participant name: Respondent 1_LSP 1
Main themes that emerged	Dual identity; Internal context; Logistics outsourcing performance; Team affect; Team behaviour; Team cognition; Team effectiveness
Information that was confusing or contradictory	n/a
Emergent questions or domains of inquiry that should be added to the subsequent instrument	n/a
Response categories for questions	LSP
Suggestions for improving the data collection event (techniques, questions, etc.)	To repeat detailed background information whenever necessary

Table 4.11

Excerpt of the interview debriefing (code based)

Category	Preliminary code	Respondent 1_LSP 1	Respondent 2_LSP 2	Respondent 9_LSC 3
The ABCs of teamwork	Team mental model	<ul style="list-style-type: none"> You'd better help it more in the issue of emotional communication among all the team members. The customer can feel you are helping him solve problems and thus saving it less troubles. A joint negotiation is essential. It is not to take it as your problem nor to say it is not its problem. Maybe the problem exists in both sides. We should try to solve it concerning with facts instead with individuals as all of us want to do things right. 	<ul style="list-style-type: none"> In terms of positive influence, we would think more in each other's shoes. For example, offering more time flexibility in the factory, answering questions or giving each suggestion on how to do a better job. It's true he was already off work. He did us a favour to sign the goods. It won't affect our cooperation even if he refused us. So, we can understand each other and think from each other's stand. Our service personnel are like the employees they can trust. 	<ul style="list-style-type: none"> This situation may exist in other companies. But I believe it's improper that I always push the supplier to deal with things while I myself do nothing. Because all of us want to do things well, after all. So, I choose to consider it as a team to finish the tasks.
Dual identity	IOTI	<ul style="list-style-type: none"> When doing contract logistics especially outsourcing 	<ul style="list-style-type: none"> Yes, like a group, we do things together. 	<ul style="list-style-type: none"> Definitely I'll regard it as a denial to me. Now when it comes to choosing suppliers, management

service, I believe it is quite important to decide whether to treat the business as “theirs” or “ours”. To tell the truth, difficulties exist if we really want to make it as “ours”.

- Yes. Identification.

is tight. Let’s forget about the long-term partners. Strict evaluation is a must for the new comers. At the same time, you will surely make a comparison about the price offered by different suppliers, won’t you? But if my long-term partner is questioned, I would surely think it is a personal denial to me, such as to my working ability or sense of responsibility. I might assume it is because of my poor performance at work.

- I quite agree with the latter one. I mean, identification. Because when it is a long-term cooperation, much mutual communication is a certain thing. If we always put the blame on the partner, personally I think it seems I am shrinking the responsibility, don’t you agree?
- Yes. The purpose is to achieve working goals instead of emphasizing whose fault.
- Generally, not. In most cases, we would offer some advice or try our best to help.

Step 5: Interview transcript and translation

In total, 12 interviews were conducted, recorded, and transcribed verbatim. All interviews lasted between 45 minutes to 1 hour.

After the interview, the audio files were transferred to a hard disk and OneDrive for storage. A copy of the files was then sent to a professional company for transcript editing, proofreading and text translation from Mandarin to English. Among the potential transcribers available, I chose one who specialised in Supply Chain Management and provided them with firm instructions for transcription and translation. The audio interviews were transcribed and edited.

After receiving the transcripts, I further proofread and compared them with my version. Where there were differences between these two versions, I listened to the original audio recording and made any necessary modifications to the English version. Considering linguistic differences, social-cultural issues and methodological concerns, a reflexive approach was applied throughout the process, involving a degree of analysis and interpretation (Xian, 2008). Finally, the revised documents were ready to examine as English written descriptions.

Data analysis procedure (qualitative)

The primary purpose of the Phase 2 study was to support the design of a subsequent quantitative instrument in a new context. Therefore, the analysis narrowly aimed to inform question stems, measurement items and domains of inquiry of that instrument.

At this phase, Silver and Lewins (2014)'s abductive approach was employed to guide the process of data analysis. Thematic content analysis was conducted to further explore and interpret the data (Rivas, 2012; Appendix 7). The software NVIVO 12 was used to support data analysis.

Step 1: Data preparation and project set-up

Within the semi-structured interview framework, similar topics were broadly discussed and, depending on different personal experience, some issues were elaborated by individual participants. For consistent coding and retrieval

operation, it was critical to form structured data to the requirements of NVIVO: the heading and paragraph formats of all transcripts were modified to conform to NVIVO's prescriptions of text layout; all interviewees' identities were anonymised, and data concerning sensitive information have been deleted entirely. Other guidelines include creating an efficient naming protocol for files, inserting section headings, numbering the questions, creating speaker identifiers, and avoiding importing double-spaced texts into NVIVO (Silver & Lewins, 2014).

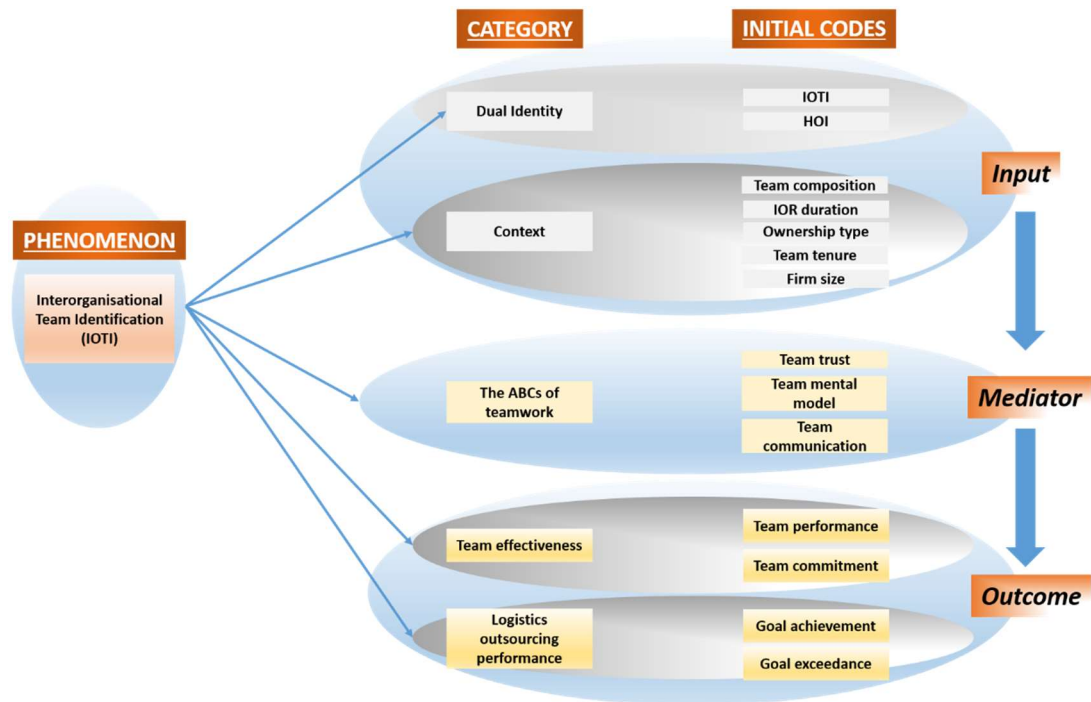
The next task was to set up the project. After creating a project in NVIVO, a structural framework was built inside for different types of data (interviews, literature), writing (process memos, analytic memos) and coding (emotion codes, value codes). Then, all data files were imported (or added afterwards) into relevant places within this framework.

Step 2: Code list development

As clarified in Section 1.3, the study aimed to investigate the transferability of existing team identification theory to a different social context (inter-organisational collaboration). Therefore, based on the results of the literature review, a provisional list of codes was developed that captured the essentials of the conceptual framework, research questions and hypotheses. Following the conceptual framework (Figure 2.5), five categories were addressed (Figure 4.4). Within each category, a group of codes was initiated.

Figure 4.4

Diagram of codes (conceptual framework based)



The structure in Figure 4.4 provided a solid starting point in the coding process. As elaborated by Saldaña (2021), 31 types of codes are available for the research. Based on the nature of the study and forms of data, a combination of codes was devised for analysing the qualitative data (Table 4.12). Throughout the coding process in the following steps (Steps 3 and 4), the list of codes was constantly reviewed and modified in an iterative way.

Based on these apriori codes, the present study prepared a codebook for data analysis (DeCuir-Gunby, Marshall, & McCulloch, 2011) (Table 4.13). This document consisted of categories, codes within each category, and definitions of each code. Supplemented with the information extracted throughout the qualitative process, the list can be developed and modified (e.g., to add an example of a quote with the use of each code). Based on the code list, the coding scheme was structured in NVIVO and ready to be refined throughout the coding process.

Table 4.12*Coding methods of the study*

Name	Sources	Description	Code type	Application	Cycle to be used
Descriptive coding	Wolcott (1994)	Summarising in a word or short phrase the basic topic of a passage of qualitative data	empirical	Appropriate for virtually all qualitative studies, but particularly for beginning qualitative researchers	First cycle
Provisional coding	Dey (2003); Miles, Huberman, and Saldaña (2014)	Establishing a predetermined start list of codes prior to fieldwork	apriori	Appropriate for qualitative studies that build on or corroborate previous research and investigations	First cycle; Second cycle
Emotion coding	Kahneman (2011); Prus (1996)	Labelling the emotions recalled and/or experienced by the participants, or inferred by the research about the participant	empirical	Particularly for the studies that explore intrapersonal and interpersonal participants experiences and actions especially in matters of social relationships, decision-making, judgment, etc.	Second cycle
Values coding	Gable, Wolf, Gable, and Wolf (1993); LeCompte, Preissle, and Tesch (1993)	Reflecting a participant's values, attitudes, and beliefs, representing his or her perspective or worldview	empirical	Particularly for the studies that explore cultural values and belief systems, identity, intrapersonal and interpersonal participant experiences and actions	Second cycle

Note. Compiled from *Qualitative data analysis from start to finish* (2nd ed.) by J. Harding, 2019, SAGE Publications and *The coding manual for qualitative researchers* (4th ed.) by J. Saldaña, 2021, SAGE Publications.

Table 4.13

The initial codebook for the project

Category	Initial code	Description/Definition
Dual identity	IOTI	The extent to which individuals from supply chain partners perceived themselves to belong to the inter-organisational team
	HOI	The boundary spanning employees' perception of oneness with or belongingness to his/her employing organisation
Context	Team composition	The configuration of member attributes
	Team tenure	The length of time the individuals have been associated with their team
	IOR duration	The years of cooperation
	Ownership type	The business category of an organisation ranging from wholly state-owned to wholly foreign owned
	Firm size	The total number of employees in the company
The ABCs of teamwork	Team trust	A shared psychological state among team members comprising willingness to accept vulnerability based on positive expectations of a specific other or others
	Team mental model	Knowledge structures held by members of a team that enable them to form accurate explanations and expectations for the task, and in turn, to

		coordinate their actions and adapt their behavior to demands of the task and other team members
	Team communication	An exchange of information, occurring through both verbal and nonverbal (e.g., email) channels, between two or more team members
Team effectiveness	Team commitment	The relative strength of an individual's identification with and involvement in a particular team
	Team performance	The perceptions of team members of their team's productivity and performance
Logistics outsourcing performance	Goal achievement	Logistics outsourcing performance that achieves expected outcomes ex ante agreed upon by a company and its logistics service provider
	Goal exceedance	Services that significantly exceed the goals and expectations set forth in the outsourcing arrangement, providing a degree of pleasant surprise espoused in the consumer concept of delight

Step 3: First cycle coding

To ensure that the primary data analysis was driven by theory evidenced in the literature review, a deductive, theoretical coding process was implemented across the dataset of interview transcripts. Text searching tools in NVIVO were used to locate specific themes in the code list. In addition, contextual passages were also coded around each occurrence of deductive codes. The key rule here was iterating the coding process when adding new data. There were two points to keep in mind: no need to identify a code for each sentence (i.e., data winnowing, a process of focusing on some of the data while disregarding other parts of it), and no permission to involve any interpretation (Guest et al., 2012).

Step 4: Second cycle recoding

To re-configure data coded through the first cycle coding, those bodies of coded data were inductively recoded to “account for the nuances within a theme” (Silver & Lewins, 2014, p. 191). Apriori and empirical codes (i.e., those that arise from the interview data) were used to derive a set of codes for in-depth analysis. At this step, the spider diagram was used to organise all codes and to refine the code list (Creswell & Poth, 2018). The final list of codes used in NVIVO is given in Table 4.14.

Table 4.14

Full list of codes in NVIVO

Category	Code	Type
Dual identity	IOTI	apriori
	HOI	apriori
Internal context	Team tenure	apriori
External context	IOR duration	apriori
	Ownership type	apriori
	Firm size	apriori
Team affect	Team affective trust	empirical

Team behaviour	Team communication	apriori
Team cognition	Team mental model	apriori
	Team cognitive trust	empirical
Team effectiveness	Team commitment	apriori
	Team performance	apriori
Logistics outsourcing performance	Goal achievement	apriori
	Goal exceedance	apriori
General information	Inter-organisational relationship	empirical
	Interpersonal relationship	empirical
	Personal background	empirical
	Logistics service provided/outsourced	empirical

Step 5: Data retrieval and interrogation

The process of coding resulted in an extensive list of codes. To support the analysis process, horizontal and vertical retrieval were used to cut through the data (Table 4.15). The coding scheme in NVIVO was constantly refined for organising coding and recoding processes (e.g., sub-codes to merge with top-level codes, short-cut code grouping sets to create to highlight further analysis directions, etc.).

Table 4.15

Types of data retrieval

Type	Definition	Description	Function
Horizontal retrieval	A means to consider a body of coded data in its entirety and supporting the development of generic themes	Retrieving individual codes across all data so far coded	To identify areas of further interest; To compare coding; To decide which data to recode

Vertical retrieval	Providing patterns and relationships to be identified and visualised on a sequential base	Retrieving code within one data file	To identify patterns in coding sequentially through a data file and through a body of broadly coded data
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Note. Adapted from *Using software in qualitative research: A step-by-step guide* (2nd ed.) by C. Silver and A. Lewins, 2014, SAGE Publications. <https://doi.org/10.4135/9781473906907>

In NVIVO, coded data and code frequency reports were generated (“Coding Summary by Code Report”) to add another dimension to the pure analysis. The results of data retrievals were outputted for further use when writing up the next step. Furthermore, to systematically present the interrogation results, NVIVO’s mapping function was used to illustrate theoretical connections and relationships between codes. Two specific formats of data display, conceptually clustered matrix and causal network, were optioned to detect differences, identify patterns and themes, and draw and verify conclusions (Table 4.16). Table 4.17 applies a conceptually clustered matrix on the code “Team Mental Model”. Figure 4.5 illustrates two examples of causal network analysis (respondent-based and thematic scenario based). Notably, a casual network aims to build either an integrated map of case phenomena (within-case) or a cross-case thematic display containing variables and relevant generalisable causal explanations (Miles, Huberman, & Saldaña, 2020).

Table 4.16

Formats of data display

Format	Description	Application	Functions used in NVIVO
Conceptually Clustered Matrix	Developed out of multiple cross-tabulations (codes by codes, codes by variables, codes by cases, etc.)	Case to Themes/codes; Case to research questions	“Framework Matrix”

Causal Network	Generated to delineate complex interrelationships between variables	Within case analysis; Cross-case analysis	“Coding query”; “Matrix coding query”; “Framework Matrix”
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Note. Adapted from *Qualitative data analysis : a methods sourcebook* (4th edition. ed.) by M. B. Miles, A. M. Huberman and J. Saldaña, 2020, SAGE Publications.

Table 4.17

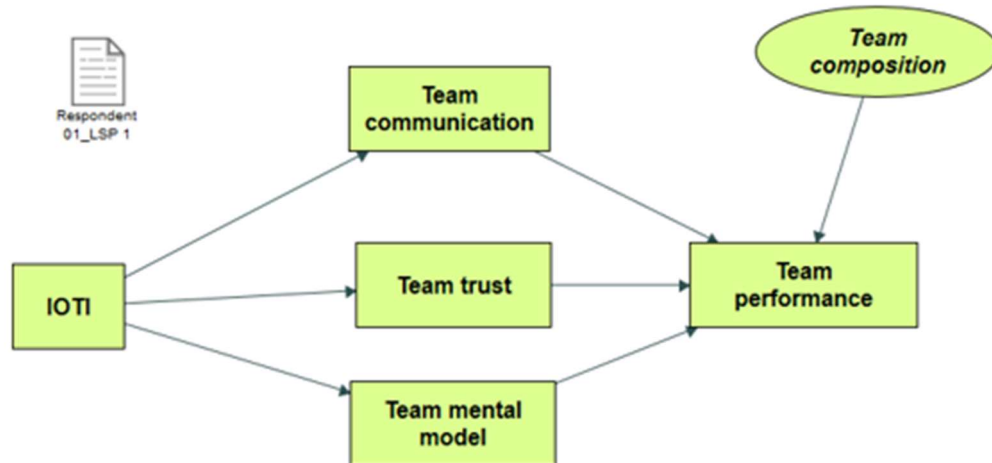
Excerpt of conceptually clustered matrix: Team Mental Model

Participants	Team performance
Respondent 3_LSP 3	“They (customers) are aggressive sometimes of course, but I think we are much of equal partners because we have been working with each other for a long time. We can fully voice our suggestions or opinions and, in most cases, they would seriously consider them. So, I think it’s pretty fair and reasonable. Basically, either party will be cooperative when the partner calls for some support.”
Respondent 10_LSC 4	“Getting along with a customer (with a certain level of cognitive ability) actually makes the cooperation much smoother.”

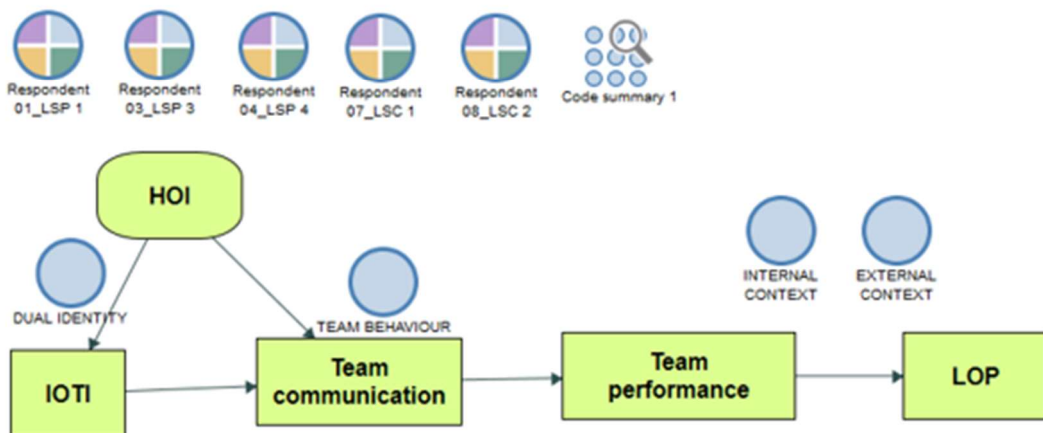
Figure 4.5

Example of causal network analysis

a) *Within-case analysis (Respondent 1_LSP 1)*



b) *Cross-case analysis (Thematic scenario based_ Team communication)*

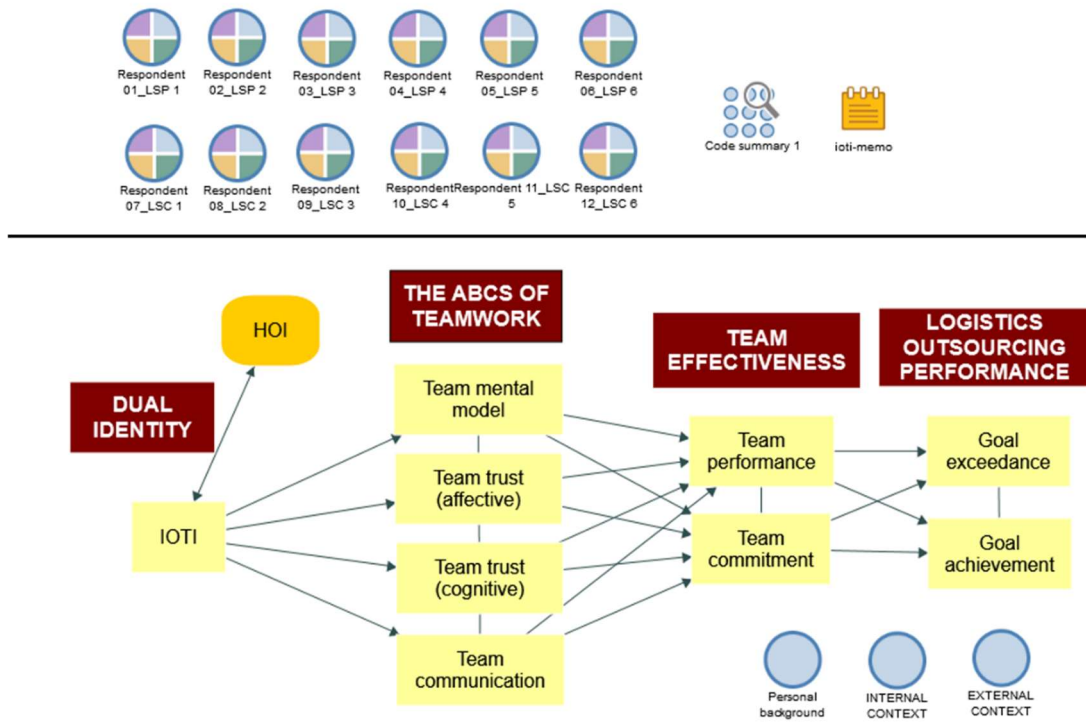


Step 6: Alignment of the conceptual framework with themes

Up to this step, relevant codes, quotes, and themes have been categorised within a specified group with the pre-determined codes. Based on a logical chain of evidence from all 12 interviews, Figure 4.6 shows a comprehensive casual network of the qualitative research (to be further explained in Section 5.1).

Figure 4.6

Causal network analysis of the qualitative study



Step 7: Data Interpretation and writing up

To comprehensively generate meaning from the data displays, the following tactics were used to interpret the interrogated data: noting patterns and themes, making contrasts/comparisons, noting the relations between variables, finding intervening variables, building a logical chain of evidence, and making conceptual coherence (Table 4.18).

Table 4.18*Tactics for generating meaning*

Tactic	Description	Application
Noting patterns and themes	Recurring patterns, themes, or “gestalts” that pull together many separate pieces of data	Matrix
Making contrasts / comparisons	Between two sets of things (persons, activities, variables, or cases) that are known to differ in some other important respect	Matrix
Noting the relations between variables	What sorts of relationship – if any – exists between two (or more) variables	Matrix; Network
Finding intervening variables	Other variables to be added in a two-variable relationship for a much clearer formulation	Matrix; Network
Making conceptual/theoretical coherence	To tie the research findings to overarching, across-more-than-one-study propositions that can account for the “how” and “why” of the phenomena under study	Network

Note. Adapted from *Qualitative data analysis : a methods sourcebook* (4th edition. ed.) by M. B. Miles, A. M. Huberman and J. Saldaña, 2020, SAGE Publications.

Finally, to organise the qualitative analysis for Phases 3 and 5, a draft structure of the final write-up was created, illuminating what would be written on the findings of Phase 2.

4.6.3 Phase 3: Develop the survey instrument

After Phase 2, the conceptual framework was empirically grounded in a new context. As shown in Figure 1.4, this phase was an intermediate phase of the study (i.e., developing a contextually appropriate quantitative instrument), bridging the qualitative analysis and results with the proposed quantitative study in a new research scenario. Guided by Creswell and Clark (2018), DeVellis (2017) and Onwuegbuzie, Bustamante, and Nelson (2010), the steps of this phase were designed as below.

Step 1: Item pool generation and instrument specification

To test the validity of published instruments and specify the content to be included in the final conceptual model, a joint display was developed to map the qualitative findings to the desired instrument achieved from the literature. To substantiate the theoretical links among all variables to be used in the questionnaire (Phase 4), the qualitative data were further interpreted to clarify: which variables are to be kept or modified in the conceptual framework, which relationships are likely to be most meaningful, and what information should be collected and analysed in Phase 4. Derived from the conceptual framework and justified by the qualitative analysis, the constructs involved in the initial conceptual model were then determined. Section 5.2 will explain more details related to this step.

Step 2: Measurement and construct operationalisation

To test the hypotheses in the conceptual model, it is essential to use measures with qualified psychometric properties. For any specific construct to analyse, a great variety of measures are available in the literature. Each of them varies in suitability for capturing the meanings of different construct components. Following the research objectives and consistent with the literature, all constructs, except for control variables, were measured by reflective multi-item scales. A modification to the original measure is that all scales were formatted as 7-point Likert scales ranging from 1 (completely disagree) to 7 (completely agree). According to Dawes (2008), the data gathered from a five-point format can readily be transferred to seven-point equivalency without significant differences in mean score, variance, skewness or kurtosis. After that, the referents that appeared in all measurement items were modified to reflect the research context of the study (e.g., “individual” was changed to “team members”, “organisations” was changed to “IOTI”, etc.). It is worth noting that content redundancy was accepted because a rich item pool strengthens internal-consistency reliability, which, in turn, affects the study’s validity (DeVellis, 2017).

Inter-organisational team identification

Respondents' identification with their IOT was measured with five items of Rockmann et al. (2007), an amended version of Mael and Ashforth (1992) scale, whose wording was modified to focus on the team. A sample item reads, "I am very interested in what others think about my team".

Home organisational identification

Home organisational identification (HOI) was assessed with a 5-item measure, adapted from Rockmann et al. (2007) and Mael and Ashforth (1992). A sample item reads, "if someone were to criticize my organisation, it would feel like a personal insult".

Team mental model

Because of their context-dependent nature, no consistent methodology has been used to measure TMMs (Mohammed et al., 2010). Given the context of the study, Fransen, Kirschner, and Erkens (2011)'s scale was used to measure TMM. A sample item reads, "this team spent time making sure every team member understands the team objectives".

Team trust (affective and cognitive)

Recommended by Feitosa et al. (2020), this study captured two dimensions of team trust (affective and cognitive). The items from McAllister (1995) were used to measure team trust: three for cognitive-based trust and three for affective-based trust, respectively. A sample item reads, "We (the team) have a sharing relationship. We can openly share our ideas and feelings".

Team communication

To measure both communication quantity and quality, four items from Mohr and Spekman (1994) were adopted. A sample item reads, "to what extent do members of your team share proprietary information with each other".

Team performance

Team performance was measured by using a four-item scale developed by Gibson et al. (2009). A sample item reads, “this team is effective”.

Team commitment

Team commitment was assessed with van Der Vegt and Bunderson (2005)’s four-item measure of commitment to the team. A sample item reads, “I feel a strong sense of belonging to my team”.

Logistics outsourcing performance

This study adopted the subjective approach to measuring logistics outsourcing performance. Developing a comprehensive measure of inter-organisational performance is difficult because of the complexity and boundary between supply chain partners. In line with recent research in the supply chain field, this study used perception-based indicators of performance (e.g. Ellinger, Chen, Tian, & Armstrong, 2015; Michalski, Montes-Botella, & Guevara, 2017). Furthermore, subjective and objective measures have been testified to be strongly correlated (Dawes, 1999). Regarding performance evaluation, perceived measures closely correspond with objective performance data, and both have been widely used in empirical studies of similar nature (Nyaga & Whipple, 2011).

Accordingly, this study initially selected two dimensions of Wallenburg et al. (2010)’s scales to measure logistics outsourcing performance construct. The sub-dimension of goal achievement consisted of four items, and that of goal exceedance has three items (based on the result of qualitative data analysis, only the dimension of goal achievement was kept for further use).

Control variables

Control variables are not directly connected with the leading theory and hypotheses but presumably able to confound them (Helmuth, Craighead, Connelly, Collier, & Hanna, 2015). To evaluate the potential spurious effects of firm- or industry-specific factors that are extraneous to the study, four controls

were included in the model. The measures of the control variables were consistent with those used in prior research.

Two variables of inter-organisational relationship duration and team tenure were controlled as both can potentially affect the dynamics of SIT/SCT (Ashforth & Mael, 1989; Haslam, 2004). In addition, firm size and ownership type were included as two more control variables. They were selected because of their justified importance to the team effectiveness literature though there has no theoretical basis to make any explicit expectations for these factors.

Inter-organisational relationship duration

Through supply chain collaboration, business partners can achieve mutual benefits and competitive advantage (Jiang, Shiu, Henneberg, & Naude, 2016). A long-term relationship with partners shapes an organisation's desire to strive short-term benefits and future goals (Prajogo & Olhager, 2012). In turn, it will affect BSEs' motive to identify with the IOT.

Given prior research establishing the effects of the years of collaboration on buyer-supplier ties (Kim & Choi, 2018), interpersonal ties between BSEs (Huang et al., 2016) and logistics outsourcing relationships (Chu, Wang, & Lado, 2016), a control variable specific to relationship characteristics (i.e., Inter-organisational relationship duration) was included in the model (Palmatier, Dant, Grewal, & Evans, 2006). As mentioned above, it was measured by the number of years the respondent's company has been in business with the specific partner.

Team tenure

According to previous studies (Hu & Liden, 2015), team tenure was controlled, and the literature showed that the time the team works influenced team effectiveness (Stewart, 2006). Specifically, the effect might be positive (e.g. Hu & Liden, 2015), negative (e.g. Katz, 1982) or non-significant (e.g. Bell, Villado, Lukasik, Belau, & Briggs, 2011). Another empirical case is Gong, Kim, Lee, and Zhu (2013), in which team tenure was used to support the causal relationships and ruled out alternative explanations in the model. Referring to Richter et al. (2006), a questionnaire item asked the respondents how long their team had

been set up (response choices are “less than 6 months,” “less than 1 year,” “between 1 and 2 years,” and “2 years or more”).

Firm size

Firm size was coded as a dummy variable, operationalised as the total number of employees in the company (natural logarithm). Large organisations potentially have more resources, structural flexibility and bargaining power and, compared with small ones, have greater influence on inter-organisational relationships (e.g. Kotabe et al., 2003) and logistics performance (e.g. Lee, Seo, & Dinwoodie, 2016).

Ownership type

Ownership type was also included as a control, measuring degrees ranging from wholly state-owned to wholly foreign-owned (Huang et al., 2016). Li et al. (2008) addressed that, when comparing performance achievements in an inter-organisational partnership, domestic firms usually have more competitive advantages than foreign ones. Thus, it is necessary to include ownership type as a control variable.

All measurements above are summarised in Appendix 8.

Step 3: Instrument expert review

To make the instrument more appropriate for the logistics outsourcing context, an iterative process of expert review was implemented to test the survey. A group of experienced professionals were contacted for the review (2 from academia and 2 from industry). They completed the survey first and then provided feedback for item modification in instruction clarity, item wording and completeness, response options, etc. Their feedback was positive, with merely marginal advice for changes (e.g., the wording of instructions). Additionally, minor wording changes were made to adapt the scale to the specific logistics outsourcing context.

Step 4: Questionnaire development

A questionnaire was needed to collect two types of data: 1) the measurement items and 2) fundamental information for further analysis (e.g., demographic information, contact details, etc.). Given resource efficiency, time, and geographic flexibility, Qualtrics was selected as the online platform to collect the survey data. Guided by Callegaro, Manfreda, and Vehovar (2015), this study focused on three aspects when developing the questionnaire: questionnaire preparation, technical preparation, and email invitation preparation. Table 4.19 briefly lists the relevant information. Section 5.2 will explain more details related to this step.

Table 4.19

Tasks to do for questionnaire development

Tasks	Contents
Questionnaire preparation	<ul style="list-style-type: none">• General issues (typology of questions, design principles, measurement process, specifics of Qualtrics questionnaire, etc.)
	<ul style="list-style-type: none">• Questionnaire translation (English to simplified Chinese)
	<ul style="list-style-type: none">• Question types
	<ul style="list-style-type: none">• Questionnaire structure, computerisation and layout
	<ul style="list-style-type: none">• Survey engagement• Check on fact validity• Control of the routing in the questionnaire
	<ul style="list-style-type: none">• Questionnaire pre-testing• Formulation of the final questionnaire
	<ul style="list-style-type: none">• Capturing and organising data
Technical preparation	<ul style="list-style-type: none">• Paradata collection
	<ul style="list-style-type: none">• Security and privacy
	<ul style="list-style-type: none">• Access auditing

	<ul style="list-style-type: none"> • Technical pre-test of survey software
	<ul style="list-style-type: none"> • Personalisation of the invitation
Email invitation preparation	<ul style="list-style-type: none"> • Motivation and tone of invitation
	<ul style="list-style-type: none"> • Format and visual design

Note. Compiled from *Web survey methodology* by M. Callegaro, K. L. Manfreda and V. Vehovar, 2015, SAGE Publications and *Design, evaluation, and analysis of questionnaires for survey research* by W. E. Saris and I. Gallhofer, 2014, John Wiley & Sons.

Regarding the task of questionnaire preparation, two key components are detailed below.

Questionnaire translation

All original measurement scales used in the survey were developed and written in English. Because the survey was administered in China, the questionnaire was translated into simplified Chinese, strictly following the back-translation technique (Brislin, 1980). Three Chinese native business experts (with advanced degrees in supply chain management and familiar with the research topic) translated the questionnaire from English to Chinese, respectively. Their translations were then compared and combined into a consolidated Chinese version. Two Chinese native speaking PhD students at UTS Business School who were unfamiliar with the research topic translated the Chinese version into English. Then, this back-translated English version was compared with the original version to ensure equivalency in both languages. Finally, the differences between the two versions were identified, and necessary changes were made to the wording and terms.

Questionnaire pre-testing

A pilot test of the revised version was conducted with individuals within the population group. The sample size was 14; sufficient for this type of pilot study (Isaac & Michael, 1995; Saunders et al., 2023). The sample was randomly selected participants who had not been part of the qualitative interview sample.

Inter-Rater Agreement (IRA) analysis was implemented with the same sampling group. The questionnaire (Appendix 9, Chinese version of Appendix 10) was published on Qualtrics, and the survey link was sent to the participants. The item was supposed to be dropped based on the following criteria:

- An item's mean value is less than the mid-point of 3.5 (i.e., not relevant sufficiently to be a part of the measure).
- An item's p-value is larger than 0.05 (i.e., the agreement about item relevance is random).
- Statistical power is less than 0.80 (i.e., the agreement about an item is unlikely to be the same in another study).
- Variance of an item that is statistically different from the rest of the group (i.e., the item is not parallel to the rest).

Based on the result of IRA analysis, the conceptual model was finalised (Figure 3.3). See Chapter Three for the details about hypotheses development. Consequently, the questionnaire was modified, and the finalised edition (Appendix 11, Chinese version of Appendix 12) was then published on Qualtrics for collecting the data in Phase 4. Section 5.2 will explain more details related to this step.

4.6.4 Phase 4: Design and implement the quantitative research

Population and Sampling strategy

As illustrated in Table 4.5, the population of the study was the members of CSCMP China, and the sampling strategy in this phase was stratified random sampling. The sample was selected using simple random sampling (M. Saunders et al., 2016). To avoid the emergence of confounding factors, the sample was drawn from the same targeted population of the interview phase, but the individuals for both samples differed. This sampling strategy was consistent with the exploratory sequential mixed methods design (Creswell & Creswell, 2023).

In the literature, collecting data from both buyers and sellers was considered reasonable and critical in inter-organisational research (Grawe et al., 2015).

Besides that, it was a common methodological approach to using team members as key informants to explore perceptions of IOT-based phenomena (e.g. Hu et al., 2019; Knoppen & Sáenz, 2017; Stock, 2014). As shown in Table 4.5, the sample in this study was selected from the member list of CSCMP China with the rule of stratified sampling (i.e., the targeted participants are BSEs coming from either LSPs or LSCs). Meanwhile, they should have work experience in an inter-organisational team scenario for a logistics outsourcing project in China. For example, the response can be from the perspective of LSP, via a key account manager or business development manager in logistics firms, with references to its customers. Otherwise, the respondents can be procurement managers or logistics operation managers in a firm that outsources logistics operations to an LSP. Given the data collected from industry practitioners, it is evident that the participants in our sample have sufficient insight and experience to answer the questions in the survey.

Given the geographical allocation of members of CSCMP China, the questionnaire was distributed to all potential participants without limiting the scope to any specified region and/or city. Due to the imbalanced economic development, most members may be from four regions: North (Beijing-Tianjin), East (Shanghai-Jiangsu-Zhejiang), South (Guangdong), and West (Sichuan-Chongqing).

Sample size and statistical power analysis

Consistent with the extant practice (SEM-based quantitative data analysis) and trend (Statistical power analysis) in the survey research in multiple disciplines (e.g. Aguinis, Beaty, Boik, & Pierce, 2005 in Psychology; Brock, 2003 in International Business; Combs, 2010 in Management; Riedl, Kaufmann, & Gaeckler, 2014 in Supply Chain Management), this study defined and estimated the sample size on the basis of power analysis (Kraemer & Blasey, 2015).

Statistical power analysis (a priori)

Statistical power refers to “the probability of making the correct decision if the alternative hypothesis is true and the null hypothesis should be rejected” (Hair,

Black, Babin, & Anderson, 2019, p. 770). To correctly interpret statistics inferences in a study, it is essential to establish suitable statistics power to avoid the dilemma of either lower power (i.e., to accept a false model) or greater power (i.e., to reject an accurate model) (Helmuth et al., 2015). Specifically, statistical power is determined by three variables: sample size (n , the quantity of research participants), significance level (α , the probability of type I error) and effect size (ES, a measure of the magnitude of the effect) (Cohen, 1988). To ensure the research validity, power and the other three factors should be simultaneously examined in the process of analysis planning and result assessment (Hair, Black, et al., 2019).

In a priori power analysis, sample size N is computed as a function of

- **the required power level:** the probability that the null hypothesis was rejected correctly.
- **the pre-specified significance level:** the likelihood of committing a Type I error (the possibility of rejecting the null hypothesis when it was true).
- **the population effect size:** an estimation of the magnitude in which the null hypothesis is false and establishes the impact of the independent variable on the dependent variable in the population.

Conventionally, the power level of 0.80 is widely used in statistical power analysis (MacCallum, Browne, & Sugawara, 1996). Similarly, SCM scholars suggested 0.80 as an adequate level for power estimation (Riedl et al., 2014). Furthermore, the significance level is also commonly fixed at 0.05 by convention (Hair, Black, et al., 2019). In contrast, the last variable, effect size, has been continuously neglected or misinterpreted in quantitative studies (Anderson, Kelley, & Maxwell, 2017; Meyvis & Van Osselaer, 2018). Because different types of quantitative analysis require corresponding types of effect size estimates, the researchers, in most cases, must rely on a substantial amount of subject judgment to determine the effect size in a study (Scherbaum & Shockley, 2015).

Effect size estimates

Effect size is “the magnitude of the relation between the independent and dependent variables” (Funder & Ozer, 2019, p. 158). As Cohen (1992) indicated, each statistical test has its own effect size index. Therefore, it is a prerequisite to determine the type of statistical tests to be conducted in a study. Based on Cohen (1988) and , there are sets of commonly used measures for specific test requirements for the underlying objectives of a study (Table 4.20). However, Cohen’s guidance has not been empirically tested despite being widely used (Nye, Bradburn, Olenick, Bialko, & Drasgow, 2019).

Table 4.20

Thresholds for effects in various tests

Statistical test	ES thresholds		
	<i>Small</i>	<i>Medium</i>	<i>Large</i>
Means – Cohen’s d	0.2	0.5	0.8
ANOVA – f	0.1	0.25	0.4
ANOVA – η^2	0.01	0.06	0.14
Regression - f^2	0.02	0.15	0.35
Correlation – γ or point serial	0.1	0.3	0.5
Correlation - γ^2	0.01	0.06	0.14
Association – 2 × 2 table	1.5	3.5	9
Association - χ^2	0.1	0.3	0.5

Note. From “A power primer” by J. Cohen, 1992, *Psychological Bulletin*, 112(1), 155-159. <https://doi.org/doi:10.1037/0033-2909.112.1.155>

In lieu of using the effect size estimate from single studies, researchers gradually recognised the value of meta-analytically derived effect size estimates. Such a comprehensive review of a specific topic in certain field(s) presumably leads to

a reliable effect size benchmark (Cumming, 2012). Table 4.21 illustrates this application in supply chain management closely related to the present study.

Table 4.21

Effect size estimates

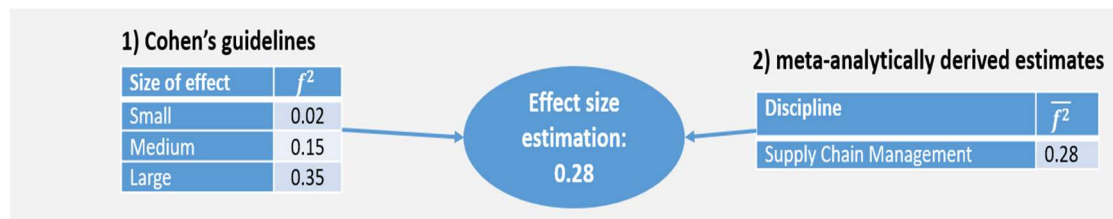
Type	Number of samples	Sources	Period	Average effect size
Regression - f^2	4,235 effects abstracted from 217 papers	Journal of Operations Management, Production and Operations Management, Decision Sciences, Management Science, Manufacturing and Service Operations Management, Journal of Business Logistics, International Journal of Logistics Management, International Journal of Physical Distribution and Logistics Management, Journal of Supply Chain Management, Journal of Purchasing and Supply Management	2002 to 2012	0.28

Note. From “Supply chain management research: Key elements of study design and statistical testing” by C. A. Helmuth, C. W. Craighead, B. L. Connelly, D. Y. Collier and J. B. Hanna, 2015, *Journal of Operations Management*, 36(1), 178-186. <https://doi.org/10.1016/j.jom.2014.12.001>

Similar to the approach of Funder and Ozer (2019) to revising traditional Cohen guidelines, this study finally proposed 0.28 as the estimated effect size for multiple regression tests (Figure 4.7).

Figure 4.7

Effect size estimates for regression test



All in all, effect size is more than just a number interpreted superficially, incorrectly, or even not reported. Instead, it should statistically facilitate the theoretical development of the research.

Sample size of the study

Based on the recommendation from Creswell and Poth (2018) and the knowledge achieved from the UTS workshop, this study utilised G*power to calculate the sample size (Faul, Erdfelder, Buchner, & Lang, 2009). It is worth noting that an a priori power analysis may not be completely accurate: when using power analysis to calculate sample sizes, the final n may not align with the expected sample size due to missing data, population studied, differing attrition rates, etc. However, it is still essential to use this tool to show the feasibility of the proposed study at this stage.

Specifically, G*Power 3.1.9.7 program was used to determine an appropriate sample size for the study (Faul et al., 2009).

Given the study objectives and the requirements for hypothesis testing, the input parameters were decided as follows:

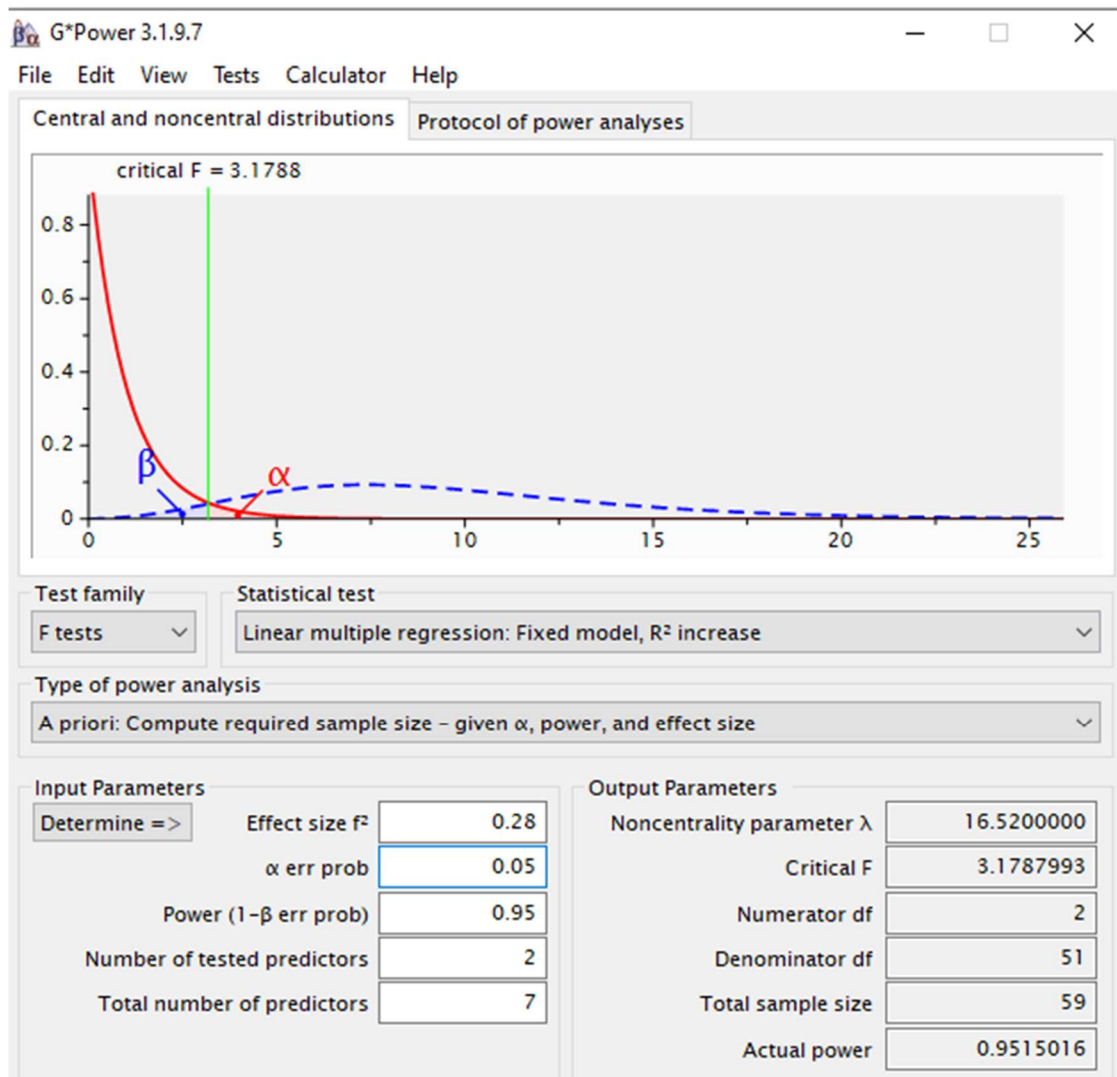
- the alpha level was set at the conventional 5% (95% significance level) used in quantitative research. The 95% significance level means that if the findings will likely indicate a statistically significant difference, the researcher can be 95% to reject the null hypothesis (Cohen, 1992).
- the power level was calculated based on the beta level (β ; i.e., the chance of Type II error), which is normally 0.20. In this study, it was changed to 0.05 due to more stringent requirements from the complex

scenarios of the study. Power was calculated as $1-\beta$, resulting in a power level of 0.95 (Jacob Cohen, 1992).

- An effect size of 0.28 was determined for a sample estimation, as shown in the previous section.

Figure 4.8

*Result of G*Power sample size estimates*



Then, F-test was selected under the test family (multiple regression, R^2 , deviation from zero), and a minimum sample size of $n = 59$ was achieved with two tested predictors, Team performance and LOP (Figure 4.8). Considering the potential issues of missing data, outliers, and additional indicators of moderating interaction terms, additional observations were required (Hair, Black, et al.,

2019). As a result, oversampling by 100% was conducted, yielding a final target sample of $n = 118$.

Data collection procedure (quantitative)

The data was collected using Qualtrics to increase the response rate and reduce the response time and data collection cost. According to the rule of sample selection, all CSCMP China members were roughly categorised into one of the two groups (LSP or LSC). An invitation email was sent to them (Appendix 14) and attached with the participant information statement (Appendix 15). Two weeks after the first email, a reminder (Appendix 16) was sent to improve and get a satisfactory response rate (Wagner & Kemmerling, 2010). All feedback received from Qualtrics, and relevant information (mailing errors, missing values, response date, etc.), was edited to finalise the dataset for further analysis. Through this collaborative way with CSCMP China, the sample was sufficiently heterogeneous, covering firm sizes of significant importance. Meanwhile, the response rate reached a satisfactory level considering the difficulty of collecting responses in such a cross-sectional study.

Data analysis procedure (quantitative)

The survey data was analysed using suitable software and techniques. All data received was exported from Qualtrics to an Excel file for data screening, cleaning and coding. It was then imported into SPSS 28.0 for preliminary analyses. To validate the instruments in a PLS-SEM approach, SmartPLS 4.0 was used to conduct the confirmatory composite analysis (CCA) to assess the quality of the measurement model (Hair, Howard, & Nitzl, 2020). Finally, PROCESS macro was installed in SPSS, and the data was transferred into the software again to test the hypothesised relationships.

Step 1: Data file creating and editing

Primary survey data was downloaded from Qualtrics as .csv files and then translated into an English version spreadsheet. To ensure the file's structure allows all further analyses, all variables were named and formatted per SPSS

requirements. For impossible or other abnormal values, the original questionnaire was checked to verify the accuracy of the data. The final dataset was saved in Excel.

Step 2: Data screening and clean-up: Monotones and abnormal responses

Monotones (responses that have no variance for all items) were identified with the variance function in Excel (=var.s()). Because this type of data had no value for the analysis, all cases with monotonous responses were removed (Roni & Djajadikerta, 2021). The dataset was then inspected for extreme and random style responses that are expected to affect many and sometimes all item scores. According to Zijlstra, van der Ark, and Sijtsma (2011), the former was defined as responses with at least 80% of answers of complete Likert-scale 1s or 7s, and the latter referred to those responses that 1s and 7s exist at the same time in one scale. All abnormal responses detected at this step were removed from the spreadsheet.

Step 3: Data screening and polishing: Missing data and outliers

There was a necessity for further remedy processes on missing data and outliers. Either of them can impose a disproportionate influence on data analysis of a multivariate nature, including the substantial interpretations regarding relationships among variables and the generalisability of the study conclusions (Hair, Black, et al., 2019). Guided by Aguinis, Gottfredson, and Joo (2013) on outlier detecting and handling, Newman (2014) on missing data identification and treatment, and Tabachnick and Fidell (2013) on multivariate data analysis, the study adopted a comprehensive procedure to deal with those two issues.

According to Newman (2014), there are two types of missing data: item-level missingness (the respondent doesn't answer all items from a scale) and construct-level missingness (the respondent answers zero items of a multi-item scale). Given the requirements of conducting a construct-level analysis, the present study treated item-level missingness using the approach of "mean substitution across items (and within an individual)" (Roth, Switzer III, & Switzer, 1999, p. 214). As an extreme case of item-level missingness, construct-level

missing data were treated with likewise deletion strategy, i.e., discarding the case with construct-level missingness (Newman, 2014).

Then, the revised data file was imported to SPSS for outlier analysis. Note that the solution to handling outliers is a non-mathematical decision (Leys, Delacre, Mora, Lakens, & Ley, 2019). Mathematics cannot detect the nature of the outliers even if it can help find the potential outliers in the dataset. It is the researchers' responsibility to "make an educated guess for a criterion and technique and justify this choice" (Leys et al., 2019, p. 7).

Second, as Aguinis et al. (2013) recommend, two techniques were used to identify the outliers: the visual technique of box-plot and the quantitative one based on standardised values. In SPSS, outliers were first inspected and displayed to examine the data distribution in a box-plot (Yuan & Bentler, 1998). Though limitations in detecting outliers in skewed distributions, box-plot is widely used because of its effectiveness, simplicity and convenience of interpretation (Walker, Dovoedo, Chakraborti, & Hilton, 2018).

Then, the function of "Standardised values" was used for the z-test to check the potential outliers with standardised scores in excess of 3.29 ($p < 0.001$, two-tailed test) (Hair, Black, et al., 2019). Subsequently, all outliers were either removed or kept in the dataset. Specifically, one outlier was only eliminated on condition that it was detected as an extreme outlier by either box-plot or z-test. All in all, using both techniques in the study can compensate for the relative weakness of each and reduce the negative effect on statistical power (Aguinis et al., 2013). It is worth noting that some cases with identified outliers may contain valuable and future-oriented knowledge for the research (Mohrman & Lawler, 2012). Therefore, rather than automatically being treated as harmful to the study, the mild outliers identified at this step were kept in the dataset as post hoc interesting outliers (Aguinis et al., 2013).

Step 4: Preliminary analyses

Two tests were conducted to ensure no indications of biases were found: non-response bias, suggested by Armstrong and Overton (1977) and Common Method Variance presence, suggested by Clifford et al. (2010).

Non-response bias analysis

Non-response bias is one of the main concerns in survey research. Identifying whether respondents chose not to participate independently or in a systematic pattern is essential. Early respondents were identified as those who completed the questionnaire during the first two weeks after the survey started, and late respondents were those who submitted the feedback after the reminder letter was sent out. To test non-response bias, two groups were compared through the independent sample t-test in SPSS.

Common Method Variance (CMV) analysis

Common Method Variance (CMV) refers to a systematic error variance that leads to common method bias and negatively influences the estimated relationships among variables/measures (Richardson, Simmering, & Sturman, 2009). CMV is usually introduced to the measures when using the same respondents to obtain self-reported data during a questionnaire survey. In other words, it arises due to the techniques of measurement rather than the corresponding theoretical constructs (Podsakoff, MacKenzie, & Podsakoff, 2012). As stated, CMV potentially threatens the validity of data (Burton-Jones, 2009), leads to a systematic bias in a study (Reio, 2010), and creates a false internal consistency in a single setting (Tehseen, Ramayah, & Sajilan, 2017).

In line with the recommendations of Podsakoff et al. (2012), the present study adopted multiple solutions to minimise the influences of CMV through either procedural remedies or statistical remedies. Procedural remedies refer to the approaches to minimising the influence of CMV before data collection. In contrast, statistical remedies aim to control the impact of CMV after data collection, which could be done either before or after analysing the data (Tehseen et al., 2017).

At this phase of quantitative data analysis, the remedy of Harman's Single-Factor Test was conducted (Harman, 1976). This test was used to examine whether a single factor is accountable for the majority of the covariance among the measures. It was conducted with the following steps (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003):

- 1) Input all items of constructs into Factor analysis and run the principal axis factoring analysis.
- 2) Select the Unrotated factor solution with Factors to extract of "1".
- 3) Check if one single factor would lead to the majority of the covariance (> 50%) among the measures in the conceptual model.

Step 5: Demographics analysis

The participants responded to demographic questions, including company role (LSP/LSC), gender, team role and frequency of communication. In SPSS, frequency distribution, mean, standard deviation, and percentages were calculated for those questions.

Step 6: Descriptive statistics and correlations

SPSS was used to compute descriptive statistics: means, standard deviations and ranges of scores for all items. Moreover, bivariate correlations among all variables were examined as pre-tests of the hypotheses.

Step 7: Statistical testing assumptions

Upon completion of data clean-up and polishing, the below assumptions were analysed for multiple regression analysis in SPSS (Hair, Black, et al., 2019; Tabachnick & Fidell, 2013):

- **Independence:** there is no correlation between the errors associated with one observation and those of any other observation.
- **Linearity:** there is a linear relationship between the independent variable and the dependent variables (Linearity of the phenomenon measured).
- **Homoscedasticity:** the variance of error terms is similar across all values of the independent variables (Constant variance of the error terms).
- **Normality:** the residuals are approximately normally distributed (Normality of the error term distribution).
- **Multicollinearity:** there is no perfect or exact relationship between the exploratory variables.

To thoroughly check the assumptions above, the Durbin-Watson test, histograms, P-P plots, scatterplots of the residuals and VIF values were achieved and analysed via linear regression analysis in SPSS (Table 4.22). Note that all the assessments were model-dependent, meaning that the conclusion may change if the quantity of predictors varies.

Table 4.22

Statistical assumptions to test

Assumption	Meaning	Approaches
Independence	Independence of the error terms (autocorrelation)	Durbin-Watson test (a value of 2 indicates that there is no first-order autocorrelation; an acceptable range is 1.5 - 2.5)
Linearity	Linearity of the phenomenon measured	Visual inspection of the scatterplot of studentized residuals versus unstandardized predicted values
Homoscedasticity	Constant variance of the error terms	Visual inspection of the scatterplot of studentized residuals versus unstandardized predicted values
Normality	Normality of the error term distribution	Visual inspection of histograms and P-P plots
Multicollinearity	Two variables' linear combination	The tolerance value should not be below 0.10 or the VIF value should not be above 10.0

Note. Combined from “A step-by-step tutorial for performing a moderated mediation analysis using PROCESS” by L. M. Clement and M. Bradley-Garcia, 2022, *The Quantitative Methods for Psychology*, 18, 258-271. <https://doi.org/10.20982/tqmp.18.3.p258> and *Multivariate data analysis* (8th ed.) by J. F. Hair, W. C. Black, B. J. Babin and R. E. Anderson, 2019, Cengage Learning.

Step 8: Measurement model analysis

Before testing the hypotheses, assessing the psychometric properties of multi-item variables in the conceptual model is a prerequisite. Structural Equation Modelling (SEM) is an advanced statistical analysis tool used to analyse the

relationships between variables. There are two main types of SEM: Covariance-based SEM (CB-SEM) and Partial least square SEM (PLS-SEM). CB-SEM method takes a confirmatory approach while testing theory-based models. Like CB-SEM, PLS-SEM has two main sub-models: (1) measurement (outer) model and (2) structural (inner) model. The measurement model evaluates the validity and reliability of all latent variables, whereas the structural model focuses on the relationship between exogenous and endogenous variables (Hair, Hult, Ringle, & Sarstedt, 2017). Furthermore, PLS-SEM can handle missing values, small sample sizes, and complex models, and, more importantly, a moderate violation of data normality is tolerated when using PLS-SEM (Hair et al., 2017). With these in mind, this study adopted the PLS-SEM approach to evaluating the reflective measurement model. Specifically, confirmatory composite analysis (CCA) was conducted in SmartPLS, which is a systematic process for confirming measurement models in PLS-SEM (Hair et al., 2020).

According to Hair et al. (2020) and Sarstedt et al. (2022), CCA in the present study consists of the following steps (Table 4.23):

- To estimate the outer loadings for indicator reliability.
- To check the composite reliability (CR) for internal consistency.
- To calculate the average variance extracted (AVE) for convergent validity.
- To examine the heterotrait-monotrait ratio of correlations (HTMT) for discriminant validity.

Table 4.23

Confirmatory composite analysis (CCA)

Criteria	Contents	Measure	Threshold Value
Indicator Reliability (items)	The amount of variance shared between the individual indicator variable and its associated construct	The size of the outer loadings	> 0.7 *

Internal Consistency (construct)	The reliability based on the intercorrelations of the observed indicator variables	Composite reliability (CR)	0.6-0.9
Convergent Validity	The construct includes more than 50% of the indicator's variance	Average Variance Extracted (AVE)	>0.5
Discriminant Validity	Every reflective construct must share more variance with its own indicators than with other constructs	HTMT	<0.9

Note. Combed from “Assessing measurement model quality in PLS-SEM using confirmatory composite analysis” by J. F. Hair, M. C. Howard and C. Nitzl, 2020, *Journal of Business Research*, 109, 101-110. <https://doi.org/10.1016/j.jbusres.2019.11.069> and “Progress in partial least squares structural equation modeling use in marketing research in the last decade” by M. Sarstedt, J. F. Hair, M. Pick, B. D. Liengaard, L. Radomir and C. M. Ringle, 2022, *Psychology & Marketing*, 39(5), 1035-1064. <https://doi.org/10.1002/mar.21640>

Step 9: Hypothesis testing analysis

The hypotheses were tested by using the SPSS version of PROCESS macro (v4.1). Introduced by Hayes (2022), PROCESS macro approach has been widely used to test conceptual models with complex conditional effects.

For conditional process analysis, there are two approaches widely used in the literature: structural equation modelling (SEM)-based, including Covariance-based SEM (CB-SEM) and partial least squares SEM (PLS-SEM), and regression-based approach (i.e. PROCESS macro). In the past decade, there has been a considerable debate about which one is better (e.g. Hair, Risher, Sarstedt, & Ringle, 2019; Hayes, Montoya, & Rockwood, 2017; Pek & Hoyle, 2016). I agree with Hayes and Rockwood (2020) that “each has strengths, weakness, and value” (p. 39). Depending on the research objectives and the data type of the moderator, PROCESS macro approach is more appropriate for the present study.

First, PROCESS is a computational tool available for SPSS that uses ordinary least squares (OLS) regression for path analysis and has been widely used to test conceptual models with complex conditional effects (Hayes, 2022). For all higher-order relations involved in the PROCESS models, each segment of the paths in the models was examined by regression testing. Indirect effects were described using the Monte Carlo bootstrapping method to estimate confidence intervals (CIs) of the unstandardised regression coefficients. This method produced 95% bias-corrected confidence intervals for the effects from 5,000 resamples of the data (Hayes, 2015). Through the pre-programmed models in the macro, PROCESS combines the calculation of direct paths with a comprehensive evaluation of the mediation, moderation and moderated mediation effects (e.g. path coefficients, standard errors, t- and p- values, confidence intervals, and various other parameters).

Second, there is no need to impose the assumption of normality or the minimum limit of sample size with the use of PROCESS approach. Instead, it applies a bootstrapping procedure that allows the distributions of these effects to be skewed and deviate from normality (Field, 2018). On the contrary, CB-SEM approach normally has requirements of sample size and imposes the assumption of normal distribution. Without large sample sizes, it can produce abnormal results with non-normal data (Reinartz, Haenlein, & Henseler, 2009). Furthermore, in some situations with PLS-SEM approach used, nonnormality can even affect the results due to peaked and skewed distributions, although bootstrapping technique is applied (Sarstedt, Ringle, & Hair, 2017).

Third, because of the limitation of modelling function in the CB-SEM software (e.g. AMOS), researchers need to manually create the latent interaction term. Failing to do so correctly may lead to the unsolid relationship between construct measurement and the actual concept it is supposed to represent (Rigdon, Becker, & Sarstedt, 2019). In contrast, PROCESS typically produces the same results as an SEM program will generate with far less work and without requiring any knowledge of SEM (Hayes et al., 2017).

Fourth, one of the limitations of PROCESS is that it ignores measurement error when estimating relationships among latent variables (Hayes & Rockwood,

2020). Nevertheless, though SEM has potential to deal with the issue of measurement error, it can generate nonlinearity estimation difficulties when constructing all possible models of latent variable interactions (de Clercq, Sofyan, Shang, & Espinal Romani, 2022).

Last, any analytical approach - either CB-SEM, PLS-SEM or PROCESS - requires various and sometimes different assumptions (Marsh, Wen, Hau, & Nagengast, 2013). The violation of such assumptions may result in significant biases when creating latent interaction terms. Taking reflective measurement models in PLS-SEM as an example. There are three options to create interaction terms, i.e. the orthogonalising approach, the product indicator approach and the two-stage approach (Rasoolimanesh, Wang, Mikulić, & Kunasekaran, 2021). The final choice of one of these approaches depends on the researcher's relative concern about Type I and Type II errors. As a result, different approaches lead to different results with its own merits and drawbacks (point estimation accuracy versus statistical power) (Rasoolimanesh et al., 2021).

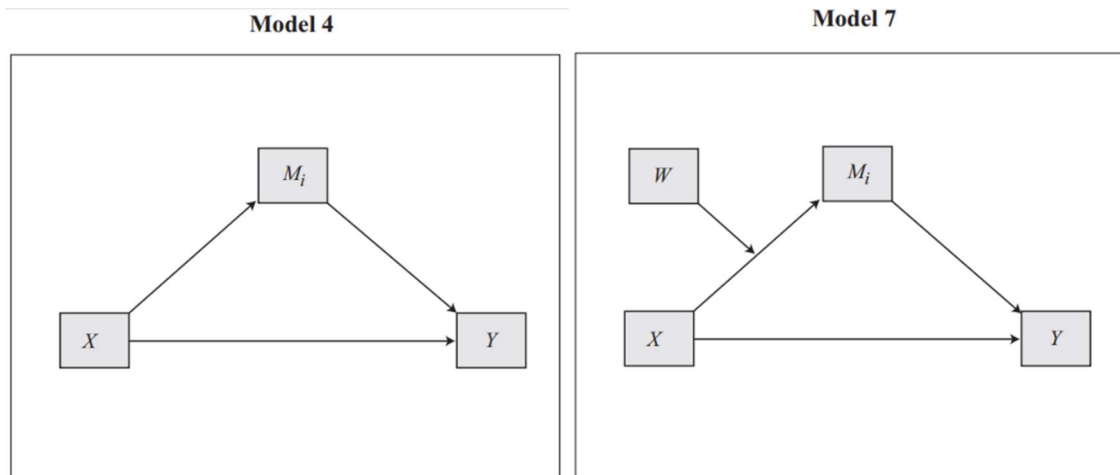
As Sarstedt et al. (2022) emphasised, "in every statistical analysis, every methodological choice comes with affordances, but also at a cost" (p. 9). Rather than claiming that PROCESS macro approach is better than CB- or PLS-SEM, I concur with Cheung and Lau (2017) and Hayes et al. (2017) that the potential bias caused by measurement error is a reasonable price to pay for the benefits of using PROCESS. Given all the reasoning above, the hypotheses of the present study were tested by using the PROCESS macro approach.

Unlike the piecemeal procedure, this approach evaluates both individual paths and indirect effects comprehensively. For all higher-order relations involved in the PROCESS models, each segment of the paths in the models was examined by regression testing. Indirect effects were described using the Monte Carlo bootstrapping method to estimate confidence intervals (CIs) of the unstandardised regression coefficients. This method produced 95% bias-corrected confidence intervals for the effects from 5,000 resamples of the data (Hayes, 2015).

Consulting Hayes's templates, the present study used the Model 4 to test the simple direct relationship and mediation, and the Model 7 to test moderation and moderated mediation (Hayes, 2022; see Figure 4.9). All control variables were taken as covariates in testing the hypotheses for controlling any variance arising from these variables. The specific steps used in prior SCM research were adopted (e.g. Chowdhury, Chowdhury, Khan, & Sajib, 2023; Chowdhury, Quaddus, & Agarwal, 2019). In particular, the use of Model 4 and 7 in one study was consistent with prior research that investigated multiple moderation and moderated mediation effects (e.g. Gu, You, & Wang, 2020; Scott & Zweig, 2020).

Figure 4.9

PROCESS models to use



Note. Adapted from *Introduction to mediation, moderation, and conditional process analysis : A regression-based approach (3rd ed.)*, Hayes, A. F. (2022), The Guilford Press.

Specifically, the magnitude and significance of the path were assessed in Model 4 ($H_1, H_{2a}, H_{2b}, H_{3a}, H_{3b}, H_{4a}, H_{4b}, H_{5a}$ and H_{5b} with direct path; H_{2c}, H_{3c}, H_{4c} and H_{5c} with indirect path). In this model, the presence of mediations was explored and assessed simultaneously (Preacher & Hayes, 2008). The magnitude of the indirect relationships between IOTI and TPM through all four mediators was evaluated. The hypothesis was accepted if 1) the p-value was < 0.05 and 2) the null 0 fell between the corresponding confidence interval (Hayes, 2022). Otherwise, the hypothesis was rejected.

As for the moderation effects (H_{6a} , H_{6b} , H_{6c} and H_{6d}), Model 7 was used to estimate the CIs for the conditional direct relationship between IOTI and each mediator at distinct values of the moderator of HOI (interaction term: IOTI x HOI). If the confidence interval contains the null of 0, then the effect is not significant (Hayes, 2022). With the use of the Johnson-Neyman technique, PROCESS visualises the interaction effect of the independent variable (IOTI) on the dependent variable (TMM, TTA, TTC and TCMN) as a function of moderating variable (HOI). Each respective effect was analysed and compared under three CI-based scenarios: the moderator is one standard deviation (SD) below its mean, equal to its mean and one SD above its mean (Hayes, 2022). In this way, it is viable to detect if the association between IOTI and each mediator could be potentially altered at different levels of HOI (H_{6a-6d}). Similarly, the moderated mediation effects (H_{7a} , H_{7b} , H_{7c} and H_{7d}) were tested by evaluating the conditional indirect relationships between IOTI and TPM, through every respective mediator, at distinct values of HOI. If the index of moderated mediation contains the null of 0 (p-value < 0.05), then there is no such effect existing in the model (Preacher et al., 2007).

Finally, a linear regression analysis was conducted in SPSS to test the simple relationship between TPM and LOP (H_8).

Step 10: Data interpretation and writing up

To organise the quantitative report to be used in Phase 5, a draft structure of the final write-up was created, illuminating what would be written on the design, methods, and findings of Phase 4.

4.6.5 Phase 5: Interpret the integrated results

This phase interprets the meaning of the results/findings achieved throughout Phases 2 to 4. Table 4.24 shows the respective procedures associated with qualitative or quantitative data interpretation.

Table 4.24

Procedures of data interpretation

Procedure of qualitative data interpretation	Procedure of quantitative data interpretation
<ul style="list-style-type: none">• Summarise the major qualitative findings (Chapter Five)• Interpret how the findings answer the research questions (Chapter Six)• Relate findings to past literature and/or theories (Chapter Six)• Bring in a personal assessment of the meaning of the findings (Chapter Six)• Identify limitations of the study (Chapter Seven)• Identify implications for future research and for audiences (Chapter Seven)	<ul style="list-style-type: none">• Summarise the major quantitative results (Chapter Five)• Compare the results to hypotheses or interpret in terms of the research questions (Chapter Six)• Examine results with respect to prior predictions or explanations drawn from the literature (Chapter Six)• Identify limitations of the study (Chapter Seven)• Identify implications for future research and for audiences (Chapter Seven)

Note. Adapted from *Designing and conducting mixed methods research* (3rd ed.), J. W. Creswell and V. L. P. Clark, 2018, SAGE Publications.

After reporting the research results in Chapter Five, the study examines the congruence and divergence of the qualitative and quantitative results in Chapter Six. Specifically, the two databases were combined with the merging integration technique for further interpretation (Creswell & Clark, 2018). Then, a mixed-method data analysis was conducted to interpret how the quantitative instruments and their subsequent results were justified through understanding “the qualitative contextual and cultural sensitivity of participant experience” (Creswell & Clark, 2018, p. 242).

4.7 Research ethics and risk considerations

Ethical concerns are prerequisite and pivotal in social research due to the involvement of people in data collection. UTS published the *Responsible Conduct of Research Policy* as a detailed guideline for procedures regarding ethical research. As required, I have completed research integrity training

courses (five modules) and successfully achieved certificates of completion for two quizzes. Meanwhile, approval for my research ethics application (Application Number: ETH19-3711) was received before collecting the data. Combining the principles provided by UTS and those by Saunders et al. (2023), this study has strictly adhered to the moral and professional guidelines below:

- Integrity and objectivity of the researcher
- Truthfulness, including limitation of deception
- Social and cultural sensitivity
- Respect for property (including University property and intellectual property rights)
- Informed and voluntary consent
- Respect for rights of privacy and confidentiality
- Research adequacy
- Responsibility for the collection and analysis of data and reporting of findings
- Compliance in the management of data
- Avoidance of conflict of interest
- Minimisation of risk
- Respect for the vulnerability of some participants
- Ensuring the safety of the researcher

4.8 Summary

This chapter has described, explained and justified the methodological concerns related to the study. The chapter comprises fundamental information (research philosophy, research scenario, the unit and level of analysis and the type of data collected) and provides a reasoning for the mixed-methods research design and an explanation of the research procedure. In addition, the conceptualisation and operationalisation of the constructs have also been clarified for further quantitative data analysis.

CHAPTER FIVE: RESULTS

The purpose of this chapter is to summarise the study's key results along with the qualitative and quantitative data introduced in Chapter Four. The research findings derived from a further synthesis of those triangulated data and a dialogue established between theories and the whole dataset. Following the research procedure in Section 4.6, this chapter reviews the findings of the qualitative interviews, instrument development, and quantitative testing.

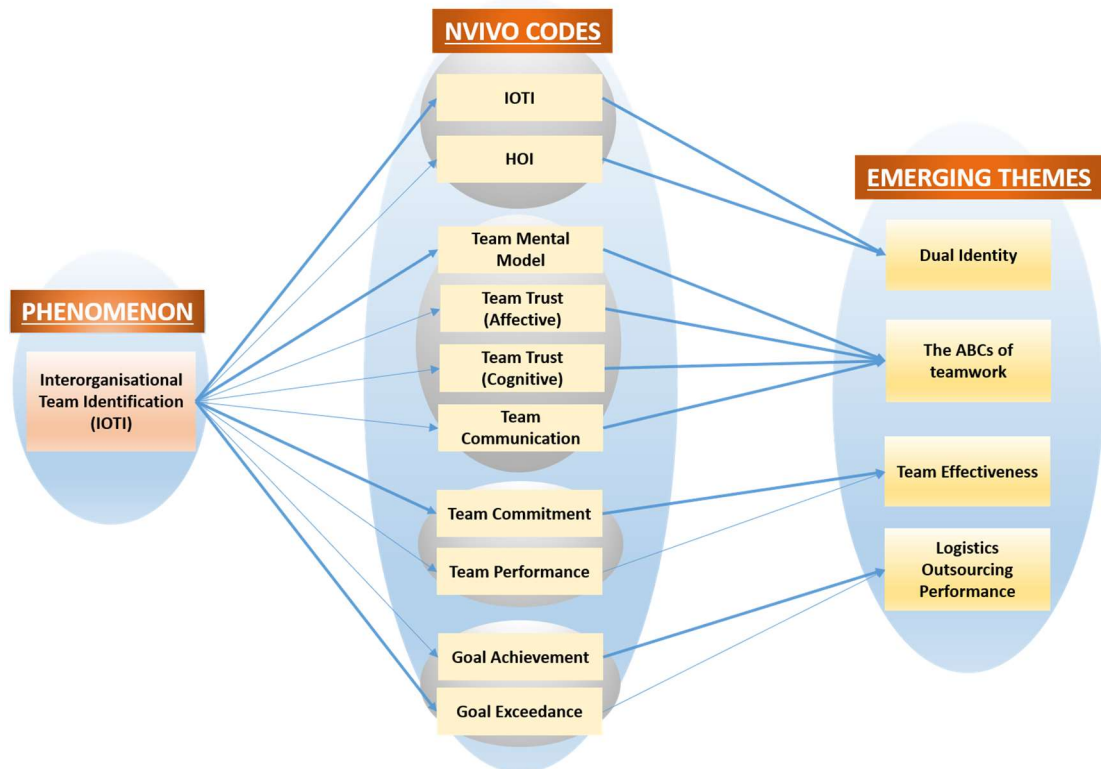
5.1 Results of qualitative interview

During Phase 2, 12 semi-structured interviews were undertaken in Shenzhen, China. The theming and coding work of interview transcriptions was conducted in NVIVO. Through analysis of 10 codes, 4 dominant themes were revealed, including 1) dual identity, 2) the ABCs of teamwork, 3) team effectiveness and 4) logistics outsourcing performance. Certain aspects of these themes have been studied before, although they are not popular in the context of interorganisational team effectiveness or the logistics outsourcing industry. Reflecting the participants' perspective on IOTI, these themes contextualise the study by rationalising the selection of survey constructs considering both the literature and qualitative interviews.

The final coding structure is illustrated in Figure 5.1. Dominant emerging themes and patterns were highlighted through reassembling and analysing raw data. The following section reviews each theme and its relationship with the relevant codes.

Figure 5.1

The concept map of the themes based on qualitative findings



5.1.1 Theme 1: Dual Identity

In the IOT context, all members identify with multiple units of affiliation, i.e., a dual identity of the inter-organisational team and their home organisation). Therefore, it is worthwhile to explore what type of effects a dual identity can lead to by maintaining common and distinct identities simultaneously. This was evident from a respondent, who commented

“When doing contract logistics business, especially outsourcing service, I believe it is quite important to decide whether to treat the business as ‘theirs’ or ‘ours’. To tell the truth, difficulties exist if we really want to make it as ‘ours’.”

(Respondent_LSP1)

First, it was emphasised by Respondent_LSP3 that “Yes, like a group, we do things together”. It is likely that identification with the IOT as a superordinate entity may facilitate the symphonic working style and the emergence of synergy

among diverse team members. For example, Respondent_LSP6 describes his understanding of the gist of IOT collaboration as

“Things like coordination, adaptability, trust and reliance in a inter-organizational team are all not one-sided, but mutual.”

Contrary to previous studies in intra-organisational team identification, the review of the interview showed that the difference between IOTI and HOI levels leads to the emergence of identity conflict (Gaertner & Dovidio, 2000; Hornsey & Hogg, 2000). During the interviews, respondents openly expressed their opinions on this issue, commenting

“A gambling relation always exist in this process (of inter-organisational collaboration).”

(Respondent_LSP1)

Generally, such conflicts are latent or minor instead of apparent and severe. When the conflict becomes troublesome for the team and its members, the dual identity model is supposed to increase the inconsistency between each party regarding their home organisation’s goals, values and norms. For example, a participant from LSP argued that

“Surely the (home) company is given priority. You can’t sacrifice the (home) company’s interest to promote or implement a project.”

(Respondent_LSP5)

Likewise, a LSC interviewee held the same opinion

“As I just said, if you put everything of your own company as a priority since you are on behalf of it, then I would rather choose the interest of my company over the progress of the project.”

(Respondent_LSC5)

Due to the adverse effects of identity conflicts between IOTI and HOI, a dual identity may potentially increase the tendency of outgroup discrimination, implying the emergence of strengthened intergroup boundaries and deteriorated intergroup relations. This was evident from one respondent, who provided a case

that one of their suppliers had to undertake the responsibility for an operation incident.

“The cost was high. It was likely that the supplier achieved no profit from that order, or even had to compensate for the loss. There is a long-term strategic cooperation between us and the supplier and we get along very well with each other. But when faced with cases like this, we will surely deal with it from the perspective of the interests of our own company.”

(Respondent_LSC6)

Another participant from the LSC side also emphasised that

Personally speaking, I would still think in the big picture and take my company’s interest as the priority. If I find any problems, I can remind him or come up with solutions to alleviate the situation, but I won’t sacrifice my company’s interest because of personal feelings.

(Respondent_LSC1)

Taken together, these findings imply that there is a close interaction between IOTI and HOI. Specifically, it is rather difficult to effectively operate an IOT team when both superordinate identity (IOTI) and subordinate identity (HOI) are salient simultaneously.

5.1.2 Theme 2: The ABCs of teamwork

As illustrated in the study’s conceptual framework (Section 2.7), teamwork typically involves behavioural processes and the emergent states of affect and cognition. Acting as the mediators in the IMO model, those processes and states are referred to as the ABCs of teamwork (Salas et al., 2008). Throughout the semi-structured interview research, three types of ABCs were further evaluated with the data: team trust of affective state, team communication of behavioural process and team mental model of cognitive state.

Team mental model

The sub-theme of TMM was justified as a typical cognitive state in an inter-organisational team. *Respondent 6_LSP 6* expressed that “everyone (in the team) knows and complies with the collaborating rules when working together for a logistics outsourcing project”. The collective perception of teamwork was also reflected from the customer’s viewpoint, with one respondent commenting

“At the beginning of the project, we would discuss and co-create a SOP (Standard Operation Procedure) as the instruction for all team members on how to carry out routine operations. Everyone begins to do his/her work after the process is settled. We would surely encounter a variety of problems when it comes to real operation while, what’s more important, it’s also the time to collaboratively optimise the coordination process, resolve task-related demands, and finally improved the teamwork efficiency.”

(Respondent 10_LSC 4)

Concerning team members’ collective beliefs in boundary-spanning activities, TMM was identified by several interviewees as a viable way of sharing knowledge for team functioning within the team, as clearly indicated in the following two responses

“A joint negotiation is essential. It is not wise to assert that it is your fault nor to say it is not when some incidents happen. Maybe the problem exists in both sides. We should try to diagnose the root causes and find a solution as all of us want to do things right.”

(Respondent 4_LSP 4)

“For a large outsourcing project, the top management teams such as the directors or vice presidents from both parties would meet for a milestone launch. Of course, there are much preparation work before. In the postal period, the responsible people from the two sides would work together on the time schedule and personnel arrangement. All team members have to be very clear of the assignment he/she takes as well as the ways to realise it.”

(Respondent 5_LSP 5)

As BSEs interact, distribute knowledge, and exchange perceptions in an IOT context, they develop emergent cognition of TMM. One recorded response was

“They (customers) are aggressive sometimes of course, but I think we are much of equal partners because we have been working with each other for a long time. We can fully voice our suggestions or opinions and, in most cases, they would seriously consider them. So, I think it’s pretty fair and reasonable. Basically, either party will be cooperative when the partner calls for some support.”

(Respondent 3_LSP 3)

As a result, TMM potentially enhances inter-organisational collaboration and predicts the positive team performance. This is reflecting in the following response

“Getting along with a customer (with a certain level of cognitive ability) actually makes the cooperation much smoother.”

(Respondent 10_LSC 4)

Altogether, the cognitive mechanism of TMM helps teams improve team functioning, capabilities, and performance more effectively.

Team trust

In the teamwork context, trust is a key variable in the workplace, and this has been explicitly elaborated by several literature reviews in various disciplines such as organisational behaviour (Feitosa et al., 2020) and supply chain management (Whipple, Griffis, & Daugherty, 2013). During the period of interview preparation, team trust was initialised as a unidimensional construct in the question list, “Please share your understandings of team trust in logistics outsourcing collaboration”. One respondent (Respondent 1_LSP1) pointed out that *“the degree of trust really matters in cooperation”*. Nevertheless, other respondents showed diverse understandings of the question, and two types of team trust emerged from the data: team affective trust and team cognitive trust.

First, team affective trust is based on expectations from close interpersonal relationships within the team. As pointed out by an LSP respondent

“The most reliable partner is the one who deserves your trust and, in critical moments, he/she can also trust and rely on you.”

(Respondent 6_LSP 6)

Similarly, a leader of an outsourcing project team from the LSC side explained the importance of trustworthiness, commenting

“I think the interpersonal emotion bond between BSEs from both sides matters. If there is a conscientious person from my supplier that I would like to trust, just as I’ve mentioned, I would assign a suitable person from my side to work with him work with a suitable guy from my side.”

(Respondent 9_LSC 3)

Furthermore, the cognitive element of team trust was also reported as contributing to the collaborative operation and team performance

“Our customer strongly trusts in us because we’ve been working together for a long time. We wouldn’t change our operation plan for any financial benefits in business at the cost of the customer’s satisfaction with our service.”

(Respondent 6_LSP6)

Grounded on the beliefs about reliability and dependability, the following response indicated a willingness to trust the team members from the partnering firm

“Exactly, we would surely provide them corresponding details of products when it comes to every single operation. This is fine because mutual trust exists.”

(Respondent 10_LSC4)

Given these responses and the IOT context of the study, it is evident to define team trust respectively with two distinctive dimensions: team affective trust and team cognitive trust.

Team communication

Effective team communication is crucial to achieving a high level of team performance. The following responses during the interview process justify this

“Partnership should be built upon effective communication between both sides.”

(Respondent 4_LSP4)

“Yes, communication between the two parties is very important.”

(Respondent 11_LSC5)

Furthermore, ideal communication patterns vary under different teamwork scenarios. As for inter-organisational teams in the logistics outsourcing industry, it is common that BSEs work together in a virtual environment as a member of a geographically dispersed team (Eisenberg, Post, & DiTomaso, 2019). For example, such type of team member dispersion was explained as

“The key contact persons (from our customers) in the project team are basically outside of the office who spend most of his work time on business trips. Some don’t even live in the same city. In most cases, we communicate via e-mail and Wechat.”

(Respondent 2_LSP2)

Specifically, the following response emphasised the linkage between team identity and team communication

“I prefer identify them (BSEs from the service supplier) as a part of our joint team rather than merely a representative from another company. Because when there is a long-term collaborating project, open and prompt communication is a necessity for effective operation. Besides that, informal and spontaneous talk is also essential to improve the effectiveness of teamwork.”

(Respondent 9_LSC3)

These comments illustrate the importance of communication for IOT operations. And a special case of a geographically dispersed team was mentioned to

illustrate the communication characteristics in a virtual collaboration environment. Overall, it is anticipated that team communication is critical in shaping IOT performance.

5.1.3 Theme 3: Team effectiveness

Given the boundary-spanning collaboration situation and the context of the logistics outsourcing industry, the study selected two indicators to evaluate team effectiveness: team performance and team commitment.

Team performance

In the team literature, team performance is the most frequently used criterion of team effectiveness (Aubé & Rousseau, 2005). To achieve specified outcomes, LSPs put great effort into accomplishing the tasks. One respondent commented

“There are very few incidents throughout the team existence period because we are capable of coping with internal and external challenges to reach both team goals and customer expectations... We make full records of our customers’ requirements, and our service team strictly operate to fulfil their requests. And, we also try out best to facilitate innovating ideas in improving service quality, reducing the redundancy of operation procedure and so on.”

(Respondent 6_LSP6)

From a customer perspective, one respondent explained a series of evaluation criteria they used to assess the IOT outcomes, commenting

“(As for the logistics outsourcing project,) a large number of unpredictable problems arise in international transport. The suppliers, our long-term partners, have much more experience than us since they’ve been specifically working in this business for many years. They would tell us what is the next destination the ship is going. Is the shipment scheduled in time for the delivery? When the goods in delivery are supposed to arrive at the destination? All that information is shared with us in real

time. Because such key points sometimes are related to our payment to the supplier abroad. Meanwhile, they have to provide us the documents of waybills, packing lists and invoices for preparing the payment to our suppliers in other countries. I mean, to send out the letter of credit in due time.”

(Respondent 8_LSC2)

On the contrary, another respondent argued that the overall sense of how effective the team operates was considered to be a useful indicator of team effectiveness

“... but some of the indicators (of IOT performance) are not objective. For example, you can say this team does excellent and superb work or the team keeps getting more effectiveness. But you can't specify how many tasks the team has accomplished within this year. Another example: my team has done a great job with very few mistakes happened throughout the whole year. But what issue will be defined as a mistake, an incident, or could be completely neglected? Sometimes for some cases, there is just no objective criteria, but subjective feelings.”

(Respondent 2_LSP2)

Therefore, it can be seen that different from traditional teams within an organisation, inter-organisational teams have their own characteristics as a type of temporary organisation. As a consequence, those subjective, process-based indicators may be put into consideration when assessing IOT performance.

Team commitment

As mentioned, team commitment is the other variable to assess team effectiveness. Surprisingly, and somewhat counter-intuitively, only one respondent mentioned this regarding the outcome of teamwork, commenting

“When facing difficulties or dilemma, our priority is to keep a win-win state and come up with a win-win solution. We devote

ourselves to strengthening our long-term collaboration with the partners. We don't say the things like "You have to compensate me, you have to do this or that, or our partnership ends now". We don't act in such unfriendly ways."

(Respondent 2_LSP2)

Due to the lack of evidence from the interview data, it is difficult to make any comments so far. Given its existence in the literature, this variable remained under the theme of team effectiveness for further analysis at the stage of instrument development.

5.1.4 Theme 4: Logistics outsourcing performance

For this study, LOP was conceived of as a bi-dimensional construct: goal achievement and goal exceedance.

First, responses from LSPs illustrated that a critical challenge for them is how to balancing the resources required to deliver value to their customers and the rewards from such effort. For example, it was mentioned that

"Despite of respective interests of each party in this relationship, we both would come to an agreement after the negotiation. We, as a service provider, are willing to develop and maintain a long-term relationship with the customer. While, at the same time, we are seriously considering the necessity of making additional effort to provide services that potentially lead to exceeding customer expectations. After all, that was not explicitly required in the contract."

(Respondent 6_LSP6)

Furthermore, another respondent answered the question regarding what level of operation goals should be achieved with

"For a large outsourcing project, you have to think: what should I do in the first two weeks, the first month or the second month? There are a number of milestones which you have to follow at each stage throughout the project lifespan. Undoubtedly, we will

make great efforts to work together. In a word, we aim to maintain a healthy relationship with our customers to achieve individual and joint goals.”

(Respondent 5_LSP5)

Acknowledging the mutual interest in achieving targeted goals, LSPs even actively pursue the performances that exceed expectations. One respondent commented

“We are quite flexible in dealing with the special requests from the customer. For example, sometimes the customer may not be satisfied with the shipment period. Meanwhile, another shipping line may provide an alternative solution which is a little more expensive but faster. I would indeed put the requirements of the customer as the precondition and choose the latter for this shipment. When we deliver the goods as early as possible for this urgent order, it signals to our customer that we are a dependable partner to set up a collaboration environment in which both parties can achieve or even exceed the pre-defined goals.”

(Respondent 3_LSP3)

On the other hand, another mentioned that there should be a balance between goal achievement and goal exceedance

“First, I think we should cooperate within the framework of the signed agreement at the beginning when both parties are not familiar with each other. The prerequisite is to work in accordance with what has been stated in the contract. Later when both parties get along with each other with a relatively stable relationship, I think we can optimise our service solution to the customer, at an accepted level of resulting costs. But it surely depends on the situation because we focus on not only customer expectations but the quality of long-term relationships.”

(Respondent 1_LSP1)

Consistent with this viewpoint, another respondent advocated that, from the customer's perspective,

“We surely hope that our partners can improve their capability and optimise the operation solutions to the outsourcing project. When services exceed our expectations, it would absolutely improve the operation efficiency and bring to us more profits.”

Overall, the comprehensive review revealed that LSP and LSC agreed to consider the subjective perceptions of outsourcing performance. Those responses provide support to the study to import a bi-dimensional conceptualisation of logistics outsourcing performance.

5.2 Results of instrument development

The integration process in Phase 3 (see Figure 1.4) acted as a major interface between the qualitative and quantitative phases. A joint display (Table 5.1) aligned the qualitative findings and the conceptual framework. Meanwhile, it also mapped the themes and codes to the scales and items of the instrument.

Table 5.1

The joint display for the instrument development

Qualitative themes	Qualitative codes	Categories in the conceptual framework	Quantitative scales	Sources of measurement items
Dual identity	IOTI	Input	IOTI	Rockmann et al. (2007)
Dual identity	HOI	Input	HOI	F. Mael and Ashforth (1992)
The ABCs of teamwork	Team mental model	Mediator	TMM	Fransen et al. (2011)
The ABCs of teamwork	Team trust (affective)	Mediator	TTA	McAllister (1995)
The ABCs of teamwork	Team trust (cognitive)	Mediator	TTC	McAllister (1995)

The ABCs of teamwork	Team communication	Mediator	TCMN	Mohr and Spekman (1994)
Team effectiveness	Team commitment	Outcome	TCMT	G. S. van Der Vegt and Janssen (2003)
Team effectiveness	Team performance	Outcome	TPM	Gibson et al. (2009)
Logistics outsourcing performance	Goal achievement	Outcome	LOP_GA	Deepen et al. (2008)
Logistics outsourcing performance	Goal exceedance	Outcome	LOP_GE	Deepen et al. (2008)

Guided by research objectives and theoretical foundations, the present study selected the most appropriate measures to use by collecting and comparing the published scales. Together with demographic information, a questionnaire was drafted and then published on Qualtrics. IRA analysis was conducted on the 14 responses from the targeted sampling group. Table 5.2 illustrates the results with the criteria clarified in Section 4.6.3. Hair, Black, et al. (2019) explain that internal reliability is a prerequisite of psychometric scales, and it can only be assessed with multiple items scales. Conventionally, a minimum of three items per scale is strongly recommended to utilise the psychometric scales in a questionnaire survey (Hair, Black, et al., 2019). Accordingly, the constructs of Team commitment (only 2 items left) and Goal exceedance of LOP (only 2 items left) were discarded (Table 5.2).

Table 5.2*Result of IRA analysis*

Constructs	Items	Mean	p	Power	Decision
Inter-Organisational Team Identification (IOTI)	(IOTI-1) If someone were to criticize this team, it would feel like a personal insult.	5.36	0.27	0.09	dropped
	(IOTI-2) I am very interested in what others think about this team.	6.07	0.00	0.94	retained
	(IOTI-3) If I were to talk about this team, I would say “we” rather than “they”.	6.57	0.00	0.97	retained
	(IOTI-4) This team’s successes are my successes.	6.43	0.00	0.99	retained
	(IOTI-5) If someone were to praise this team, it would feel like a personal compliment.	6.50	0.00	0.97	retained
Team Mental Model (TMM)	(TMM-1) It was clear from the beginning what this team had to accomplish.	6.36	0.00	0.93	retained
	(TMM-2) This team spent time making sure every team member understands the team objectives.	6.21	0.00	0.95	retained
	(TMM-3) Team members understand what is expected of them in their respective roles.	6.50	0.00	0.99	retained
	(TMM-4) Shortly after the start this team had a common understanding of the task we had to handle.	6.36	0.00	0.98	retained

	(TMM-5) Shortly after the start this team had a common understanding of how to deal with the task.	6.36	0.00	0.98	retained
Team Trust (Affective) (TTA)	(TTA-1) We (the team) have a sharing relationship. We can openly share our ideas and feelings.	5.86	0.01	0.84	retained
	(TTA-2) We can talk freely to each other about difficulties we are having in completing the project and know that each other will listen.	6.21	0.01	0.81	retained
	(TTA-3) If I shared my ideas and project-related problems with the members of my team, I know they would respond constructively and caringly.	6.07	0.00	0.87	retained
Team Trust (Cognitive) (TTC)	(TTC-1) The members of my team approach the team project with professionalism and dedication.	6.07	0.00	0.94	retained
	(TTC-2) Given the track record of my team members, I see no reason to doubt their competence and preparation for the upcoming presentation.	5.79	0.00	0.89	retained
	(TTC-3) I can rely on the members of my team not to make my job more difficult by careless work.	5.86	0.00	0.92	retained
Team Communication (TCMN)	(TCMN-1) Members in my team inform each other in advance of changing needs.	6.14	0.01	0.84	retained
	(TCMN-2) Members in my team share proprietary information with each other.	5.79	0.01	0.81	retained

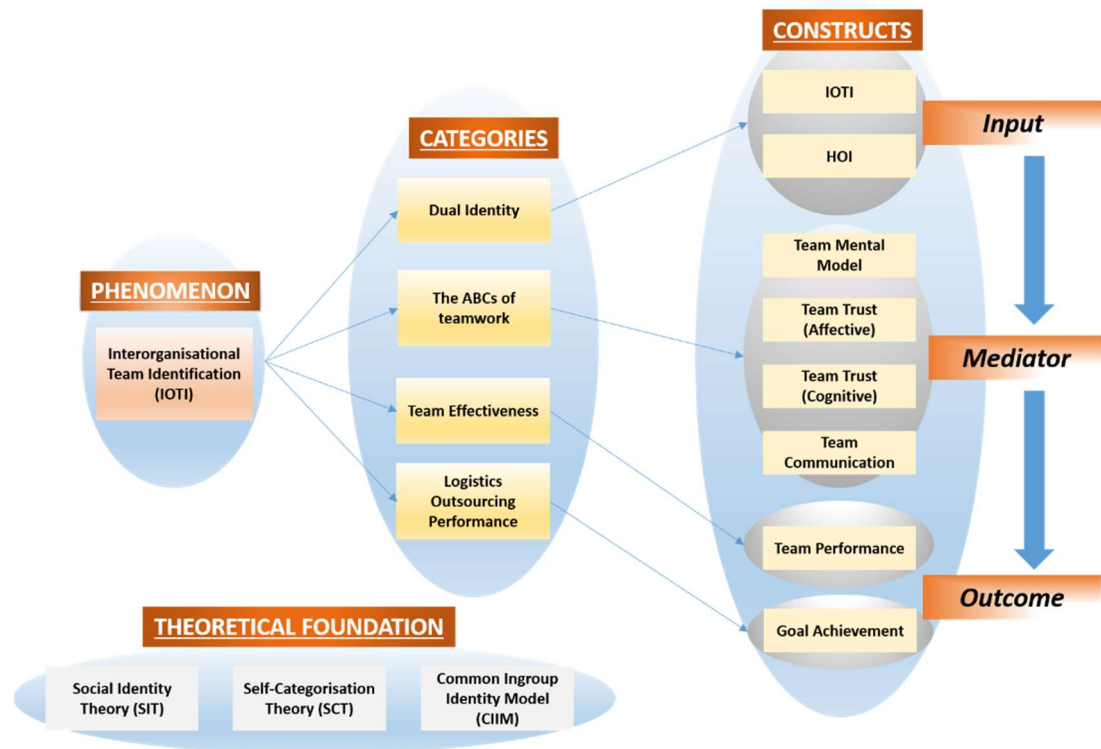
	(TCMN-3) Members in my team provide any information that might help the partner's side.	5.64	0.00	0.86	retained
	(TCMN-4) Members in my team keep each other informed about events or changes that may affect the other side.	5.93	0.00	0.87	retained
Team Performance (TPM)	(TPM-1) This team is consistently a high performing team.	6.00	0.00	0.91	retained
	(TPM-2) This team is effective.	6.43	0.00	0.97	retained
	(TPM-3) This team makes few mistakes.	5.79	0.01	0.81	retained
	(TPM-4) This team does high quality work.	6.00	0.01	0.82	retained
Team Commitment (TCMT)	(TCMT-1) Members of this team feel emotionally attached to the team.	5.64	0.00	0.93	retained
	(TCMT-2) Members of this team feel a strong sense of belonging to the team.	5.71	0.00	0.64	dropped
	(TCMT-3) Members of this team feel as if the team's problems are their own.	5.64	0.01	0.77	dropped
	(TCMT-4) Members of this team feel like part of the family in the team.	5.86	0.00	0.97	retained
Home Organisation Identification (HOI)	(HOI-1) When someone criticises my organisation, it feels like a personal insult.	5.57	0.14	0.18	dropped
	(HOI-2) I am very interested in what others think about my organisation.	5.79	0.03	0.52	dropped

	(HOI-3) When I talk about this organisation, I usually say 'we' rather than 'they'.	6.29	0.00	0.87	retained
	(HOI-4) This organisation's successes are my successes.	6.00	0.00	0.96	retained
	(HOI-5) When someone praises this organisation, it feels like a personal compliment.	6.50	0.00	0.99	retained
Logistics Outsourcing Performance (LOP)	(LOP_GA-1) We completely fulfills the goals and expectations jointly set with the customer prior to this logistics outsourcing relationship.	6.21	0.00	0.95	retained
	(LOP_GA-2) The customer is very satisfied with our services.	5.93	0.00	0.98	retained
	(LOP_GA-3) The relationship with this customer is very good.	6.21	0.00	0.99	retained
	(LOP_GA-4) We deliver the services always with the quality required by the customer.	6.07	0.00	0.94	retained
	(LOP_GE-1) The goals and expectations jointly set by two partners prior to this arrangement were significantly exceeded.	5.64	0.00	0.98	retained
	(LOP_GE-2) The customer is significantly more satisfied with the quality of our services than expected.	5.57	0.00	0.92	retained
	(LOP_GE-3) The relationship between actual costs for this project and the overall service performance is much better than expected.	5.64	0.01	0.67	dropped

Within the scope of the revised conceptual framework (Figure 5.2), the conceptual model was finalised with a series of hypotheses to test in the next phase. See Chapter Three for more details.

Figure 5.2

Key components in the conceptual framework (revised)



Ultimately, the questionnaire was finalised. The completed survey consists of seven sections with 19 questions. The privacy and consent information were displayed in the first section. Section A contained a filter question to ensure participants were from the targeted population (LSP or LSC). Six questions were used to collect individual- and team-level information in the IOT context (in Sections B and C). There are 8 Likert-style questions in Sections C, D, and E that address the eight constructs in the concept model. The survey concluded with three demographic questions and one open-ended question, which would be potentially used for additional opportunities for data exploration during data analysis and result discussion. The survey was published and administered via Qualtrics.

5.3 Results of quantitative survey

The quantitative survey was undertaken on Qualtrics. The sampling frame for the survey consisted of members of CSCMP China. Among all types of memberships (industry, academia, government, etc), only those from LSP or LSC were shortlisted and 1,148 research invitations were finally distributed to the targeted participants. Among 812 participants (response rate=70.7%) who selected “yes” on the consent form and proceeded to the survey, 169 responses were deleted in that 1) they dropped out before completing the questionnaire or 2) they successfully submitted the survey but did not answer any question related to the constructs for hypothesis testing. Thus, the final number of valid responses was confirmed as n = 643 (the valid response rate is 56.0%).

5.3.1 Data clean-up and polishing

The survey data was downloaded to Excel as a .csv file for data screening and handling. A variety of undesired responses were removed from the database. After screening and handling the original dataset (Table 5.3), the study collected a total of 440 useable samples for the next step.

Table 5.3

Review of data clean-up (Excel-based)

Issue	Number of responses affected	Criteria	Decision	Reference
Incomplete response	23	Cases with 50% or more missing data (>=15)	Deleted	Hair, Black, et al. (2019)
Missing data (item-level)	137	Mean substitution across items within one particular scale	Retained	Newman (2014)
Missing data (construct-level)	63	Like-wise deletion	Deleted	Newman (2014)

Monotones	18	Cases with answers that have no variance for all items	Deleted	Roni and Djajadikerta (2021)
Extreme response	43	Cases with 80% answers are 1s or 7s	Deleted	Zijlstra et al. (2011)
Random response	56	Cases in which 1s and 7s exist at the same time in one scale	Deleted	Zijlstra et al. (2011)

Following this step, the data file was loaded into SPSS for an outlier check. As explained in Section 4.6.4, the visual technique of box-plot and the quantitative z-test were used to identify the potential outliers. As shown in Figure 5.3, there were a number of outliers upon examining the box-plots of all constructs. Specifically, the box-plot for TPM indicated one extreme outlier, Response 143 and that for HOI identified the same extreme outlier, Response 143. All other responses with outliers detected were verified as mild due to a low level of inconsistent answers that skewed the results. Furthermore, the z-test was conducted in SPSS to detect the variables with standardised scores over 3.29 (Tabachnick & Fidell, 2013). As a result, Responses 141 and 143 were identified as outliers (see Table 5.4). Two responses were removed, and all mild outliers remained in the dataset for further analysis. In the end, the final sample size was 438.

Figure 5.3

Result of the outlier check (box-plot based)

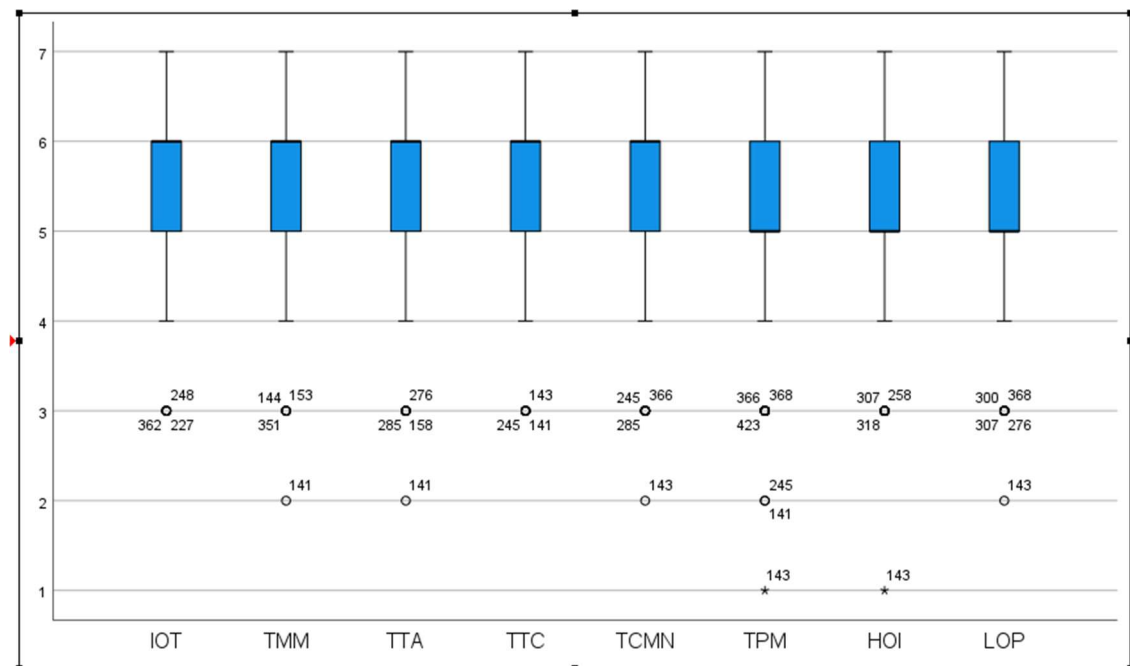


Table 5.4

Result of the outlier check (box-plot based)

Respondent ID	IOTI	TMM	TTA	TTC	TCMN	TPM	HOI	LOP
141	-2.65	-3.75	-3.81	-2.83	-2.63	-3.17	-2.44	-2.54
143	0.60	-0.48	-1.62	-2.83	-3.72	-4.14	-4.54	-3.64

5.3.2 Preliminary analyses

Non-response analysis

It is likely that missing data from non-respondents would negatively affect the generalisability of research results. Following the assumption that late respondents are more like non-respondents, the present study compared early versus late responses (Armstrong & Overton, 1977). A test of non-response bias was conducted by comparing the data from early and late respondents. Specifically, the sample was split into two groups: 1) early respondents who completed the survey during the first two weeks since the invitation letter was

sent out, and 2) late respondents who submitted the feedback after the reminder letter was distributed.

The results from independent sample t-tests analysis on all variables were not significant (all p values > 0.05, as shown in Table 5.5), indicating that non-response bias did not substantially impact the research results.

Table 5.5

Result of non-response bias test

Variables	Early responses (n=354)		Late responses (n=84)		t	p
	Mean	SD	Mean	SD		
IOT	5.46	0.949	5.37	0.803	0.932	0.353
TMM	5.45	0.952	5.38	0.759	0.732	0.465
TTA	5.48	0.938	5.46	0.813	0.184	0.854
TTC	5.48	0.888	5.40	0.793	0.737	0.463
TCMN	5.41	0.925	5.40	0.893	0.070	0.944
TPM	5.26	1.042	5.23	0.961	0.260	0.795
HOI	5.30	0.968	5.36	0.873	-0.507	0.613
LOP	5.32	0.929	5.33	0.841	-0.136	0.892

Common Method Variance (CMV) analysis

Common method bias was assessed with Harman's single-factor test (Podsakoff et al., 2012). The results in Table 5.6 showed that the first extracted factor accounted for 27.98% of the total variance in the data (well below the threshold of 50%), suggesting that common method bias was not a serious concern in the study.

Table 5.6*Result of Harman's single factor test*

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	<i>Total</i>	<i>% of Variance</i>	<i>Cumulative %</i>	<i>Total</i>	<i>% of Variance</i>	<i>Cumulative %</i>
1	9.088	30.292	30.292	8.393	27.978	27.978
2	2.571	8.571	38.864			
3	1.908	6.360	45.224			
4	1.309	4.362	49.586			
5	1.259	4.197	53.783			
6	1.168	3.894	57.678			
7	0.970	3.233	60.910			
8	0.906	3.020	63.930			
9	0.850	2.834	66.764			
10	0.817	2.725	69.489			
11	0.771	2.569	72.058			
12	0.757	2.523	74.581			
13	0.658	2.194	76.775			
14	0.638	2.127	78.902			
15	0.591	1.970	80.872			
16	0.556	1.854	82.726			
17	0.525	1.749	84.475			
18	0.490	1.632	86.107			
19	0.468	1.560	87.667			
20	0.447	1.489	89.155			
21	0.411	1.371	90.527			

22	0.403	1.342	91.869
23	0.386	1.286	93.154
24	0.351	1.168	94.323
25	0.329	1.097	95.420
26	0.318	1.059	96.478
27	0.304	1.013	97.492
28	0.285	0.949	98.441
29	0.259	0.864	99.304
30	0.209	0.696	100.000

Extraction Method: Principal Axis Factoring.

5.3.3 Demographics Analysis

Frequency and percentage were calculated for demographic questions. Of the 438 responses included for analysis, 38.8% identified as female, 58.2% identified as male, and 3% did not respond to this question. For IOT level questions, 42% were the key contact person for their home organisation, and 53.2% were IOT members (4.8% did not respond); about half of the respondents (46.3%) had 2 to 3 years of experience, and 23.5% had more than 3 years of experience in the IOT; the frequency of communication in the IOT ranged from hourly (12.1%), daily (25.6%), weekly (8.7%), monthly (39.3%) to quarterly or longer (12.8%).

The respondents were also asked for general information about their home organisation. Given the logistics outsourcing project they selected as the basic scenario for the survey, 324 (74%) were from the LSP side, while 114 (26%) were from the LSC side. Most respondents reported that they had a collaborative relationship with the selected partner for 3 to 5 years (66.9%). As for the number of employees in the organisation, most responses were 501–1,000 (36.8%), then 101–250 (23.1%), less than 100 (20.8%), and more than 1,000 (13%), and the least was 251–500 (5.7%). Finally, the top two types of their home organisation were state-owned (45.9%), private (25.1%) and-foreign owned (16%). Only

11.6% selected “Joint venture”, and 1.4% did not respond to this question. Refer to Table 5.7 for a complete review of the demographics at various levels.

Table 5.7

Demographic variable descriptives (n=438)

Category	Variable	Option	Frequency	Percentage
Individual level	Gender	Female	170	38.8
		Male	255	58.2
		n/a	13	3
IOT level	Role in the IOT	Key contact person	184	42
		Team member	233	53.2
		n/a	21	4.8
	Work experience in the IOT	Less than 1 year	61	13.9
		1 to 2 years	66	15.1
		2 to 3 years	203	46.3
		More than 3 years	103	23.5
		n/a	5	1.1
	Frequency of communication in the IOT	Hourly	53	12.1
		Daily	112	25.6
		Weekly	38	8.7
		Monthly	172	39.3
		Quarterly or longer	56	12.8
		n/a	7	1.6
	Company role	LSP	324	74

		LSC	114	26
		1 to 3 years	27	6.2
		3 to 5 years	293	66.9
	Length of services	Less than 1 year	41	9.4
		More than 5 years	62	14.2
		n/a	15	3.4
Organisation level	Number of employees in China	Less than 100	91	20.8
		251 to 500	25	5.7
		501 to 1000	161	36.8
		101 to 250	101	23.1
		More than 1,000	57	13
		n/a	3	0.7
	Type of enterprise	Foreign owned	70	16
		Joint venture	51	11.6
		Private	110	25.1
		State owned	201	45.9
		n/a	6	1.4

5.3.4 Descriptive Statistics and correlations of model variables

Table 5.8 shows the descriptive statistics containing the mean values, standard deviations, minimum values and maximum values. Table 5.9 contains the correlations between the variables. As expected, the inter-correlations among

the variables are relatively low (all coefficients are lower than the threshold value of 0.70), indicating there is no high-correlation issue.

Table 5.8

Descriptive statistics of the study variables

	n	Mean	SD	Minimum	Maximum
IOTI	438	5.32	0.89	2.50	7.00
TMM	438	5.31	0.88	2.25	7.00
TTA	438	5.32	0.86	2.25	7.00
TTC	438	5.34	0.85	2.50	7.00
TCMN	438	5.29	0.88	1.75	7.00
TPM	438	5.1324	0.99	1.25	7.00
HOI	438	5.18	0.91	1.25	7.00
LOP	438	5.20	0.87	1.50	7.00
CV_RD	438	2.89	0.76	1.00	4.00
CV_FS	438	2.98	1.40	1.00	5.00
CV_OT	438	2.16	1.25	1.00	4.00
CV_TT	438	2.80	0.95	1.00	4.00

Notes:

CV_RD = Relationship Duration (Length of Services);

CV_OT = Ownership Type (Type of Enterprise);

CV_TT = Team Tenure (Years of Work Experience);

CV_FS = Firm size (Number of Employees in China).

Table 5.9*Correlations between the study variables*

	IOTI	TMM	TTA	TTC	TCMN	TPM	HOI	LOP	CV_RD	CV_FS	CV_OT	CV_TT
IOTI	1											
TMM	.418**	1										
TTA	.352**	.471**	1									
TTC	.297**	.425**	.510**	1								
TCMN	.280**	.463**	.319**	.431**	1							
TPM	.305**	.482**	.379**	.504**	.580**	1						
HOI	.272**	.350**	.399**	.470**	.448**	.502**	1					
LOP	.298**	.430**	.388**	.483**	.486**	.544**	.552**	1				
CV_RD	-0.068	-.125*	-.122*	-0.042	-0.045	-0.076	-0.038	-0.073	1			
CV_FS	-0.068	-0.016	-0.037	0.031	-0.026	-0.039	0.037	-0.051	.210**	1		
CV_OT	.096*	-0.02	-0.012	0.004	-0.02	-0.028	0.044	-0.049	0.012	-.129**	1	
CV_TT	-0.003	0.07	-0.024	0.078	-0.029	0.05	0.048	0.04	.289**	.425**	0.03	1

Notes:

-
- 1) *Pearson's Y was used to examine the correlations between two continuous variables;
**: Correlation is significant at the 0.01 level (2-tailed) *: Correlation is significant at the 0.05 level (2-tailed).*
 - 2) *Eta squared was used to examine the association between categorical and continuous variables;*
 - 3) *Cramer's V was used to examine the association between two categorical variables.*
-

5.3.5 Statistical assumption assessment

To fulfil the research objectives listed in Section 1.5, this study conducted simple or multiple regression models to test the hypotheses. To avoid Type I or Type II error, the following test of assumptions was undertaken: independence of the residuals, linearity of the relationships between variables, homoscedasticity of the residuals, normality of distributions for variables, and the absence of multicollinearity (see Table 4.22).

Independence

The assumption of independence means that the errors associated with one observation are not correlated with the errors of any other observation. The Durbin-Watson statistic was used to test for the independence of autocorrelation. The findings (Table 5.10) illustrate no violation of this assumption under all scenarios (within the range of 1.5 - 2.5).

Table 5.10

Results of Durbin-Watson test

Scenario	Predictors	Dependent variable	Durbin-Watson
1	IOTI, HOI	TPM	1.982
2	IOTI, HOI, TMM	TPM	1.987
3	IOTI, HOI, TTA	TPM	1.965
4	IOTI, HOI, TTC	TPM	1.976
5	IOTI, HOI, TCMN	TPM	1.977
6	TPM	LOP	2.163

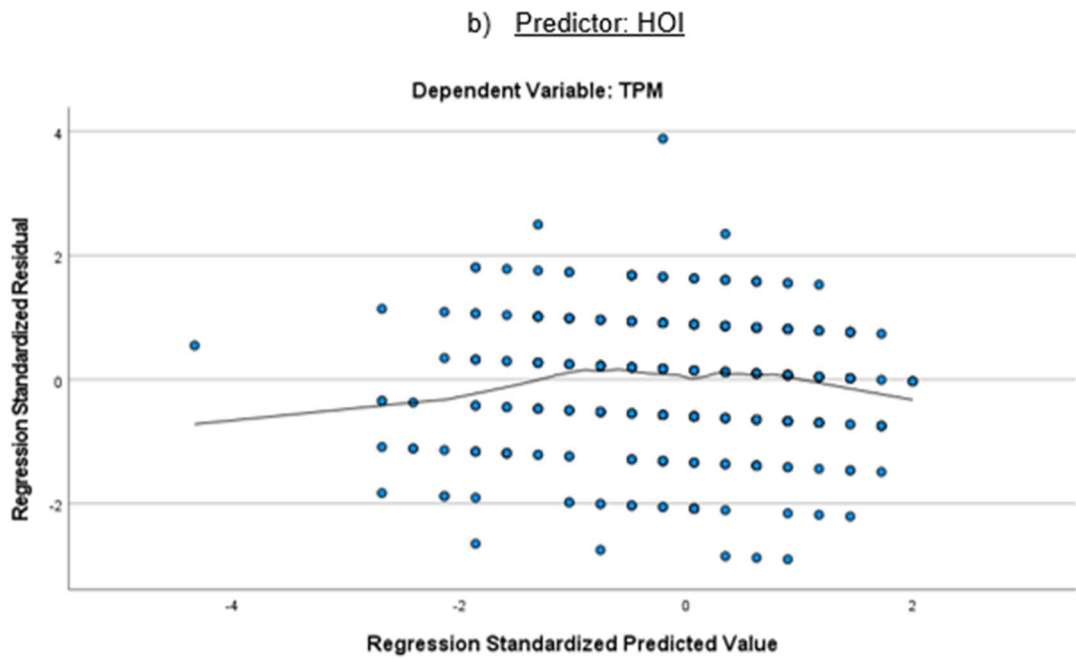
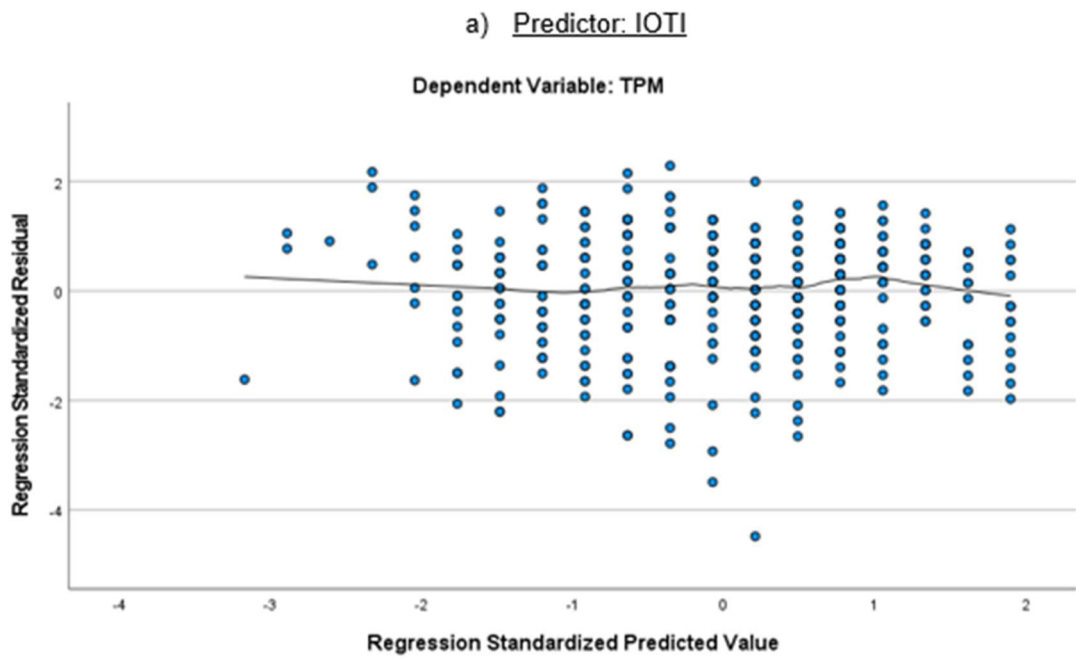
Linearity

Linearity refers to whether the predictor variables in the regression have a straight-line relationship with the outcome variable. It was assessed based on a visual inspection of the scatterplots of the standardised predicted value with the standardized residual (Hair, Black, et al., 2019).

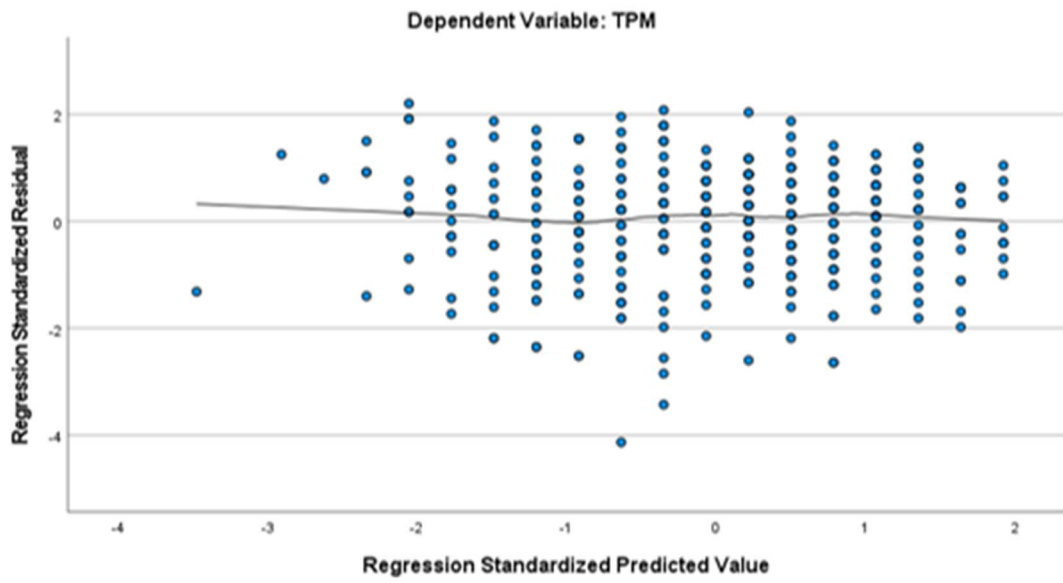
Taking the pair of IOTI (predictor) and TPM (outcome) as an example from the Loess Curve (Figure 5.4.a), it appears that, though a few of the circles deviated from the zero line, most residuals were randomly scattered around zero. This indicated that the relationship of predicted value to the residuals is roughly linear around zero. Therefore, it can be concluded that there is a linear relationship between IOTI and TPM. In the same logic, the linearity exists in all other pairs of predictor and outcome variables (Figure 5.4.b-g).

Figure 5.4

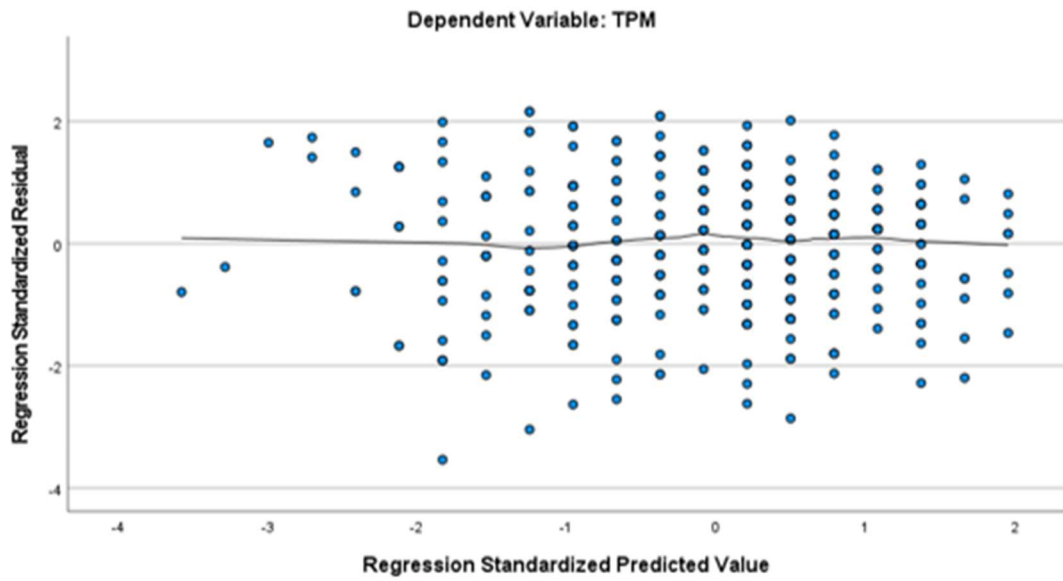
Results of linearity and homoscedasticity tests



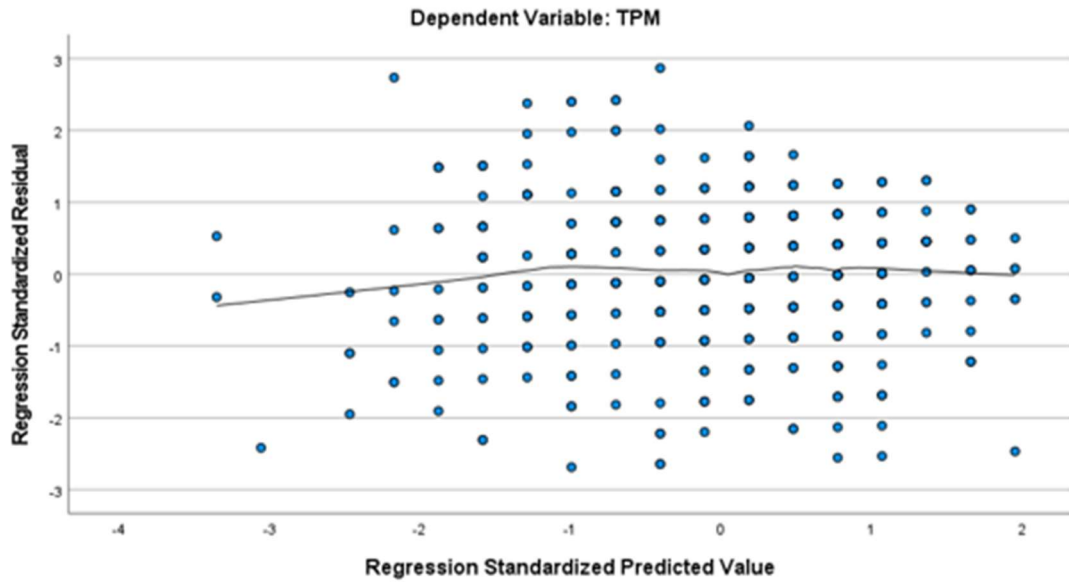
c) Predictor: TMM



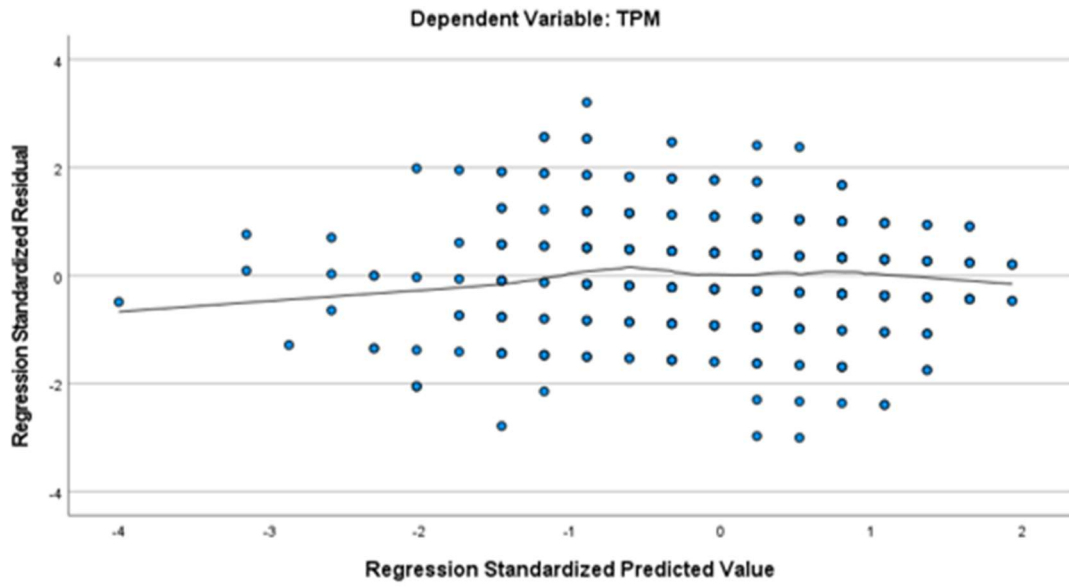
d) Predictor: TTA

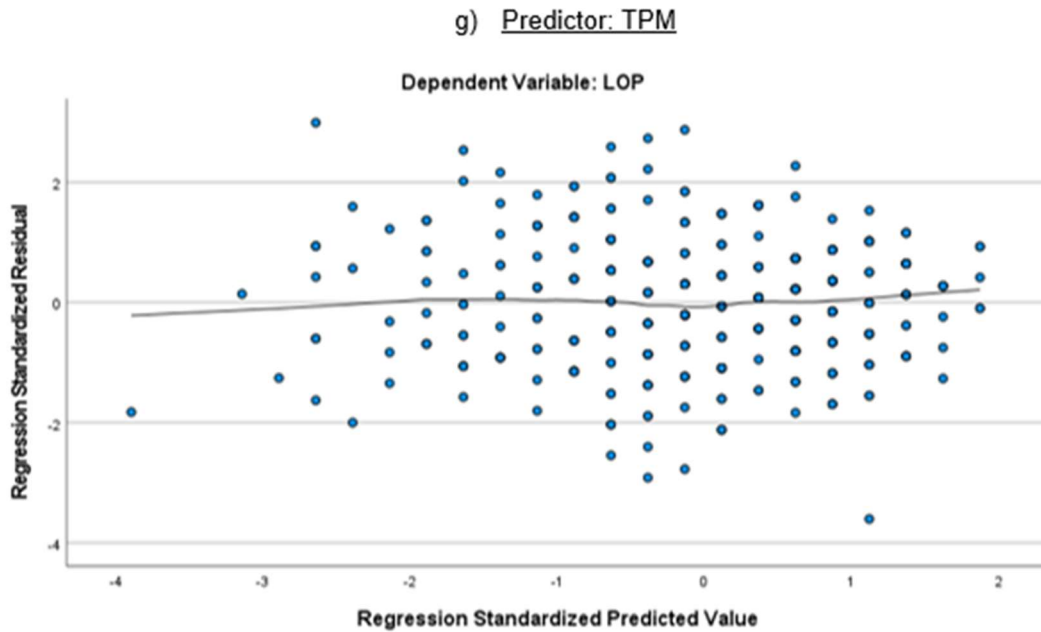


e) Predictor: TTC



f) Predictor: TCMN





Homoscedasticity

Homoscedasticity, also known as homogeneity, means that the variance of the residuals is homogeneous across levels of the predicted values. Similar to the approach to testing the linearity, the graphic method was used to check if the assumption of homoscedasticity was violated in the regression model (Hair, Black, et al., 2019). The data is deemed homogeneous if the points are ideally distributed equally above and below zero on the X axis and to the left and right of zero on the Y axis.

As shown in Figure 5.4, the scatterplot suggested that the residuals were centred around zero. Due to some outliers (see Section 5.3.1), a few residuals were located farther from the centre point. Nevertheless, the variance of the residuals was roughly scattered randomly and uniformly. Therefore, for the model with IOTI as the predictor and TPM as the outcome variable, there is no issue related to the violation of homoscedasticity. As for all other predictors in the conceptual model, the visual inspections implied that the assumption of homoscedasticity was satisfied (Figure 5.4).

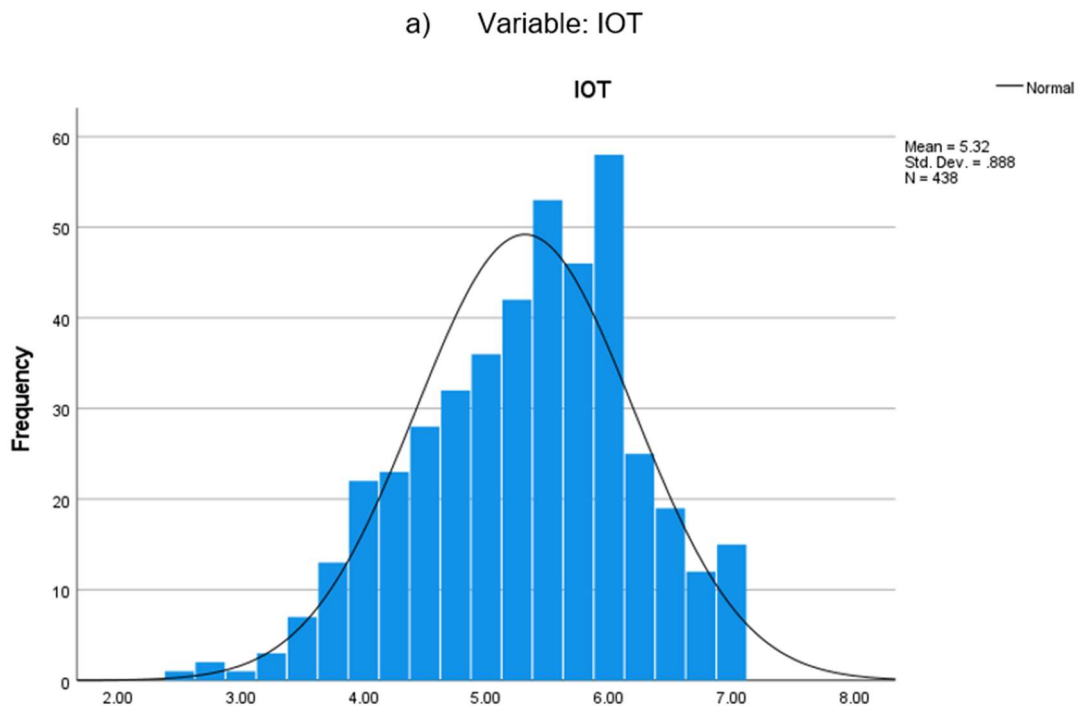
Normality

For valid inferences from linear regression analysis, it is required that the residuals of the regression should be normally distributed rather than the outcome be normally distributed. In SPSS, normality was tested in two ways: 1) histograms and 2) P-P plots.

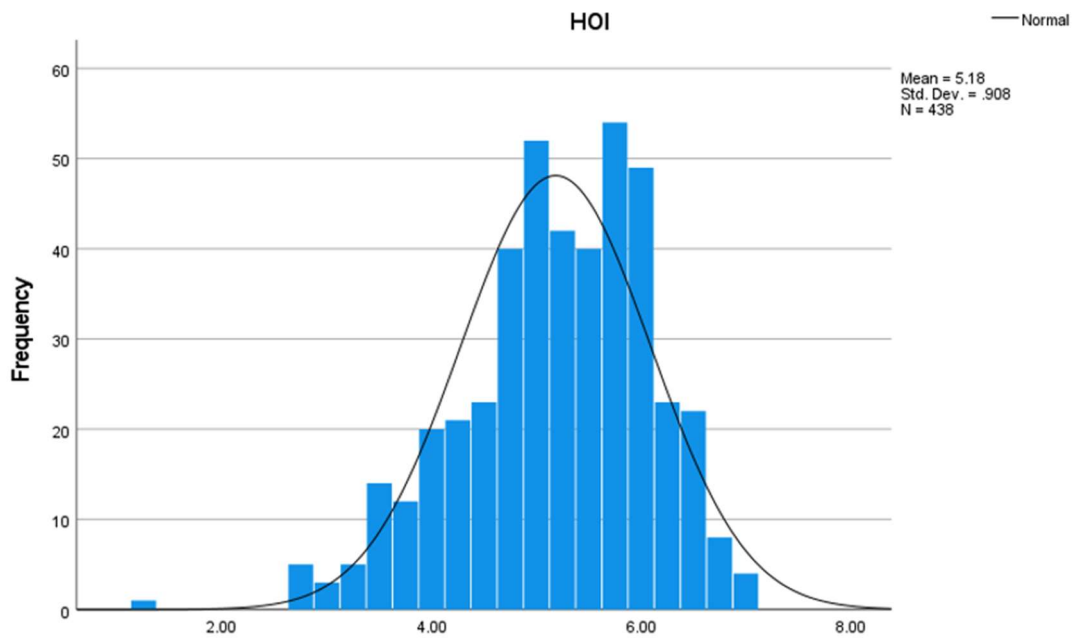
First, histograms were visually checked to see if the data was normally distributed. From Figure 5.5, it can be seen that the shapes of all distributions were more or less skewed. The main reason is that the data gathered for measurement instruments are discrete. For the Likert scales used in the present study, most respondents tended to provide feedback with more upper ends of the scale.

Figure 5.5

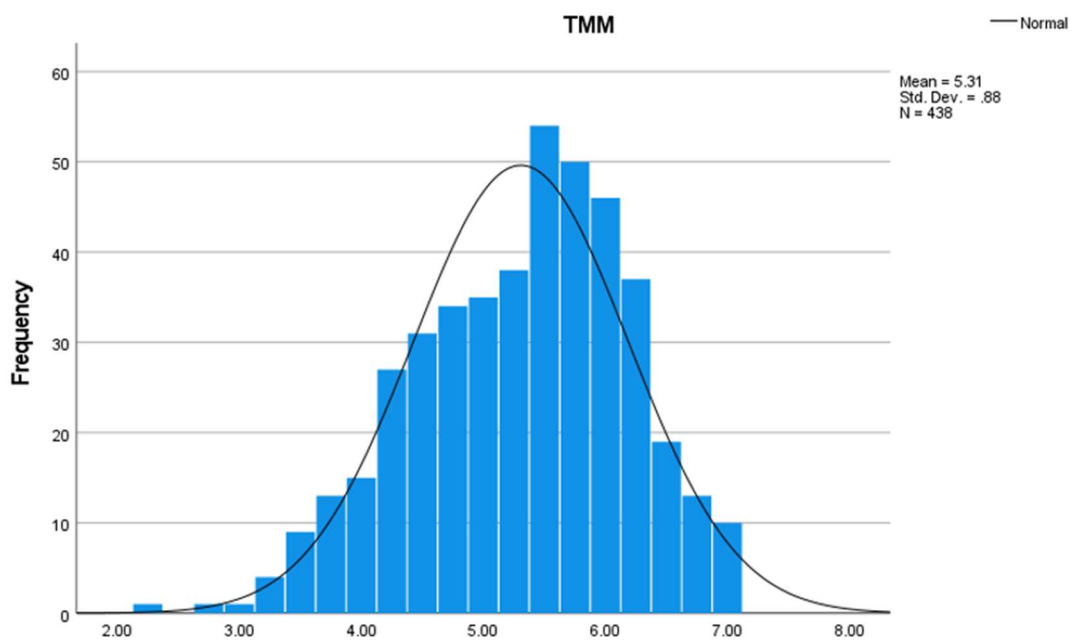
Histograms of all variables



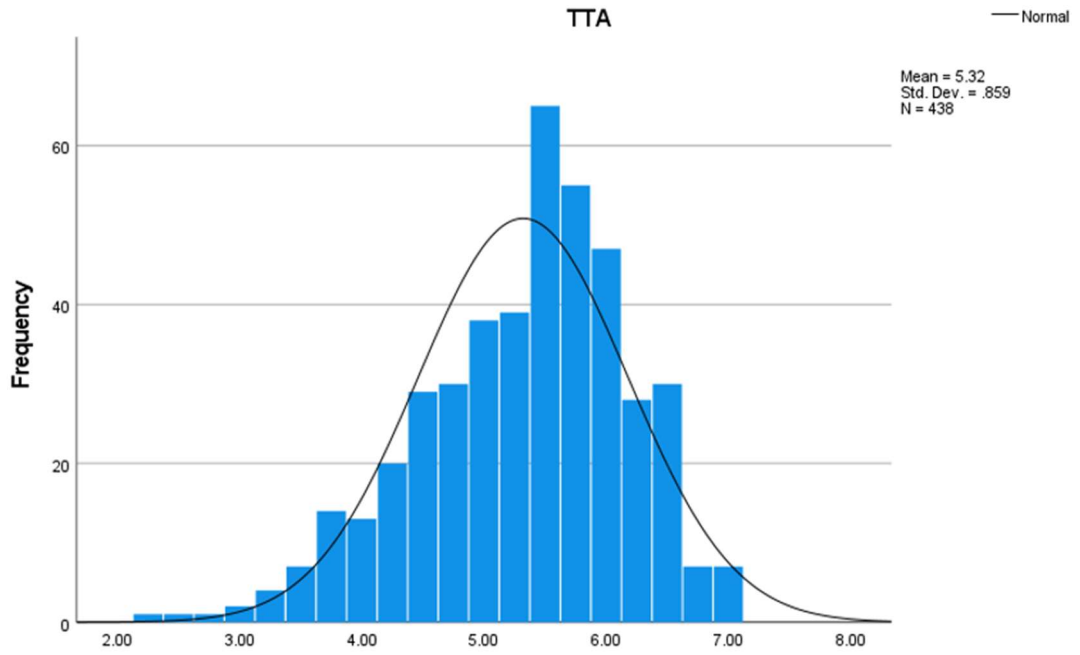
b) Variable: HOI



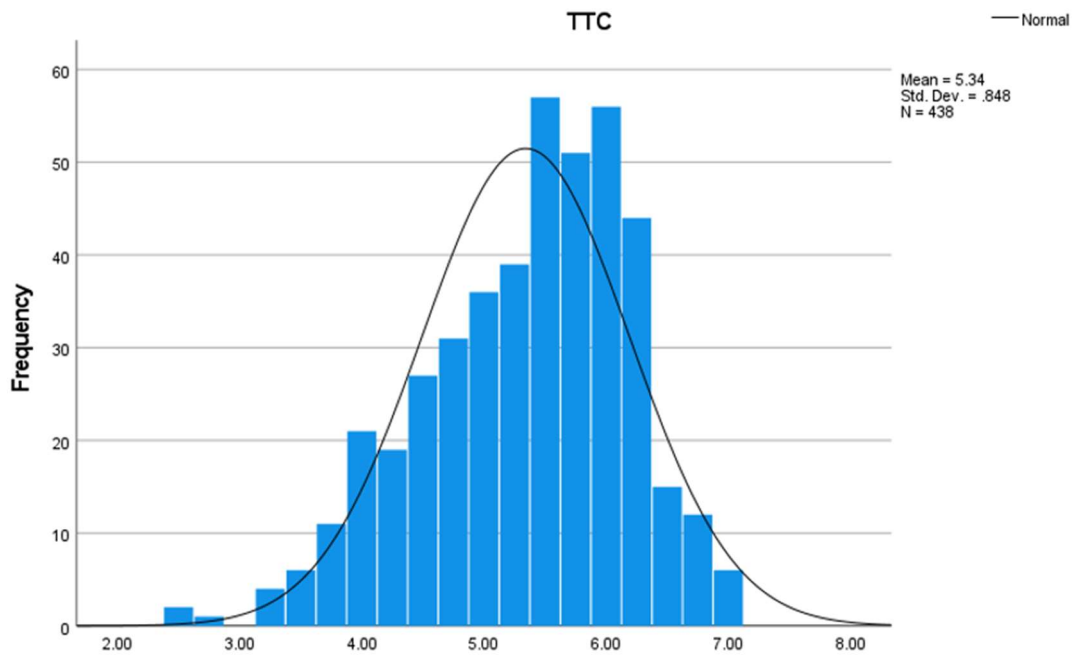
c) Variable: TMM



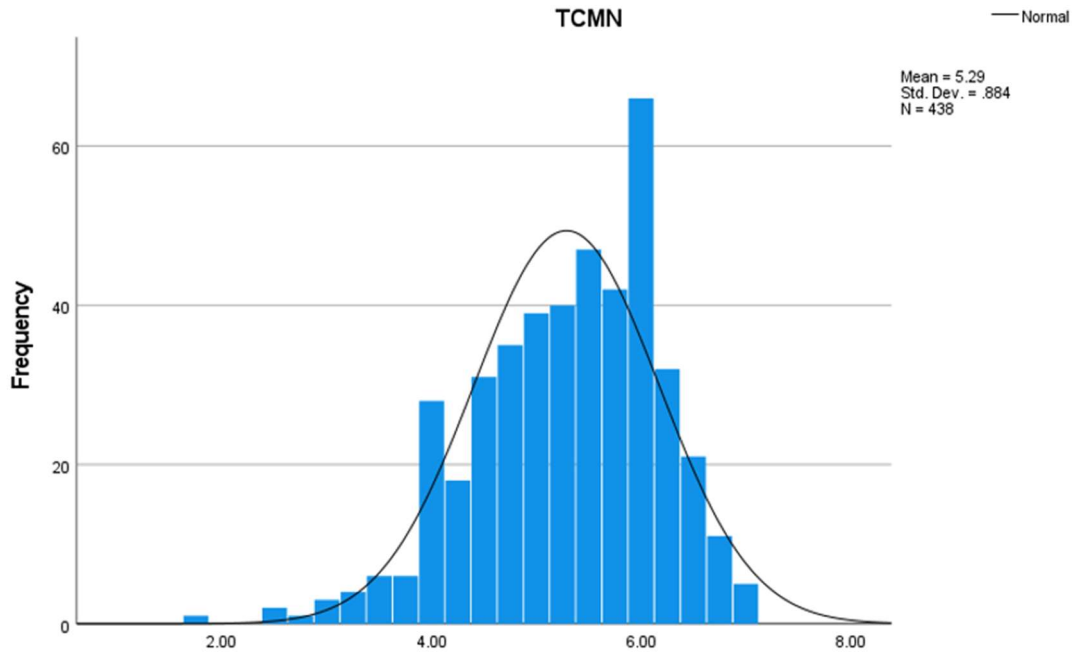
d) Variable: TTA



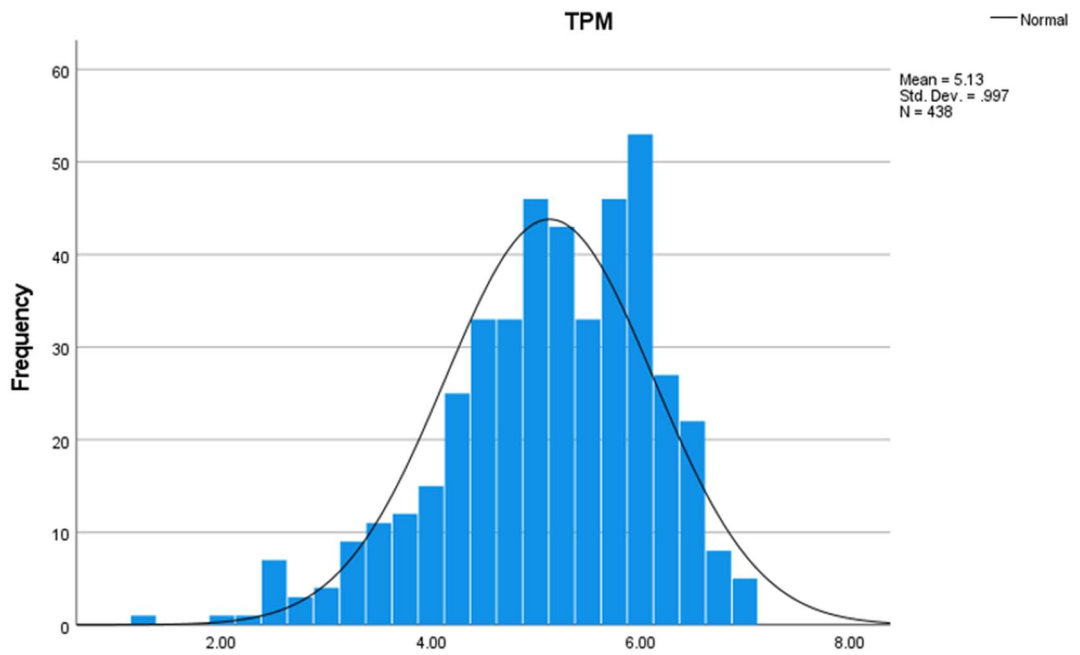
e) Variable: TTC

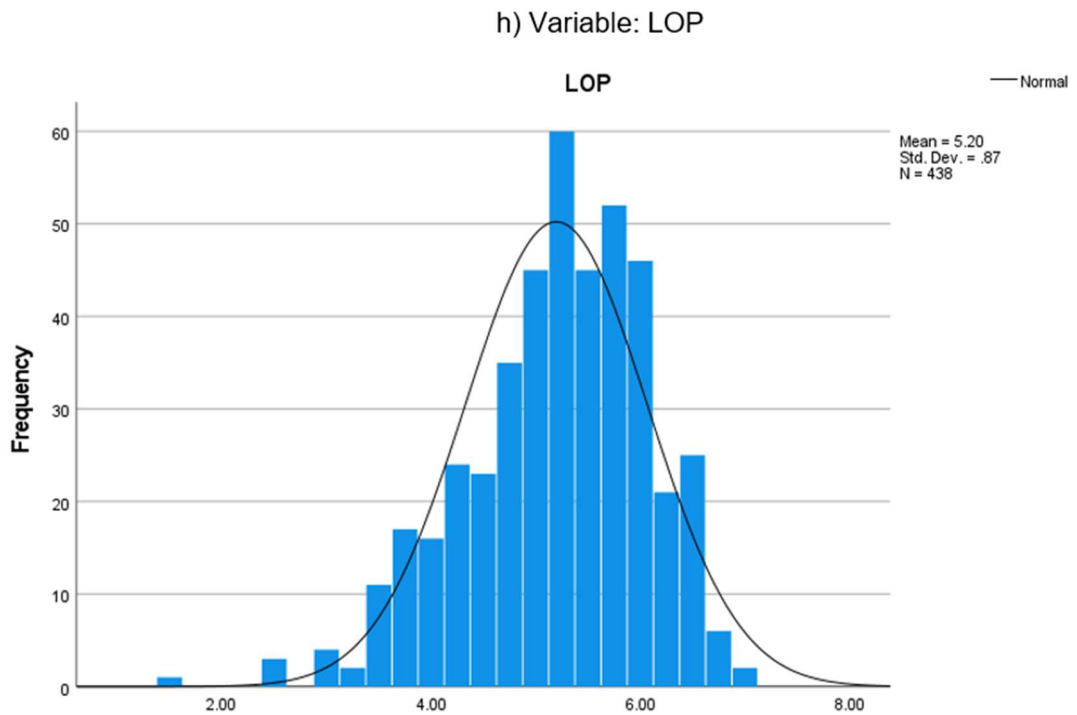


f) Variable: TCMN



g) Variable: TPM



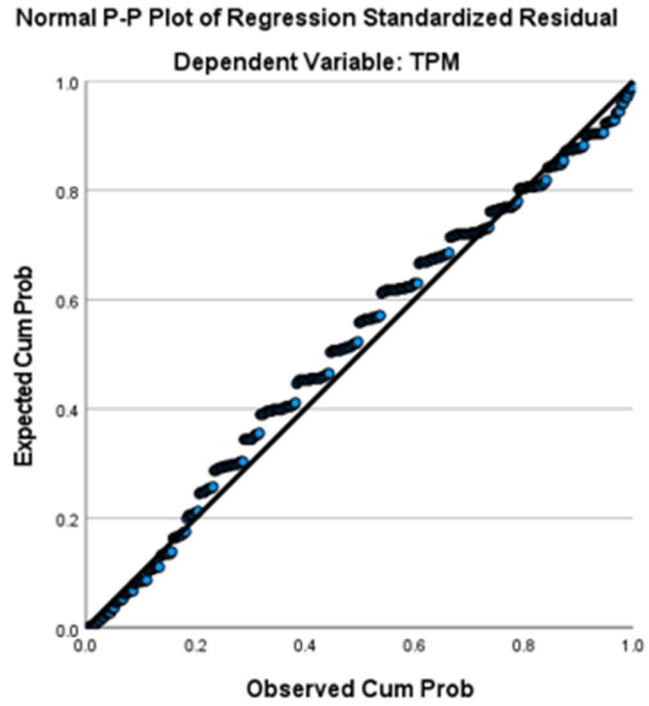


In addition, normality was evaluated with a visual inspection of the P-P plots. If normally distributed, the residuals will conform to the diagonal line. As indicated by the plot distribution in Figure 5.6, the circles in some charts roughly followed the normality line (i.e., sub-figures c, d, and g). At the same time, there was a small amount of deviation in other sub-figures (not perfectly aligned along the diagonal line). Reasonably, the data can be assumed non-normally distributed at a low level rather than drastic deviations.

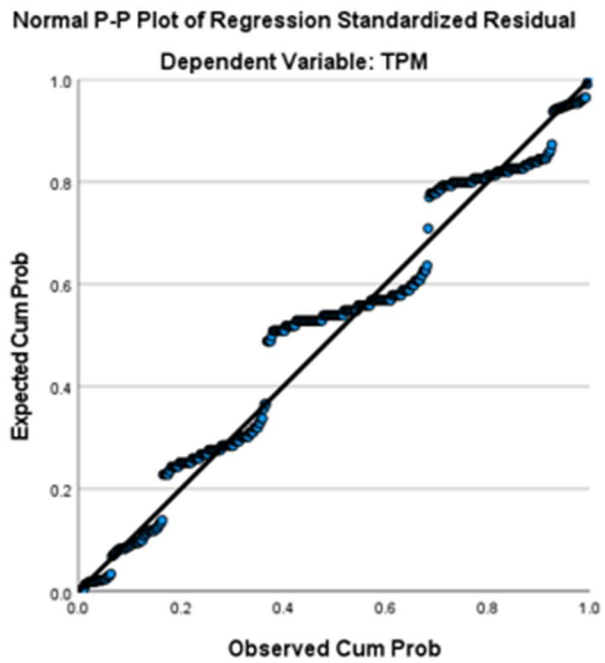
Figure 5.6

P-P plots for normality test

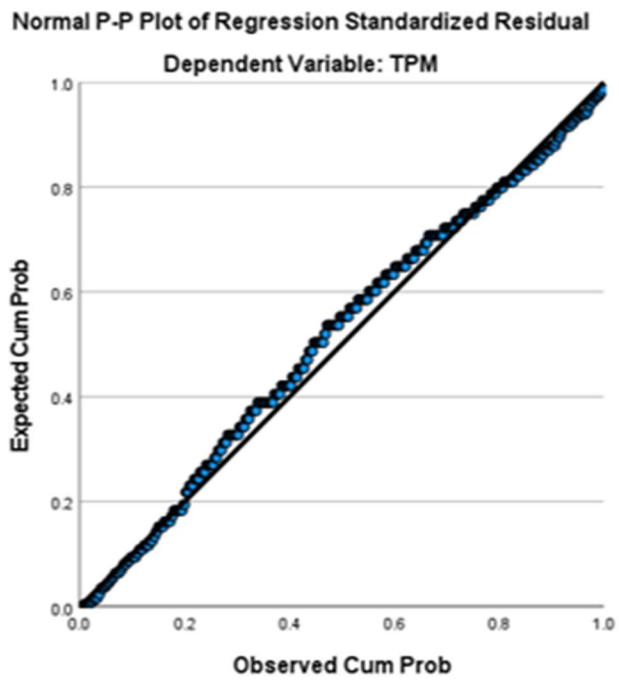
a) Predictor: IOTI



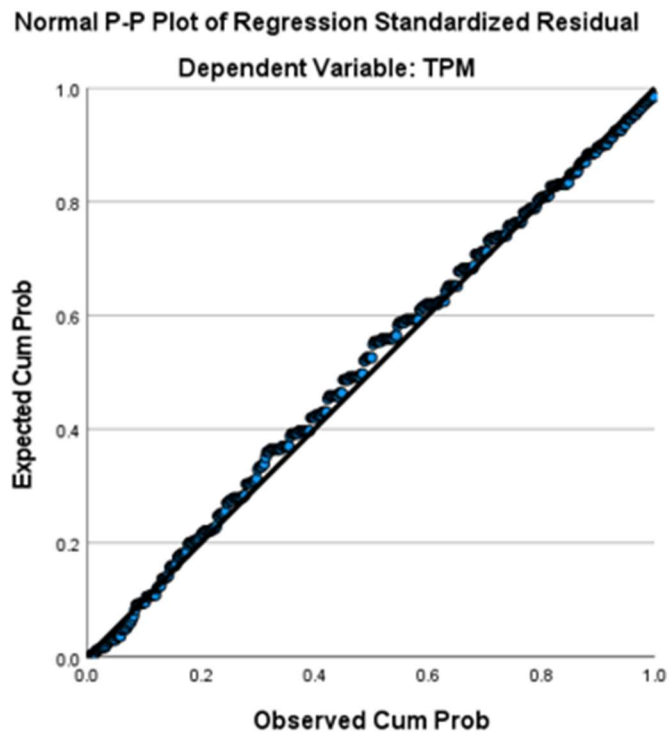
b) Predictor: HOI



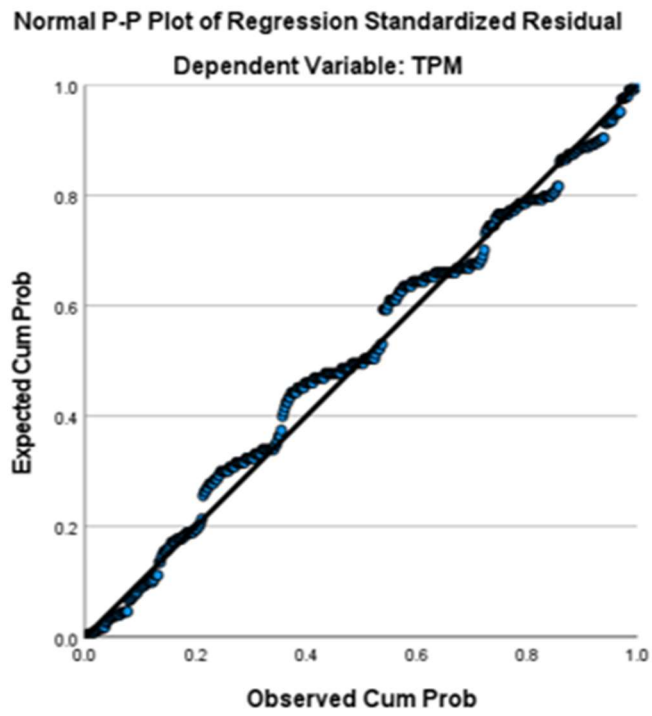
c) Predictor: TMM



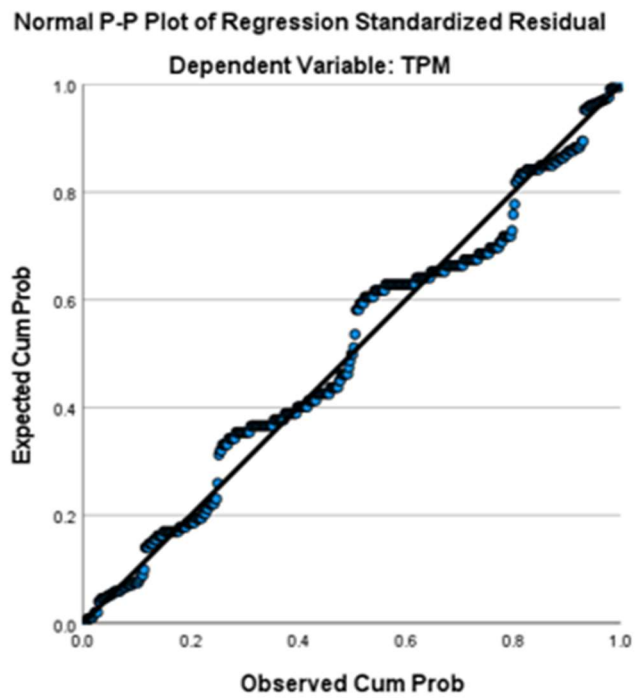
d) Predictor: TTA



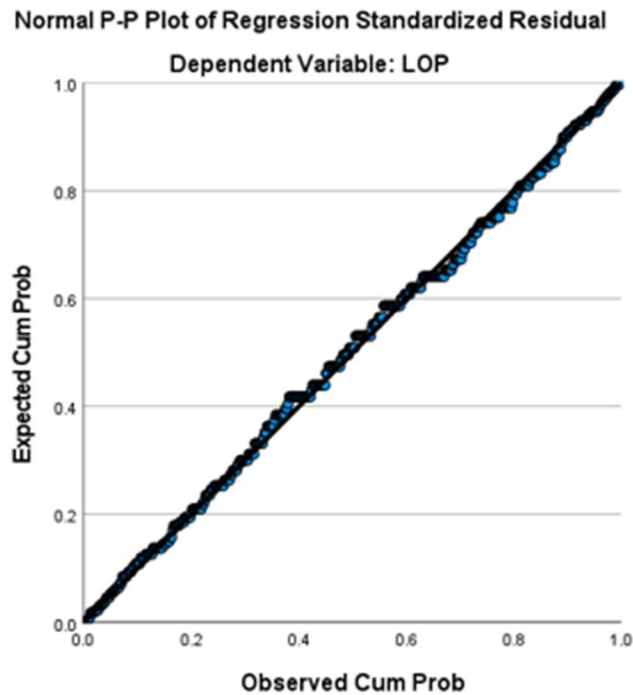
e) Predictor: TTC



f) Predictor: TCMN



g) Predictor: TPM



Combining the results of both tests above, it can be seen that the data was not normally distributed. The plot in Figure 5.6.g was an exception: normality likely existed with the predictor TPM and the dependent variable LOP. However, strict normality is rarely met in a survey using Likert scales (Hayes, 2022). Tabachnick and Fidell (2013) further pointed out that, with relatively large sample sizes (e.g., 200 cases or more), skewness does not impose any substantive effects on the analyses. Besides that, as mentioned in Section 4.6.4, the mild outliers were kept in the dataset for exploring potential knowledge of the study. Therefore, the study decided to keep the data with non-normal distribution and looked for the statistical tools that enable the analysis of such data.

Multicollinearity

Multicollinearity was assessed by checking variance inflation factor (VIF) values under each scenario of hypothesised relationships between IOTI and TPM. In the absence of multicollinearity, the predictor variables should not be strongly correlated with each other (Clement & Bradley-Garcia, 2022).

To be more detailed, the combined information from Table 5.11 indicated that all VIF values are below the threshold value of 10.0. Therefore, the assumption was met that the predictors were not multicollinear in each model in the study. Note that there is no need to check the multicollinearity with the pair of TPM and LOP because there is only one independent variable (predictor) in the model (Clement & Bradley-Garcia, 2022).

Table 5.11

Multicollinearity check (dependent variable: TPM; moderator: HOI)

a) IOT to TPM			b) IOT to TMM to TPM			c) IOT to TTA to TPM		
	Collinearity			Collinearity			Collinearity	
	Tolerance	VIF		Tolerance	VIF		Tolerance	VIF
IOT	0.800	1.251	IOT	0.105	9.483	IOT	0.305	3.281
HOI	0.800	1.251	HOI	0.763	1.310	HOI	0.688	1.453
			TMM	0.101	9.920	TTA	0.263	3.808

d) IOT to TTC to TPM			e) IOT to TCMN to TPM		
	Collinearity			Collinearity	
	Tolerance	VIF		Tolerance	VIF
IOT	0.544	1.839	IOT	0.757	1.321
HOI	0.485	2.064	HOI	0.263	3.808
TTC	0.331	3.020	TCMN	0.250	4.008

Based on the assessment of all the assumptions above, it was evident that the survey data did not have a normal distribution. This conclusion influenced the final decision on the tools for measurement model evaluation and hypotheses testing. Note that regression is robust against mild violations of normality so there was no transformation of data before proceeding the further data analysis (Hayes, 2022).

5.3.6 Measurement model evaluation

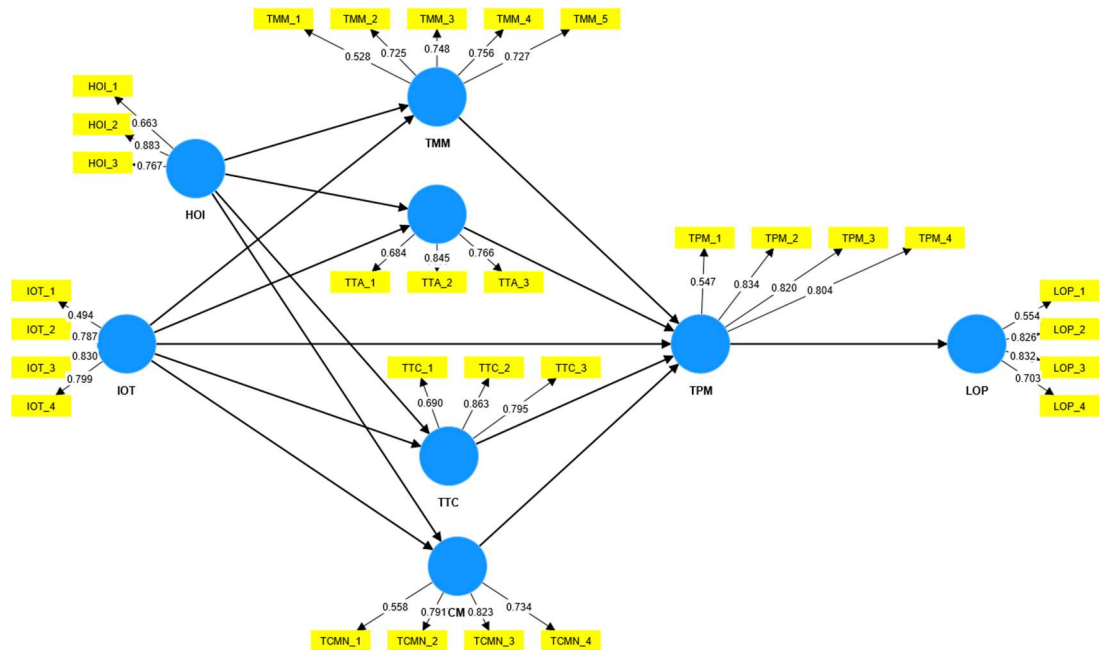
Scenario 1 (Initial)

As mentioned in Section 4.6.4, before testing the hypotheses, it was necessary to justify the construct measures' reliability and validity in the conceptual model (Figure 3.3). Therefore, an initial PLS-SEM path model was constructed in SmartPLS (Figure 5.7). Then, Confirmatory composite analysis (CCA) was conducted to evaluate the quality of the measurement model in aspects of

indicator reliability, internal consistency, convergent validity and discriminant validity.

Figure 5.7

Initial path model (Scenario 1)



First, the outer loadings were calculated to assess the reliability of all items. As a rule, the indicator reliabilities should have a loading of 0.7 or higher, indicating that 50% of the item variance is shared with the construct. As shown in Table 5.12, all loadings were above 0.40 with the highest loading of 0.883 and the lowest of 0.494. Besides, the outer loadings of some items were below the threshold value of 0.70. Note that those items would be deleted only if the removal potentially increases composite reliability and AVE above the suggested threshold value (Hair et al., 2017).

Table 5.12

The outer loadings (Scenario 1)

	HOI	IOT	LOP	TCMN	TMM	TPM	TTA	TTC
HOI_1	0.663							
HOI_2	0.883							

HOI_3	0.767	
IOTI_1	0.494	
IOT_2	0.787	
IOT_3	0.830	
IOT_4	0.799	
LOP_1	0.554	
LOP_2	0.826	
LOP_3	0.832	
LOP_4	0.703	
TCMN_1	0.558	
TCMN_2	0.791	
TCMN_3	0.823	
TCMN_4	0.734	
TMM_1	0.528	
TMM_2	0.725	
TMM_3	0.748	
TMM_4	0.756	
TMM_5	0.727	
TPM_1	0.547	
TPM_2	0.834	
TPM_3	0.820	
TPM_4	0.804	
TTA_1	0.684	
TTA_2	0.845	
TTA_3	0.766	

TTC_1	0.690
TTC_2	0.863
TTC_3	0.795

Following this, the CR value was reviewed to evaluate internal consistency reliability, and the AVE values were checked for convergent validity. All CR values were above 0.60, while the AVE value of TMM (0.493) was below the threshold value of 0.50 (Table 5.13). Therefore, the item TMM_1, the lowest loading in the construct TMM, was tentatively removed from the initial model, which was assessed again. If needed, the item with the lowest loading in this revised model would be deleted, and the same evaluation process was repeated until acceptable CR and AVE values were achieved (Hair et al., 2017).

Table 5.13

Composite reliability (CR) and Average variance extracted (AVE) (Scenario 1)

	Composite reliability (rho_a)	Average variance extracted (AVE)
HOI	0.679	0.603
IOT	0.754	0.548
LOP	0.747	0.544
TCMN	0.722	0.538
TMM	0.745	0.493
TPM	0.774	0.579
TTA	0.675	0.589
TTC	0.698	0.618

Finally, the HTMT (Heterotrait-Monotrait ratio of correlation) values for all pairs of constructs were used to evaluate whether the construct measures discriminate well. Table 5.14 illustrated that the HTMT value of “TCMN–TPM” was greater than 0.9, suggesting a necessity for further checks afterwards.

Table 5.14

Heterotrait-Monotrait ratio of correlation (HTMT) (Scenario 1)

	HOI	IOT	LOP	TCMN	TMM	TPM	TTA	TTC
HOI	1							
IOT	0.446	1						
LOP	0.865	0.463	1					
TCMN	0.747	0.491	0.807	1				
TMM	0.599	0.684	0.651	0.731	1			
TPM	0.746	0.448	0.782	0.911	0.739	1		
TTA	0.655	0.564	0.643	0.592	0.753	0.577	1	
TTC	0.733	0.5	0.734	0.752	0.692	0.717	0.797	1

Scenario 2 (TMM_1 removed)

The initial model was revised with the removal of the item TMM_1 (Figure 5.8) and the outer loadings changed accordingly (Table 5.15).

Figure 5.8

Revised path model (Scenario 2)

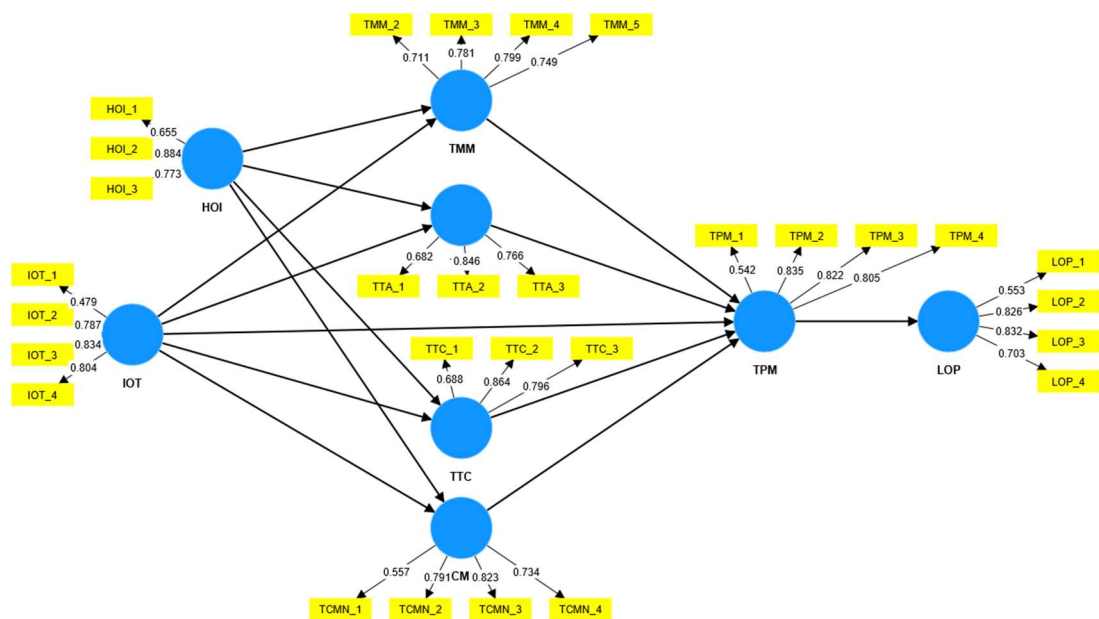


Table 5.15*The outer loadings (Scenario 2)*

	HOI	IOT	LOP	TCMN	TMM	TPM	TTA	TTC
HOI_1	0.655							
HOI_2	0.884							
HOI_3	0.773							
IOT_1		0.479						
IOT_2		0.787						
IOT_3		0.834						
IOT_4		0.804						
LOP_1			0.553					
LOP_2			0.826					
LOP_3			0.832					
LOP_4			0.703					
TCMN_1				0.557				
TCMN_2				0.791				
TCMN_3				0.823				
TCMN_4				0.734				
TMM_2					0.711			
TMM_3					0.781			
TMM_4					0.799			
TMM_5					0.749			
TPM_1						0.542		
TPM_2						0.835		
TPM_3						0.822		
TPM_4						0.805		

TTA_1	0.682
TTA_2	0.846
TTA_3	0.766
TTC_1	0.688
TTC_2	0.864
TTC_3	0.796

As seen in Table 5.16, the AVE value of the construct TMM increased to 0.579, which is greater than the threshold value of 0.50. Therefore, AVE values of all constructs under this scenario were accepted. Nevertheless, the HTMT result in Table 5.17 suggested a potential lack of discriminant validity between the constructs TCMN and TPM ($0.911 >$ the threshold value of 0.9). To address this issue, the cross-loadings were further explored (Table 5.18). Compared with all other items under the construct TCMN, the item TCMN_1 had the lowest value and thus was removed for further analysis (Farrell, 2010).

Table 5.16

Composite reliability (CR) and Average variance extracted (AVE) (Scenario 2)

	Composite reliability (rho_a)	Average variance extracted (AVE)
HOI	0.682	0.603
IOT	0.761	0.548
LOP	0.747	0.544
TCMN	0.722	0.538
TMM	0.756	0.579
TPM	0.776	0.579
TTA	0.676	0.589
TTC	0.699	0.618

Table 5.17*Heterotrait-Monotrait ratio of correlation (HTMT) (Scenario 2)*

	HOI	IOT	LOP	TCMN	TMM	TPM	TTA	TTC
HOI	1							
IOT	0.446	1						
LOP	0.865	0.463	1					
TCMN	0.747	0.491	0.807	1				
TMM	0.545	0.616	0.607	0.706	1			
TPM	0.746	0.448	0.782	0.911	0.700	1		
TTA	0.655	0.564	0.643	0.592	0.680	0.577	1	
TTC	0.733	0.500	0.734	0.752	0.621	0.717	0.797	1

Table 5.18*The cross-loadings (Scenario 2)*

	HOI	IOT	LOP	TCMN	TMM	TPM	TTA	TTC
HOI_1	0.655	0.24	0.364	0.334	0.213	0.338	0.339	0.344
HOI_2	0.884	0.242	0.486	0.449	0.34	0.454	0.351	0.421
HOI_3	0.773	0.205	0.514	0.398	0.34	0.425	0.325	0.371
IOT_1	0.206	0.479	0.17	0.166	0.165	0.124	0.21	0.166
IOT_2	0.268	0.787	0.281	0.278	0.353	0.283	0.291	0.29
IOT_3	0.203	0.834	0.237	0.273	0.372	0.281	0.301	0.316
IOT_4	0.209	0.804	0.281	0.291	0.442	0.291	0.314	0.245
LOP_1	0.391	0.184	0.553	0.364	0.21	0.319	0.291	0.36
LOP_2	0.483	0.268	0.826	0.469	0.322	0.503	0.35	0.415
LOP_3	0.485	0.29	0.832	0.454	0.389	0.471	0.338	0.37
LOP_4	0.375	0.224	0.703	0.38	0.381	0.38	0.314	0.356
TCMN_1	0.311	0.238	0.349	0.557	0.25	0.401	0.278	0.364

TCMN_2	0.436	0.252	0.444	0.791	0.411	0.532	0.389	0.433
TCMN_3	0.404	0.271	0.465	0.823	0.442	0.512	0.281	0.404
TCMN_4	0.333	0.26	0.397	0.734	0.397	0.471	0.24	0.326
TMM_2	0.287	0.407	0.297	0.367	0.711	0.41	0.422	0.38
TMM_3	0.289	0.34	0.345	0.394	0.781	0.401	0.306	0.348
TMM_4	0.334	0.343	0.365	0.418	0.799	0.401	0.363	0.301
TMM_5	0.27	0.334	0.348	0.398	0.749	0.403	0.387	0.354
TPM_1	0.282	0.123	0.295	0.396	0.262	0.542	0.273	0.329
TPM_2	0.504	0.359	0.461	0.548	0.485	0.835	0.4	0.413
TPM_3	0.41	0.259	0.478	0.49	0.414	0.822	0.323	0.431
TPM_4	0.382	0.269	0.491	0.552	0.427	0.805	0.239	0.382
TTA_1	0.237	0.274	0.26	0.221	0.274	0.222	0.682	0.359
TTA_2	0.401	0.3	0.356	0.344	0.412	0.356	0.846	0.446
TTA_3	0.34	0.304	0.379	0.357	0.417	0.336	0.766	0.421
TTC_1	0.375	0.258	0.342	0.333	0.226	0.31	0.37	0.688
TTC_2	0.404	0.277	0.411	0.429	0.38	0.427	0.44	0.864
TTC_3	0.377	0.29	0.434	0.459	0.447	0.457	0.446	0.796

Scenario 3 (TCMN_1 removed)

Scenario 3 (TCMN_1 removed) was built to test the revised model (Figure 5.9). The analysing results showed that: 1) all factor loadings were above the minimum level of 0.40, among which most exceeded the threshold value of 0.70; 2) all CR values were within the range of 0.60–0.90; 3) the AVE values of all construct were well above 0.50; and 4) the optimised HTMT ratios of correlation were lower than 0.9 (See Table 5.19, Table 5.20 and Table 5.21). Finally, each item in any construct loaded well onto its construct instead of other constructs in the model (Table 5.22). Therefore, the cross-loading was not a concern in this scenario.

Figure 5.9

Revised path model (Scenario 3)

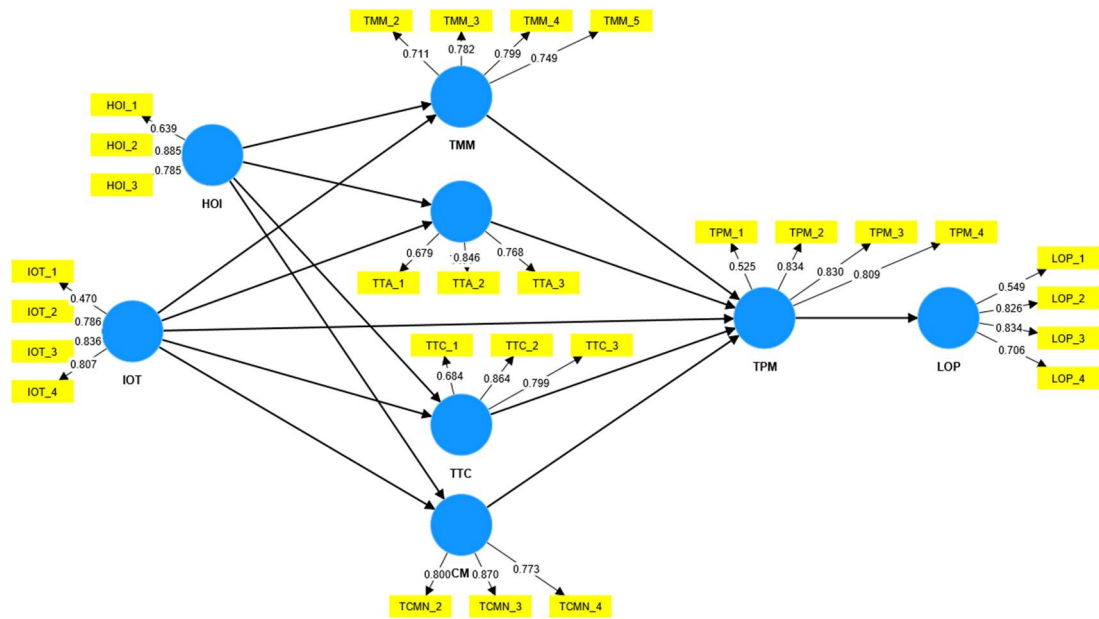


Table 5.19

Composite reliability (CR) and Average variance extracted (AVE) (Scenario 3)

	HOI	IOT	LOP	TCMN	TMM	TPM	TTA	TTC
HOI_1	0.639							
HOI_2	0.885							
HOI_3	0.785							
IOT_1		0.470						
IOT_2		0.786						
IOT_3		0.836						
IOT_4		0.807						
LOP_1			0.549					
LOP_2			0.826					
LOP_3			0.834					
LOP_4			0.706					
TCMN_2				0.800				

TCMN_3	0.870
TCMN_4	0.773
TMM_2	0.711
TMM_3	0.782
TMM_4	0.799
TMM_5	0.749
TPM_1	0.525
TPM_2	0.834
TPM_3	0.830
TPM_4	0.809
TTA_1	0.679
TTA_2	0.846
TTA_3	0.768
TTC_1	0.684
TTC_2	0.864
TTC_3	0.799

Table 5.20

Composite reliability (CR) and Average variance extracted (AVE) (Scenario 3)

	Composite reliability (rho_a)	Average variance extracted (AVE)
HOI	0.688	0.603
IOT	0.764	0.547
LOP	0.749	0.544
TCMN	0.752	0.665
TMM	0.756	0.579
TPM	0.784	0.579

TTA	0.677	0.589
TTC	0.701	0.617

Table 5.21

Heterotrait-Monotrait ratio of correlation (HTMT) (Scenario 3)

	HOI	IOT	LOP	TCMN	TMM	TPM	TTA	TTC
HOI	1							
IOT	0.446	1						
LOP	0.865	0.463	1					
TCMN	0.676	0.424	0.727	1				
TMM	0.545	0.616	0.607	0.68	1			
TPM	0.746	0.448	0.782	0.818	0.700	1		
TTA	0.655	0.564	0.643	0.513	0.680	0.577	1	
TTC	0.733	0.500	0.734	0.654	0.621	0.717	0.797	1

Table 5.22

The cross-loadings (Scenario 3)

	HOI	IOT	LOP	TCMN	TMM	TPM	TTA	TTC
HOI_1	0.639	0.239	0.362	0.256	0.213	0.332	0.339	0.343
HOI_2	0.885	0.241	0.486	0.431	0.34	0.455	0.351	0.421
HOI_3	0.785	0.206	0.515	0.42	0.34	0.429	0.326	0.371
IOT_1	0.202	0.47	0.169	0.114	0.165	0.121	0.209	0.165
IOT_2	0.267	0.786	0.281	0.249	0.353	0.283	0.291	0.289
IOT_3	0.202	0.836	0.237	0.257	0.372	0.283	0.301	0.316
IOT_4	0.209	0.807	0.281	0.288	0.442	0.294	0.315	0.246
LOP_1	0.383	0.183	0.549	0.278	0.21	0.313	0.29	0.359
LOP_2	0.485	0.268	0.826	0.44	0.322	0.504	0.35	0.415

LOP_3	0.487	0.291	0.834	0.453	0.389	0.473	0.339	0.371
LOP_4	0.379	0.224	0.706	0.385	0.38	0.382	0.315	0.357
TCMN_2	0.436	0.252	0.443	0.8	0.411	0.531	0.39	0.433
TCMN_3	0.406	0.271	0.465	0.87	0.442	0.514	0.282	0.405
TCMN_4	0.335	0.26	0.397	0.773	0.397	0.472	0.241	0.327
TMM_2	0.287	0.407	0.297	0.366	0.711	0.41	0.422	0.381
TMM_3	0.291	0.341	0.345	0.389	0.782	0.401	0.307	0.349
TMM_4	0.336	0.344	0.365	0.416	0.799	0.402	0.364	0.302
TMM_5	0.27	0.334	0.349	0.383	0.749	0.403	0.388	0.354
TPM_1	0.276	0.122	0.293	0.285	0.262	0.525	0.273	0.327
TPM_2	0.503	0.36	0.461	0.52	0.485	0.834	0.4	0.413
TPM_3	0.413	0.26	0.479	0.494	0.414	0.83	0.323	0.433
TPM_4	0.385	0.27	0.491	0.548	0.427	0.809	0.239	0.383
TTA_1	0.233	0.272	0.259	0.151	0.274	0.218	0.679	0.357
TTA_2	0.4	0.301	0.356	0.336	0.412	0.356	0.846	0.446
TTA_3	0.342	0.304	0.379	0.347	0.417	0.336	0.768	0.422
TTC_1	0.37	0.255	0.34	0.249	0.226	0.303	0.369	0.684
TTC_2	0.404	0.277	0.411	0.399	0.38	0.427	0.44	0.864
TTC_3	0.379	0.291	0.434	0.46	0.447	0.459	0.447	0.799

As the above analysis shows, all evaluation criteria under the scenario have been successfully met. Therefore, the path model in Figure 5.9 was justified with acceptable reliability and validity for further works on hypotheses testing.

5.3.7 Hypothesis testing analysis

All hypotheses (excepted H_8) were tested using PROCESS macro in SPSS, under the participation of control variables. Table 5.23 shows the findings (Model 4) related to H_{2a-c} , H_{3a-c} , H_{4a-c} and H_{5a-c} (See Appendix 17 for the original

outputs). Table 5.24 shows the findings (Model 7) related to H_{6a-d} , H_{7a-d} and H_1 (See Appendix 18 for the original outputs). Table 5.25 shows the findings related to H_8 . Relationship duration (CV_RD, length of services), Ownership type (CV_OT, type of enterprise), Team tenure (CV_TT, years of work experience) and Firm size (CV_FS, number of employees in China) were controlled for as covariates in Model 4 and 7. The p-values of all control variables in both tests were above 0.05, meaning there were no effects incurred.

IOTI to TPM; Mediator: TMM (H_{2a-c})

The results indicated that IOTI was a significant predictor of TMM, $b = 0.391$, $p < 0.001$, in support of H_{2a} , which, in turn, improved TPM ($b = 0.153$, $p < 0.01$), in support of H_{2b} . Furthermore, the effect size was 0.06 for the indirect relationship between IOTI and TPM through TMM; its CI did not include 0 [0.023, 0.103], which affirmed the presence of mediation (H_{2c}). Approximately 25.3% of the variance in satisfaction was accounted for by the predictors ($R^2 = 0.253$).

IOTI to TPM; Mediator: TTA (H_{3a-c})

The results indicated that IOTI was a significant predictor of TTA, $b = 0.262$, $p < 0.001$, in support of H_{3a} . However, there was no significant effect via TTA, thus H_{3b} was not supported. Furthermore, the effect size for the indirect relationship was 0.004; its CI included 0 [-0.024, 0.036], which refused the presence of mediation (H_{3c}). Approximately 23% of the variance in satisfaction was accounted for by the predictors ($R^2 = 0.23$).

IOTI to TPM; Mediator: TTC (H_{4a-c})

The results indicated that IOTI was a significant predictor of TTC, $b = 0.204$, $p < 0.001$, in support of H_{4a} , which, in turn, improved TPM, in support of H_{4b} . Furthermore, the effect size was 0.037 for the indirect relationship between IOTI and TPM through TTC; its CI did not include 0 [0.012, 0.07], which affirmed the presence of mediation (H_{4c}). Approximately 25.7% of the variance in satisfaction was accounted for by the predictors ($R^2 = 0.257$).

IOTI to TPM; Mediator: TCMN (H_{5a-c})

The results indicated that IOTI was a significant predictor of TCMN, $b = 0.206$, $p < 0.001$, in support of H_{5a} , which, in turn, improved TPM, in support of H_{5b} . Furthermore, the effect size was 0.061 for the indirect relationship between IOTI and TPM through TCMN; its CI did not include 0 [0.026, 0.105], which affirmed the presence of mediation (H_{5c}). Approximately 23.4% of the variance in satisfaction was accounted for by the predictors ($R^2 = 0.234$).

IOTI to TMM to TPM; Moderator: HOI (H_{6a} and H_{7a})

The results indicated that there was no significant effect of the IOTI X HOI interaction term ($B = -0.051$, $p > 0.05$) for predicting TMM. As a result, H_{6a} was not supported.

Meanwhile, Table 5.24 showed that the effect size decreased at higher levels of the moderator: from 0.07 at one SD below the mean, to 0.062 at the mean, to 0.054 at one SD above the mean. However, the index of moderated mediation was -0.008 whereas the CI spanned 0 [-0.027, 0.008]. Thus, H_{7a} was not supported.

IOTI to TTA to TPM; Moderator: HOI (H_{6b} and H_{7b})

The results indicated that there was no significant effect of the IOTI X HOI interaction term ($B = -0.05$, $p > 0.05$) for predicting TTA. As a result, H_{6b} was not supported.

Meanwhile, Table 5.24 showed that the effect size decreased at higher levels of the moderator: from 0.016 at one SD below the mean, to 0.014 at the mean, to 0.011 at one SD above the mean. However, the index of moderated mediation was -0.002 whereas the CI spanned 0 [-0.014, 0.004]. Thus, H_{7b} was not supported.

IOTI to TTC to TPM; Moderator: HOI (H_{6c} and H_{7c})

The results indicated that there was no significant effect of the IOTI X HOI interaction term ($B = -0.003$, $p > 0.05$) for predicting TTC. As a result, H_{6c} was not supported.

Meanwhile, Table 5.24 showed that the effect size decreased at higher levels of the moderator: from 0.048 at one SD below the mean, to 0.047 at the mean, to 0.046 at one SD above the mean. However, the index of moderated mediation was -0.001 whereas the CI spanned 0 [-0.025, 0.027]. Thus, H_{7c} was not supported.

IOTI to TCMN to TPM; Moderator: HOI (H_{6d} and H_{7d})

The results indicated that there was a significant effect of the IOTI X HOI interaction term ($B = -0.1$, $p < 0.05$) for predicting TCMN. That is, the positive relationship between IOTI and TCMN became weaker at increasing levels of HOI (0.302 at one SD below the mean, 0.206 at the mean and 0.111 at one SD above the mean), in support of H_{6d} . The CIs did not include 0 at the two lower levels ([0.161, 0.44] and [0.103, 0.31] respectively), whereas the CI include 0 at the highest level ([-0.03, 0.25]) with $p = 0.12$ (> 0.05). Approximately 24.1% of the variance in satisfaction was accounted for by the predictors ($R^2 = 0.241$).

Meanwhile, Table 5.24 showed that the effect size decreased at higher levels of the moderator: from 0.104 at one SD below the mean, to 0.071 at the mean, to 0.038 at one SD above the mean. However, the index of moderated mediation was -0.034 whereas the CI spanned 0 [-0.073, 0.003]. Thus, H_{7d} was not supported.

IOTI to TPM (H_1)

According to the outcome variable TPM in Table 5.24, the model was significant ($p < 0.0001$). the R^2 value (0.451) illustrated that all predictors (IOTI, TMM, TTA, TTC and TCMN) accounted for 45.1% of the variance of TPM. Nevertheless, there was no direct association between IOTI and TPM ($B = 0.05$, $p = 0.265$) because the p-value was above 0.05. Therefore, H_1 was not supported.

TPM to LOP (H_8)

The regression analysis was used to assess the direct relationship between TPM and LOP. As shown in Table 5.25, the p-value was below 0.001, indicating the statistical significance of the regression model (i.e., H_8 was supported). Furthermore, the effect size was 0.535 and 29.6% of the variation in LOP was explained by TPM.

Based on this analysis, the results of hypothesis testing were combined and illustrated in Table 5.26.

Table 5.23*Results of mediation test (Model 4_PROCESS macro)*

Variables	TMM				TTA				TTC			
	<i>b</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>	<i>b</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>	<i>b</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>
CV_RD	-0.124	0.054	-2.3	0.022	-0.048	0.052	-0.917	0.36	-0.04	0.058	-0.684	0.494
CV_FS	-0.024	0.036	-0.661	0.509	-0.015	0.032	-0.454	0.65	0.000	0.037	-0.007	0.994
CV_OT	-0.059	0.033	-1.756	0.08	-0.035	0.032	-1.095	0.274	-0.024	0.034	-0.719	0.473
CV_TT	0.088	0.056	1.575	0.116	-0.017	0.049	-0.353	0.724	0.067	0.055	1.225	0.221
HOI	0.267	0.051	5.24	0.000	0.312	0.048	6.53	0.000	0.432	0.053	8.223	0.000
IOTI	0.391	0.052	7.576	0.000	0.262	0.047	5.609	0.000	0.204	0.056	3.623	0.000
F-value (df1, df2)	24.261 (6,431)				21.393 (6, 431)				24.892 (6,431)			
R²	0.253				0.23				0.257			

Variables	TCMN			
	<i>b</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>
CV_RD	-0.026	0.058	-0.449	0.654
CV_FS	-0.018	0.038	-0.488	0.626
CV_OT	-0.05	0.038	-1.331	0.184
CV_TT	-0.041	0.054	-0.751	0.453
HOI	0.461	0.055	8.337	0.000
IOTI	0.206	0.057	3.623	0.000
F-value (df1, df2)	21.983 (6, 431)			
R²	0.234			

Variables	TPM			
	<i>b</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>
CV_RD	-0.028	0.049	-0.566	0.572
CV_FS	-0.042	0.029	-1.432	0.153
CV_OT	-0.029	0.028	-1.02	0.308
CV_TT	0.057	0.044	1.295	0.196
HOI	0.21	0.054	3.918	0.000
IOTI	0.037	0.045	0.835	0.404
TMM	0.153	0.048	3.2	0.001
TTA	0.015	0.057	0.273	0.785
TTC	0.182	0.05	3.668	0.000
TCMN	0.295	0.047	6.325	0.000
F-value (df1, df2)	39.994 (10, 427)			
R²	0.479			

Note:

n = 438;

b = Unstandardised regressions coefficients;

SE = Standard error.

Indirect effects (mediation)

via	Effect size	Bootstrap SE	Bootstrap LLCI	Bootstrap ULCI
TMM	0.06	0.02	0.023	0.103
TTA	0.004	0.015	-0.024	0.036
TTC	0.037	0.015	0.012	0.07
TCMN	0.061	0.02	0.026	0.105
TOTAL	0.162	0.034	0.099	0.235

Note:

n = 438;

All data is standardised;

SE = Standard error;

LLCI = Lower limit confidence interval;

ULCI = Upper limit confidence interval.

Table 5.24*Results of moderated mediation test (Model 7_PROCESS macro)*

Variables	TMM				TTA				TTC			
	<i>B</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>	<i>B</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>	<i>B</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>
CV_RD	-0.125	0.054	-2.331	0.02	-0.05	0.05	-0.999	0.318	-0.04	0.05	-0.76	0.448
CV_FS	-0.024	0.034	-0.706	0.481	-0.02	0.03	-0.474	0.636	0	0.03	-0.008	0.993
CV_OT	-0.06	0.035	-1.745	0.082	-0.04	0.03	-1.179	0.239	-0.025	0.03	-0.723	0.47
CV_TT	0.092	0.05	1.824	0.069	-0.01	0.05	-0.308	0.759	0.068	0.05	1.373	0.17
IOTI	0.391	0.048	8.083	0.000	0.263	0.04	5.976	0.000	0.204	0.05	4.291	0
HOI	0.259	0.046	5.592	0.000	0.305	0.04	7.245	0.000	0.431	0.05	9.481	0
IOTI x HOI	-0.051	0.046	-1.12	0.263	-0.05	0.04	-1.149	0.251	-0.003	0.05	-0.076	0.939
F-value (df1, df2)	20.986 (7,430)				18.539 (7,430)				21.287 (7,430)			
R²	0.255				0.232				0.257			

Variables	TCMN			
	<i>B</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>
CV_RD	-0.03	0.06	-0.462	0.645
CV_FS	-0.02	0.04	-0.498	0.619
CV_OT	-0.05	0.04	-1.429	0.154
CV_TT	-0.03	0.05	-0.63	0.529
IOTI	0.206	0.05	3.928	0.000
HOI	0.445	0.05	8.86	0.000
IOTI x HOI	-0.1	0.05	-1.971	0.049
F-value (df1, df2)	19.524 (7,430)			
R²	0.241			

Variables	TPM			
	<i>B</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>
CV_RD	-0.03	0.05	-0.556	0.578
CV_FS	-0.04	0.03	-1.216	0.225
CV_OT	-0.02	0.03	-0.696	0.487
CV_TT	0.063	0.04	1.485	0.138
IOTI	0.05	0.05	1.115	0.265
TMM	0.158	0.05	3.498	0.001
TTA	0.052	0.05	1.052	0.293
TTC	0.231	0.05	5.147	0.000
TCMN	0.345	0.04	8.87	0.000
F-value (df1, df2)	39.071 (7,430)			
R²	0.451			

Note:

n = 438;
B = Standardised regressions coefficients;
SE = Standard Error.

Conditional direct relationship between IOTI and TCMN (moderated by HOI)

	Effect	SE	t-value	p-value	LLCI	ULCI
-0.974	0.302	0.071	4.217	0.000	0.161	0.44
0	0.206	0.053	3.928	0.000	0.103	0.31
0.974	0.111	0.071	1.559	0.12	-0.03	0.25

Note:

n = 438;
 All data is standardised;
SE = Standard error;
LLCI = Lower limit confidence interval;
ULCI = Upper limit confidence interval.

Conditional indirect relationship between IOTI and TPM (moderated by HOI; moderated mediation)

a) mediated by TMM

Effect	BootSE	BootLLCI	BootULCI
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-0.974	0.07	0.025	0.027	0.122
0	0.062	0.017	0.025	0.105
0.974	0.054	0.023	0.021	0.097
Index of moderated mediation	-0.008	0.009	-0.027	0.008

b) mediated by TTA

	Effect	BootSE	BootLLCI	BootULCI
-0.974	0.016	0.018	-0.015	0.054
0	0.014	0.015	-0.013	0.045
0.974	0.011	0.013	-0.011	0.04
Index of moderated mediation	-0.002	0.005	-0.014	0.004

c) mediated by TTC

	Effect	BootSE	BootLLCI	BootULCI
-0.974	0.048	0.019	0.014	0.089

0	0.047	0.017	0.018	0.105
0.974	0.046	0.023	0.007	0.097
Index of moderated mediation	-0.001	0.013	-0.025	0.008

d) mediated by TCMN

	Effect	BootSE	BootLLCI	BootULCI
-0.974	0.104	0.029	0.051	0.165
0	0.071	0.022	0.032	0.118
0.974	0.038	0.028	-0.014	0.097
Index of moderated mediation	-0.034	0.019	-0.073	0.003

Note:

n = 438;

All data is standardised;

BootSE = Boot Standard Error;

Boot LLCI = Boot Lower limit confidence interval;

BootULCI = Boot Upper limit confidence interval.

Table 5.25*Results of simple regression test (TPM to LOP)*

Variables	LOP			
	<i>b</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>
TPM	0.535	0.04	13.542	< 0.001
F-value (df1, df2)	183.393 (1,436)			
R²	0.296			

*Note:**n = 438;**b = Unstandardised regressions coefficients;**SE = Standard error.*

Table 5.26*Results of hypotheses test*

	Hypothesis	Relationship	Result
H₁	IOTI has a positive effect on team effectiveness.	IOTI → TPM	Rejected
H_{2a}	IOTI has a positive effect on team mental model.	IOTI → TMM	Accepted
H_{2b}	Team mental model has a positive effect on team effectiveness.	TMM → TPM	Accepted
H_{2c}	IOTI is positively related to team effectiveness through team mental model.	IOTI → TMM → TPM	Accepted
H_{3a}	IOTI has a positive effect on team trust (affective).	IOTI → TTA	Accepted
H_{3b}	Team trust (affective) has a positive effect on team effectiveness.	TTA → TPM	Rejected
H_{3c}	IOTI is positively related to team effectiveness through team trust (affective).	IOTI → TTA → TPM	Rejected
H_{4a}	IOTI has a positive effect on team trust (cognitive).	IOTI → TTC	Accepted
H_{4b}	Team trust (cognitive) has a positive effect on team effectiveness.	TTC → TPM	Accepted
H_{4c}	IOTI is positively related to team effectiveness through team trust (cognitive).	IOTI → TTC → TPM	Accepted
H_{5a}	IOTI has a positive effect on team communication.	IOTI → TCMN	Accepted

H_{5b}	Team communication has a positive effect on team effectiveness.	TCMN → TPM	Accepted
H_{5c}	IOTI is positively related to team effectiveness through team communication.	IOTI → TCMN → TPM	Accepted
H_{6a}	IOTI has a stronger, more negative relationship with team mental model when HOI is high than when it is low.	IOTI → TMM (HOI)	Rejected
H_{6b}	IOTI has a stronger, more negative relationship with team trust (affective) when HOI is high than when it is low.	IOTI → TTA (HOI)	Rejected
H_{6c}	IOTI has a stronger, more negative relationship with team trust (cognitive) when HOI is high than when it is low.	IOTI → TTC (HOI)	Rejected
H_{6d}	IOTI has a stronger, more negative relationship with team communication when HOI is high than when it is low.	IOTI → TCMN (HOI)	Accepted
H_{7a}	The indirect relationship between IOTI and team effectiveness, through team mental model, is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.	IOTI → TMM → TPM (HOI)	Rejected
H_{7b}	The indirect relationship between IOTI and team effectiveness, through team trust (affective), is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.	IOTI → TTA → TPM (HOI)	Rejected
H_{7c}	The indirect relationship between IOTI and team effectiveness, through team trust (cognitive), is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.	IOTI → TTC → TPM (HOI)	Rejected

H_{7d}	The indirect relationship between IOTI and team effectiveness, through team communication, is moderated by HOI, such that this indirect relationship is weaker when HOI is becoming stronger.	indirect IOTI → TCMN → TPM (HOI)	Rejected
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H₈	Team effectiveness has a positive effect on logistics outsourcing.	TPM → LOP	Accepted
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5.4 Summary

This chapter presents the qualitative findings from the interview with the themes of dual identity, the ABCs of teamwork, team effectiveness and LOP. The survey instruments were examined and justified, based on which the conceptual model was finalised for further quantitative analysis. Finally, the Hayes's PROCESS macro (Models 4 and 7) was used in SPSS to test multiple relationships among all variables, including simple direct effects, mediation, moderation and moderated mediation.

CHAPTER SIX: DISCUSSIONS AND IMPLICATIONS OF THE STUDY

This chapter presents an interpretation of the findings achieved from both qualitative interviews and quantitative survey, and highlights the contributions of the study in aspects of theoretical and practical implications.

6.1 Interpretation of the findings

As explained in Chapters One, Three and Four, three research questions and associated hypotheses were proposed based on the theoretical background of SIT, SCT, and CIIM. This section reviews the findings by answering the research questions and clarifying the results of the hypothesised test (Table 6.1).

Table 6.1

Research questions and corresponding hypotheses

Research question	Hypothesis	Relationship	Result
<u>RQ-1:</u> To what extent, and in what ways, is IOTI related to team effectiveness?	H ₁	IOTI → TPM	Rejected
	H _{2a}	IOTI → TMM	Accepted
	H _{2b}	TMM → TPM	Accepted
	H _{2c}	IOTI → TMM → TPM	Accepted
	H _{3a}	IOTI → TTA	Accepted
	H _{3b}	TTA → TPM	Rejected
	H _{3c}	IOTI → TTA → TPM	Rejected
	H _{4a}	IOTI → TTC	Accepted
	H _{4b}	TTC → TPM	Accepted
	H _{4c}	IOTI → TTC → TPM	Accepted
	H _{5a}	IOTI → TCMN	Accepted

	H _{5b}	TCMN → TPM	Accepted
	H _{5c}	IOTI → TCMN → TPM	Accepted
	H _{6a}	IOTI → TMM (HOI)	Rejected
	H _{6b}	IOTI → TTA (HOI)	Rejected
RQ-2:	H _{6c}	IOTI → TTC (HOI)	Rejected
To what extent, and in what ways, does HOI influence the effectiveness of IOTI?	H _{6d}	IOTI → TCMN (HOI)	Accepted
	H _{7a}	IOTI → TMM → TPM (HOI)	Rejected
	H _{7b}	IOTI → TTA → TPM (HOI)	Rejected
	H _{7c}	IOTI → TTC → TPM (HOI)	Rejected
	H _{7d}	IOTI → TCMN → TPM (HOI)	Rejected
RQ-3:			
To what extent, and in what ways, is team effectiveness related to logistics outsourcing performance?	H ₈	TPM → LOP	Accepted

6.1.1 Research question 1

To what extent, and in what ways, is IOTI related to team effectiveness?

This question was designed to test if IOTI affected team effectiveness and, if so, how it predicted the scope and magnitude of the influences on team functioning. In a comprehensive model analysed with PROCESS macro Model 7, the result of statistical analysis rejected H_1 , meaning that the direct effect between IOTI and TPM was not significant (see Table 6.2).

Table 6.2*Extracted test results (IOTI to TPM)*

Variables	TPM			
	<i>B</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>
IOTI	0.05	0.05	1.115	0.265

SCT presumes that team identification may generate homogeneity between team members and thus increase the likelihood of their adherence to group norms (Turner, 1985). Furthermore, the salience of collective identity, either directly or indirectly through other influential factors, motivates team members to act for the benefit of the collective, thus advancing team performance (Ellemers et al., 2004). Nevertheless, the test result for H_1 did not justify the theory above. One explanation for this lack of positive findings may be due to the nature of boundary-spanning activities. Compared to the scenario of intra-organisational teams, it is more difficult for the IOT members of an outsourcing project to collaborate for common goals with their counterparts from the partnering firm. In addition, this result was supported by the evidence achieved from the qualitative study. As shown in Section 5.1.1, the issue of dual identity may impede collaborative efforts for better team performance. As one interviewee emphasised,

“... After all, we are all individuals in the project team and the members are from two sides. So when it comes to the issue of conflict, we surely have to ensure our own company’s interest.”

(Respondent_LSC2)

Thus, it is reasonable that H_1 was rejected.

Apart from testing this simple direct relationship, this study further explored the indirect effects of IOTI on TPM via other factors within the IMO framework. SIT clearly points out that how people categorise others, i.e., as ingroup or outgroup members, has an impact on cognitions, affect, and behaviour (Tajfel & Turner, 1979).

Contrary to traditional views of group relations, SIT argues that ingroup favouritism is supposed to occur even in the absence of member interdependence or interaction (Ashforth & Mael, 1989). Tajfel's minimal group studies illustrate that assigning an individual to a group is sufficient to generate ingroup favouritism (Tajfel, 1982). Turner (1984) extended this viewpoint and proposed the existence of a so-called "psychological group", i.e., "a collection of people who share the same social identification or define themselves in terms of the same social category membership" (p. 530). Individuals in a psychological group do not need to interact with other members. Instead, their perception is the basis of ingroup cooperation and outgroup discrimination (Turner, 1984).

Therefore, team identification was supposed to consolidate team processes (actions) and emergent states (knowledge and perspectives, feelings and moods) and achieve team efficiency and positive performance.

In this theoretical context, four mediating variables were identified in the conceptual model: TMM (cognition), TTA (affect), TTC (cognition) and TCMN (behaviour). For every mediator, the direct effects of IOTI on the mediator, the direct effects of the mediator on TPM, and the effects of IOTI on TPM via that mediator were assessed under the PROCESS macro Model 4 scenario.

The results of overall mediation regression support the proposed relationships for H_{2a-c} , H_{4a-c} and H_{5a-c} (Table 6.1). As reasoned in Section 3.4, the direct relationships and the mediation relationships of "IOTI→TMM→TPM", "IOTI→TTC→TPM" and "IOTI→TCMN→TPM" were founded on the theoretical basis of SIT, SCT and CIIM. The findings above were consistent with the qualitative analysis of the ABCs of teamwork in Section 5.1.2. Taking the theme of TMM as an example, one respondent pointed out that

"Getting along with a customer (with a certain level of cognitive ability) actually makes the cooperation much smoother."

In their research on team identification, Jans, Postmes, and van der Zee (2011) argued that team outcomes were influenced by the members' sense of awareness of

membership (cognition), emotional attachment to the team (affect), and intra-team interaction.

Nevertheless, the analysis on the variable of TTA found that there was no significant relationship between TTA and TPM (H_{3b}) and the mediation relationships of “IOTI→TTA→TPM” (H_{3c}).

Table 6.3

Extracted test results (mediator: TTA)

a) direct relationship (IOTI -> TTA and TTA -> TPM)

Variables	TTA				TPM			
	<i>b</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>	<i>b</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>
IOTI	0.262	0.047	5.609	0.000	-	-	-	-
TTA	-	-	-	-	0.015	0.057	0.273	0.785

b) indirect relationship (IOTI -> TTA -> TPM)

via	Effect size	Bootstrap SE	Bootstrap LLCI	Bootstrap ULCI
TTA	0.004	0.015	-0.024	0.036

As shown in Table 6.3, H_{3b} and H_{3c} were rejected. In Section 5.1.2, team trust was defined as a bi-dimensional factor: TTA and the TTC. The contradicting findings of TTA implied that, compared with TTA, the cognitive team trust (TTC) was more likely to directly affect the team outcome. Consequently, IOTI could indirectly impose influence on TPM via TTC. This result was original and potentially pivotal for future research because there is no literature anticipating or supporting this.

In conclusion, the answer to Research question 1 is: 1) IOTI does not directly affect team effectiveness; 2) there are mediated relationships between IOTI and team effectiveness with TMM, TTC and TCMN; and 3) there is no mediated relationship between IOTI and TTA.

6.1.2 Research question 2

To what extent, and in what ways, does HOI influence the effectiveness of IOTI?

Focusing on the issue of dual identity, this question was designed to test how HOI affects IOTI and team effectiveness. As mentioned in Section 5.1.1, most interviewees of the present study agreed with the comment from Respondent_LSP1 that

“When doing contract logistics business, especially outsourcing service, I believe it is quite important to decide whether to treat the business as ‘theirs’ or ‘ours’. To tell the truth, difficulties exist if we really want to make it as ‘ours’.”

From an SCT perspective, this response implied that, in the context of the logistics outsourcing industry, the social categorisation process in an IOT results in the distinctiveness between mentally “ingroup” and “outgroup” members, which in turn potentially affects emergent states and process of the team (Dovidio et al., 2007). In other words, when team members identify with the overarching IOT, they focus more attention on what all members have in common rather than the differences between those “ingroup” and “outgroup” members. On the contrary, the salience of HOI over IOTI negatively affects the magnitude of positive distinctiveness between their home and partnering organisations (Drach-Zahavy & Somech, 2010).

From a comprehensive perspective (SIT and CIIM), when team members identify with only one of the two identities (home organisation or IOT), they merely focus on the pursuits and goals of this particular entity alone (Gaertner & Dovidio, 2000; Tajfel, 1982). In logistics outsourcing collaboration, IOT members work towards a joint team goal but also strive for the goals of their home organisation. For example, if BSEs from LSP identify more with their own organisation rather than IOT, they may somewhat favour LSP’s business goals to the detriment of IOT performance. Such strong home organisation identification negatively influences inter-organisational relations due to the mindset of “us-versus-them” (Dovidio & Gaertner, 2010; Porck et al., 2020). This social comparison process indicates that, as HOI increases, BSEs are prone to the cognitive isolation of the self from IOT members from the partnering organisation.

Consequently, they may sacrifice overall IOT outcomes and pursue their own goals instead.

Based on the relevant theories and empirical studies, this study developed the hypotheses on the dual identities of IOTI and HOI in two aspects: the moderation effect and the moderated mediation effect.

First, the moderation effects of HOI on the relationships between IOTI and all four mediators were tested. As shown in Table 6.1, H_{6a} , H_{6b} and H_{6c} were rejected, meaning that HOI failed to moderate the relationship between the predictor (IOTI) and the mediators (TMM, TTA and TTC). The only exception was related to TCMN. The product term IOTI x HOI in Table 6.4 showed that HOI negatively affected the relationship between IOTI and TCMN ($p < 0.05$).

Table 6.4

Extracted test results (IOTI→TCMN (HOI))

Variables	TCMN			
	<i>B</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>
IOTI x HOI	-0.1	0.05	1.971	0.049

Furthermore, the study explored the complex relationships among the variables in a moderated mediation scenario. Specifically, the PROCESS macro Model 7 was used to evaluate the effects of IOTI on team effectiveness with concurrent mediators which were moderated by HOI. As shown in Table 6.1, all hypotheses related to moderated mediation were rejected because CIs of all effects spanned the null of 0 (Table 6.5).

The theories of SIT and SCT assume that, under certain social settings, people categorise themselves and others in terms of group memberships (Tajfel, 1978). Group members have the same understanding of who they are, their characteristics, and how they differ from outgroups (Hogg et al., 2004). On the other hand, a fundamental assumption underlying SIT and SCT is that an individual's multiple social identities may vary in their relative importance due to the interaction among those

identities. Focusing on the dual identity in a logistics outsourcing team, it was reasonable to say that the interaction between IOTI and HOI influences cognitive, affective, and behavioural consequences and team performance associated with each of those two identities (Hogg, Terry, & White, 1995).

Table 6.5

Extracted test results (Index of moderated mediation)

Index of moderated mediation	Effect	BootSE	BootLLCI	BootULCI
TMM	-0.008	0.009	-0.027	0.008
TTA	-0.002	0.005	-0.014	0.004
TTC	-0.001	0.013	-0.025	0.027
TCMN	-0.034	0.019	-0.073	0.003

Although the analysing results did not support the hypothesised relationships for H_{6a-d} , the study added to the body of knowledge as there is no previous study on the dual identity of IOTI and HOI in the logistics outsourcing context. The literature of social psychology and organisational behaviour has often argued that the social identity perspective could be generalised to all social categories. The findings were inconsistent with SIT and SCT, indicating that when an IOT setting was introduced into the research, the proposed effects were not the same as those of an intra-organisational team. However, the study is original and essential to the logistics outsourcing research as the theoretical justification of Research question 2 provided novel findings for the combination of IOTI and HOI, which was rarely investigated in the literature.

In conclusion, the answer to Research question 2 is: 1) HOI moderated the relationship between IOTI and TCMN; HOI has no moderating effects on the relationship between IOTI and other mediators (TMM, TTA and TTC); and 3) HOI does not moderate any

indirect relationship between IOTI and team effectiveness that TMM, TTA, TTC or TMM mediated.

6.1.3 Research question 3

To what extent, and in what ways, is team effectiveness related to logistics outsourcing performance?

As explained in Section 4.6.3, subjective measures were used to evaluate if the contractual requirements have been fulfilled through logistics outsourcing collaboration. The result of a simple regression test showed that TPM, the criterion of team effectiveness, significantly predicted LOP (Table 6.6). The following comment from one interviewee of the study reflects this relationship:

We (as an LSP) make full records of our customers' requirements, and our service team strictly operate to fulfill their requests. And, we also try out best to facilitate innovating ideas in improving service quality, reducing the redundancy of operation procedure and so on."

(Respondent 6_LSP6)

From the LSP perspective, the efforts of pursuing effective team performance resulted in the achievement of customer expected outcomes. This is evidenced in the following response:

"Despite of respective interests of each party in this relationship, we both would come to an agreement after the negotiation. We, as a service provider, are willing to develop and maintain a long-term relationship with the customer."

(Respondent 6_LSP6)

Table 6.6

Extracted test results (TPM to LOP)

Variables	LOP			
	<i>b</i>	<i>SE</i>	<i>t-value</i>	<i>p-value</i>

TPM	0.535	0.04	13.542	< 0.001
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In conclusion, the answer to Research question 3 is: TPM has a significant direct influence on LOP.

Overall, this section has interpreted the research results achieved from qualitative interviews and quantitative analysis. Supported by the relevant theories and previous empirical studies, the findings of this study have presented some novel findings on IOTI and boundary spanning phenomenon.

6.2 Implications of the study

6.2.1 Theoretical implications

First, to answer the call for an integration of relevant theories in SCM (Chicksand, Watson, Walker, Radnor, & Johnston, 2012), this study developed arguments based on three theories that have never been used in the study of LORM: Social Identity Theory (Tajfel, 1978), Self-Categorisation Theory (Turner et al., 1988) and Common Ingroup Identity Model (Gaertner et al., 1993). The combination of theoretically grounded variables constituted a comprehensive model that explains the linkage between IOTI and resulting outcomes in logistics outsourcing collaboration. Introducing this innovative reasoning approach allowed researchers to understand the phenomenon of logistics outsourcing collaboration from a boundary-spanning perspective. By meaningfully extending the work on team identity and inter-organisational relationships, this study also broadened the basis for further study of IOT and LORM.

Second, even though a few empirical studies have proved that the human factor is crucial in logistics outsourcing collaboration, the mechanism of how it influences logistics outsourcing relationships and performance has rarely been studied. Acknowledging that BSEs are simultaneously nested within multiple groups (IOT and home organisation) in a supply chain, this study extended our understanding of LORM in a novel perspective with multiple considerations on micro-foundations, meso-level interactions, and inter-organisational relationships. Combining both qualitative and

quantitative data, the present study provided the first empirical test of the meso-level perspective of exploring personal issues (IOTI) in the SCM context.

Last, this study initiated and tested a comprehensive framework comprised of three mediating mechanisms — affect, behaviour, and cognition — to explain the association between IOTI and effectiveness. Meanwhile, the framework also considered contextual factors (moderating or contingent) that may exert influence on the linkages involved. In such a comprehensive way, this study successfully developed the knowledge needed to design interventions that modify mediating mechanisms and improve IOT effectiveness and logistics outsourcing performance.

6.2.2 Practical implications

First, because IOTI is supposed positively affect IOT effectiveness, managers should be aware of factors that influence it in inter-organisational contexts. Knowing that BSEs' effect, behaviour, and cognition potentially contribute to a higher level of logistics outsourcing performance, managers should actively cultivate and maintain IOTI in dual group membership settings. This might include, for example, organising team-building activities to enhance BSEs' cohesion or aligning job promotion and monetary awards associated with role expectations to improve their job satisfaction. Besides formal review meetings, managers can encourage open communication between IOT members from both partnering firms to clarify task priorities, make operation adjustments and reduce goal conflicts.

Furthermore, when setting up and staffing an IOT, LSPs often have an employee pool they can draw from, placing individuals from various functions into the team with similar teammate configurations (Mathieu et al., 2008). Beyond technical issues of the team operation, managers should be mindful of employees' prior experience working together, i.e., each individual's satisfactory or negative experience with certain colleagues. At the same time, it is also crucial to consider the prior coordinating experience of own employees with BSEs from the customer firm. Managers should reconfigure the team whenever needed to avoid contamination of current IOT coordination and further strengthen inter-organisational relationships.

6.4 Summary

This chapter interprets the research results achieved from both qualitative interview and quantitative analysis. Supported by the relevant theories and previous empirical studies, the findings of this study presented some novel findings as follows: IOTI has no direct effect on team effectiveness but TPM directly influences LOP; TMM, TTC and TCMN simultaneously mediate the relationships between IOTI and team effectiveness; HOI moderates the relationship between IOTI and the mediator of TCMN. In particular, HOI does not moderate any indirect relationship between IOTI and team effectiveness that was mediated by TMM, TTA, TTC or TMM. Based on the results above, both theoretical and practical implications were discussed in great detail, in aspects of building theoretical basis for further study of IOT and LORM and developing the conceptual framework for practical implications. All in all, the findings from the study made contributions to both academic researchers and industry practitioners.

CHAPTER SEVEN: CONCLUSIONS, LIMITATIONS OF THE STUDY AND FUTURE RESEARCH DIRECTIONS

This chapter presents the conclusions of the study, reviews the limitations of the study and then provides recommendations for future research.

7.1 Summary and conclusions of the study

Conceptualised as a governance structure, SCM considers “the fundamental nature of the organization in regard to what we do ourselves vs. outsource, how we treat others in the supply chain in terms of relationship issues, and who controls various aspects of SCM” (Ellram & Cooper, 2014, p. 17). The reliance on external resources and relationships to compete in the market brings the benefit of competitive differentiation and the necessity of successful relationship management differentiation (Holcomb & Hitt, 2007). In SCM literature, a large variety of research has been done on inter-organisational interactions, mainly focusing on how the relationships are managed, what factors might affect the relationship management, and what benefits and risks the firms can achieve (Autry & Golobic, 2010; Zacharia et al., 2011).

From the perspective of BSEs, the present study examined the role of IOTI in cross-boundary collaborations in the logistics outsourcing industry. To answer the research call for a multi-disciplinary study of logistics outsourcing, this study borrowed the theories in the field of social psychology to build up the conceptual model. Extending the logistics outsourcing research into the field of human factors and behaviour SCM, the present study explored how and to what extent IOTI influences team effectiveness and LOP. Given their temporal limitation, IOTs challenge traditional understandings of effective organisation and bring additional uncertainty and ambiguity in IOTI-centred research (Lundin & Söderholm, 1995). From an SCM perspective, this study explored the role of supply chain socialisation in facilitating logistics outsourcing collaboration (Kulangara, Jackson, & Prater, 2016). In coherence with typical IOT configurations, such socialisation happens among a group of employees from two organisations to form a boundary-spanning system in pursuit of a common goal (Das & Teng, 2002). Those BSE’s perceptions of IOTI may affect supply chain partnerships

due to task complexity, resource dependence and long-term relationship orientation (Burke & Morley, 2016). Given that logistics outsourcing collaboration is a sub-category of such supply chain relationships, it is undoubtedly reasonable to explore the mechanism through which BSE's socialisation and the resulting IOTI affect team functioning and, ultimately, logistics outsourcing performance (Liu et al., 2017).

In this research context, the present study examined the mechanism linking all variables in the conceptual model to capture their interactions throughout the process. Specifically, the calculation of both individual paths for direct effects and comprehensive models (mediation, moderation and mediated moderation) were undertaken with PROCESS macro approach. Whereas not all hypotheses were accepted, the findings confirmed the mediating role of TMM, TTC and TCMN between IOTI and TPM, the moderating influence of HOI on the relationship between IOTI and TCMN and the direct relationship between TPM and LOP. Meanwhile, the study did not find significant moderated mediation effects in the conceptual model.

As for the research design and implementation, the present study adopted an exploratory sequential mixed-method approach. The first phase was the literature review to build a solid research foundation. After delimiting the geographical boundary of the research (LSPs and their customers in China), qualitative data were collected through interviews with participants on the role of IOTI in logistics outsourcing collaboration. Based on this initial exploration, the qualitative findings were used to contextualise a survey instrument that can be administered to a large sample. In the planned quantitative phase, survey data were collected to test the effectiveness and evaluate the validity of this instrument. A PROCESS macro approach was used to explore direct and indirect relationships (mediation, moderation and moderated mediation) in the conceptual model. Finally, both qualitative and quantitative results were combined for an integrated discussion and interpretation.

Overall, the present study provided insights into the influence of IOTI on team functioning in the logistics outsourcing industry. Meanwhile, it developed a theoretical framework to analyse and explain a range of phenomena regarding group-level

psychological mechanisms. Lastly, the findings from the study provided theoretical and practical implications to academic researchers and industry practitioners.

7.2 Limitations of the study and future research directions

The present study acknowledged several limitations that should be highlighted to interpret the research findings and identify future research opportunities appropriately. First, the research was based on cross-sectional and self-reported data. As a result, casual inferences were not made. Besides that, when completing the online questionnaire, the respondents may need more clarification on the questions, or may misreport the answers creating a respondent bias in the research results. Although using the tool of online questionnaires is common in empirical studies to collect data, it is recommended for future research to test causality with additional approaches (longitudinal data, experimental, etc.).

Another limitation of this study surrounds the nature of the data collected. As can be seen from the conceptual framework, the mediators consisted of both emergent states and team processes. All of them were imagined and defined with a solid theoretical basis but were only assessed with “static retrospective perceptions” (Kozlowski & Chao, 2018, p. 578). Meanwhile, the researchers argued that team affect, cognition, and behaviour were essential to investigate team dynamics and team functioning (Marks et al., 2001). Therefore, it is essential to investigate the mechanisms that explain the emergent phenomena and corresponding process dynamics. Therefore, beyond the analysis of linear relationships in static structures, future research should utilise other tools to explore the nature of team dynamics and how they evolve over time. For example, computational modelling or agent-based simulation could be used to model a complex IOT system with various combinations of inputs (e.g., supply chain orientation and team virtuality), mechanisms (e.g., team psychological safety and team political skill) and outcomes (e.g., team innovation and inter-organisational citizenship behaviour).

Furthermore, future research could extend the conceptual model by exploring other factors that moderate and/or mediate the relationships between IOTI and team effectiveness. For example, the transactive memory system may mediate relations

between IOTI and TPM (Lewis & Herndon, 2011). Other variables, such as team training (Eaidgah et al., 2018) and the perceptions of supply chain orientation (Min & Mentzer, 2004), may moderate the relations between IOTI and TPM.

The last limitation is related to generalisability. Due to time and cost restraints, both qualitative and quantitative data for the study were exclusively collected from China-based firms. Therefore, cultural and economic differences must be considered when generalising the present study's findings and conclusions to other countries or contexts. Future research could examine the conceptual model under various scenarios in different countries. Focusing on the logistics outsourcing industry, the recommended directions for future research implied various ways of proliferating the research context and validating the mechanism of IOT functioning and the role of IOTI in boundary-spanning collaboration.

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APPENDICES

Appendix 1: Micro-macro divides (management subdomain)

Subdomain	Micro Entities	Macro Entities	Corresponding Micro-Macro Divide(s)
Strategy	Firm, corporation	Industries, interfirm networks, regional clusters, strategic groups, economies	Separation between scholarship on organisations vs. economic and social systems
Entrepreneurship	Individuals or firms	Alliances, interfirm networks, regional clusters, strategic groups, industries, populations, economies	<p>Separation between scholarship on individuals and groups vs. organisations</p> <hr/> <p>Separation between scholarship on individuals and groups vs. economic and social systems</p> <hr/> <p>Separation between scholarship on organisations vs. economic and social systems</p>
Organisation and Management Theory	Groups, organisations	Organisations, industries, fields, populations, societies, economies	<p>Separation between scholarship on individuals and groups vs. organisations</p> <hr/> <p>Separation between scholarship on organisations vs. economic and social systems</p>

Human Resource Management	Individuals, interpersonal dyads, groups	Organisations broadly defined, a labour market	<hr/> Separation between scholarship on individuals and groups vs. organisations <hr/> Separation between scholarship on individuals and groups vs. economic and social systems <hr/>
International Business	Individuals, groups, firms, subsidiaries, firm components, multinational enterprises	Strategic groups, industries, populations, nations, societies, suprasocietal structures	<hr/> Separation between scholarship on individuals and groups vs. organisations <hr/> Separation between scholarship on organisations vs. economic and social systems <hr/> Separation between scholarship on individuals and groups vs. economic and social systems <hr/>
Organisational Behaviour	Individuals, interpersonal dyads, groups	Organisations broadly defined	<hr/> Separation between scholarship on individuals and groups vs. organisations <hr/>

Note. From “The myth of “the” micro-macro divide: Bridging system-level and disciplinary divides” by J. C. Molloy, R. E. Ployhart and P. M. Wright, 2011, *Journal of Management*, 37(2), 581-609. <https://doi.org/10.1177/0149206310365000>

Appendix 2: Construct conceptualisation

Category	Construct	Definition	Source
Independent variable	Inter-organisational Team Identification	The extent to which boundary spanning employees from supply chain partners perceived themselves to belong to the inter-organisational team	author
Mediator	Team Mental Model	Knowledge structures held by members of a team that enable them to form accurate explanations and expectations for the task, and in turn, to coordinate their actions and adapt their behavior to demands of the task and other team members	Cannon-Bowers et al. (1993, p. 228)
	Team Trust	A shared psychological state among team members comprising willingness to accept vulnerability based on positive expectations of a specific other or others	Fulmer and Gelfand (2012, p. 1174)
	Team Communication	An exchange of information, occurring through both verbal and nonverbal (e.g., email) channels, between two or more team members	Marlow et al. (2018, p. 148)
	Team Performance	The perceptions of team members of their team's productivity and performance	Guenter et al. (2016, p. 570)
	Team Commitment	The relative strength of an individual's identification with and involvement in a particular team	S. Lee et al. (2018, p. 2365)
Dependent variable	Goal Achievement	Logistics outsourcing performance that achieves expected outcomes ex ante agreed upon by a company and its logistics service provider	Wallenburg et al. (2010, p. 581)

	Goal Exceedance	Services that significantly exceed the goals and expectations set forth in the outsourcing arrangement, providing a degree of pleasant surprise espoused in the consumer concept of delight	Wallenburg et al. (2010, p. 581)
Moderator	Home Organisation Identification	The boundary spanning employees' perception of oneness with or belongingness to his/her employing organisation	author
	Interorganisational Relationship Duration	The years of cooperation	Zhong et al. (2017)
Control variable	Team Tenure	The length of time the individuals have been associated with their team	J. I. A. Hu and Liden (2015)
	Firm Size	The total number of employees in the company	Huang et al. (2016)
	Ownership Type	The business category of an organisation ranging from wholly state-owned to wholly foreign owned	

Appendix 3: Research recruitment advertisement letter

Title: Influences of Inter-organisational Team Identification on Logistics Outsourcing Performance: A Boundary-spanning Perspective

研究课题: “从边界跨越的角度来分析跨企业团队的身份认同及其对物流外包绩效的影响”

UTS approval number: UTS HREC REF NO. ETH19-3711

悉尼科技大学项目获批编号: UTS HREC REF NO. ETH19-3711

Dear all members,

Researchers at University of Technology Sydney (UTS) are seeking volunteer research participants to investigate how and the extent to which inter-organisational team identification may influence team effectiveness and ultimately logistics outsourcing performance.

The potential participants are supposed to:

- be from either logistics service providers or customers;
- deal directly with your counterparts in the partnering firms;
- are the member of an inter-organisational team-based logistics outsourcing project

If you would like more information or are interested in being part of the study, please contact:

Name: Shiyou Liu

Organisation: University of Technology Sydney (UTS)

Email: shiyou.liu@student.uts.edu.au

Thanks.

Best regards

Council of Supply Chain Management Professionals (CSCMP) China

Appendix 4: Follow-up letter after the recruitment advertisement

Title: Influences of Inter-organisational Team Identification on Logistics Outsourcing Performance: A Boundary-spanning Perspective

研究课题: “从边界跨越的角度来分析跨企业团队的身份认同及其对物流外包绩效的影响”

UTS approval number: UTS HREC REF NO. ETH19-3711

悉尼科技大学项目获批编号: UTS HREC REF NO. ETH19-3711

Dear Sir/Madam,

Thank you for expressing your interest in this research that aims to investigate how and the extent to which inter-organisational team identification may influence team effectiveness and ultimately logistics outsourcing performance.

Taking part in this research study is optional. Please kindly check the attachment for Participant Information Sheet and Consent Form which need to be signed before the interview. If you would like more information or are interested in being part of the research study, please contact me.

Thanks in advance and look forward to your participation!

Yours sincerely,

Shiyu Liu, PhD candidate

Management Discipline Group,

UTS Business School,

*University of Technology Sydney,
PO Box 123, Broadway NSW 2007,
Australia*

+61 2 9514 3614

shiyu.liu@student.uts.edu.au

Appendix 5: Participant information sheet and the consent form

PARTICIPANT INFORMATION SHEET

调研访谈信息说明

Title: Influences of Inter-organisational Team Identification on Logistics Outsourcing Performance: A Boundary-spanning Perspective

研究课题: “从边界跨越的角度来分析跨企业团队的身份认同及其对物流外包绩效的影响”

UTS approval number: UTS HREC REF NO. ETH19-3711

悉尼科技大学项目获批编号: UTS HREC REF NO. ETH19-3711

WHO IS DOING THE RESEARCH?

My name is Shiyou Liu Shiyou.liu@student.uts.edu.au and I am a PhD student at UTS. Other investigators in the research team are my supervisors: Dr. Sanjoy Paul Sanjoy.Paul@uts.edu.au; Dr. Maruf Chowdhury Maruf.Chowdhury@uts.edu.au; and Dr. Moira Scerri Moira.Scerri@uts.edu.au.

调研主体:

悉尼科技大学商学院在读博士生刘士友（电邮：shiyou.liu@student.uts.edu.au）。导师为：Sanjoy Paul 博士（电邮：Sanjoy.Paul@uts.edu.au）； Maruf Chowdhury 博士（电邮：Maruf.Chowdhury@uts.edu.au）； Moira Scerri 博士（电邮：Moira.Scerri@uts.edu.au）

WHAT IS THIS RESEARCH ABOUT?

This research is to find out how and the extent to which inter-organisational team identification may influence team effectiveness and ultimately logistics outsourcing performance.

调研背景

本次在线调查的目的为探究跨企业团队的身份认同对团队效能及物流外包绩效的影响。

WHY HAVE I BEEN ASKED?

You have been invited to participate because your position and industry segment make you uniquely qualified to help with this interview and contribute to the

study's success. Your contact details were obtained from Council of Supply Chain Management Professionals China (CSCMP China).

受邀原因

经由行业机构及业界权威人士的举荐，邀请您参与本次调研。

IF I SAY YES, WHAT WILL IT INVOLVE?

If you decide to participate, I will invite you to participate in a 30-minute semi-structured interview that will be audio recorded and transcribed.

访谈细节

如果同意参与调研，我们将请您配合完成一次用时约 20 分钟的半结构化访谈（内容将被录音）。

DO I HAVE TO SAY YES?

Participation in this study is voluntary. It is completely up to you whether or not you decide to take part.

参与自由

您自主决定是否参与调研。即便在访谈进行过程中，您仍有权利随时停止参与并不用承担任何后果。

WHAT WILL HAPPEN IF I SAY NO?

If you decide not to participate, it will not affect your relationship with the researchers or the University of Technology Sydney. If you wish to withdraw from the study once it has started, you can do so at any time without having to give a reason, by contacting Mr. Shiyou Liu Shiyou.liu@student.ut.edu.au. Alternatively, you could contact the local person for this research: Jason Min Gao at gaom@cscmpChina.org.

If you decide to leave the research project, we will not collect additional personal information from you, although personal information already collected will be retained to ensure that the results of the research project can be measured properly and to comply with law. You should be aware that data collected up to the time you withdraw will form part of the research project results.

退出自由

不参与访谈的决定不会影响到您与调研人员或悉尼科技大学的关系。在最终研究报告发表之前的任何时间，您都可以告知退出调研项目的决定。请联系刘士友（电邮：shiyou.liu@student.uts.edu.au）。

收到退出项目的通知邮件之后，我们将不会继续收集您的个人信息；已经获取到的信息仍将作为研究项目的一部分加以保留，以便在依照相关法律法规的前提下，确保对课题研究项目的正确评估。

CONFIDENTIALITY

By signing the consent form, you consent to the research team collecting and using personal information about you for the research project. All this information will be treated confidentially. The result of this interview will be reported only in summary form and no mention of firms or participants will be given. We plan to publish the results in Mr. Shiyu Liu's PhD thesis, academic publications and/or internal reports. In any publication, information will be provided in such a way that you cannot be identified.

保密条款

如无疑问，签署同意书即代表您已同意调研人员获取并使用您提供的所有信息用于后续研究。所有访谈信息将严格保密，任何个人及企业相关的、具有身份辨识度的信息均不会对外公布。本次调研所获取的信息将用于撰写刘士友的博士论文，并可能会用于后续的其他研究项目。在任何情况下，您提供的所有信息仍将严格保密。

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

If you have concerns about the research that you think I or my supervisors can help you with, please feel free to contact us on the emails provided above.

You will be given a copy of this form to keep.

相关疑问

如您有任何相关问题需要我或我的导师进行解答，请通过“调研主体”部分提供的电子邮件随时联系。

您将获得一份该表格的副本进行留存。

NOTE:

This study has been approved in line with the University of Technology Sydney Human Research Ethics Committee [UTS HREC] guidelines. If you have any concerns or complaints about any aspect of the conduct of this research, please contact the Ethics Secretariat on ph.: +61 2 9514 2478 or email: Research.Ethics@uts.edu.au, and quote the UTS HREC reference number. Any matter raised will be treated confidentially, investigated and you will be informed of the outcome.

声明:

该调研已通过悉尼科技大学人伦研究委员会审核并批准。如与调研人员就参与此次问卷调查相关的问题有任何质疑，您可以通过以下方式直接联系委员会相关人员（电话: +61 2 9514 2478; 电子邮件: Research.Ethics@uts.edu.au），并提供 UTS HREC 参考编号以获取支持。我们将尽全力调查您的任何疑虑并告知处理结果，同时保证所有信息完全保密。

CONSENT FORM

同意书

Title: Influences of Inter-organisational Team Identification on Logistics Outsourcing Performance: A Boundary-spanning Perspective

研究课题：“从边界跨越的角度来分析跨企业团队的身份认同及其对物流外包绩效的影响”

UTS approval number: UTS HREC REF NO. ETH19-3711

悉尼科技大学项目获批编号：UTS HREC REF NO. ETH19-3711

I _____ [*participant's name*] agree to participate in the research project of

Influences of Inter-organisational Team Identification on Logistics Outsourcing Performance: A Boundary-spanning Perspective

being conducted by *Shiyu Liu (UTS Business School, University of Technology Sydney, PO Box 123, Broadway NSW 2007, Australia, +61 2 9514 3614)*.

我_____ (姓名)同意参与该研究项目并接受访谈。

I have read the Participant Information Sheet or someone has read it to me in a language that I understand.

我已经阅读完或已由其他人通过本人可以理解的语言代为告知《调研访谈信息说明》所包含的所有内容。

I understand the purposes, procedures and risks of the research as described in the Participant Information Sheet.

我已得知与研究项目相关的信息（目的、流程、风险等）。

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

我已得到了提问的机会并对获得的答案很满意。

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney.

基于本人真实意愿，我自愿参与到上述研究项目中。同时本人知悉：可随时做出退出此项目的决定，且不会影响到与调研人员或悉尼科技大学的关系。

I understand that I will be given a signed copy of this document to keep.

本人知悉：将获得一份有双方前面的表格副本进行留存。

I agree to be:

Audio recorded

我同意：

对访谈内容全程录音

I agree that the research data gathered from this project may be published in a form that:

Does not identify me in any way

May be used for future research purposes

我同意：访谈信息可以通过以下方式对外发表：

不包含任何与本人相关的、具有身份辨识度的信息

可用于未来的其他研究项目

I would like to receive a copy of the results of this study:

Yes (Email: _____)

No

在研究项目结束后，我希望获得一份调研报告

是 (Email: _____)

否

Appendix 6: Interview protocol

Title: Influences of Inter-organisational Team Identification on Logistics Outsourcing Performance: A Boundary-spanning Perspective

研究课题：“从边界跨越的角度来分析跨企业团队的身份认同及其对物流外包绩效的影响”

Interviewer: Shiyu Liu, PhD candidate (Management Discipline Group, UTS Business School)

访谈人： 刘士友（悉尼科技大学商学院管理专业在读博士生）

Participant（受访人）：

Date（日期）：

Time（时间）：

Place（地点）：

Opening (Purpose of study): Thank you for taking time out of your busy schedule to meet with me. I would like to take a few minutes to explain the research project to you. 开场白（访谈目的）：感谢您在百忙之中抽出时间来接受我的采访。首先为您简单介绍一下相关背景。

I am from University of Technology Sydney (UTS) in Australia, trying to understand how people from both LSPs and their customers work and interact with each other in an inter-organisational team for collaborative projects. 我来自澳大利亚悉尼科技大学，是一名管理专业在读博士生，目前从事的课题研究以物流服务供应商与其客户之间的跨组织合作为研究背景，致力于探索项目团队成员之间在日常工作中的互动与工作特性。

I would like for our interview today to be very open, informal, and conversational. There are no right and wrong answers, you are the expert and I'm here to learn from you. Our interview is confidential. In order to keep the conversation flowing I would like with your permission to record our conversation. 在今天的访谈中，我会秉持着开放、自由及平等对话的态度。所有问题的回答都不会有对错之分，我很真诚的希望通过与像您这样的业内专家的交流，可以获取到更多的专业知识。访谈内容会一直处于保密状态，但为了保持对话的流畅性，希望您同意我对本次访谈进行全程录音。

Obtain informed consent? 受访人是否同意接受采访？

Any questions before we begin? 在访谈开始前，是否有任何问题需要解答？

Record session 录音部分

1. Could you please tell me about your position in your company and what your main responsibilities include? (Probe as needed to fully understand

the person's role, background and orientation). 请您简单介绍一下自己在公司所担任的职务及其相关职责。

2. Can you think of one specific inter-organisational team of which you are/were the member? That team should be composed of people from both LSPs and their customers. (Assuming yes) Please place your interactions with members from the partnering company clearly in your mind first. 请您在头脑中选定一个曾经或目前所在的跨企业团队（成员分别来自物流服务供应商或客户）。
3. Please share your understandings of Inter-organisational team identification in logistics outsourcing collaboration. 您对跨企业团队的身份认同有哪些认识（在物流外包合作项目的背景下）？
4. Please share your understandings of team mental model in logistics outsourcing collaboration. 您对跨企业团队的心智模式有哪些认识（在物流外包合作项目的背景下）？
5. Please share your understandings of team trust in logistics outsourcing collaboration. 您对跨企业团队的信任有哪些认识（在物流外包合作项目的背景下）？
6. Please share your understandings of team communication in logistics outsourcing collaboration. 您对跨企业团队的沟通有哪些认识（在物流外包合作项目的背景下）？
7. Please share your understandings of team performance and commitment in logistics outsourcing collaboration. 您对跨企业团队的绩效及承诺有哪些认识（在物流外包合作项目的背景下）？
8. Please share your understandings of home organisation identification in logistics outsourcing collaboration. 您对跨企业团队对所就职企业的组织认同有哪些认识（在物流外包合作项目的背景下）？
9. Please share your understandings of logistics outsourcing performance in logistics outsourcing collaboration. 您对物流外包绩效有哪些认识（在物流外包合作项目的背景下）？
10. Any comments related to the topic but not mentioned above. 任何与研究课题相关但没有谈到的信息。

11. Summarise the points mentioned and ask the participant if the summary is correct (by the interviewer). 总结访谈的主要内容并得到被访谈者的认同（由调研者）。

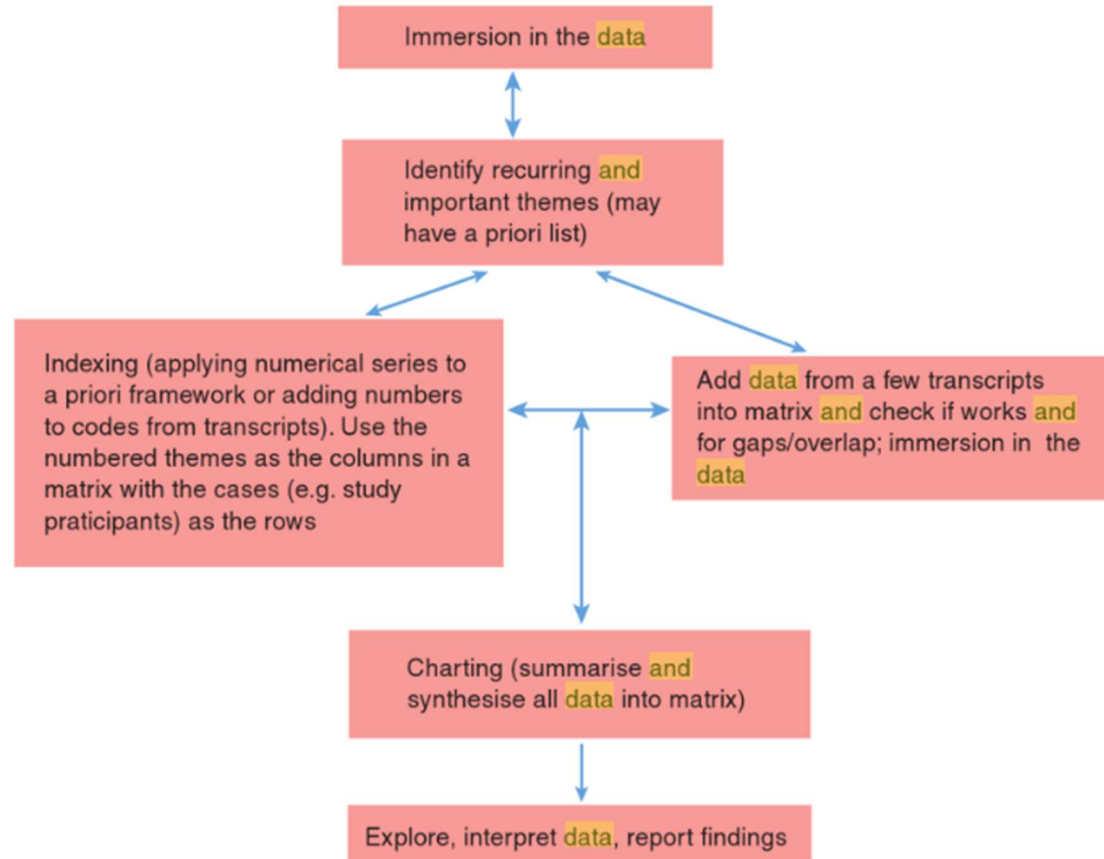
Floating Prompts 引导式提问

- Can you tell me more about that? 可以分享更多的相关信息吗?
- Can you explain that in more detail? 可以提供更多的相关细节吗?
- That's interesting. Please go on 非常有意思的观点。请继续。
- Can you give me an example? 可以举个例子吗?
- What do you mean by that? 那个说明了什么呢?
- What happened next? 然后呢?
- How did you deal with that? 您是如何处理那件事的呢?

Wrap up 总结陈词

That's all for today's interview. Thank you so much for your time and cooperation! You have been very helpful. You will receive a copy of our report after I finish the data analysis. If you have any questions, or if you can think of anything else you'd like to share with us, please feel free to contact me. 以上就是今天访谈的全部内容。十分感谢您的配合! 在完成数据分析之后, 您将可以收到一份相关的研究报告。如果您有任何疑问或希望补充更多信息, 请随时和我联系。

Appendix 7: Procedure of thematic content analysis (TCA)



Note. From “Coding and analysing qualitative data” by C. Rivas, In C. Seale (Ed.), *Researching Society and Culture* (2 ed., pp. 367-392), 2012, SAGE Publications.

Appendix 8: Measurement and construct operationalisation (initial)

Category	Construct	Measurement Items (modified)	Source(s)
Independent variable	Inter-organisational Team Identification	<ul style="list-style-type: none"> • If someone were to criticize this team, it would feel like a personal insult. • I am very interested in what others think about this team. • If I were to talk about this team, I would say “we” rather than “they.” • This team’s successes are my successes. • If someone were to praise this team, it would feel like a personal compliment. 	Rockmann et al. (2007)
Mediator	Team Mental Model	<ul style="list-style-type: none"> • It was clear from the beginning what this team had to accomplish • This team spent time making sure every team member understands the team objectives • Team members understand what is expected of them in their respective roles • Shortly after the start this team had a common understanding of the task we had to handle • Shortly after the start this team had a common understanding of how to deal with the task 	Fransen et al. (2011)
	Team Trust (cognitive-based)	<ul style="list-style-type: none"> • Members of the team approach the team project with professionalism and dedication. • Given the track record of the team members, I see no reason to doubt their competence and preparation for the upcoming presentation. • I can rely on other members of the team not to make my job more difficult by careless work. 	McAllister (1995)

	Team Trust (affective-based)	<ul style="list-style-type: none"> • We (the team) have a sharing relationship. We can openly share our ideas and feelings. • We can talk freely to each other about difficulties we are having in completing the project and know that each other will listen. • If I shared my ideas and project-related problems with the members of the team, I know they would respond constructively and caringly. 	McAllister (1995)
	Team Communication	<ul style="list-style-type: none"> • Members of the team inform each other in advance of changing needs • Members of the team share proprietary information with each other • Members of the team provide any information that might help the partner's side • Members of the team keep each other informed about events or changes that may affect the other side 	Mohr and Spekman (1994)
	Team Performance	<ul style="list-style-type: none"> • This team is consistently a high performing team • This team is effective • This team makes few mistakes • This team does high quality work 	Gibson et al. (2009)
	Team Commitment	<ul style="list-style-type: none"> • Members of the team feel emotionally attached to the team • Members of the team feel a strong sense of belonging to the team • Members of the team feel as if the team's problems are their own • Members of the team feel like part of the family in the team 	G. S. van Der Vegt and Janssen (2003)
Dependent variable	Goal Achievement	<ul style="list-style-type: none"> • Our LSP completely fulfills the goals and expectations we jointly set prior to this logistics outsourcing relationship • We are very satisfied with our LSP • The relationship with this LSP is very good • LSP delivers its service always with the required quality 	Deepen et al. (2008)

	Goal Exceedance	<ul style="list-style-type: none"> • The goals and expectations we jointly set prior to this arrangement were significantly exceeded • We are significantly more satisfied with the quality of the LSP services than we expected • The relationship between actual costs for this project and the overall service performance is much better than expected 	Deepen et al. (2008)
Moderator	Home Organisation Identification	<ul style="list-style-type: none"> • When someone criticises my organisation, it feels like a personal insult • I am very interested in what others think about my organisation • When I talk about this organisation, I usually say 'we' rather than 'they' • This organisation's successes are my successes • When someone praises this organisation, it feels like a personal compliment 	F. Mael and Ashforth (1992)
	Firm size	<ul style="list-style-type: none"> • The total number of fulltime employees in your organisation 	Huang et al. (2016)
	Team Tenure	<ul style="list-style-type: none"> • How long has this team been set up? 	Richter et al. (2006)
Control variable	Inter-organisational Relationship Duration	<ul style="list-style-type: none"> • The number of years your organisation has been in business with this specific partner 	Lusch and Brown (1996)
	Ownership type	<ul style="list-style-type: none"> • Foreign owned • Joint venture • State-owned • Private 	Huang et al. (2016)

Appendix 9: On-line questionnaire for IRA analysis (Chinese version)

参与者声明

- 我了解我被询问并要求确认同意参加本调研；
- 我已经阅读了中文版本的《参与者信息表》，并已明确知晓本调研相关的研究目的、程序以及风险等信息；
- 我同意所收集的、与我相关的个人信息仅用于本调研；
- 我同意参加本调研，并已明确知晓：我可以随时选择退出而不会影响我与相关研究人员或悉尼科技大学的关系；
- 我了解如果我对本调研有任何疑问，可以与刘士友先生联系。

问卷填写说明

以下为相关说明：

- 为确保所得信息的有效性与可靠性，请根据个人及所在企业的实际情况填写或回答本问卷（有些问题或选项看似重复）；标记有星号（*）的问题为必答问题；
- 请选取贵企业**某一个重要的合作伙伴**为调研背景来回答问卷。该合作伙伴必须是：1) 与贵企业有长期稳定的合作关系；2) 您在此合作关系中作为项目团队成员承担一定职责；
- 结合本次调研的目的，**物流服务供应商**包括以下两种企业：1) 为客户直接提供物流服务并进行管理；2) 代为协调管理多个物流服务供应商以便综合支持客户的物流运营；**物流外包客户**定义为“接受物流服务供应商提供的服务的任何企业”（可以是物流企业或者其他行业的企业）。
- 本次问卷调查约需10-15分钟。如果不能一次性完成，或在答题过程中意外关掉页面，仍可以点击原邀请邮件中的链接或重新扫描微信二维码继续填写问卷；
- 回答完所有问题后，请点击页面中的“提交”按钮。

1. 背景信息

(BI-1) 为实现调研目的，需要您根据问卷说明中的相关定义，确定所在企业的类型（唯一选项）。在回答本次问卷的过程中，您所在的企业将被定义为（必答）？

- 物流服务供应商
- 物流外包客户

2. 基本信息

(LSP-1) 贵企业为客户提供哪些物流服务（可多选）？

- 国内运输
- 仓储
- 国际运输
- 货运代理
- 报关代理
- 逆向物流
- 越库作业
- 运费审核及结算
- 运输规划及管理
- 库存管理
- 产品贴标签、包装、装配及配套拣货
- 订单管理及履行
- 服务配件物流
- 车队管理
- 信息技术服务
- 供应链咨询
- 客户服务
- 领先物流供应商/第三方物流服务

(LSC-1) 贵企业外包了哪些物流业务（可多选）？

- 国内运输
- 仓储
- 国际运输
- 货运代理
- 报关代理
- 逆向物流
- 越库作业
- 运费审核及结算
- 运输规划及管理
- 库存管理
- 产品贴标签、包装、装配及配套拣货
- 订单管理及履行

- 服务配件物流
- 车队管理
- 信息技术服务
- 供应链咨询
- 客户服务
- 领先物流供应商/第三方物流服务

(LSP-2) 贵企业与您的客户已经合作的年限？如有多个客户，请选取某一最重要合作伙伴为调研对象。

- 少于一年
- 1至3年
- 3至5年
- 5年以上

(LSC-2) 贵企业与您的物流服务供应商已经合作的年限？如有多个供应商，请选取某一最重要合作伙伴为调研对象。

- 少于一年
- 1至3年
- 3至5年
- 5年以上

(LSP-3) 贵企业在中国的员工人数？

- 少于100
- 101至250
- 251至500
- 501至1000
- 1000以上

(LSC-3) 贵企业在中国的员工人数？

- 少于100
- 101至250
- 251至500
- 501至1000
- 1000以上

(LSP-4) 企业性质

- 外商独资
- 合资
- 国有
- 私有

(LSC-4) 企业性质

- 外商独资
- 合资
- 国有
- 私有

3. 跨企业合作信息

(LSP-5) 您参与物流外包项目的工作年限？

- 少于1年
- 1至2年
- 2至3年
- 3年以上

(LSC-5) 您参与物流外包项目的工作年限？

- 少于1年
- 1至2年
- 2至3年
- 3年以上

(LSP-6) 您与客户员工的沟通频率？

- 每小时
- 每天
- 每周
- 每月
- 每季度或更长周期

(LSC-6) 您与供应商员工的沟通频率？

- 每小时
- 每天
- 每周
- 每月
- 每季度或更长周期

针对以下陈述，请表明您的同意程度：(1) 坚决不同意；(2) 不同意；(3) 基本不同意；(4) 中立；(5) 基本同意；(6) 同意；(7) 坚决同意。

(LSP-7) 跨企业团队的身份认同

	坚决不同意				坚决同意		
(IOT-1) 如果团队遭到非议，我会觉得也是对我个人的侮辱	1	2	3	4	5	6	7
(IOT-2) 我非常在意其他人对团队的想法	1	2	3	4	5	6	7
(IOT-3) 当谈到团队时，我倾向于使用“我们”而不是“他们”	1	2	3	4	5	6	7
(IOT-4) 团队的成功与我个人的成功密切相关	1	2	3	4	5	6	7
(IOT-5) 如果团队得到赞扬，我会觉得也是对我个人的正面评价	1	2	3	4	5	6	7

(LSC-7) 跨企业团队的身份认同

	坚决不同意				坚决同意		
(IOT-1) 如果团队遭到非议，我会觉得也是对我个人的侮辱	1	2	3	4	5	6	7
(IOT-2) 我非常在意其他人对团队的想法	1	2	3	4	5	6	7
(IOT-3) 当谈到团队时，我倾向于使用“我们”而不是“他们”	1	2	3	4	5	6	7
(IOT-4) 团队的成功与我个人的成功密切相关	1	2	3	4	5	6	7
(IOT-5) 如果团队得到赞扬，我会觉得也是对我个人的正面评价	1	2	3	4	5	6	7

(LSP-8) 跨企业团队的心智模式

	坚决不同意				坚决同意		
(TMM-1) 项目初期即已明确物流外包团队的职能定位	1	2	3	4	5	6	7
(TMM-2) 每个成员均已明确整体的工作目标	1	2	3	4	5	6	7
(TMM-3) 团队成员均已明确个人在其中的角色及作用	1	2	3	4	5	6	7

(TMM-4) 项目开始运作的短时间内，团队即已对应承担的工作任务达成共识	1	2	3	4	5	6	7
(TMM-5) 项目开始运作的短时间内，团队即已对如何完成该工作任务达成共识	1	2	3	4	5	6	7

(LSC-8) 跨企业团队的心智模式

	坚决不同意				坚决同意		
(TMM-1) 项目初期即已明确物流外包团队的职能定位	1	2	3	4	5	6	7
(TMM-2) 每个成员均已明确整体的工作目标	1	2	3	4	5	6	7
(TMM-3) 团队成员均已明确个人在其中的角色及作用	1	2	3	4	5	6	7
(TMM-4) 项目开始运作的短时间内，团队即已对应承担的工作任务达成共识	1	2	3	4	5	6	7
(TMM-5) 项目开始运作的短时间内，团队即已对如何完成该工作任务达成共识	1	2	3	4	5	6	7

(LSP-9) 跨企业团队的信任（情感相关）

	坚决不同意				坚决同意		
(TTA-1) 团队成员可以坦诚地分享想法及感受。	1	2	3	4	5	6	7
(TTA-2) 团队成员可以就项目相关的困难自由地交流，并知道对方会认真倾听	1	2	3	4	5	6	7
(TTA-3) 如果我与团队成员分享自己的看法以及项目相关的问题，我知道对方会做出建设性的、关怀的回应	1	2	3	4	5	6	7

(LSC-9) 跨企业团队的信任（情感相关）

	<i>坚决不同意</i>			<i>坚决同意</i>			
(TTA-1) 团队成员可以坦诚地分享想法及感受。	1	2	3	4	5	6	7
(TTA-2) 团队成员可以就项目相关的困难自由地交流，并知道对方会认真倾听	1	2	3	4	5	6	7
(TTA-3) 如果我与团队成员分享自己的看法以及项目相关的问题，我知道对方会做出建设性的、关怀的回应	1	2	3	4	5	6	7

(LSP-10) 跨企业团队的信任 (认知相关)

	<i>坚决不同意</i>			<i>坚决同意</i>			
(TTC-1) 团队成员以专业和奉献的态度来参与合作项目	1	2	3	4	5	6	7
(TTC-2) 鉴于团队成员过往的表现，没有理由怀疑他们的能力及认真的合作态度	1	2	3	4	5	6	7
(TTC-3) 我可以依靠团队成员的帮助来避免由于自身粗心而引起的、职责相关的困扰	1	2	3	4	5	6	7

(LSC-10) 跨企业团队的信任 (认知相关)

	<i>坚决不同意</i>			<i>坚决同意</i>			
(TTC-1) 团队成员以专业和奉献的态度来参与合作项目	1	2	3	4	5	6	7
(TTC-2) 鉴于团队成员过往的表现，没有理由怀疑他们的能力及认真的合作态度	1	2	3	4	5	6	7
(TTC-3) 我可以依靠团队成员的帮助来避免由于自身粗心而引起的、职责相关的困扰	1	2	3	4	5	6	7

(LSP-11) 跨企业团队的沟通

(TPM-1) 团队具有可持续性的高绩效	1	2	3	4	5	6	7
(TPM-2) 团队具有执行力	1	2	3	4	5	6	7
(TPM-3) 团队很少出现工作失误	1	2	3	4	5	6	7
(TPM-4) 团队完成的任務质量很高	1	2	3	4	5	6	7

(LSP-13) 跨企业团队的承诺

	<i>坚决不同意</i>			<i>坚决同意</i>			
(TCM-1) 团队成员对这个集体充满情感	1	2	3	4	5	6	7
(TCM-2) 团队成员对这个集体有强烈的归属感	1	2	3	4	5	6	7
(TCM-3) 团队成员会把共同遇到的困难看做是自己个人的问题	1	2	3	4	5	6	7
(TCM-4) 团队成员在其中会感觉到是一个大家庭的成员之一	1	2	3	4	5	6	7

(LSC-13) 跨企业团队的承诺

	<i>坚决不同意</i>			<i>同意</i>				<i>坚决</i>
(TCM-1) 团队成员对这个集体充满情感	1	2	3	4	5	6	7	
(TCM-2) 团队成员对这个集体有强烈的归属感	1	2	3	4	5	6	7	
(TCM-3) 团队成员会把共同遇到的困难看做是自己个人的问题	1	2	3	4	5	6	7	
(TCM-4) 团队成员在其中会感觉到是一个大家庭的成员之一	1	2	3	4	5	6	7	

4. 组织认同

针对以下陈述，请标明您的同意程度：(1) 坚决不同意；(2) 不同意；(3) 基本不同意；(4) 中立；(5) 基本同意；(6) 同意；(7) 坚决同意。

(LSP-14) 所就职企业的组织认同

	坚决不同意				坚决同意			
(HOI-1) 如果所在企业遭到非议，我会觉得也是对我个人的侮辱	1	2	3	4	5	6	7	
(HOI-2) 我非常在意其他人对我所在企业的看法	1	2	3	4	5	6	7	
(HOI-3) 当谈到我所在的企业时，我倾向于使用“我们”而不是“他们”	1	2	3	4	5	6	7	
(HOI-4) 企业的成功与我个人的成功密切相关	1	2	3	4	5	6	7	
(HOI-5) 如果所在企业得到赞扬，我会觉得也是对我个人的正面评价	1	2	3	4	5	6	7	

(LSC-14) 所就职企业的组织认同

	坚决不同意				坚决同意			
(HOI-1) 如果所在企业遭到非议，我会觉得也是对我个人的侮辱	1	2	3	4	5	6	7	
(HOI-2) 我非常在意其他人对我所在企业的看法	1	2	3	4	5	6	7	
(HOI-3) 当谈到我所在的企业时，我倾向于使用“我们”而不是“他们”	1	2	3	4	5	6	7	
(HOI-4) 企业的成功与我个人的成功密切相关	1	2	3	4	5	6	7	
(HOI-5) 如果所在企业得到赞扬，我会觉得也是对我个人的正面评价	1	2	3	4	5	6	7	

5. 物流外包绩效

针对以下陈述，请标明您的同意程度：(1) 坚决不同意；(2) 不同意；(3) 基本不同意；(4) 中立；(5) 基本同意；(6) 同意；(7) 坚决同意。

(LSP-15) 物流外包绩效

	坚决不同意				坚决同意			
(LOP-1) 我们能够与客户一同完全实现由双方在合作之初所制定的目标及希望值。	1	2	3	4	5	6	7	

(LOP-2) 客户对我们的表现非常满意。	1	2	3	4	5	6	7
(LOP-3) 我们与客户的合作关系非常融洽。	1	2	3	4	5	6	7
(LOP-4) 我们总是可以提供满足客户质量要求的服务。	1	2	3	4	5	6	7
(LOP-5) 我们的表现大大超出了双方在合作之初所制定的目标及期望值。	1	2	3	4	5	6	7
(LOP-6) 我们所提供的服务大大超出了客户最初所提出的质量要求。	1	2	3	4	5	6	7
(LOP-7) 相对于外包业务付出的成本而言，客户在服务绩效方面所获得的回报大大超出了其最初的期望值。	1	2	3	4	5	6	7

(LSC-15) 物流外包绩效

	坚决不同意			坚决同意			
(LOP-1) 与我们合作的物流服务供应商能够完全实现由双方在合作之初所制定的目标及希望值。	1	2	3	4	5	6	7
(LOP-2) 我们对所合作供应商的表现非常满意。	1	2	3	4	5	6	7
(LOP-3) 我们与供应商的合作关系非常融洽。	1	2	3	4	5	6	7
(LOP-4) 供应商总是可以提供满足我们质量要求的服务。	1	2	3	4	5	6	7
(LOP-5) 供应商的表现大大超出了双方在合作之初所制定的目标及期望值。	1	2	3	4	5	6	7
(LOP-6) 供应商所提供的服务大大超出了我们最初所提出的质量要求。	1	2	3	4	5	6	7
(LOP-7) 相对于外包业务付出的成本而言，我们所获得的服务绩效方面的回报大大超出了最初的期望值。	1	2	3	4	5	6	7

6. 个人信息

(RP-1) 您目前的工作职位。

(RP-2) 您目前在外包团队中的角色。

- 团队负责人/主管
- 团队成员

(RP-3) 您的性别

- 男性
- 女性

(RP-4) 如对本问卷或课题有任何建议或评价，请留言。

问卷调查到此结束，感谢您的合作！

Appendix 10: On-line questionnaire for IRA analysis (English version)

DECLARATION BY THE PARTICIPANT

Research topic: Influences of inter-organisational team identification on logistics outsourcing performance: A boundary-spanning perspective

By checking the 'I agree, start questionnaire' button option below:

- I understand I am being asked to provide consent to participate in this research study;
- I have read the Participant Information Sheet in a language that I understand, acknowledging the purposes, procedures and risks of the research as described in the sheet;
- I provide my consent for the information collected about me to be used for the purpose of this research study only;
- I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney;
- I am aware that I can contact Mr. Shiyu Liu if I have any concerns about the research.

INSTRUCTIONS

The instructions below will assist you in completing the questionnaire:

- It is important that you answer ALL the questions in the questionnaire even if some questions look repetitive. A small set of required questions are identified with an asterisk (*).
- When answering questions related to your company's partner and/or the inter-organisational team (IOT), please think of **THE ONE KEY BUSINESS** with which your company has had a long-term logistics collaboration. This partnership should be regarded as **THE MOST IMPORTANT ONE** that you actively participate as a boundary spanning employee (BSE).
- For purposes of this study, a broad definition of LSP (Logistics service provider) is the company that provides/manages logistics services for its customers or that manage multiple logistics providers to facilitate its customer's logistics. And the customer is defined as any organisation that uses the services provided by LSP(s).
- It is estimated that the survey may take about 10-15 minutes to complete. If you are unable to finish the survey in one sitting or accidentally close your web browser without finishing the survey, you can return to finish the survey at a later time by clicking on the ORIGINAL LINK in your email invitation or the QR CODE in your Wechat invitation.
- Please complete the survey online and click the "Submit" button when complete.

SECTION A: BACKGROUND INFORMATION

(BI-1) Is your company an LSP (logistics service provider) or customer (LSC) (if both, choose THE ONE that better describes your company)? *

- LSP
- LSC

SECTION B: GENERAL INFORMATION

(LSP-1) Which of the following logistics services does your company provide to customers (please choose all applicable services)?

- Domestic transportation
- Warehousing
- International transportation
- Freight forwarding
- Customs brokerage
- Reverse logistics (defective, repair, return)
- Cross-docking
- Freight bill auditing and payment
- Transportation planning and management
- Inventory management
- Product labelling, packaging, assembly, kitting
- Order management and fulfilment
- Service parts logistics
- Fleet management
- Information technology (IT) services
- Supply chain consultancy
- Customer service
- LLP/4PL services

(LSC-1) Which of the following logistics services does your company outsource (please choose all applicable services)?

- Domestic transportation
- Warehousing
- International transportation
- Freight forwarding
- Customs brokerage
- Reverse logistics (defective, repair, return)
- Cross-docking
- Freight bill auditing and payment
- Transportation planning and management
- Inventory management
- Product labelling, packaging, assembly, kitting
- Order management and fulfilment
- Service parts logistics

- Fleet management
- Information technology (IT) services
- Supply chain consultancy
- Customer service
- LLP/4PL services

(LSP-2) How many years have you provided the services to your customer? If you have several customers, think about ONLY ONE, which is the most important to your company.

- Less than 1 year
- 1-3 years
- 3-5 years
- More than 5 years

(LSC-2) How many years have you used the services provided by your LSP? If you have several providers, think about ONLY ONE, which is the most important to your company.

- Less than 1 year
- 1-3 years
- 3-5 years
- More than 5 years

(LSP-3) Approximately the total number of full-time employees in your company in China (if you are unsure, please estimate)

- Less than 100
- 101 to 250
- 251 to 500
- 501 to 1000
- Over 1000

(LSC-3) Approximately the total number of full-time employees in your company in China (if you are unsure, please estimate)

- Less than 100
- 101 to 250
- 251 to 500
- 501 to 1000
- Over 1000

(LSP-4) Type of your company

- Foreign owned
- Joint venture
- State-owned
- Private

(LSC-4) Type of your company

- Foreign owned
- Joint venture
- State-owned
- Private

SECTION C: INTER-ORGANISATIONAL COLLABORATION INFORMATION

(LSP-5) Please indicate how long you have been the member of this team?

- Less than 1 year
- 1-2 years
- 2-3 years
- More than 3 years

(LSC-5) Please indicate how long you have been the member of this team?

- Less than 1 year
- 1-2 years
- 2-3 years
- More than 3 years

(LSP-6) Which of the following best describes the frequency of your interactions (e.g., phone, email, in-person, etc.) with team members from the partnering company?

- Hourly
- Daily
- Weekly
- Monthly
- Quarterly

(LSC-6) Which of the following best describes the frequency of your interactions (e.g., phone, email, in-person, etc.) with team members from the partnering company?

- Hourly
- Daily
- Weekly
- Monthly
- Quarterly

Please indicate the level of agreement that you have with each statement below. The scale is interpreted as: (1) strongly disagree; (2) disagree; (3) somewhat disagree; (4) neither agree nor disagree; (5) somewhat agree; (6) agree; (7) strongly agree.

(LSP-7) Inter-organisational team identification

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(IOT-1) If someone were to criticize this team, it would feel like a personal insult.	1	2	3	4	5	6	7
(IOT-2) I am very interested in what others think about this team.	1	2	3	4	5	6	7
(IOT-3) If I were to talk about this team, I would say "we" rather than "they."	1	2	3	4	5	6	7
(IOT-4) This team's successes are my successes.	1	2	3	4	5	6	7
(IOT-5) If someone were to praise this team, it would feel like a personal compliment.	1	2	3	4	5	6	7

(LSC-7) Inter-organisational team identification

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(IOT-1) If someone were to criticize this team, it would feel like a personal insult.	1	2	3	4	5	6	7
(IOT-2) I am very interested in what others think about this team.	1	2	3	4	5	6	7
(IOT-3) If I were to talk about this team, I would say "we" rather than "they."	1	2	3	4	5	6	7
(IOT-4) This team's successes are my successes.	1	2	3	4	5	6	7
(IOT-5) If someone were to praise this team, it would feel like a personal compliment.	1	2	3	4	5	6	7

(LSP-8) Team mental model

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TMM-1) It was clear from the beginning what this team had to accomplish	1	2	3	4	5	6	7
(TMM-2) This team spent time making sure every team member understands the team objectives	1	2	3	4	5	6	7
(TMM-3) Team members understand what is expected of them in their respective roles	1	2	3	4	5	6	7
(TMM-4) Shortly after the start this team had a common	1	2	3	4	5	6	7

understanding of the task we had to handle							
(TMM-5) Shortly after the start this team had a common understanding of how to deal with the task	1	2	3	4	5	6	7

(LSC-8) Team mental model

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TMM-1) It was clear from the beginning what this team had to accomplish	1	2	3	4	5	6	7
(TMM-2) This team spent time making sure every team member understands the team objectives	1	2	3	4	5	6	7
(TMM-3) Team members understand what is expected of them in their respective roles	1	2	3	4	5	6	7
(TMM-4) Shortly after the start this team had a common understanding of the task we had to handle	1	2	3	4	5	6	7
(TMM-5) Shortly after the start this team had a common understanding of how to deal with the task	1	2	3	4	5	6	7

(LSP-9) Team trust (affective)

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TTA-1) We (the team) have a sharing relationship. We can openly share our ideas and feelings.	1	2	3	4	5	6	7
(TTA-2) We can talk freely to each other about difficulties we are having in completing the project and know that each other will listen.	1	2	3	4	5	6	7
(TTA-3) If I shared my ideas and project-related problems with the members of my team, I know they would respond constructively and caringly.	1	2	3	4	5	6	7

(LSC-9) Team trust (affective)

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
--	--------------------------	--	--	--	-----------------------	--	--

(TTA-1) We (the team) have a sharing relationship. We can openly share our ideas and feelings.	1	2	3	4	5	6	7
(TTA-2) We can talk freely to each other about difficulties we are having in completing the project and know that each other will listen.	1	2	3	4	5	6	7
(TTA-3) If I shared my ideas and project-related problems with the members of my team, I know they would respond constructively and caringly.	1	2	3	4	5	6	7

(LSP-10) Team trust (cognitive)

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TTC-1) The members of my team approach the team project with professionalism and dedication.	1	2	3	4	5	6	7
(TTC-2) Given the track record of my team members, I see no reason to doubt their competence and preparation for the upcoming presentation.	1	2	3	4	5	6	7
(TTC-3) I can rely on the members of my team not to make my job more difficult by careless work.	1	2	3	4	5	6	7

(LSC-10) Team trust (cognitive)

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TTC-1) The members of my team approach the team project with professionalism and dedication.	1	2	3	4	5	6	7
(TTC-2) Given the track record of my team members, I see no reason to doubt their competence and preparation for the upcoming presentation.	1	2	3	4	5	6	7
(TTC-3) I can rely on the members of my team not to make my job more difficult by careless work.	1	2	3	4	5	6	7

(LSP-11) Team communication

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
--	--------------------------	--	--	--	-----------------------	--	--

(TCM-1) Members in my team inform each other in advance of changing needs	1	2	3	4	5	6	7
(TCM-2) Members in my team share proprietary information with each other	1	2	3	4	5	6	7
(TCM-3) Members in my team provide any information that might help the partner's side	1	2	3	4	5	6	7
(TCM-4) Members in my team keep each other informed about events or changes that may affect the other side	1	2	3	4	5	6	7

(LSC-11) Team communication

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TCM-1) Members in my team inform each other in advance of changing needs	1	2	3	4	5	6	7
(TCM-2) Members in my team share proprietary information with each other	1	2	3	4	5	6	7
(TCM-3) Members in my team provide any information that might help the partner's side	1	2	3	4	5	6	7
(TCM-4) Members in my team keep each other informed about events or changes that may affect the other side	1	2	3	4	5	6	7

(LSP-12) Team performance

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TPM-1) This team is consistently a high performing team	1	2	3	4	5	6	7
(TPM-2) This team is effective	1	2	3	4	5	6	7
(TPM-3) This team makes few mistakes	1	2	3	4	5	6	7
(TPM-4) This team does high quality work	1	2	3	4	5	6	7

(LSC-12) Team performance

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TPM-1) This team is consistently a high performing team	1	2	3	4	5	6	7
(TPM-2) This team is effective	1	2	3	4	5	6	7

(TPM-3) This team makes few mistakes	1	2	3	4	5	6	7
(TPM-4) This team does high quality work	1	2	3	4	5	6	7

(LSP-13) Team commitment

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TCM-1) Members of this team feel emotionally attached to the team	1	2	3	4	5	6	7
(TCM-2) Members of this team feel a strong sense of belonging to the team	1	2	3	4	5	6	7
(TCM-3) Members of this team feel as if the team's problems are their own	1	2	3	4	5	6	7
(TCM-4) Members of this team feel like part of the family in the team	1	2	3	4	5	6	7

(LSC-13) Team commitment

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TCM-1) Members of this team feel emotionally attached to the team	1	2	3	4	5	6	7
(TCM-2) Members of this team feel a strong sense of belonging to the team	1	2	3	4	5	6	7
(TCM-3) Members of this team feel as if the team's problems are their own	1	2	3	4	5	6	7
(TCM-4) Members of this team feel like part of the family in the team	1	2	3	4	5	6	7

SECTION D: HOME ORGANISATION

Please indicate the level of agreement that you have with each statement. The scale is interpreted as: (1) strongly disagree; (2) disagree; (3) somewhat disagree; (4) neither agree nor disagree; (5) somewhat agree; (6) agree; (7) strongly agree.

(LSP-14) Home organisation identification

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(HOI-1) When someone criticises my organisation, it feels like a personal insult.	1	2	3	4	5	6	7

(HOI-2) I am very interested in what others think about my organisation.	1	2	3	4	5	6	7
(HOI-3) When I talk about this organisation, I usually say 'we' rather than 'they'.	1	2	3	4	5	6	7
(HOI-4) This organisation's successes are my successes.	1	2	3	4	5	6	7
(HOI-5) When someone praises this organisation, it feels like a personal compliment.	1	2	3	4	5	6	7

(LSC-14) Home organisation identification

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(HOI-1) When someone criticises my organisation, it feels like a personal insult.	1	2	3	4	5	6	7
(HOI-2) I am very interested in what others think about my organisation.	1	2	3	4	5	6	7
(HOI-3) When I talk about this organisation, I usually say 'we' rather than 'they'.	1	2	3	4	5	6	7
(HOI-4) This organisation's successes are my successes.	1	2	3	4	5	6	7
(HOI-5) When someone praises this organisation, it feels like a personal compliment.	1	2	3	4	5	6	7

SECTION E: LOGISTICS OUTSOURCING PERFORMANCE

Please indicate the level of agreement that you have with each statement. The scale is interpreted as: (1) strongly disagree; (2) disagree; (3) somewhat disagree; (4) neither agree nor disagree; (5) somewhat agree; (6) agree; (7) strongly agree.

(LSP-15) Logistics outsourcing performance

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(LOP-1) We completely fulfill the goals and expectations jointly set with the customer prior to this logistics outsourcing relationship.	1	2	3	4	5	6	7
(LOP-2) The customer is very satisfied with our services.	1	2	3	4	5	6	7

(LOP-3) The relationship with this customer is very good.	1	2	3	4	5	6	7
(LOP-4) We deliver the services always with the quality required by the customer.	1	2	3	4	5	6	7
(LOP-5) The goals and expectations we jointly set prior to this arrangement were significantly exceeded.	1	2	3	4	5	6	7
(LOP-6) The customer is significantly more satisfied with the quality of our services than it expected.	1	2	3	4	5	6	7
(LOP-7) The relationship between actual costs for this project and the overall service performance is much better than expected.	1	2	3	4	5	6	7

(LSC-15) Logistics outsourcing performance

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(LOP-1) Our LSP completely fulfills the goals and expectations we jointly set prior to this logistics outsourcing relationship.	1	2	3	4	5	6	7
(LOP-2) We are very satisfied with our LSP.	1	2	3	4	5	6	7
(LOP-3) The relationship with this LSP is very good.	1	2	3	4	5	6	7
(LOP-4) LSP delivers its service always with the required quality.	1	2	3	4	5	6	7
(LOP-5) The goals and expectations we jointly set prior to this arrangement were significantly exceeded.	1	2	3	4	5	6	7
(LOP-6) We are significantly more satisfied with the quality of the LSP services than we expected.	1	2	3	4	5	6	7
(LOP-7) The relationship between actual costs for this project and the overall service performance is much better than expected.	1	2	3	4	5	6	7

SECTION F: RESPONDENT PROFILE

(RP-1) Your current job title within the organisation.

(RP-2) Your role in the logistics outsourcing team

- Key contact person to the partnering firm
- Team member with operational duties

(RP-3) Your gender

- Male
- Female

(RP-4) If there are any comments you would like to contribute to the questionnaire or the research topic, please do so.

Thanks for your kind participation!

Appendix 11: On-line questionnaire (final, Chinese version)

参与者声明

- 我了解我被询问并要求确认同意参加本调研；
- 我已经阅读了中文版本的《参与者信息表》，并已明确知晓本调研相关的研究目的、程序以及风险等信息；
- 我同意所收集的、与我相关的个人信息仅用于本调研；
- 我同意参加本调研，并已明确知晓：我可以随时选择退出而不会影响我与相关研究人员或悉尼科技大学的关系；
- 我了解如果我对本调研有任何疑问，可以与刘士友先生联系。

问卷填写说明

以下为相关说明：

- 为确保所得信息的有效性与可靠性，请根据个人及所在企业的实际情况填写或回答本问卷（有些问题或选项看似重复）；标记有星号（*）的问题为必答问题；
- 请选取贵企业**某一个重要的合作伙伴**为调研背景来回答问卷。该合作伙伴必须是：1) 与贵企业有长期稳定的合作关系；2) 您在此合作关系中作为项目团队成员承担一定职责；
- 结合本次调研的目的，**物流服务供应商**包括以下两种企业：1) 为客户直接提供物流服务并进行管理；2) 代为协调管理多个物流服务供应商以便综合支持客户的物流运营；**物流外包客户**定义为“接受物流服务供应商提供的服务的任何企业”（可以是物流企业或者其他行业的企业）。
- 本次问卷调查约需10-15分钟。如果不能一次性完成，或在答题过程中意外关掉页面，仍可以点击原邀请邮件中的链接或重新扫描微信二维码继续填写问卷；
- 回答完所有问题后，请点击页面中的“提交”按钮。

1. 背景信息

(BI-1) 为实现调研目的，需要您根据问卷说明中的相关定义，确定所在企业的类型（唯一选项）。在回答本次问卷的过程中，您所在的企业将被定义为*

- 物流服务供应商
- 物流外包客户

2. 基本信息

(LSP-1) 贵企业为客户提供哪些物流服务（可多选）？

- 国内运输
- 仓储
- 国际运输
- 货运代理
- 报关代理
- 逆向物流
- 越库作业
- 运费审核及结算
- 运输规划及管理
- 库存管理
- 产品贴标签、包装、装配及配套拣货
- 订单管理及履行
- 服务配件物流
- 车队管理
- 信息技术服务
- 供应链咨询
- 客户服务
- 领先物流供应商/第三方物流服务

(LSC-1) 贵企业外包了哪些物流业务（可多选）？

- 国内运输
- 仓储
- 国际运输
- 货运代理
- 报关代理
- 逆向物流
- 越库作业
- 运费审核及结算
- 运输规划及管理
- 库存管理
- 产品贴标签、包装、装配及配套拣货
- 订单管理及履行

- 服务配件物流
- 车队管理
- 信息技术服务
- 供应链咨询
- 客户服务
- 领先物流供应商/第三方物流服务

(LSP-2) 贵企业与您的客户已经合作的年限？如有多个客户，请选取某一最重要合作伙伴为调研对象。

- 少于一年
- 1至3年
- 3至5年
- 5年以上

(LSC-2) 贵企业与您的物流服务供应商已经合作的年限？如有多个供应商，请选取某一最重要合作伙伴为调研对象。

- 少于一年
- 1至3年
- 3至5年
- 5年以上

(LSP-3) 贵企业在中国的员工人数？

- 少于100
- 101至250
- 251至500
- 501至1000
- 1000以上

(LSC-3) 贵企业在中国的员工人数？

- 少于100
- 101至250
- 251至500
- 501至1000
- 1000以上

(LSP-4) 企业性质

- 外商独资
- 合资
- 国有

- 私有

(LSC-4) 企业性质

- 外商独资
- 合资
- 国有
- 私有

3. 跨企业合作信息

(LSP-5) 您参与物流外包项目的工作年限?

- 少于 1 年
- 1 至 2 年
- 2 至 3 年
- 3 年以上

(LSC-5) 您参与物流外包项目的工作年限?

- 少于 1 年
- 1 至 2 年
- 2 至 3 年
- 3 年以上

(LSP-6) 您与客户员工的沟通频率?

- 每小时
- 每天
- 每周
- 每月
- 每季度或更长周期

(LSC-6) 您与供应商员工的沟通频率?

- 每小时
- 每天
- 每周
- 每月
- 每季度或更长周期

针对以下陈述，请表明您的同意程度：(1) 坚决不同意；(2) 不同意；(3) 基本不同意；(4) 中立；(5) 基本同意；(6) 同意；(7) 坚决同意。

(LSP-7) 跨企业团队的身份认同

	坚决不同意						坚决同意
(IOT-1) 我非常在意其他人对团队的想法	1	2	3	4	5	6	7
(IOT-2) 当谈到团队时，我倾向于使用“我们”而不是“他们”	1	2	3	4	5	6	7
(IOT-3) 团队的成功与我个人的成功密切相关	1	2	3	4	5	6	7
(IOT-4) 如果团队得到赞扬，我会觉得也是对我个人的正面评价	1	2	3	4	5	6	7

(LSC-7) 跨企业团队的身份认同

	坚决不同意						坚决同意
(IOT-1) 我非常在意其他人对团队的想法	1	2	3	4	5	6	7
(IOT-2) 当谈到团队时，我倾向于使用“我们”而不是“他们”	1	2	3	4	5	6	7
(IOT-3) 团队的成功与我个人的成功密切相关	1	2	3	4	5	6	7
(IOT-4) 如果团队得到赞扬，我会觉得也是对我个人的正面评价	1	2	3	4	5	6	7

(LSP-8) 跨企业团队的心智模式

	坚决不同意						坚决同意
(TMM-1) 项目初期即已明确物流外包团队的职能定位	1	2	3	4	5	6	7
(TMM-2) 每个成员均已明确整体的工作目标	1	2	3	4	5	6	7
(TMM-3) 团队成员均已明确个人在其中的角色及作用	1	2	3	4	5	6	7

(TMM-4) 项目开始运作的短时间内，团队即已对应承担的工作任务达成共识	1	2	3	4	5	6	7
(TMM-5) 项目开始运作的短时间内，团队即已对如何完成该工作任务达成共识	1	2	3	4	5	6	7

(LSC-8) 跨企业团队的心智模式

	坚决不同意				坚决同意		
(TMM-1) 项目初期即已明确物流外包团队的职能定位	1	2	3	4	5	6	7
(TMM-2) 每个成员均已明确整体的工作目标	1	2	3	4	5	6	7
(TMM-3) 团队成员均已明确个人在其中的角色及作用	1	2	3	4	5	6	7
(TMM-4) 项目开始运作的短时间内，团队即已对应承担的工作任务达成共识	1	2	3	4	5	6	7
(TMM-5) 项目开始运作的短时间内，团队即已对如何完成该工作任务达成共识	1	2	3	4	5	6	7

(LSP-9) 跨企业团队的信任（情感相关）

	坚决不同意				坚决同意		
(TTA-1) 团队成员可以坦诚地分享想法及感受。	1	2	3	4	5	6	7
(TTA-2) 团队成员可以就项目相关的困难自由地交流，并知道对方会认真倾听	1	2	3	4	5	6	7
(TTA-3) 如果我与团队成员分享自己的看法以及项目相关的问题，我知道对方会做出建设性的、关怀的回应	1	2	3	4	5	6	7

(LSC-9) 跨企业团队的信任 (情感相关)

	<i>坚决不同意</i>				<i>坚决同意</i>		
(TTA-1) 团队成员可以坦诚地分享想法及感受。	1	2	3	4	5	6	7
(TTA-2) 团队成员可以就项目相关的困难自由地交流, 并知道对方会认真倾听	1	2	3	4	5	6	7
(TTA-3) 如果我与团队成员分享自己的看法以及项目相关的问题, 我知道对方会做出建设性的、关怀的回应	1	2	3	4	5	6	7

(LSP-10) 跨企业团队的信任 (认知相关)

	<i>坚决不同意</i>				<i>坚决同意</i>		
(TTC-1) 团队成员以专业和奉献的态度来参与合作项目	1	2	3	4	5	6	7
(TTC-2) 鉴于团队成员过往的表现, 没有理由怀疑他们的能力及认真的合作态度	1	2	3	4	5	6	7
(TTC-3) 我可以依靠团队成员的帮助来避免由于自身粗心而引起的、职责相关的困扰	1	2	3	4	5	6	7

(LSC-10) 跨企业团队的信任 (认知相关)

	<i>坚决不同意</i>				<i>坚决同意</i>		
(TTC-1) 团队成员以专业和奉献的态度来参与合作项目	1	2	3	4	5	6	7
(TTC-2) 鉴于团队成员过往的表现, 没有理由怀疑他们的能力及认真的合作态度	1	2	3	4	5	6	7
(TTC-3) 我可以依靠团队成员的帮助来避免由于自身粗心而引起的、职责相关的困扰	1	2	3	4	5	6	7

(LSP-11) 跨企业团队的沟通

	坚决不同意				坚决同意		
(TCMN-1) 团队成员会在工作职责变化之前互相告知	1	2	3	4	5	6	7
(TCMN-2) 团队成员会彼此共享双方均相关的个人层面的信息	1	2	3	4	5	6	7
(TCMN-3) 团队成员会彼此共享对合作企业一方有帮助的任何信息	1	2	3	4	5	6	7
(TCMN-4) 团队成员彼此互通信息, 随时了解可能影响到对方的事件或变化	1	2	3	4	5	6	7

(LSC-11) 跨企业团队的沟通

	坚决不同意				坚决同意		
(TCMN-1) 团队成员会在工作职责变化之前互相告知	1	2	3	4	5	6	7
(TCMN-2) 团队成员会彼此共享双方均相关的个人层面的信息	1	2	3	4	5	6	7
(TCMN-3) 团队成员会彼此共享对合作企业一方有帮助的任何信息	1	2	3	4	5	6	7
(TCMN-4) 团队成员彼此互通信息, 随时了解可能影响到对方的事件或变化	1	2	3	4	5	6	7

(LSP-12) 跨企业团队的绩效

	坚决不同意				坚决同意		
(TPM-1) 团队具有可持续性的高绩效	1	2	3	4	5	6	7
(TPM-2) 团队具有执行力	1	2	3	4	5	6	7
(TPM-3) 团队很少出现工作失误	1	2	3	4	5	6	7
(TPM-4) 团队完成的任務质量很高	1	2	3	4	5	6	7

(LSC-12) 跨企业团队的绩效

	坚决不同意				坚决同意		
(TPM-1) 团队具有可持续性的高绩效	1	2	3	4	5	6	7
(TPM-2) 团队具有执行力	1	2	3	4	5	6	7
(TPM-3) 团队很少出现工作失误	1	2	3	4	5	6	7
(TPM-4) 团队完成的任務质量很高	1	2	3	4	5	6	7

4. 组织认同

针对以下陈述，请标明您的同意程度：(1) 坚决不同意；(2) 不同意；(3) 基本不同意；(4) 中立；(5) 基本同意；(6) 同意；(7) 坚决同意。

(LSP-13) 所就职企业的组织认同

	坚决不同意				坚决同意		
(HOI-1) 当谈到我所在的企业时，我倾向于使用“我们”而不是“他们”	1	2	3	4	5	6	7
(HOI-2) 企业的成功与我个人的成功密切相关	1	2	3	4	5	6	7
(HOI-3) 如果所在企业得到赞扬，我会觉得也是对我个人的正面评价	1	2	3	4	5	6	7

(LSC-13) 所就职企业的组织认同

	坚决不同意				坚决同意		
(HOI-1) 当谈到我所在的企业时，我倾向于使用“我们”而不是“他们”	1	2	3	4	5	6	7
(HOI-2) 企业的成功与我个人的成功密切相关	1	2	3	4	5	6	7
(HOI-3) 如果所在企业得到赞扬，我会觉得也是对我个人的正面评价	1	2	3	4	5	6	7

5. 物流外包绩效

针对以下陈述，请标明您的同意程度：(1) 坚决不同意；(2) 不同意；(3) 基本不同意；(4) 中立；(5) 基本同意；(6) 同意；(7) 坚决同意。

(LSP-14) 物流外包绩效

	<i>坚决不同意</i>							<i>坚决同意</i>						
(LOP-1) 作为物流服务供应商，我们能够完全实现与客户在合作之初所制定的目标及希望值。	1	2	3	4	5	6	7	1	2	3	4	5	6	7
(LOP-2) 客户对我们的表现非常满意。	1	2	3	4	5	6	7	1	2	3	4	5	6	7
(LOP-3) 我们与客户的合作关系非常融洽。	1	2	3	4	5	6	7	1	2	3	4	5	6	7
(LOP-4) 我们总是可以提供满足客户质量要求的服务。	1	2	3	4	5	6	7	1	2	3	4	5	6	7

(LSC-14) 物流外包绩效

	<i>坚决不同意</i>							<i>坚决同意</i>						
(LOP-1) 与我们合作的物流服务供应商能够完全实现由双方在合作之初所制定的目标及希望值。	1	2	3	4	5	6	7	1	2	3	4	5	6	7
(LOP-2) 我们对所合作供应商的表现非常满意。	1	2	3	4	5	6	7	1	2	3	4	5	6	7
(LOP-3) 我们与供应商的合作关系非常融洽。	1	2	3	4	5	6	7	1	2	3	4	5	6	7
(LOP-4) 供应商总是可以提供满足我们质量要求的服务。	1	2	3	4	5	6	7	1	2	3	4	5	6	7

6. 个人信息**(RP-1) 您目前的工作职位。**

(RP-2) 您目前在外包团队中的角色。

- 团队负责人/主管
- 团队成员

(RP-3) 您的性别

- 男性
- 女性

(RP-4) 如对本问卷或课题有任何建议或评价，请留言。

问卷调查到此结束，感谢您的合作！

Appendix 12: On-line questionnaire (final, English version)

DECLARATION BY THE PARTICIPANT

Research topic: Influences of inter-organisational team identification on logistics outsourcing performance: A boundary-spanning perspective

By checking the 'I agree, start questionnaire' button option below:

- I understand I am being asked to provide consent to participate in this research study;
- I have read the Participant Information Sheet in a language that I understand, acknowledging the purposes, procedures and risks of the research as described in the sheet;
- I provide my consent for the information collected about me to be used for the purpose of this research study only;
- I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney;
- I am aware that I can contact Mr. Shiyou Liu if I have any concerns about the research.

INSTRUCTIONS

The instructions below will assist you in completing the questionnaire:

- It is important that you answer ALL the questions in the questionnaire even if some questions look repetitive. A small set of required questions are identified with an asterisk (*).
- When answering questions related to your company's partner and/or the inter-organisational team (IOT), please think of **THE ONE KEY BUSINESS** with which your company has had a long-term logistics collaboration. This partnership should be regarded as **THE MOST IMPORTANT ONE** that you actively participate as a boundary spanning employee (BSE).
- For purposes of this study, a broad definition of LSP (Logistics service provider) is the company that provides/manages logistics services for its customers or that manage multiple logistics providers to facilitate its customer's logistics. And the customer is defined as any organisation that uses the services provided by LSP(s).
- It is estimated that the survey may take about 10-15 minutes to complete. If you are unable to finish the survey in one sitting or accidentally close your web browser without finishing the survey, you can return to finish the survey at a later time by clicking on the

ORIGINAL LINK in your email invitation or the QR CODE in your Wechat invitation.

- Please complete the survey online and click the “Submit” button when complete.

SECTION A: BACKGROUND INFORMATION

(BI-1) Is your company an LSP (logistics service provider) or customer (LSC) (if both, choose THE ONE that better describes your company)? *

- LSP
- LSC

SECTION B: GENERAL INFORMATION

(LSP-1) Which of the following logistics services does your company provide to customers (please choose all applicable services)?

- Domestic transportation
- Warehousing
- International transportation
- Freight forwarding
- Customs brokerage
- Reverse logistics (defective, repair, return)
- Cross-docking
- Freight bill auditing and payment
- Transportation planning and management
- Inventory management
- Product labelling, packaging, assembly, kitting
- Order management and fulfilment
- Service parts logistics
- Fleet management
- Information technology (IT) services
- Supply chain consultancy
- Customer service
- LLP/4PL services

(LSC-1) Which of the following logistics services does your company outsource (please choose all applicable services)?

- Domestic transportation
- Warehousing
- International transportation
- Freight forwarding
- Customs brokerage
- Reverse logistics (defective, repair, return)
- Cross-docking
- Freight bill auditing and payment
- Transportation planning and management
- Inventory management
- Product labelling, packaging, assembly, kitting
- Order management and fulfilment
- Service parts logistics

- Fleet management
- Information technology (IT) services
- Supply chain consultancy
- Customer service
- LLP/4PL services

(LSP-2) How many years have you provided the services to your customer? If you have several customers, think about ONLY ONE, which is the most important to your company.

- Less than 1 year
- 1-3 years
- 3-5 years
- More than 5 years

(LSC-2) How many years have you used the services provided by your LSP? If you have several providers, think about ONLY ONE, which is the most important to your company.

- Less than 1 year
- 1-3 years
- 3-5 years
- More than 5 years

(LSP-3) Approximately the total number of full-time employees in your company in China (if you are unsure, please estimate)

- Less than 100
- 101 to 250
- 251 to 500
- 501 to 1000
- Over 1000

(LSC-3) Approximately the total number of full-time employees in your company in China (if you are unsure, please estimate)

- Less than 100
- 101 to 250
- 251 to 500
- 501 to 1000
- Over 1000

(LSP-4) Type of your company

- Foreign owned
- Joint venture
- State-owned
- Private

(LSC-4) Type of your company

- Foreign owned
- Joint venture
- State-owned
- Private

SECTION C: INTER-ORGANISATIONAL COLLABORATION INFORMATION

(LSP-5) Please indicate how long you have been the member of this team?

- Less than 1 year
- 1-2 years
- 2-3 years
- More than 3 years

(LSC-5) Please indicate how long you have been the member of this team?

- Less than 1 year
- 1-2 years
- 2-3 years
- More than 3 years

(LSP-6) Which of the following best describes the frequency of your interactions (e.g., phone, email, in-person, etc.) with team members from the partnering company?

- Hourly
- Daily
- Weekly
- Monthly
- Quarterly

(LSC-6) Which of the following best describes the frequency of your interactions (e.g., phone, email, in-person, etc.) with team members from the partnering company?

- Hourly
- Daily
- Weekly
- Monthly
- Quarterly

Please indicate the level of agreement that you have with each statement below. The scale is interpreted as: (1) strongly disagree; (2) disagree; (3) somewhat disagree; (4) neither agree nor disagree; (5) somewhat agree; (6)

agree; (7) strongly agree.

(LSP-7) Inter-organisational team identification

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(IOT-1) I am very interested in what others think about this team.	1	2	3	4	5	6	7
(IOT-2) If I were to talk about this team, I would say "we" rather than "they."	1	2	3	4	5	6	7
(IOT-3) This team's successes are my successes.	1	2	3	4	5	6	7
(IOT-4) If someone were to praise this team, it would feel like a personal compliment.	1	2	3	4	5	6	7

(LSC-7) Inter-organisational team identification

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(IOT-1) I am very interested in what others think about this team.	1	2	3	4	5	6	7
(IOT-2) If I were to talk about this team, I would say "we" rather than "they."	1	2	3	4	5	6	7
(IOT-3) This team's successes are my successes.	1	2	3	4	5	6	7
(IOT-4) If someone were to praise this team, it would feel like a personal compliment.	1	2	3	4	5	6	7

(LSP-8) Team mental model

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TMM-1) It was clear from the beginning what this team had to accomplish	1	2	3	4	5	6	7
(TMM-2) This team spent time making sure every team member understands the team objectives	1	2	3	4	5	6	7
(TMM-3) Team members understand what is expected of them in their respective roles	1	2	3	4	5	6	7
(TMM-4) Shortly after the start this team had a common	1	2	3	4	5	6	7

understanding of the task we had to handle							
(TMM-5) Shortly after the start this team had a common understanding of how to deal with the task	1	2	3	4	5	6	7

(LSC-8) Team mental model

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TMM-1) It was clear from the beginning what this team had to accomplish	1	2	3	4	5	6	7
(TMM-2) This team spent time making sure every team member understands the team objectives	1	2	3	4	5	6	7
(TMM-3) Team members understand what is expected of them in their respective roles	1	2	3	4	5	6	7
(TMM-4) Shortly after the start this team had a common understanding of the task we had to handle	1	2	3	4	5	6	7
(TMM-5) Shortly after the start this team had a common understanding of how to deal with the task	1	2	3	4	5	6	7

(LSP-9) Team trust (affective)

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TTA-1) We (the team) have a sharing relationship. We can openly share our ideas and feelings.	1	2	3	4	5	6	7
(TTA-2) We can talk freely to each other about difficulties we are having in completing the project and know that each other will listen.	1	2	3	4	5	6	7
(TTA-3) If I shared my ideas and project-related problems with the members of my team, I know they would respond constructively and caringly.	1	2	3	4	5	6	7

(LSC-9) Team trust (affective)

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TTA-1) We (the team) have a sharing relationship. We can openly share our ideas and feelings.	1	2	3	4	5	6	7
(TTA-2) We can talk freely to each other about difficulties we are having in completing the project and know that each other will listen.	1	2	3	4	5	6	7
(TTA-3) If I shared my ideas and project-related problems with the members of my team, I know they would respond constructively and caringly.	1	2	3	4	5	6	7

(LSP-10) Team trust (cognitive)

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TTC-1) The members of my team approach the team project with professionalism and dedication.	1	2	3	4	5	6	7
(TTC-2) Given the track record of my team members, I see no reason to doubt their competence and preparation for the upcoming presentation.	1	2	3	4	5	6	7
(TTC-3) I can rely on the members of my team not to make my job more difficult by careless work.	1	2	3	4	5	6	7

(LSC-10) Team trust (cognitive)

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TTC-1) The members of my team approach the team project with professionalism and dedication.	1	2	3	4	5	6	7
(TTC-2) Given the track record of my team members, I see no reason to doubt their competence and preparation for the upcoming presentation.	1	2	3	4	5	6	7
(TTC-3) I can rely on the members of my team not to make my job more difficult by careless work.	1	2	3	4	5	6	7

(LSP-11) Team communication

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TCMN-1) Members in my team inform each other in advance of changing needs	1	2	3	4	5	6	7
(TCMN-2) Members in my team share proprietary information with each other	1	2	3	4	5	6	7
(TCMN-3) Members in my team provide any information that might help the partner's side	1	2	3	4	5	6	7
(TCMN-4) Members in my team keep each other informed about events or changes that may affect the other side	1	2	3	4	5	6	7

(LSC-11) Team communication

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TCMN-1) Members in my team inform each other in advance of changing needs	1	2	3	4	5	6	7
(TCMN-2) Members in my team share proprietary information with each other	1	2	3	4	5	6	7
(TCMN-3) Members in my team provide any information that might help the partner's side	1	2	3	4	5	6	7
(TCMN-4) Members in my team keep each other informed about events or changes that may affect the other side	1	2	3	4	5	6	7

(LSP-12) Team performance

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(TPM-1) This team is consistently a high performing team	1	2	3	4	5	6	7
(TPM-2) This team is effective	1	2	3	4	5	6	7
(TPM-3) This team makes few mistakes	1	2	3	4	5	6	7
(TPM-4) This team does high quality work	1	2	3	4	5	6	7

(LSC-12) Team performance

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
--	--------------------------	--	--	--	-----------------------	--	--

(TPM-1) This team is consistently a high performing team	1	2	3	4	5	6	7
(TPM-2) This team is effective	1	2	3	4	5	6	7
(TPM-3) This team makes few mistakes	1	2	3	4	5	6	7
(TPM-4) This team does high quality work	1	2	3	4	5	6	7

SECTION D: HOME ORGANISATION

Please indicate the level of agreement that you have with each statement. The scale is interpreted as: (1) strongly disagree; (2) disagree; (3) somewhat disagree; (4) neither agree nor disagree; (5) somewhat agree; (6) agree; (7) strongly agree.

(LSP-13) Home organisation identification

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(HOI-1) When I talk about this organisation, I usually say 'we' rather than 'they'.	1	2	3	4	5	6	7
(HOI-2) This organisation's successes are my successes.	1	2	3	4	5	6	7
(HOI-3) When someone praises this organisation, it feels like a personal compliment.	1	2	3	4	5	6	7

(LSC-13) Home organisation identification

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(HOI-1) When I talk about this organisation, I usually say 'we' rather than 'they'.	1	2	3	4	5	6	7
(HOI-2) This organisation's successes are my successes.	1	2	3	4	5	6	7
(HOI-3) When someone praises this organisation, it feels like a personal compliment.	1	2	3	4	5	6	7

SECTION E: LOGISTICS OUTSOURCING PERFORMANCE

Please indicate the level of agreement that you have with each statement. The scale is interpreted as: (1) strongly disagree; (2) disagree; (3) somewhat disagree; (4) neither agree nor disagree; (5) somewhat agree; (6) agree; (7) strongly agree.

(LSP-14) Logistics outsourcing performance

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(LOP-1) We completely fulfill the goals and expectations jointly set with the customer prior to this logistics outsourcing relationship.	1	2	3	4	5	6	7
(LOP-2) The customer is very satisfied with our services.	1	2	3	4	5	6	7
(LOP-3) The relationship with this customer is very good.	1	2	3	4	5	6	7
(LOP-4) We deliver the services always with the quality required by the customer.	1	2	3	4	5	6	7

(LSC-14) Logistics outsourcing performance

	<i>Strongly disagree</i>				<i>Strongly agree</i>		
(LOP-1) Our LSP completely fulfills the goals and expectations we jointly set prior to this logistics outsourcing relationship.	1	2	3	4	5	6	7
(LOP-2) We are very satisfied with our LSP.	1	2	3	4	5	6	7
(LOP-3) The relationship with this LSP is very good.	1	2	3	4	5	6	7
(LOP-4) LSP delivers its service always with the required quality.	1	2	3	4	5	6	7

SECTION F: RESPONDENT PROFILE

(RP-1) Your current job title within the organisation.

(RP-2) Your role in the logistics outsourcing team

- Key contact person to the partnering firm
- Team member with operational duties

(RP-3) Your gender

- Male
- Female

(RP-4) If there are any comments you would like to contribute to the questionnaire or the research topic, please do so.

Thanks for your kind participation!

Appendix 13: Statistical ways of determining sample size (quantitative)

Formula	Components	Reference
$n = \left(1 - \frac{n}{N}\right) \times \frac{t^2(p \times q)}{d^2}$ <p>= finite population correction \times $\frac{\text{probability level} \times \text{variance}}{\text{confidence interval}}$</p>	<p>n = the sample size or the number of completed interviews;</p> <p>N = the size of the eligible population;</p> <p>t^2 = the squared value of the standard deviation score that refers to the area under a normal distribution of values;</p> <p>p = the percentage category for which we are computing the sample size;</p> <p>q = 1 – p;</p> <p>d^2 = the squared value of one-half of the precision interval around the sample estimate.</p>	Blair, Czaja, and Blair (2013)
$n^a = \frac{n \times 100}{re\%}$	<p>n^a = the actual sample size required;</p> <p>n = the minimum sample size;</p> <p>re% = the estimated response rate expressed as a percentage.</p>	M. N. K. Saunders et al. (2023)
$n = \frac{z^2 \times SD^2}{e}$	<p>N = the minimum sample size;</p> <p>z = degree of confidence required;</p> <p>SD = the standard deviation;</p> <p>E = acceptable amount of sample error.</p>	Gray (2021)

Appendix 14: Survey invitation letter (e-mail)

Dear [*name of the targeted participant*],

My name is Shiyu Liu and I am a PhD candidate at the University of Technology, Sydney.

I am conducting research into logistics outsourcing and sincerely invite you to participate in the survey on INFLUENCES OF INTER-ORGANISATIONAL TEAM IDENTIFICATION ON LOGISTICS OUTSOURCING PERFORMANCE: A BOUNDARY-SPANNING PERSPECTIVE.

During the past two decades, logistics outsourcing has become a potential solution to helping firms focus on core business and gain competitive advantage. Whilst many companies have successfully benefited from logistics outsourcing, some others have struggled or even failed to do so. Therefore, to further explore relevant issues of logistics outsourcing is heavily essential for firms to develop rigorous and implementable solutions applicable in reality. In the context of supply chain relationship management and boundary spanning team identification, it is potentially worthwhile of further exploring such questions as: the function of inter-organisational team identification, the mechanisms of its influences on team effectiveness when managing outsourcing activities, the criteria to evaluate outsourcing outcomes and so on.

With you help, this survey aims to investigate how and the extent to which inter-organisational team identification may influence team effectiveness and ultimately logistics outsourcing performance. Your position and industry segment make you uniquely qualified to help with this survey and contribute to the study's success. I would greatly appreciate it if you would fully complete an online questionnaire via the Qualtrics link below, directing you to a secure web site:

https://utsau.au1.qualtrics.com/jfe/form/SV_08r3F6iRoVB2t82

This survey will take approximately 10-15 minutes to complete. Strict confidentiality to the survey is assured. The survey data will be analysed and written up as academic research and the potential outputs may be thesis, internal reports and/or academic publication. The result of this survey will be reported only in summary form and no mention of particular firms or participants will be given.

If you would like to receive a copy of the finding report from this research, please send me your request to me at shiyou.liu@student.uts.edu.au. If you have any questions about the survey you may use the same email to get your response. Alternatively, you could contact the local person for this research: Jason Min Gao at gaom@cscmpChina.org.

Thank you very much for your contribution to this significant logistics outsourcing research study!

Yours sincerely,

Shiyou Liu, PhD candidate
Management Discipline Group,
UTS Business School,
University of Technology Sydney,
PO Box 123, Broadway NSW 2007,
Australia
+61 2 9514 3614
shiyou.liu@student.uts.edu.au

NOTE:

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 2478 Research.Ethics@uts.edu.au), and quote the UTS HREC reference number. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

调研邀请函

尊敬的____先生/女士:

您好! 我是澳大利亚悉尼科技大学商学院在读博士生刘士友, 在此诚挚邀请您参与我们正在进行的一项关于**中国物流外包行业发展现状**的学术研究。

在过去的数十年间, 物流外包在帮助众多企业聚焦核心业务、提升竞争优势等方面发挥了巨大的作用。与此同时, 某些企业在实施外包策略后却收效不明显, 甚至在运营成本和效率方面起到了负面作用。这一现状对商业界和学术界都提出了挑战, 并促使双方意识到了合作研究的重要性: 通过对供应链内相关企业的物流外包合作项目的运作进行更深层次的探索研究, 寻找并制定在实际操作中具有可执行性的解决方案。

基于供应链关系管理与跨企业边界团队身份认同的双重理论框架, 本次调研的课题最终确定为“**从边界跨越的角度来分析跨企业团队的身份认同及其对物流外包绩效的影响**”。本次调研以第三方物流公司及其客户为研究对象, 通过对合作项目团队成员的调研, 深入了解并验证: 1) 跨企业团队的身份认同是否会影团队效能; 2) 如有影响, 则通过何种机制并在何种程度上产生作用; 3) 受影响的团队效能将如何影响到最终的物流外包绩效。

经由行业机构及业界权威人士的举荐, 在此郑重邀请并希望您可以参与本次调研, 并基于本人工作经验及对所在公司的相关运营状况回答有关问题。请点击下面链接

https://utsau.au1.qualtrics.com/jfe/form/SV_08r3F6iRoVB2t82

或扫描下方二维码进入在线问卷环节:



再次感谢您的支持并郑重承诺: 您提供的所有信息将仅做学术研究使用, 最终的研究报告将整体分析数据和结论, 对所涉及的企业及个人信息严格保密。如有任何疑问或建议, 请与我联系: shiyu.liu@student.uts.edu.au。

衷心感谢您的参与!

刘士友

澳大利亚悉尼科技大学商学院管理系

电话: +61 2 9514 3614

电子邮件: shiyou.liu@student.uts.edu.au

声明:

该调研已通过悉尼科技大学人伦研究委员会审核并批准。如与调研人员就参与此次问卷调查相关的问题有任何疑问,您可以通过以下方式直接联系委员会相关人员(电话: +61 2 9514 2478; 电子邮件: Research.Ethics@uts.edu.au),并提供 UTS HREC 参考编号以获取支持。我们将尽全力调查您的任何疑虑并告知处理结果,同时保证所有信息完全保密。

Appendix 15: Participant information statement (attached to the survey invitation letter)



**Management Discipline Group
UTS Business Scholl,
University of Technology Sydney
Broadway NSW 2007
Australia**

**澳大利亚悉尼科技大学
商学院管理系**

Participant Information Statement (Online survey)

在线调研信息说明及同意书

Title: Influences of Inter-organisational Team Identification on Logistics Outsourcing Performance: A Boundary-spanning Perspective

研究课题: “从边界跨越的角度来分析跨企业团队的身份认同及其对物流外包绩效的影响”

UTS approval number: UTS HREC REF NO. ETH19-3711

悉尼科技大学项目获批编号: **UTS HREC REF NO. ETH19-3711**

What is the research study about?

The purpose of this research/online survey is to investigate how and the extent to which inter-organisational team identification may influence team effectiveness and ultimately logistics outsourcing performance.

You have been invited to participate because your position and industry segment make you uniquely qualified to help with this survey and contribute to the study's success.

调研背景

本次在线调查的目的为探究跨企业团队的身份认同对团队效能及物流外包绩效的影响。经由行业机构及业界权威人士的举荐，邀请您参与本次调研。

Who is conducting this research?

My name is Shiyou Liu Shiyou.liu@student.uts.edu.au and I am a PhD student at UTS. Other investigators in the research team are my supervisors: Dr. Sanjoy Paul Sanjoy.Paul@uts.edu.au; Dr. Maruf Chowdhury Maruf.Chowdhury@uts.edu.au; and Dr. Moira Scerri Moira.Scerri@uts.edu.au.

调研主体:

悉尼科技大学商学院在读博士生刘士友 (电邮: shiyou.liu@student.uts.edu.au)。导师为: Sanjoy Paul 博士 (电邮: Sanjoy.Paul@uts.edu.au) ; Maruf Chowdhury 博士 (电邮: Maruf.Chowdhury@uts.edu.au) ; Moira Scerri 博士 (电邮: Moira.Scerri@uts.edu.au) 。

Inclusion/Exclusion Criteria

Before you decide to participate in this research study, we need to ensure that it is ok for you to take part. To ensure that the participants are capable of answering questions, the survey targets are limited to employees who deal directly with their counterparts in the partnering firm (i.e. operational boundary spanning employees). It should be bear in mind that the respondents should be selected in the context of inter-organisational team-based logistics outsourcing project, consisting of the members from either logistics service providers or customers.

调研对象

为确保参与者具有与本次调研相匹配的从业背景以便准确有效地回答相关问题, 本此问卷调查对象包括以下两个范畴: 1) 代表所在企业与合作方的员工在日常运营方面有直接联系与合作的员工 (即跨企业边界的、参与物流外包项目的操作人员); 2) 管理物流外包合作项目的中高层经理级别员工 (即跨企业边界的管理人员: 物流企业的业务拓展/大客户经理或与物流外包企业的服务采购/运营管理经理) 。

Do I have to take part in this research study?

Participation in this study is voluntary. It is completely up to you whether or not you decide to take part. If you decide to participate, I will invite you to complete this questionnaire. You can change your mind at any time and stop completing the surveys without consequences.

参与意愿

您自主决定是否参与调研。如接受在线调查邀请并已开始回答问卷, 您仍有权利改变意愿, 可自行决定在任何阶段停止参与调研并不用承担任何后果。

What will happen to information about me?

Submission of the online questionnaire is an indication of your consent. By clicking the 'I agree, start questionnaire' button at the end of this section, you

consent to the research team collecting and using the information you provide for the research study. In all instances, your information will be treated confidentially and anonymously and all possible identifying characteristics are separated from the publicly available data:

- Information collected from you in an electronic format stored on a UTS password protected, research dedicated database only accessible to agreed members of the research team listed at the above section “WHO IS DOING THE RESEARCH”;
- Codes for each participant, firms and place will be used in the thesis/publications/internal reports to protect identities.

个人信息

在回答完所有问题后，点击“提交”按钮即默认您已同意调研人员获取并使用您提供的所有信息用于后续研究。所有信息将严格保密，任何个人及企业相关的、具有身份辨识度的信息均不会对外公布。本次调研所获取的信息将可能会用于后续的其他研究项目。在任何情况下，您提供的所有信息仍将严格保密。

What if I have concerns or a complaint?

If you have concerns about the research that you think I or my supervisors can help you with, please feel free to contact us on the emails provided above.

If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer on 02 9514 9772 or Research.ethics@uts.edu.au and quote this number [ETH19-3711].

相关疑问

如您有任何相关问题需要我或我的导师进行解答，请通过“调研主体”部分提供的电子邮件随时联系。如您希望与和本次调研项目无相关利益的人员沟通，您可以通过以下方式直接联系悉尼科技大学研究伦理委员会（电话: +61 2 9514 2478; 电子邮件: Research.ethics@uts.edu.au），并提供 UTS HREC 参考编号 (ETH19-3711) 以获取支持。

Appendix 16: A remind letter for logistics outsourcing survey

Dear CSCMP China members,

Recently we sent you a request to participate in a survey conducted by CSCMP China and Shiyu Liu at University of Technology Sydney (UTS), Australia. Please consider adding your feedback on your experiences as a professional in logistics industry.

The link for the survey is:

https://utsau.au1.qualtrics.com/jfe/form/SV_08r3F6iRoVB2t82

Simply click on this address to go to directly to the survey. If the link does not work, copy and paste the above URL into the address bar of your internet browser. Your participation in this research is strictly voluntary.

Thank you for participating in this important research.

Yours sincerely,

Shiyu Liu, PhD candidate

Management Discipline Group,

UTS Business School,

University of Technology Sydney,
PO Box 123, Broadway NSW 2007,
Australia

+61 2 9514 3614

shiyu.liu@student.uts.edu.au

NOTE:

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 2478 Research.Ethics@uts.edu.au), and quote the UTS HREC reference number. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

Appendix 17: Original output of PROCESS analysis (Model 4)

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 4.1 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
 Documentation available in Hayes (2022). www.guilford.com/p/hayes3

Model: 4

Y: TPM
 X: IOT
 M1: TMM
 M2: TTA
 M3: TTC
 M4: TCMN

Covariates:

CV_RD CV_FS CV_OT CV_TT HOI

Sample

Size: 438

OUTCOME VARIABLE:

TMM

Model Summary

	R	R-sq	MSE	F(HC4)	df1	df2	p
	.502	.252	.798	22.872	6.000	431.000	.000

Model

	coeff	se (HC4)	t	p	LLCI	ULCI
constant	2.016	.341	5.912	.000	1.346	2.686
IOT	.391	.052	7.576	.000	.290	.493
CV_RD	-.124	.054	-2.300	.022	-.231	-.018
CV_FS	-.024	.036	-.661	.509	-.096	.048
CV_OT	-.059	.033	-1.756	.080	-.124	.007
CV_TT	.088	.056	1.575	.116	-.022	.198
HOI	.267	.051	5.240	.000	.167	.368

Standardized coefficients

	coeff
IOT	.352
CV_RD	-.100
CV_FS	-.033
CV_OT	-.072
CV_TT	.083
HOI	.254

OUTCOME VARIABLE:

TTA

Model Summary

	R	R-sq	MSE	F(HC4)	df1	df2	p
	.479	.229	.657	17.894	6.000	431.000	.000

Model

	coeff	se (HC4)	t	p	LLCI	ULCI
constant	2.614	.335	7.806	.000	1.956	3.272
IOT	.262	.047	5.609	.000	.170	.354
CV_RD	-.048	.052	-.917	.360	-.151	.055

CV_FS	-.015	.032	-.454	.650	-.078	.049
CV_OT	-.035	.032	-1.095	.274	-.099	.028
CV_TT	-.017	.049	-.353	.724	-.113	.079
HOI	.312	.048	6.530	.000	.218	.406

Standardized coefficients

	coeff
IOT	.264
CV_RD	-.043
CV_FS	-.022
CV_OT	-.048
CV_TT	-.018
HOI	.332

OUTCOME VARIABLE:

TTC

Model Summary

R	R-sq	MSE	F(HC4)	df1	df2	p
.507	.257	.768	23.620	6.000	431.000	.000

Model

	coeff	se (HC4)	t	p	LLCI	ULCI
constant	1.870	.381	4.905	.000	1.121	2.619
IOT	.204	.056	3.623	.000	.093	.315
CV_RD	-.040	.058	-.684	.494	-.155	.075
CV_FS	.000	.037	-.007	.994	-.073	.072
CV_OT	-.024	.034	-.719	.473	-.091	.042
CV_TT	.067	.055	1.225	.221	-.041	.176
HOI	.432	.053	8.223	.000	.329	.535

Standardized coefficients

	coeff
IOT	.187
CV_RD	-.033
CV_FS	.000
CV_OT	-.030
CV_TT	.065
HOI	.417

OUTCOME VARIABLE:

TCMN

Model Summary

R	R-sq	MSE	F(HC4)	df1	df2	p
.484	.234	.944	21.011	6.000	431.000	.000

Model

	coeff	se (HC4)	t	p	LLCI	ULCI
constant	1.901	.379	5.019	.000	1.157	2.646
IOT	.206	.057	3.623	.000	.094	.318
CV_RD	-.026	.058	-.449	.654	-.139	.088
CV_FS	-.018	.038	-.488	.626	-.092	.056
CV_OT	-.050	.038	-1.331	.184	-.124	.024
CV_TT	-.041	.054	-.751	.453	-.148	.066
HOI	.461	.055	8.337	.000	.352	.570

Standardized coefficients

	coeff
IOT	.172
CV_RD	-.019
CV_FS	-.023
CV_OT	-.057
CV_TT	-.036

HOI .407

OUTCOME VARIABLE:

TPM

Model Summary

	R	R-sq	MSE	F(HC4)	df1	df2	p
	.692	.479	.543	39.994	10.000	427.000	.000

Model

	coeff	se (HC4)	t	p	LLCI	ULCI
constant	.714	.340	2.100	.036	.046	1.381
IOT	.037	.045	.835	.404	-.050	.125
TMM	.153	.048	3.200	.001	.059	.248
TTA	.015	.057	.273	.785	-.096	.127
TTC	.182	.050	3.668	.000	.085	.280
TCMN	.295	.047	6.325	.000	.203	.386
CV_RD	-.028	.049	-.566	.572	-.123	.068
CV_FS	-.042	.029	-1.432	.153	-.099	.016
CV_OT	-.029	.028	-1.020	.308	-.084	.027
CV_TT	.057	.044	1.295	.196	-.030	.143
HOI	.210	.054	3.918	.000	.105	.316

Standardized coefficients

	coeff
IOT	.034
TMM	.156
TTA	.014
TTC	.182
TCMN	.322
CV_RD	-.023
CV_FS	-.058
CV_OT	-.036
CV_TT	.055
HOI	.203

Test(s) of X by M interaction:

	F(HC4)	df1	df2	p
M1*X	.595	1.000	426.000	.441
M2*X	.311	1.000	426.000	.577
M3*X	1.025	1.000	426.000	.312
M4*X	1.964	1.000	426.000	.162

***** TOTAL EFFECT MODEL *****

OUTCOME VARIABLE:

TPM

Model Summary

	R	R-sq	MSE	F(HC4)	df1	df2	p
	.543	.294	.728	26.152	6.000	431.000	.000

Model

	coeff	se (HC4)	t	p	LLCI	ULCI
constant	1.964	.379	5.183	.000	1.220	2.709
IOT	.199	.048	4.117	.000	.104	.294
CV_RD	-.062	.057	-1.090	.277	-.175	.050
CV_FS	-.051	.032	-1.617	.107	-.113	.011
CV_OT	-.058	.032	-1.774	.077	-.121	.006
CV_TT	.070	.048	1.469	.143	-.024	.165
HOI	.471	.050	9.459	.000	.373	.569

Standardized coefficients

	coeff
IOT	.182
CV_RD	-.051

CV_FS -.071
 CV_OT -.072
 CV_TT .068
 HOI .455

***** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y *****

Total effect of X on Y
 Effect se (HC4) t p LLCI ULCI c'_cs
 .199 .048 4.117 .000 .104 .294 .182

Direct effect of X on Y
 Effect se (HC4) t p LLCI ULCI c'_cs
 .037 .045 .835 .404 -.050 .125 .034

Indirect effect(s) of X on Y:
 Effect BootSE BootLLCI BootULCI
 TOTAL .162 .034 .099 .235
 TMM .060 .020 .023 .103
 TTA .004 .015 -.024 .036
 TTC .037 .015 .012 .070
 TCMN .061 .020 .026 .105
 (C1) .056 .027 .003 .111
 (C2) .023 .024 -.024 .070
 (C3) -.001 .027 -.055 .050
 (C4) -.033 .023 -.082 .011
 (C5) -.057 .025 -.110 -.009
 (C6) -.024 .025 -.073 .023

Completely standardized indirect effect(s) of X on Y:
 Effect BootSE BootLLCI BootULCI
 TOTAL .148 .030 .092 .211
 TMM .055 .018 .021 .094
 TTA .004 .014 -.022 .033
 TTC .034 .014 .011 .064
 TCMN .056 .018 .023 .093
 (C1) .051 .025 .003 .101
 (C2) .021 .022 -.022 .064
 (C3) -.001 .025 -.050 .045
 (C4) -.030 .021 -.075 .011
 (C5) -.052 .023 -.099 -.008
 (C6) -.022 .022 -.067 .021

Specific indirect effect contrast definition(s):
 (C1) TMM minus TTA
 (C2) TMM minus TTC
 (C3) TMM minus TCMN
 (C4) TTA minus TTC
 (C5) TTA minus TCMN
 (C6) TTC minus TCMN

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
 95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
 5000

NOTE: A heteroscedasticity consistent standard error and covariance matrix estimator was used.

----- END MATRIX -----

Appendix 18: Original output of PROCESS analysis (Model 7)

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 4.1 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
 Documentation available in Hayes (2022). www.guilford.com/p/hayes3

Model: 7

Y: TPM
 X: IOT
 M1: TMM
 M2: TTA
 M3: TTC
 M4: TCMN
 W: HOI

Covariates:

CV_RD CV_FS CV_OT CV_TT

Sample

Size: 438

OUTCOME VARIABLE:

TMM

Model Summary

	R	R-sq	MSE	F	df1	df2	p
	.505	.255	.798	20.986	7.000	430.000	.000

Model

	coeff	se	t	p	LLCI	ULCI
constant	5.563	.193	28.817	.000	5.184	5.943
IOT	.391	.048	8.083	.000	.296	.487
HOI	.259	.046	5.592	.000	.168	.350
Int_1	-.051	.046	-1.120	.263	-.141	.039
CV_RD	-.125	.054	-2.331	.020	-.230	-.020
CV_FS	-.024	.034	-.706	.481	-.091	.043
CV_OT	-.060	.035	-1.745	.082	-.128	.008
CV_TT	.092	.050	1.824	.069	-.007	.190

Product terms key:

Int_1: IOT x HOI

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.002	1.254	1.000	430.000	.263

Focal predict: IOT (X)
 Mod var: HOI (W)

Data for visualizing the conditional effect of the focal predictor:
 Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/

IOT	HOI	TMM.
-.923	-.974	4.604
.000	-.974	5.011
.923	-.974	5.419
-.923	.000	4.902
.000	.000	5.264

```

      .923      .000      5.625
    -.923      .974      5.201
      .000      .974      5.516
      .923      .974      5.831

```

END DATA.

GRAPH/SCATTERPLOT=

IOT WITH TMM BY HOI.

OUTCOME VARIABLE:

TTA

Model Summary

R	R-sq	MSE	F	df1	df2	p
.481	.232	.657	18.539	7.000	430.000	.000

Model

	coeff	se	t	p	LLCI	ULCI
constant	5.694	.175	32.518	.000	5.350	6.039
IOT	.263	.044	5.976	.000	.176	.349
HOI	.305	.042	7.245	.000	.222	.387
Int_1	-.048	.042	-1.149	.251	-.129	.034
CV_RD	-.049	.049	-.999	.318	-.144	.047
CV_FS	-.015	.031	-.474	.636	-.076	.046
CV_OT	-.037	.031	-1.179	.239	-.099	.025
CV_TT	-.014	.046	-.308	.759	-.103	.075

Product terms key:

Int_1: IOT x HOI

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.002	1.319	1.000	430.000	.251

Focal predict: IOT (X)

Mod var: HOI (W)

Data for visualizing the conditional effect of the focal predictor:

Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/

IOT HOI TTA.

BEGIN DATA.

```

    -.923    -.974    4.813
     .000    -.974    5.098
     .923    -.974    5.384
    -.923     .000    5.153
     .000     .000    5.395
     .923     .000    5.637
    -.923     .974    5.492
     .000     .974    5.692
     .923     .974    5.891

```

END DATA.

GRAPH/SCATTERPLOT=

IOT WITH TTA BY HOI.

OUTCOME VARIABLE:

TTC

Model Summary

R	R-sq	MSE	F	df1	df2	p
.507	.257	.770	21.287	7.000	430.000	.000

Model

coeff	se	t	p	LLCI	ULCI
-------	----	---	---	------	------

constant	5.255	.190	27.721	.000	4.883	5.628
IOT	.204	.048	4.291	.000	.111	.298
HOI	.431	.046	9.481	.000	.342	.521
Int_1	-.003	.045	-.076	.939	-.092	.085
CV_RD	-.040	.053	-.760	.448	-.143	.063
CV_FS	.000	.034	-.008	.993	-.066	.066
CV_OT	-.025	.034	-.723	.470	-.091	.042
CV_TT	.068	.049	1.373	.170	-.029	.165

Product terms key:

Int_1: IOT x HOI

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.000	.006	1.000	430.000	.939

Focal predict: IOT (X)

Mod var: HOI (W)

Data for visualizing the conditional effect of the focal predictor:
 Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/

```

IOT      HOI      TTC.
BEGIN DATA.
  -.923   -.974   4.665
   .000   -.974   4.857
   .923   -.974   5.048
  -.923   .000   5.089
   .000   .000   5.277
   .923   .000   5.465
  -.923   .974   5.512
   .000   .974   5.697
   .923   .974   5.883

```

END DATA.

GRAPH/SCATTERPLOT=

IOT WITH TTC BY HOI.

OUTCOME VARIABLE:

TCMN

Model Summary

	R	R-sq	MSE	F	df1	df2	p
	.491	.241	.938	19.524	7.000	430.000	.000

Model

	coeff	se	t	p	LLCI	ULCI
constant	5.465	.209	26.112	.000	5.054	5.877
IOT	.206	.053	3.928	.000	.103	.309
HOI	.445	.050	8.860	.000	.346	.544
Int_1	-.098	.050	-1.971	.049	-.195	.000
CV_RD	-.027	.058	-.462	.645	-.141	.087
CV_FS	-.019	.037	-.498	.619	-.091	.054
CV_OT	-.054	.038	-1.429	.154	-.127	.020
CV_TT	-.034	.054	-.630	.529	-.141	.073

Product terms key:

Int_1: IOT x HOI

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.007	3.883	1.000	430.000	.049

Focal predict: IOT (X)

Mod var: HOI (W)

Conditional effects of the focal predictor at values of the moderator(s):

HOI	Effect	se	t	p	LLCI	ULCI
-.974	.302	.071	4.217	.000	.161	.442
.000	.206	.053	3.928	.000	.103	.309
.974	.111	.071	1.559	.120	-.029	.251

Moderator value(s) defining Johnson-Neyman significance region(s):

Value	% below	% above
.793	93.607	6.393

Conditional effect of focal predictor at values of the moderator:

HOI	Effect	se	t	p	LLCI	ULCI
-3.263	.525	.170	3.084	.002	.190	.860
-3.013	.501	.159	3.158	.002	.189	.812
-2.763	.476	.147	3.242	.001	.188	.765
-2.513	.452	.135	3.337	.001	.186	.718
-2.263	.427	.124	3.445	.001	.184	.671
-2.013	.403	.113	3.568	.000	.181	.625
-1.763	.379	.102	3.706	.000	.178	.579
-1.513	.354	.092	3.860	.000	.174	.534
-1.263	.330	.082	4.027	.000	.169	.491
-1.013	.305	.073	4.193	.000	.162	.448
-.763	.281	.065	4.332	.000	.153	.408
-.513	.256	.058	4.388	.000	.142	.371
-.263	.232	.054	4.284	.000	.126	.338
-.013	.208	.053	3.951	.000	.104	.311
.237	.183	.054	3.404	.001	.077	.289
.487	.159	.058	2.748	.006	.045	.272
.737	.134	.064	2.100	.036	.009	.260
.793	.129	.066	1.965	.050	.000	.257
.987	.110	.072	1.531	.126	-.031	.251
1.237	.085	.081	1.058	.291	-.073	.244
1.487	.061	.090	.673	.501	-.117	.239
1.737	.036	.101	.362	.718	-.162	.234

Data for visualizing the conditional effect of the focal predictor:

Paste text below into a SPSS syntax window and execute to produce plot.

```

DATA LIST FREE/
  IOT      HOI      TCMN.
BEGIN DATA.
  -.923    -.974    4.412
  .000     -.974    4.691
  .923     -.974    4.969
  -.923    .000     4.934
  .000     .000     5.124
  .923     .000     5.315
  -.923    .974     5.456
  .000     .974     5.558
  .923     .974     5.661
END DATA.
GRAPH/SCATTERPLOT=
  IOT      WITH    TCMN      BY      HOI.

*****
OUTCOME VARIABLE:
  TPM

Model Summary
  R      R-sq      MSE      F      df1      df2      p
  .672   .451      .570     39.071  9.000   428.000  .000

Model
  coeff      se      t      p      LLCI      ULCI
  
```

constant	1.228	.334	3.679	.000	.572	1.884
IOT	.050	.045	1.115	.265	-.038	.137
TMM	.158	.045	3.498	.001	.069	.247
TTA	.052	.049	1.052	.293	-.045	.148
TTC	.231	.045	5.147	.000	.143	.319
TCMN	.345	.039	8.870	.000	.268	.421
CV_RD	-.025	.046	-.556	.578	-.115	.064
CV_FS	-.035	.029	-1.216	.225	-.092	.022
CV_OT	-.020	.029	-.696	.487	-.078	.037
CV_TT	.063	.043	1.485	.138	-.021	.148

Test(s) of X by M interaction:

	F	df1	df2	p
M1*X	.897	1.000	427.000	.344
M2*X	.133	1.000	427.000	.715
M3*X	.841	1.000	427.000	.360
M4*X	3.802	1.000	427.000	.052

***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
.050	.045	1.115	.265	-.038	.137

Conditional indirect effects of X on Y:

INDIRECT EFFECT:

IOT	->	TMM	->	TPM	
HOI	Effect	BootSE	BootLLCI	BootULCI	
-.974	.070	.025	.027	.122	
.000	.062	.021	.025	.105	
.974	.054	.020	.021	.097	

Index of moderated mediation:

Index	BootSE	BootLLCI	BootULCI	
HOI	-.008	.009	-.027	.008

Pairwise contrasts between conditional indirect effects (Effect1 minus Effect2)

Effect1	Effect2	Contrast	BootSE	BootLLCI	BootULCI
.062	.070	-.008	.009	-.026	.008
.054	.070	-.016	.017	-.052	.016
.054	.062	-.008	.009	-.026	.008

INDIRECT EFFECT:

IOT	->	TTA	->	TPM	
HOI	Effect	BootSE	BootLLCI	BootULCI	
-.974	.016	.018	-.015	.054	
.000	.014	.015	-.013	.045	
.974	.011	.013	-.011	.040	

Index of moderated mediation:

Index	BootSE	BootLLCI	BootULCI	
HOI	-.002	.005	-.014	.004

Pairwise contrasts between conditional indirect effects (Effect1 minus Effect2)

Effect1	Effect2	Contrast	BootSE	BootLLCI	BootULCI
.014	.016	-.002	.004	-.014	.004
.011	.016	-.005	.009	-.028	.008
.011	.014	-.002	.004	-.014	.004

INDIRECT EFFECT:

IOT	->	TTC	->	TPM		
	HOI	Effect	BootSE	BootLLCI	BootULCI	
	-.974	.048	.019	.014	.089	
	.000	.047	.017	.018	.083	
	.974	.046	.023	.007	.096	

Index of moderated mediation:

	Index	BootSE	BootLLCI	BootULCI
HOI	-.001	.013	-.025	.027

Pairwise contrasts between conditional indirect effects (Effect1 minus Effect2)

Effect1	Effect2	Contrast	BootSE	BootLLCI	BootULCI
.047	.048	-.001	.013	-.024	.026
.046	.048	-.002	.025	-.049	.052
.046	.047	-.001	.013	-.024	.026

INDIRECT EFFECT:

IOT	->	TCMN	->	TPM		
	HOI	Effect	BootSE	BootLLCI	BootULCI	
	-.974	.104	.029	.051	.165	
	.000	.071	.022	.032	.118	
	.974	.038	.028	-.014	.097	

Index of moderated mediation:

	Index	BootSE	BootLLCI	BootULCI
HOI	-.034	.019	-.073	.003

Pairwise contrasts between conditional indirect effects (Effect1 minus Effect2)

Effect1	Effect2	Contrast	BootSE	BootLLCI	BootULCI
.071	.104	-.033	.019	-.071	.003
.038	.104	-.066	.037	-.142	.006
.038	.071	-.033	.019	-.071	.003

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
5000

W values in conditional tables are the mean and +/- SD from the mean.

NOTE: The following variables were mean centered prior to analysis:
HOI IOT

----- END MATRIX -----