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Learning to be: Acculturation as a learning process
A Case Study of International Chinese PhD Students at a New Zealand
University

A thesis
submitted in fulfilment
of the requirements for the degree
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Abstract

It is challenging to transition from a Master's level of education to a PhD level, more so when students complete their PhD education in an unfamiliar academic and societal environment. PhD education undertaken internationally can, at the same time, provide tremendous learning opportunities. Accordingly, acculturation to the doctoral journey seems to be important for successful doctoral research. Due to the focus of the adopted theories, previous scholars have concentrated either on the cognitive, psychological, or social aspects of academic acculturation. In addition, the focus on more narrow ways of development or adjustment has not adequately captured the process of academic acculturation. This study adopts Illeris's Comprehensive Learning Theory (CLT) to shed light on academic acculturation. It aims to integrate the cognitive, emotional and interaction aspects of academic acculturation to explore the possible processes by which Chinese PhD students are acculturated to their doctoral journeys in New Zealand. The research was guided by the overarching research question: How do international Chinese PhD students learn to acculturate academically in a New Zealand university?

Given its exploratory nature, this study embraced a qualitative research paradigm. To gain in-depth insight into academic acculturation, this study conducted semi-structured interviews with Chinese PhD students enrolled at a New Zealand university. The interviews employed critical incident techniques and were supported by follow-up interviews. In total, eleven students took part in the semi-structured interviews. Each participant was encouraged to share their memorable doctoral experiences and to elaborate on their understanding and emotions of doctoral experiences.

Through thematic analysis, this study identified forms of learning content, incentives and social interactions that were embedded in the process of academic acculturation. Besides the research itself, Chinese PhD students encountered various contents to learn in order to guarantee the success of their doctoral journey. These students demonstrated diverse motivations, which served as incentives for their pursuit of a doctoral degree. To ensure success, Chinese PhD students also engaged in interactions, including observations, learning initiatives, and interactions with various people. Furthermore, Chinese PhD students demonstrated four processes to academic acculturation: assimilation, multiple identities construction, accommodation and transformation. Yet, their previous educational experiences could potentially lead to misunderstandings and defence against acculturating to their doctoral journey. Combined, the findings underscored the intricacies of an academic acculturation process, which need to be investigated through content, incentive and interaction dimensions as a comprehensive whole. Four academic acculturation processes underscored the situational nature of the acculturation process, influenced by both Chinese students' prior educational backgrounds and their specific doctoral journeys. This

strengthens the notion that individuals could experience different academic acculturation pathways, and any single process (such as knowledge acquisition, transformation or adjustments) is inadequate to encompass the entirety of potential acculturation processes.

This study contributes a holistic perspective that helps doctoral supervisors and administrators provide relevant support to international Chinese doctoral students, as well as other international students. The research encourages Chinese PhD students to enrich their research skills and experiences before their doctoral journey. The students should also be aware that the doctoral journey in all likelihood will not take place as they expected, as their pre-established experiences might not guarantee a smooth doctoral journey and even cause challenges. Yet, challenges also contain great opportunities for enhancing knowledge, academic capacities, adaptability and even personal growth. This study also suggests that the process of academic acculturation can be enhanced through observations and active participation in diverse activities, as well as engage during interactions with a variety of individuals. These interactions collectively contribute to enriching students' knowledge and facilitating necessary adjustments for successful acculturation to the new academic environment.

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List of Abbreviations

CLT	Comprehensive Learning Theory
CoP	Community of Practice
LPP	Legitimate Peripheral Participation
TL	Transformative Learning
ZPD	Zone of Proximal Development

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Chapter 1: Introduction

With my strong enthusiasm for adult education and lifelong learning, this research endeavours to investigate learning theories and practices in the context of cross-cultural academia. This chapter begins with an overview of the background of Chinese PhD students, followed by an introduction to challenges faced by international PhD students and theoretical gaps in the existing literature, which serve as the rationale for conducting this research. Furthermore, this chapter presents the purpose of the research and the research questions. Finally, it highlights the significance of the thesis and outlines its structure.

1.1 Research Background

This study originates from a context in which an increasing number of Chinese students choose to conduct their doctoral education internationally. As one of this cohort, I noticed that the international doctoral journey contains various difficulties.

1.1.1 A growing population of international Chinese PhD students

The Chinese government pays attention to cultivating skillful people and experts within specific domains who will then contribute to the development of the country. To cultivate the people, one of measurement is the Chinese Scholarship Council (CSC)¹ through which the Chinese government awards scholarships to international students at 279 Chinese universities every year; the funding for each student covers 100% of tuition and includes living expenses up to \$5,000 per year. With support from the government, an increasing number of students are supported to pursue their higher education overseas. According to the data from the Ministry of Education of China², the total number of Chinese students studying abroad was 703,500; the total number of returnees from overseas studies was 580,300.

Over 21,000 fee-paying international Chinese students were studying in New Zealand in 2020, and in 2019 33% of international students in New Zealand were from China³. PhD students comprise a significant proportion of these numbers. While the total number of international students dropped because of the Covid pandemic and border restrictions⁴, international PhD students are still a considerable population in New Zealand⁵. According to

¹ <https://www.cscscholarship.org/>

² <http://www.moe.gov.cn/>

³ <https://nzchinacouncil.org.nz/statistics/>

⁴ <https://www.rnz.co.nz/news/national/437119/foreign-phd-students-lifeblood-of-universities-research-effort>

⁵ OECD Indicators. https://www.oecd.org/education/education-at-a-glance/EAG2019_CN_NZL.pdf

the International Education Strategy (Education New Zealand Manapou ki te Ao)⁶, New Zealand universities had agreements with the Chinese government to recruit more international Chinese PhD students who will contribute to profitable research not only for New Zealand but also worldwide in 2018-2030. The success of these strategies and agreements requires these students to quickly adapt and progress their PhD within an unfamiliar context, along with the academic challenge of transition from a master's programme to doctoral education.

1.1.2 Being an international student

My international education experiences prompted me to reflect on adult learning in a cross-cultural academic environment. In 2016, I had the opportunity (funded by CSC) to visit Roskilde University (RUC) in Denmark as a visiting scholar to conduct a research project for my Master's thesis. During my time at RUC, I collaborated with two supervisors working on a research project. These two supervisors provided me with invaluable insights into Workplace Learning, Life History Approach, Lifelong Learning, and Adult Learning Theory. The interactions with these two esteemed professors profoundly influenced my research and further sparked my research interests. Along with these experiences, I noticed the academic communication, learning experiences, and supervision encountered at RUC were distinct from my previous experiences in China. This left an indelible impression on me.

I also encountered many difficulties, especially, during my initial months in Denmark. I experienced hardship when communicating with people and interacting with my supervisors. Despite having read books and articles from my supervisors beforehand, differences in presenting ideas, coupled with language barriers, posed communication challenges. In addition, each student is assigned at least two supervisors who encourage critical thinking and idea presentation. Such student-centred supervision was distinct from what I had experienced in China. This approach enabled high-quality guidance to be delivered and enhanced my research capacities, but it, sometimes, resulted in pressure. Additionally, I struggled to balance my studies with my social life, as I was unfamiliar with the social environment, social rules, and accommodations. There were limited opportunities for social activities and friends, which triggered my negative emotional reactions, making me feel unwilling to study and apprehensive about communication. Being an international student, I often felt like an outsider in the Denmark environment, while at the same time, also feeling I was detached from my original community in China.

⁶ <https://www.enz.govt.nz/home/SearchForm>

As an international PhD student in New Zealand, I have encountered similar experiences, despite receiving significant pastoral support from my supervisors and being surrounded by a large number of Chinese communities. Interestingly, I noticed that Chinese students who started their PhD programs before me also faced challenges, but they appeared to better balance their academic and personal lives. It seems that they were able to manage their doctoral studies more effectively, which led me to reflect on the phenomenon of acculturation. I was wondering about the difficulties they encountered and whether these challenges were similar to mine. How did they cope with these difficulties and navigate their doctoral studies? How did they manage the challenging period and establish a rapport with their supervisors? Could their prior international education background have played a role? Did they acquire specific skills or knowledge that enabled them to adapt to the academic environment efficiently? What strategies allowed them acculturate to their doctoral journey? These questions all revolve around the central theme of how international Chinese PhD students adapt to a new academic environment.

1.2 Rationale and Problem Statement

With these questions in mind, I tried to find answers from the literature. Previous scholars adopted various perspectives exploring academic acculturation. These scholars called for further attention to the international PhD students' cohort. Through my initial review, I noticed that international PhD students, like me, faced various challenges in their doctoral journey. Additionally, the initial review highlighted the importance of exploring the experiences of Chinese PhD students in New Zealand's doctoral education system. It also revealed several gaps in the existing research that warrant further investigation.

1.2.1 International PhD education: an unmapped journey

Based on this initial review of the literature, I noticed that international PhD students face various challenges and difficulties during their doctoral journey. These challenges were often associated with the multicultural academic environment in which they were situated (e.g. Li Wang & Rähä, 2021; Y. Zhang & Mi, 2010). The difficulties could be related to living conditions, accommodations, interpersonal conflicts, discrimination (e.g. Murad, 2021; Pham, 2022; H.-p. Wu, Garza, & Guzman, 2015), language barriers, unpleasant relationship between supervisor and student, being independent and critical (Kandiko Howson, Kinchin, & Gravett, 2022; Seeber & Horta, 2021), loneliness, depressions, homesickness, and lowered self-esteem (Cruz-Virella, 2017; Elliot, Baumfield, & Reid, 2016; Fu, Hu, & Liu, 2022; Yu & Wright,

2015). These studies suggest that international PhD education is a complicated journey during which students face challenges related to intercultural differences, academic disparities, social issues, and psychological well-being. A more comprehensive review of these challenges and difficulties is presented in Chapter 2.

The challenges faced by international PhD students make doctoral education a complicated journey, and these students represent a unique cohort that requires attention to both their academic progress and acculturation. First of all, doctoral education itself is an “unmapped journey because it contains numerous possibilities, both supervisors and students do not know the results of the research before they embark on the journey” (Elliot, Baumfield, & Reid, 2016, p. 1181). Apart from collaborating with supervisors to explore new knowledge, students also need to transition to becoming part of the academic community with certain expectations regarding their critical and innovative thinking skills (Franco & DeLuca, 2019; Friedrich-Nel & Mac Kinnon, 2019). Furthermore, differences in educational practices and criteria between their home country and the host country can intensify the international PhD journey (Hu, Zhao, & van Veen, 2020). Students’ expectations and previous understanding can influence supervision, causing a mismatch of expectations between supervisors and students, which makes the doctoral journey difficult (Campbell, 2015; Carroll, 2014). Despite these challenges, international PhD students are expected to produce original research and work autonomously (Ding, 2018; Ding & Devine, 2018; Elliot & Kobayashi, 2019). Given all these factors, it is not surprising that international doctoral PhD education is a complicated journey that requires attention.

In light of the complexity embedded in the international education journey, there is a need to clarify academic acculturation, and how it contributes towards each student’s research journey and their transition to independent researchers, and vice versa (Laufer & Gorup, 2019; M. Wu & Hu, 2020).

1.2.2 What makes New Zealand doctoral education and Chinese PhD students different?

New Zealand doctoral education is similar to the British and most European doctoral systems. It is research-focused and does not include compulsory coursework (Elliot, Baumfield, & Reid, 2016). This educational model requires students to demonstrate an established capacity for independent research prior to their doctoral studies (M. Wu & Hu, 2020). During the doctoral research process, students collaborate closely with a chief supervisor and additional supervisors. The relationship between supervisors and students in New Zealand is typically

less formal compared to other systems (S. Lee, 2017). Notably, the tuition fees for PhD programs in New Zealand are relatively lower than in many other countries, such as the UK, the USA, and Australia⁷. Coupled with favourable immigration policies, New Zealand has become an attractive destination for international students pursuing doctoral education.

Upon reviewing the features of the New Zealand PhD education system, the characteristics of Chinese students underscore the importance of understanding how Chinese students can adapt to the New Zealand PhD educational environment. For instance, Chinese students often have a strong foundational knowledge and excel in tests and formative coursework. Coming from a collectivist culture, they pursue group harmony and show respect for authority (Xiong & Zhou, 2018; C. Y. Yang & Bai, 2020). Due to the economic growth in contemporary China, along with a societal emphasis on education, Chinese students are able to pursue further education. These students are motivated to return to China driven by a desire to achieve academic success and secure academic positions. The motivation for Chinese students is a combination of personal ambition, family expectations, and cultural values (C. Y. Yang & Bai, 2020). Apart from these features, language proficiency is another distinguishing feature of Chinese students (Vyas & Yu, 2018) compared to other Asian students from countries where English is more commonly used, such as India and the Philippines.

While numerous scholars have investigated the challenges faced by Chinese PhD students and how they adapt to the New Zealand PhD education system, there is limited research exploring why these students form their understandings and how their previous knowledge and background function during their acculturation to the New Zealand context (Ward & Masgoret, 2004). Specifically, how do Chinese PhD students manage their previous knowledge and academic experiences alongside the new knowledge they acquire during their PhD journey in New Zealand? Do these previous understandings change, persist, or transform in some way? These questions are crucial yet underexplored thoroughly (refer to Section 2.4 and 2.5). Therefore, this study aims to address these gaps by investigating the experiences of Chinese PhD students in New Zealand doctoral education.

1.2.3 Problems in the previous academic acculturation research

Two gaps in previous research on academic acculturation form the primary motivations for conducting this study. This section will outline these two gaps with more detailed research presented in the Literature Review (Chapter 2). One gap in previous studies was the detached

⁷ [Circular 2020/08 - Eligibility to enrol in New Zealand schools – Education in New Zealand](#)

focus on cognitive, psychological, and interactional aspects when analysing academic acculturation. Consequently, there is a lack of a comprehensive perspective that encompasses these three aspects for analysing academic acculturation. For instance, Li Wang and Rähkä (2021) showed that social support enabled students to change their original identities but to maintain their original cultural preferences. Similarly, Yao (2016) noticed that international Chinese students often maintain their cultural identities, leading to separation from American roommates. Additionally, students asked for help or searched for resources (including social support and various communities) to solve particular problems, such as language issues, loneliness and research difficulties (e.g. Cai et al., 2019; Qi & Li, 2021; Y.-L. Wu, 2017). However, the perspective of the above studies was that students search for resources to overcome difficulties. This perspective primarily focused on the function of social interaction, with less focus on the function of cognitive aspects. As Gill writes: “there has been very little research investigating the nature of changes occurring in Chinese students, such as those relating to understanding, learning, perceptions of self, values ...” (Gill, 2007, p. 169). In other words, these studies did not present how a student’s psychological functionality works in the process of problem-solving, especially if a student’s previous experiences/knowledge benefit their academic acculturation.

The second gap is that previous studies revealed academic acculturation processes but lacked a comprehensive consideration of the academic acculturation processes that students might encounter. For instance, scholars (e.g., Edwards, 2018; Ye & Edwards, 2015) argued that academic acculturation is a process of reflexivity and self-identity formation, which involved extensive adjustment in self-identity. Likewise, scholars (e.g., Cai et al., 2019; Ding, 2016; Ding, 2018; Y. Wang, 2018b) highlighted that academic acculturation is achieved when students obtain/develop academic capacities, communicative skills, or language proficiency. Other scholars (Ritz, 2010; Zhao & Liu, 2022) regard academic acculturation as a process of transformative learning involving the reconstruction of one’s frames of reference and identity. These studies presented distinct academic acculturation processes, showing that academic acculturation is represented by identity adjustments, knowledge acquisition, or frame of reference reconstruction. Assuming these different elements exist in the academic acculturation process, do they coexist at the same time? If so, can one identified process fit all the academic acculturation situations? As an example, transformative learning can explain the adjustment/reconstruction process of one’s frame of reference (Ritz, 2010). However, not all learning issues need self-reflection or change of identity, such as language skills acquisition. As Illeris

states: “it is obvious that transformative learning is extremely demanding and a strain, and only takes place when the learner is in a situation with no other way out that can be experienced as sustainable” (2016, p. 45). That means we cannot incorporate all academic acculturation issues by using one single process. Just as the transformative process could adequately address the development of language proficiency, experiential learning cannot explain the process of identity change, and vice versa.

In relation to these two gaps, it does not mean that focusing on one (or two) acculturation aspect(s) and process(es) is not worthwhile. However, they do show that academic acculturation likely encompasses more than just one aspect or process. Acculturation is a complex process related to how we see a culture and includes both psychological and behavioural aspects (Berry, 2005, 2019; Ward & Geeraert, 2016). The “lack of a comprehensive framework synthesising those well-established and emerging factors that examine from a broader view a full picture” (X. Xu, 2020, p. 41) of academic acculturation drove my research and my search for a more comprehensive theory that covers the larger picture of acculturation.

1.3 Research Purpose, Questions and Significance

1.3.1 Research purpose

As per the challenges identified in international PhD student research, and enlightened by my learning experiences in Denmark, this study aims to adopt Illeris’ (2016) Comprehensive Learning Theory (CLT) to investigate academic acculturation in order to bridge the theoretical gaps mentioned in Section 1.2.2. Ultimately, this study proposes a comprehensive framework for examining academic acculturation, which can encompass affective, behavioural and cognitive (ABC) aspects (Sarmiento, Pérez, Bustos, Hidalgo, & del Solar, 2019; Ward, 2001; Ward & Geeraert, 2016), and can explore potential academic acculturation processes. The second and third chapters provide a detailed justification for using CLT as a framework for analysing academic acculturation.

This study examines three specific aspects of acculturation. First, the study intends to specify the “types of influences or aspects of the environment that impact on the individual” (Sarmiento et al., 2019, p. 21). Second, it seeks to investigate the diverse psychological mechanisms that underlie the process of academic acculturation (Doucerain, 2019; Gill, 2007). Lastly, the research examines the relationship between students’ cognitive aspects and their current doctoral journey. For instance, it explores how students organize their perceptions in

situations when the student's previous experiences are consistent with the new academic environment (Zeng, 2016); “How are new and old schemas organized cognitively? Do they change to accommodate new cultural meanings?” (Doucerain, 2019, p. 21)

1.3.2 Research questions

To achieve its fundamental purpose, this study selects international Chinese PhD students who are learning at the University of Waikato as a case study. The central research question is:

How do international Chinese PhD students learn to acculturate academically at a New Zealand university?

Since this study is grounded in CLT to explore the cognitive, affective and social aspects (Ward, 2001) of academic acculturation, the structured dimensions of content, incentive and interaction (Illeris, 2016) are used as a theoretical foundation. Accordingly, using this foundation, three sub-questions were asked:

- (1) What and how did the Chinese PhD students learn during academic acculturation?
- (2) What incentive components influenced Chinese PhD students to acculturate academically?
- (3) How did Chinese PhD students interact with the New Zealand academic environment?

The three dimensions provide insight into the various aspects of academic acculturation and were used to explore potential processes involved. To gain a comprehensive understanding of academic acculturation, it was also crucial to consider situations where acculturation may be hindered or does not occur. Therefore, two additional sub-questions were asked:

- (4) What types of learning did Chinese PhD students experience during academic acculturation?
- (5) What barriers prevented Chinese PhD students from acculturating to the New Zealand environment?

1.3.3 Significance of the research

This study uses CLT in the context of academic acculturation, contributing to both theoretical and practical understanding. Firstly, this study addresses cognitive, emotional, and

social aspects of academic acculturation, specifying various components under each aspect. This bridges the gap in previous theories that focused on only one or a few aspects of academic acculturation, leaving other aspects insufficiently covered. This integrated approach provides a more comprehensive perspective on academic acculturation instead of using multiple approaches to investigate the acculturation process separately. Secondly, CLT enables this study to uncover the types of learning embedded in academic acculturation processes; thus, the study goes beyond previous research that viewed acculturation as a single process of adjustment, knowledge acquisition, or transformation. This helps to contribute to the idea that acculturation includes multiple processes. Moreover, CLT allows for an examination of how individuals organize their mental schemas during the academic acculturation process, thus shedding light on the psychological mechanisms at play in a cross-cultural academic context. Lastly, as few previous studies have adopted CLT in the domain of academic acculturation, especially in the context of how international Chinese PhD students acculturate to the New Zealand academic environment, this study introduces and applies CLT in the domain of academic acculturation. The consequence is an enrichment of acculturation theory. In addition, this study examines the use of CLT for analysing academic acculturation, thus expanding the application scope of CLT.

In practical terms, this study informs both learning practices and PhD education which subsequently contribute to the improvement of academic acculturation at the PhD level. Specifically, by presenting diverse learning content, this study expects to assist international Chinese PhD students who may struggle with adapting to and understanding a new academic environment in their doctoral journey. This could help future Chinese doctoral students to psychologically prepare for potential uncertainties, disorientations, and other psychological challenges they may face during their PhD program. Moreover, this study has the potential to enhance the quality of PhD education and supervision. By examining three dimensions of learning and identifying barriers to academic acculturation, this research can provide valuable insights to supervisors regarding how international PhD students navigate their previous knowledge and their current PhD journey. Such insights can enable supervisors to develop effective strategies to facilitate students' integration into the supervision process. This study can also benefit future students by offering practical guidance for their doctoral journey, highlighting the significance of engaging in diverse interactions with people and communities. From a broader perspective, this study sheds light on how Chinese PhD students adapt to their environment and identifies the types of support that are most beneficial to them. This

information can inform policy-makers and administrators in devising approaches and policies to better support international Chinese PhD students in their pursuit of successful doctoral research.

1.4 Structure of the Thesis

The thesis is structured into ten chapters. It begins with an introduction that provides the background for the study and justifies the need to investigate the challenges of international doctoral students by highlighting the limitations of existing literature. The introduction also presents the aims, research questions, and significance of the research. Chapter 2 presents a comprehensive review of key concepts related to the study. This includes a review of various theories on academic acculturation, leading to the justification for adopting the Comprehensive Learning Theory (CLT) as the framework for this study. The chapter then narrows the focus to international doctoral students, with a particular emphasis on Chinese doctoral students in the global context, and their academic acculturation experiences in New Zealand.

In Chapter 3, the theoretical framework is detailed and its relevance to the study is further argued. This chapter provides an overview of the learning concept, learning process, three dimensions of learning, four types of learning, and learning barriers as proposed by CLT. Chapter 4 justifies the epistemological stance and the selection of the methodological approach, data collection methods, and analysis procedures. This chapter outlines the process of participant recruitment, data collection, and ethical considerations. It also provides details on how the data was translated and analysed.

Chapters 5-7 show the findings under the three learning dimensions (content, incentive, and social interaction). Chapter 5 provides an overview of the participants' learning contents during their academic acculturation process, encompassing not only knowledge and skills but also their understanding of doctoral supervision and the overall doctoral learning experience. Chapter 6 presents the complexities of the participants' driving forces for their academic acculturation, such as emotional aspects, cognitive dissonance, desires and needs. Chapter 7 sheds light on how the participants interact with the academic environment in New Zealand. The form of social interaction involves observation, communication and, in a broader sense, participation in supervision and academic activities. Chapter 8 presents different types of learning exhibited by participants during their academic acculturation process. This chapter reveals that all participants demonstrated assimilative and accommodative learning, while only a limited number of individuals experienced transformative learning during their academic acculturation.

Chapter 9 summarizes, interprets and discusses the key findings from Chapters 5-8. Based on the findings, the chapter identifies four acculturation processes, which is followed by a further discussion regarding these four acculturation processes. Then, I develop a theoretical framework based on CLT and my findings, followed by an evaluation of the theoretical framework. Chapter 10 concludes the thesis by outlining the theoretical and methodological practical contributions of this research. The chapter highlights the implications and acknowledges the limitations of the study, then ends with recommendations for future research.

Chapter 2: Literature Review

In Section 1.2.2, I presented two theoretical gaps that guide this exploration of academic acculturation. This chapter reviews the existing academic acculturation research so as to gain a deeper understanding of how Chinese international PhD students acculturate academically. The chapter begins with a review of conceptions of academic acculturation. This includes the content that international doctoral students need to acculturate and the challenges they face. The second part focuses on understanding Chinese education and international doctoral education, followed by a review of cultural and non-cultural issues. Subsequently, the review explores how international doctoral students acculturate academically. Attention then concentrates on the academic acculturation experiences of Chinese doctoral students as a group in the international context as well as the New Zealand context. Finally, the chapter ends with the theories adopted by scholars to justify the necessity of using a new theoretical framework to bridge the gaps.

2.1 Academic Acculturation and Related Concerns

As shown in Section 1.2, academic acculturation is a complex process. This prompts me to reflect on several crucial questions: What does academic acculturation include? What challenges do overseas students commonly encounter during this process? These questions shape the contents of this section of the literature review.

2.1.1 What is academic acculturation?

Before exploring academic acculturation, this study will distinguish acculturation and academic acculturation. Acculturation is a recognized process involving behavioural and psychological changes that occur when individuals encounter different cultures (e.g. Berry, 2005; Ward, 1997). It is defined as “the dual process of cultural and psychological change that takes place as a result of contact between two or more cultural groups and their individual members” (Berry, 2005, p. 669). In this definition, acculturation is defined widely. Acculturation could be any dynamic process by which individuals upon contacting or interacting with the environment enrich or change their understandings and establish a relatively stable relationship with the environment. According to Berry’s theory, acculturation has the following key features. Firstly, it is a process of cultural and psychological change between two groups of people. At the group level, acculturation involves changes in social structures, institutions, and cultural practices. At the individual level, it results in changes in a

person's behavior, such as how they speak, dress, eat, and interact socially. Secondly, it is a long-term, mutual and interactive process. Acculturation is an ongoing process where culturally different groups adapt to each other over time. This often involves learning languages, sharing food, and adopting each other's clothing and social practices.

Compared to acculturation, academic acculturation specifically refers to the adaptation processes of students within academic environments. Academic acculturation is the process through which students engage with the culture of an academic environment where contains academic norms, values, and expectations within the university context(Y. X. Wang & Bai, 2021). Vyas and Yu (2018) indicated that academic acculturation involves students adapting to different educational systems, i.e., making changes to adapt to a new education model and learning cultures. In general, 'academic acculturation' differs from 'acculturation' because it focuses specifically on academic culture. However, academic acculturation is much more varied in its definitions. One position is that academic acculturation can be seen as a problem-solving process. Since students often face various acculturative challenges that can impede their academic performance, it seems reasonable to consider academic acculturation as a process of identifying difficulties, searching for help and dealing with the difficulties. For instance, students asked for help or searched for resources (including social support and various communities) to solve particular problems, such as language, loneliness and research difficulties (e.g. Cai et al., 2019; Qi & Li, 2021; Y.-L. Wu, 2017). Specifically, students encountered psychological difficulties, such as uncertainty, isolation, loneliness and distress (Jackman, Jacobs, Hawkins, & Sisson, 2021; J. Li, Wang, & Xiao, 2019). By seeking social support from co-nationals, friends or supervisors, participating in various academic and non-academic communities and even finding jobs, students could distract their attention, alleviate their stress and loneliness and overcome these psychological difficulties, which allow psychological adjustment (W. Gu & Usinger, 2021; J. Li, Marbley, Bradley, & Lan, 2016; C. Y. Yang & Bai, 2020; Yu & Wright, 2015; W. Zheng, 2017). Furthermore, apart from the psychological issues, scholars have also identified academic and financial challenges that international doctoral students encounter. These scholars also revealed that students looked for various means of support from universities (such as scholarships and learning resources), social communities (such as job opportunities and religious experiences) and supervisors (such as engaging in the publishing process) (Cai et al., 2019; Ding & Devine, 2017; F. S. Li, Qi, & Guo, 2021; Qi & Li, 2021).

However, academic acculturation is more complicated than just problem-solving. For example, even after overcoming cultural difficulties, some international students may still feel marginalised in the academic environment (e.g. Q. Gu & Maley, 2008; L. Wang & Byram, 2018; Yao, 2016). Yao (2016) showed that acculturation is not solely related overcoming English challenges; the scholar further indicated that Chinese students chose to maintain their cultural identities by creating distance from American roommates. This led to a lack of mutual acceptance, even though the Chinese students improved their language proficiency. These studies indicated that problem-solving may not always result in acculturation. Acculturation appears to be influenced by other factors, including an individual's acceptance of the host culture and their willingness to undergo psychological and behavioural changes (Berry, 2005; Berry & Sabatier, 2010). In other words, acculturation process could lead to an individual's changes in many aspects. Problem-solving could not very well detail the specific psychological changes taking place in the acculturation.

Academic acculturation can be seen as a learning process and socialisation. Scholars (e.g. Cai et al., 2019; Ding, 2016; Ding, 2018; Y. Wang, 2018b) indicate that academic acculturation is a learning process in which students obtain/develop academic capacities, communicative skills, or language proficiency. For example, self-directed learning strategies or linguistic capacities (such as doctoral writing or social skills) are regarded as the learning contents or doctoral skills that students need to learn during their doctoral journey. Thus academic acculturation is a process of obtaining these proficiencies (e.g. Ding, 2016; Son & Park, 2014). PhD education is similar to a community of practice; it is the process of training a student to be a scholar in a particular domain that can lead a student from “novice” to expert (Ding, 2016). Scholars (e.g. Edwards, 2018; Ye & Edwards, 2015) suggest that acculturation to the doctoral journey closely relates to changes in their previous frame of reference or reform of their ontological identities. Academic acculturation is a process of reflexion and development of “identity” or “self-formation”. These studies are also similar to studies that indicated that academic acculturation is a process of socialization; that is, individuals acquire new knowledge, skills, and values that enable them to adapt to new cultural environments or social contexts (Wendan Li and Collins (2014). With academic expectations, standards, and norms of academia being internalized, students moved from “outsider” to “insider” status (Austin & McDaniels, 2006, p. 400). The studies mentioned above have shed light on the connection between an individual's acquisition of knowledge and changes in their social status,

with more focus being put on the social process; that is, social interactions lead to knowledge assimilation and, in turn, cause changes in social status.

Building on these studies that adopted learning theories, the academic acculturation process is more than knowledge acquisition, and it takes many forms. For instance, Lam et al. (2019) adopted Experiential Learning and showed that collaborative learning enhanced international doctoral students' academic writing, collaboration, intercultural competence, reflective practice, and personal epistemology. Y. Wang (2018b) adopted Transformative Learning, and showed that international students' intercultural experience is complex and that students' transformations are influenced by factors such as culture shock, motivation, and teaching style differences. Ye and Edwards (2017) adopted the reflexive project of the self (Giddens, 1991), showing that international Chinese doctoral students' academic identities were shaped by their agency, motivation and self-determination during their academic journey. All these studies seem to indicate that academic acculturation could be seen as a different learning process. If academic acculturation can be regarded as a transformative learning process, collaborative learning process or self-reflexivity, these learning processes might coexist during academic acculturation.

2.1.2 What to acculturate?

Before gaining insight into how students acculturate to their doctoral education, we might have to think about what students need to acculturate to. Previous studies adopted terms to describe what students learned, transitioned or developed during academic acculturation, such as “issues in doctoral studies” (Jones, 2013), “personal development” (X. Xu, 2018) and “academic transitions” (Elliot, Reid, & Baumfield, 2015). Yet these terms either are limited to a specific area or have a positive or negative tendency. In a normal sense, acculturation mainly contains psychological adjustments (Berry, 2015), although these adjustments also include others, such as identity adjustments (Ye & Edwards, 2017) and academic skills acquisition (Son & Park, 2014). Technically, skill acquisition or identity adjustment can be understood as types of psychological adjustments but the meaning of “adjustment” is different from that of “acquisition”. To avoid unnecessary limitations and to be consistent with the Comprehensive Learning Theory (CLT), this study adopts the term “acculturation content” to describe that which students need to acculturate.

The existing literature maintains that students need to acculturate to a specific way of doctoral study or learning. For instance, Elliot, Baumfield, Reid, and Makara (2016) showed

that doctoral students need to make original contributions to knowledge, which requires students to have research skills, and critical and reflective thinking. Acculturation to doctoral study could also relate to the way of identifying the research topic. PhD students “usually choose their own topic and are rarely attached to a research team” (Deem & Brehony, 2000, p. 151), and not all the students have experiences of being responsible for independently selecting a research topic. One of goals of doctoral education is to train students to become highly independent and self-regulated researchers, and the doctoral supervisor plays an important role in guiding students to develop and adapt to self-regulated learning (Stracke & Kumar, 2010) and learning autonomously (Edwards, 2018; Elliot & Kobayashi, 2018). Engaging in a writing group helps students gain confidence and develop the skills and knowledge required to prepare for their proposal presentation. This, in turn, aids students in transitioning to become independent researchers (Chatterjee-Padmanabhan & Nielsen, 2018; Anne Lee, 2012). The studies mentioned above appear to demonstrate that the doctoral journey is a complex process involving the transition of students into independent researchers. This transition encompasses not only knowledge acquisition but also an adjustment in learning methods.

International doctoral students also need to acculturate to doctoral supervision. The literature shows that doctoral supervision or supervisory practices in the host country are usually different from what international students have experienced in their home countries (Amelia, Welsh, Winarnita, & López Castellano, 2021). The differences are embodied in how supervisors manage students’ research (e.g. Ahram Lee, 2018; Robinson-Pant, 2009; Son & Park, 2014; Warner & Miller, 2015; M. Wu & Hu, 2020) as well as the student-supervisor relationship (Kirkland, 2018). For instance, some scholars found that PhD students have difficulties responding to critical feedback from supervisors (Warner & Miller, 2015). The traditionally hierarchical relationships that students commonly experienced in their previous educational settings coupled with language barriers prevent students from confidently expressing their ideas and expectations to their supervisors (Ahram Lee, 2018; Robinson-Pant, 2009).

However, positive aspects of the different supervisory practices have also been identified. International students experienced non-bureaucracy supervision and a more relaxed relationship with their supervisors and the supervision model facilitates the PhD students to be critical and helps them integrate into a research community (Cai et al., 2019; Elliot & Kobayashi, 2017, 2018). The above studies highlight the doctoral training process or the

supervisory style to which students need to acculturate, and the focus of these studies tends to be on the interaction between students and supervisors.

Beyond doctoral learning and supervision, Jones (2013) identified six issues that students encountered during their doctoral journey. These six issues encompass (1) doctoral program design, (2) employment and career, (3) teaching, (4) student-supervisor relationship, (5) writing and research, and (6) the doctoral student experience (Jones, 2013). Among these six issues, the first two focus on doctoral education, assessment and students' employment, which is related to the specific way the academic environment operates. Issues (3) and (4) focus on doctoral supervision, which echoes the studies mentioned in the last paragraph. The last two issues focus on students' doctoral studies, which present how students conduct their doctoral research. These six issues may indicate acculturation content. However, these issues may have limitations in fully considering what students need to acculturate, as academic acculturation also includes an individual's psychological concerns that students need to overcome (Dai & Hardy, 2021; Elliot, Baumfield, et al., 2016). With this limitation in mind, we have to acknowledge the significance of studies with the perspective of problem-solving; that is, academic acculturation is a process of identifying difficulties, searching for help and dealing with the difficulties. In this process, problems, difficulties or challenges (no matter what they are) indicate the specific content students deal with or solve, and thus, can be included as acculturation content for their doctoral journey. In this sense, the perspective of problem-solving broadens our understanding of academic acculturation. Since international doctoral study can encounter various challenges, and the challenges are interrelated (Gao, 2021), I will detail the challenges international student encountered during acculturation in Subsection 2.1.3.

2.1.3 Challenges and difficulties in the acculturation process

As noted by previous scholars, PhD research is filled with uncertainty and has no formal coursework in most European countries (including New Zealand), thereby, it can be described as an "unmapped journey" (Elliot, Baumfield, & Reid, 2016, p. 1181). What makes this journey difficult is that students need to contribute original knowledge through their critical and innovative thinking (Franco & DeLuca, 2019; Friedrich-Nel & Mac Kinnon, 2019). The independence, autonomy and creativity embedded in doctoral education may be challenging for students who are used to dependence on instilled pedagogy (Roumell & Bolliger, 2017). Specifically, most doctoral students "usually choose their own topic and are rarely attached to a research team" (Deem & Brehony, 2000, p. 151), and students who have had fewer

experiences in assuming the initiative and responsibilities in doing research encounter difficulties when choosing a research topic and doing research by themselves (Laufer & Gorup, 2019). According to these above studies, doctoral education poses a challenge due to its unstructured nature and because it requires students to independently contribute original knowledge through self-discipline and critical thinking.

Another challenge relates to language issues. International PhD students often experience disempowerment when writing and expressing their ideas in English, which is one of the sources of misunderstanding between supervisors and students (Akiyama, 2016; Soong, Thi Tran, & Hoa Hiep, 2015). Language issues can cause misunderstandings, confusion and difficulties in engaging with supervisors and peers (Gao, 2021). Inadequate communication would further induce psychological issues. For example, students may not be confident in communicating with local people and supervisors, thereby hindering clarification of ideas and research progress (Laufer & Gorup, 2019; Poyrazli & Lopez, 2007; Yu, Mak, & Bodycott, 2021). In addition to communication, language issues are also related to academic writing and publication. Inadequate proficiency in written English makes it hard for students to publish their articles in good journals (Ma, 2019).

Cultural differences and academic differences in academic practices can cause PhD education to become complicated. Students' expectations and understanding are based on their previous educational experiences and social background, and the different academic contexts can have considerable impact on the quality of their research (Campbell, 2015; Carroll, 2014). These experiences may further influence the perceived quality of supervision, causing a mismatch of anticipation between supervisors and students (M. Wu & Hu, 2020). Furthermore, the mismatched expectations can ultimately result in a scenario where both students and supervisors persist in operating within their respective norms (Hu et al., 2020). "Students await leading from supervisors while supervisors trust and expect students to take the initiative" (Elliot & Kobayashi, 2019, p. 3). Moreover, the situation is more complicated for those international students who once studied in an intensive hierarchical educational context. Chinese doctoral students and other Asian students are influenced by traditional hierarchical structures, in which a culture of respectful dependence restricts their decision-making abilities (Dai & Hardy, 2021; L. Xu & Grant, 2017; Y. Yang, Volet, & Mansfield, 2018). This culture would make the students' adaption to collegial supervision quite challenging (Elliot & Kobayashi, 2019). Influenced by hierarchical traditions, these students are less likely to express

their ideas in meetings and try to avoid raising contradictory ideas with their supervisors (Samanhudi, 2021).

Psychological issues are just one of the challenges that doctoral students need to deal with. The enduring hardships and disorientation experienced by students can lead to a decrease in their self-efficacy and a heightened level of depression, which, consequently, can undermine their motivation to actively engage in their research (Mak, Bodycott, & Ramburuth, 2015). These psychological issues appear to be intensified when students lack sufficient support from their peers or supervisors. Not being understood, students may become despairing, and develop a pervasive sense of loneliness or marginalization (e.g. Khalid, Tadesse, Abdellahi, Jiali, & Gao, 2021; Anne Lee, 2012; Xiang, 2015; S. Zhang, Li, & Unger, 2022). In extreme circumstances, these psychological problems can lead to dropout (Laufer & Gorup, 2019). Psychological challenges may also be related to identity development (e.g. imposter syndrome). Students construct self-understandings as a researcher, and perpetuate “the sense that one is not good enough to be in academia” (Keefer, 2015, p. 20). The doctoral journey can also result in students’ frustration and depression, and different cultural values and doctoral practices may also cause tensions and difficulties in how the students are maturing (McAlpine, Jazvac-Martek, & Hopwood, 2009). Huang (2022) revealed that students can be situated in a dual exclusive situation in which they had developed a sense of belonging neither to Western culture nor to their original culture.

2.2 Chinese Education and International PhD Education

To gain a better understanding of how international Chinese PhD students acculturate academically, it is essential to explore their educational backgrounds and the differences between Chinese education and international PhD education.

2.2.1 Chinese education

As identified, students’ educational background is an important factor to consider in relation to academic acculturation (Campbell, 2015). Chinese education has long been guided by Confucian ideology (Anne Lee, 2008) and is characterised as a teacher-centred and examination-oriented system, which is different from the social constructivist learning approach (Yu, Bodycott, & Mak, 2019). Characteristics such as “memorization”, “lack of critical thinking”, “rote-learning”, “lack of practical application” and “repetition” have been used to describe Chinese education (e.g. Quan, He, & Sloan, 2016; Su & Harrison, 2016).

Within this environment, learning aims to pursue the “right” answer, at the expense of creativity (Doe, Lyden, Jaikaran-Doe, & Wang, 2018; Sit, 2013; Wong, 2004). It seems that this style of learning does not develop individual critical capacities but rather prepares students for a particular purpose, such as examinations or dissertations (e.g. Kurose, 2019; Oxford & Anderson, 1995). As Jin and Cortazzi (2006) described, most of the learning activities take place in the classroom environment, and they include “demonstration, modelling, tracing, repeated copying, and ultimately active memorisation of the precise movement” (p. 9). Students learn disciplined knowledge in a group environment (classroom), but they have minimal opportunities to discuss the knowledge (Hong & Snell, 2008). This type of learning is referred to as “collective individualism” (Xudong & Li, 2020); it heavily relies on the instruction of the teacher and overlooks students’ efforts and independent interpretation (Yu & Wright, 2015).

Within this environment, teaching activities centre on transmitting disciplinary knowledge rather than students’ learning and development (e.g. Cheng, Adekola, Shah, & Valyrakis, 2016; Yeh & Inose, 2003). Even in higher education, participatory teaching methods are not commonly observed, and teaching practices often rely heavily on textbook-based instruction and the pursuit of standardized knowledge (Liu, Qiao, & Liu, 2006; C. Wang, 2016; Wong, 2004). Although Chinese teachers have managed to adopt e-learning methods to innovate their teaching practices, the lecture style of teaching and the way of knowledge transmission are still dominant in the Chinese higher education system (McConnell, 2018). This form of teaching style can be attributed to two factors: one is the assessment “work against student participation in group work”; another is that “China’s tradition of competitive learning is hard to throw off”(McConnell, 2018, p. 1042)

The student-teacher relationship is fundamentally built on teaching and learning, but the relationship contains a hierarchical power imbalance (e.g. L. Wang & Byram, 2018; Z. Zhang & Brunton, 2007). This imbalanced power and hierarchical feature esteems teachers as absolute authorities of knowledge, skills and even moral behaviour (Vyas & Yu, 2018). Students are taught to respect these “authorities” and obey teachers' instructions. Since the teachers tend to have greater authority in the students' learning and they can commend the students' obedience, challenging teachers' ideas is regarded as impolite behaviour (e.g. McClure, 2005; Y. Zhou, Jindal-Snape, Topping, & Todman, 2008). Understandably, this type of relationship is considered a teacher-centric relationship with asymmetric power in which the students are in a respectful dependence situation (Ramchander, 2022; L. Xu & Grant, 2017).

In other words, to deal with and balance the unequal power relationship, students pursue interpersonal harmony (Yu et al., 2021), and they have to withdraw from critical thinking and place themselves in passivity, respecting their teachers' ideas and relying on the instructions.

As shown in these previous studies, Chinese students demonstrated specific study patterns, which are closely related to the Chinese educational environment. However, scholars argue that these patterns cannot be attributed solely to environmental influences. Personal factors also play a significant role in shaping students' study patterns (Ding, 2018). This will be further discussed in Section 2.3.2. In this study, I did not assume that all international Chinese PhD students have educational experiences influenced by such Chinese traditions. Yet knowing about the Chinese educational traditions assists me in identifying the differences between New Zealand and Chinese education, and it also assists me in understanding the Chinese PhD students' acculturation experiences.

2.2.2 International PhD education

International doctoral education is conducted differently. American Universities use substantial coursework, along with a qualifying examination and dissertation, which collectively leads to the attainment of a doctoral degree (Shin, Postiglione, & Ho, 2018). Chinese doctoral education also contains certain coursework, and the curriculum is structured within the framework set by the state. Universities have the autonomy to develop their own specific curricula within this framework (G. Zheng, Shen, & Cai, 2018). Coursework holds significant importance as it provides opportunities for students to acquire essential knowledge and develop the necessary skills relevant to their academic disciplines (Shin et al., 2018).

In contrast, doctoral education in European countries, as well as in New Zealand and Australia, has no formal coursework and is characterised as a goal-oriented independent process and a personal developmental journey (Stamou, 2017). Within this type of doctoral education, students select workshops or seminars according to their needs (Spronken-Smith, Cameron, & Quigg, 2018). Students do not have "classmates" sharing or pursuing the same projects during their academic journey (Cornwall et al., 2019). Rather, they are more likely to work on their own research and develop their research skills. Although students do not have classmates, students are assigned to at least two supervisors who manage their research, providing periodical guidance and pastoral care (Walsh, 2010), and the students develop their research according to the supervisors' feedback. Students need to select their research topic independently and work out a proposal to confirm their doctoral candidature at the beginning

of their PhD career (L. Xu & Zhang, 2019). This form of doctoral research requires collaborative efforts from both supervisors and students (e.g. Ding & Devine, 2018; Elliot & Kobayashi, 2017, 2019; Kumar & Stracke, 2007; L. Wang & Byram, 2018).

One of the goals of the doctoral programme is that, through doctoral training, students will independently produce a high-quality research thesis and contribute original knowledge (Y. Li, 2006; M. Wu & Hu, 2020). Contributing new knowledge is mostly driven by the student's own efforts instead of the "taught system of learning" (Elliot, Baumfield, et al., 2016, p. 48). Doctoral supervisors manage students' research and foster students' independence, critical thinking, planning, and relational strategies (Elliot, Baumfield, et al., 2016; Li Wang & Rähä, 2021).

2.3 Academic Culture and Non-academic Culture

Scholars continue to debate if academic acculturation is influenced by cultural differences (Ding & Devine, 2018). To better understand academic acculturation, this section defines academic culture and embeds the academic culture in the process of academic acculturation.

2.3.1 Academic culture

Clark (1980, pp. 3-16) proposed four types of academic culture: "the culture of the system", "the culture of the discipline", "the culture of the enterprise" and "the culture of the profession". These types of academic cultures are shaped by a group of people at different levels. The culture of the system reflects a guiding ideology or philosophy of education in a country. Academic cultures "in major part have their sources in the larger national context or in the way the system as a whole has been traditionally organized" (Clark, 1980, p. 15). For instance, Korean academic culture is featured as "eastern spirit, western science" Kim (2005, p. 93), while Chinese academic culture focuses on integration "between theory and practice, fact and value, individual and community, institution and political-social-natural context" (Hayhoe, 2001, p. 347). The culture of a discipline refers to the specialization among different academic divisions and professional fields; each institute has its specialized domains and specialists (Clark, 1980). The culture of the enterprise is the culture at the organizational level. Institutes have their own "institutional symbolic" and "unifying ideologies" (Clark, 1980, p. 11). Here, academic cultures are "a set of shared attitudes, values, goals, and practices that characterizes an institution or organization" (Velkley, 2002, p. 11), represented by a group's working styles, ways of management, or professionalism in different disciplines, faculties, or

even in each university (Davies, Douglas, & Douglas, 2007). Lastly, the culture of the profession “provides a general identity referred to by the phrase ‘academic man’”, and it “contains rich ideologies, referred to in such well-known phrases as freedom of research, freedom of teaching, and community of scholars” (Clark, 1980, p. 9). In other words, this type of academic culture of the system refers to working styles, behavioural norms and values perceived by individual academic staff and students (e.g. Cortazzi & Jin, 2002; Shen & Tian, 2012).

Consequently, the definition of academic culture varies. Academic culture is not limited to universal or collective ideologies, values or beliefs, such as Confucianism or Socratic philosophy. This is because academic culture can relate to specific academic practices and personal values and beliefs (Shen & Tian, 2012; Taylor, Kiley, & Humphrey, 2017). At the same time, academic culture should not be limited to a particular pattern of behaviours adopted by a team or individuals. This is because academic culture is also shaped by institutional values and the philosophy of education in a nation (Jin & Cortazzi, 2006). Therefore, academic cultures should be considered as a set of educational values, beliefs, ideologies, traditions and regulations, as well as the specific academic practices and a pattern of academic behaviours, which are influenced by the universal traditions and ideologies of a country or nation (e.g. Kuh & Whitt, 1988; Shen & Tian, 2012).

2.3.2 The cultural issue in academic acculturation

There is one stream of scholars who claim that academic acculturation is influenced by academic cultures. As noted previously, Chinese students “favour rote memorisation, lack critical thinking skills”, lack creative thinking and prefer to accept knowledge from textbooks (Edwards, 2018, p. 2; Wendan Li & Collins, 2014; Ye & Edwards, 2015). These educational experiences or learning approaches could cause challenges to students’ doctoral journey, resulting in mismatched expectations between supervisors and students (M. Wu & Hu, 2020; Ye & Edwards, 2017). In addition, students are also influenced by the ideas of advocating social community, group goals and harmony (Vyas & Yu, 2018). Furthermore, Chinese students commonly avoid criticising their doctoral supervisors’ opinions and seek harmony in the supervisor-student relationship (Wendan Li & Collins, 2014; Ye & Edwards, 2017; Y. L. Zhang, 2016). Moreover, students are “trapped within traditional values as deference to authority” (Ding, 2018, p. 75); the students demonstrated respectful obedience to their doctoral

supervisors, and having to follow their supervisors' instructions was assumed (e.g. Leung & Yu, 2020; X. Xu, 2020).

However, cultural differences should not be overemphasised in academic acculturation. Ding claims that "cultural factors should not be taken for granted in doing an analysis of international students' interactions with host university staff" (2018, p. 75). The core idea is that academic acculturation is closely related to personal factors, supervisor-student interaction and the academic environment of the host country. For example, some Chinese PhD students preferred self-directed learning, and student agency and personal characteristics had a greater impact on adapting to supervision (Ding, 2018). Few Chinese students mentioned that cultural differences hindered their communication with supervisors (M. Li, 2016a). Compared to cultural differences, the difficulties are more related to the mismatched expectations between students and supervisors (M. Li, 2016a; Li Wang, 2019). Contradictory to the obedience advocated by Confucious philosophy, doctoral supervisors managed students' research based on the students' freedom (Li Wang, 2019; Li Wang & R ih a, 2021, p. 303). Acculturation to the doctoral journey only demonstrates an identity transitional process from course-takers to independent researchers (Lovitts, 2005). In this sense, academic acculturation lies in the "relationships between students and the practices in which they and their teachers engage during the course of their ongoing interactions" (Goode, 2007, p. 589). Overemphasizing the cultural issues "allowed their (researchers') sweeping assumptions of an entire culture to lead and often overshadow their conclusions"(Goode, 2007, p. 593).

Based on the review of these two streams of studies, I consider academic acculturation to be not only linked to academic culture but also to be dependent on students' personal factors. On the individual level, both students' and supervisors' personal factors (e.g. expectations toward academic independence) are important for academic acculturation, especially when the students' previous experiences would influence their motivation for their doctoral study (e.g. Campbell, 2015). Due to individual factors, the doctoral journey could be "experienced variously by students as puzzling, frustrating or enraging, as well as at times stimulating, exciting and creative" (Kidman, Manathunga, & Cornforth, 2017, p. 1218). In other words, the individual factors, such as students' motivations and supervisors' expectations play important roles for academic acculturation. Beyond the individual level, we should also acknowledge academic cultural differences; after all, academic cultures embody a set of attitudes, values, objectives, and routines that define an institution or organization (Velkley, 2002, p. 11). Individuals construct their understanding according to the environment in which they are

situated (Illeris, 2016; Wenger, 1999). In other words, international Chinese PhD students' perceptions and way of doing research are rooted in the educational environment they have experienced. When experiencing an educational environment different from their previous experience, the new educational environment would also have influence on the students' perceptions and their way of doing research because “the structure of man’s consciousness is linked in a regular way with the structure of his activity” (Leontjev, 1981, p. 231). Both individual factors and cultural factors need to be considered when investigating academic acculturation because focusing solely on cultural distinctions may lead to an underestimation of the significance of individual traits and, conversely, exclusively considering personal characteristics may oversimplify academic acculturation as a universal phenomenon.

2.4 Academic Acculturation Experiences of International PhD Students

Previous scholars have examined academic acculturation from various perspectives, and have emphasised psychological adjustment, academic interactions, and cognitive development when examining international doctoral students' academic acculturation experiences. These three perspectives can be respectively categorized as the affective, behavioural, and cognitive aspects. Accordingly, this section presents how students acculturate academically from these three perspectives.

2.4.1 Psychological well-being and adjustment

Researchers who focus on students' psychological aspects conceptualise academic acculturation as a process of seeking psychological well-being or as a process of psychological adjustment. Within this stream of studies, scholars have identified acculturative stressors and have examined the strategies employed by students to facilitate psychological adjustments.

Previous studies identified strategies that students have adopted to address these psychological issues and attain psychological well-being. The strategies could be categorized into social and psychological aspects. Scholars who focus on strategies from the social perspective emphasise the actions/support that international PhD students pursue to address psychological issues (e.g. Janta, Lugosi, & Brown, 2014; Sustarsic & Zhang, 2022; Yousaf, Usman, & Akram, 2016; Yu et al., 2019). For instance, international doctoral students alleviated their academic stress by participating in doctoral forums/conferences; interacting with non-academics; and establishing a relationship with local students (Janta et al., 2014; Yu

et al., 2019). Doctoral students minimised their anxiety by seeking emotional support from friends and family back in their home country. They could also seek advice from academic or international student advisors (Sustarsic & Zhang, 2022). According to these scholars, social support seems to be problem-driven, and students could acculturate and achieve psychological changes because of social resources. In other words, strategies are under the assumption of handling difficulties, and the psychological adjustment is the result of social interaction (B. C. Kuo, 2011).

Research focused on psychological strategies suggest that students adjust their preferences, identities and emotional aspects. For instance, Latif, Harrison, and Chu (2020) adopted Berry's theory (2005) and found that, with sufficient social support from the local people, students tended to show "change in their preferences, affiliation and interest" (p. 177); whereas, students who did not obtain enough support tended to be isolated, demonstrating a preference for escaping from their surroundings, and exhibiting disappointment (Bar, 2017). Although the aforementioned studies used Berry's (2005) theory to explore the acculturative strategies adopted by students, scholars also discovered that students used strategies beyond those outlined in Berry's theory to achieve psychological development. For instance, Bar (2017) found that the students presented integration-assimilation strategies. Students could present an integration strategy when developing academic identities, but the evidence did not show that students completely discarded their previous identities (Li Wang, 2019). In most cases, students have to accept the new methods of communication and writing styles because these new "rules" guarantee the students' academic success (S. Park, 2022), i.e. presenting the strategies as assimilation or integration. In this sense, the strategies could also vary depending on whether an individual willingly or not chooses a particular country for study (Schwartz, Unger, Zamboanga, & Szapocznik, 2010).

An unfamiliar academic environment often requires international students to achieve a high-quality standard, especially when using English as their second language. In addition to the workloads, international students suffer cultural and language-induced isolation. As a result of academic acculturation, international students developed additional strategies to handle the extra workload, and they also developed psychological mechanisms to overcome feelings of isolation. The experiences of dealing with workloads and psychological issues fostered these students' resilience and strengthened their sense of self-efficacy and professional confidence (S. Park, 2022). Latif's (2020) research also showed similar results. Apart from developing adaptive learning strategies, international students achieve cultural membership within the host

university context, which is crucial for fostering a sense of belonging and psychological well-being or psychological comfort. The academic acculturation could lead these students to have psychological well-being and help them achieve academic success in the host academic environment (Latif et al., 2020).

2.4.2 Social interaction and community

On the social aspect, academic acculturation is achieved through both academic and non-academic interactions. The interactions between students and their doctoral supervisors play a crucial role in academic acculturation. Effective supervision helps alleviate academic stress and anxiety (Crosby, 2016). The interaction between supervisors and students enables students to be independent and to obtain mastery in a particular domain of research (Palmer, 2016). Effective doctoral supervision enhances international students' intercultural and academic competencies; it “could bring challenges but could equally enhance their intercultural competencies and serve as a resource for meaning enrichment” (Elliot & Kobayashi, 2018, p. 2).

Interaction with doctoral peers can also benefit the process of acculturation. Students look for peer support, and peers can provide students with emotional support (McPherson, Punch, & Graham, 2018). Apart from the emotional aspects, PhD peers may even provide informal mentoring; more seasoned students could provide research experiences and skills to the new students, enabling the new students to enhance their own learning experiences, research capacity and self-confidence (Hughes et al., 2021; McPherson et al., 2018; Palmer, 2016). The interaction between peers also provides students with a platform to express their concerns and receive support; it can offer insights for the new students into doctoral supervision and supervisor-student relationships (S. Lee, 2017).

Friends, family members and co-national groups also contribute to students' academic acculturation. The international doctoral journey could significantly influence the students' sense of self; students often seek support from groups or people who come from the same cultural background or country (Cai et al., 2019). These people are often referred to as “co-nationals” (Bodycott, 2015, p. 247). Moreover, students could benefit from this group by expanding social networks and facilitating personal development (Cai et al., 2019). Moreover, these groups provide a place where students can express their feelings of loneliness, obtain emotional support and share stories of their feelings about doing a PhD, which could alleviate

anxiety, loneliness, homesickness and academic pressure (Fu et al., 2022; Haslam, Jetten, Postmes, & Haslam, 2009; Mayne, 2019).

Social activities, support and activities play an important role in contributing to academic acculturation. Danso and Aalgaard (2019) adopted socialization as a conceptual framework, showing that observation and participation in activities, such as teaching, being a research assistant and attending conferences were helpful for doctoral students' development. According to Cai et al. (2019), institutional research and discipline/inter-discipline communities play a crucial role in fostering the professional growth of international PhD students. These communities not only strengthen the students' relationships with faculty and the doctoral community but also contribute to building their confidence. Additionally, these communities have a positive influence on the formation of students' academic identities (Cai et al., 2019). Elliot, Baumfield, and Reid (2016) found students would search for a “third space” (e.g. public library, sports club, friendships, social activities and wider support networks). Such a third space can not only scaffold PhD studies but also can provide students with relaxation, recreation and development. It “afforded meaningful learning (e.g. improving linguistic competence) through very informal contexts” (Elliot, Baumfield, & Reid, 2016, p. 1192)

Scholars who focused on the social perspective maintain that academic acculturation is shaped by various social interactions. The underlying idea of these studies was that acculturation is achieved through interactions. Thus, this stream of scholars explored various social factors and interactions that students experienced in the process of acculturation. For instance, Elliot, Baumfield, and Reid (2016); Mayne (2019); Trần (2019) used Bio-ecological system (Bronfenbrenner, 2005) to explore different situational factors that influenced academic acculturation. The findings showed that factors (e.g. supervisor-student relationships, social connections, academic communities, cultural values and important life events) together formed personal, societal and academic transitions. Likewise, scholars have adopted Wenger's (1999) Community of Practice (Ching, 2021; Crosby, 2016) to reveal the function of academic communities for academic acculturation. Doctoral students developed their academic identities by being situated in supervisors' mentoring and participating in various communities (Palmer, 2016). However, acculturation is a process of psychological change through social interactions (Sam & Berry, 2006). This stream of scholars concentrated on how an individual took actions to acculturate academically but overlooked an individual's agency and the psychological change processes (Ding & Devine, 2018).

Among these studies above, academic acculturation provides international students with significant benefits. These benefits could be summarised as follows: development of academic identity, career prospects enhancement, social integration and personal growth. These aspects are crucial for the international students' success and well-being in the academic environment. For instance, Ching (2021) mentioned engagement and participation with mentors and peers provide students with opportunities to learn the norms and values of their academic community. Such acquisition of academic norms and values had multiple functions for international students. The acquisition provides students with resilience and coping strategies for dealing with the challenges of adapting to a new academic (Ching, 2021). Furthermore, it further leads to shaping students' professional and academic identities, which is connected to the student's sense of fulfillment and their academic careers (Danso & Aalgaard, 2019). The study from Cai et al. (2019) could systematically illustrate the benefits of academic acculturation. The distinct points made in Cai's study are that students suffering psychological stress in their doctoral journey, participation in various CoP can foster students' sense of belonging; can reduce the psychological strain associated with adapting to a new culture; can enhance their intercultural competence; and can a deeper understanding of the host culture (Cai et al., 2019).

2.4.3 Cognitive adjustment and knowledge acquisition

Another stream of research has focused on cognitive aspects. These studies note that academic acculturation is a process of development of expertise, research skills and academic competencies. Specifically, international students improve their English language proficiency, which is accompanied by the acquisition of discourse language and writing skills (e.g. M. Li, 2016b; L. Xu & Grant, 2017). Lin (2021) also found students developed research skills, professional knowledge, and confidence after a period of academic struggles. Apart from second language acquisition and professional knowledge enhancement, T. Wang and Li (2011) mentioned that intercultural awareness and culturally specific knowledge were obtained as students participated in professional learning activities and discussions with international students. Here, intercultural awareness is homogeneous with the notions of "uncodified knowledge" (Eraut, 2007, p. 406) or "hidden curriculum" (Elliot, Baumfield, et al., 2016; Leask, 2015). The "hidden curriculum" includes a wide range of learning opportunities, such as strategic learning approaches, values, attitudes, beliefs and patterns of behaviour that learners absorb without the conscious effort by the teacher or learner; it also includes practical skills and the knowledge of how the new academic systems operate (Elliot, Baumfield, et al., 2016;

Leask, 2015). Thus, academic acculturation is a matter of socialising with people and internalizing such knowledge. Admittedly, some knowledge (e.g. learning and cross-cultural experiences) may be obtained through vicarious learning, such as the observation of other people's experiences during the learning process (Leask, 2015). The studies mentioned above demonstrate that academic acculturation encompasses more than just acquiring language and discipline-specific knowledge. It is a broader process of knowledge acquisition that extends to numerous aspects of academic life.

From the cognitive perspective, scholars have emphasized that academic acculturation is a process of adjustments in students' cognition and identities. Zeng (2016) indicated that international students partially adjusted their understandings and academic practices as they encountered cultural and academic conflicts. Likewise, Lynch and Kuntz (2019), showed that female doctoral students, after reflecting on themselves and their doctoral research, adjusted their understanding of doctoral research and self-understanding. In addition, (Bar, 2017) showed that students may not only change their cultural identity but also change aspects beyond identities, such as behaviours, values, and attitudes. Moreover, academic acculturation may lead to adjustments in the students' cultural understanding (Nada, Montgomery, & Araújo, 2018; Trechsel et al., 2021), ideology, values, attitudes and confidence (Bhukhanwala, Dean, & Troyer, 2017; Nada & Legutko, 2022), identities (Kuiper, 2017, p. 22). The fundamental idea of these scholars was that doctoral practices differ from students' previous educational experiences (Dai & Hardy, 2021). As students engage in doctoral practices, both psychological and cognitive adjustments take place (Nada & Legutko, 2022).

As shown in the previous studies, student's previous educational experiences play an important role when they acculturate to a new academic environment (Bilecen and Faist (2015). Likewise, Campbell (2015) noticed that students' willingness, decisions and desires to studying overseas directly hinged on students' past educational experiences and societal practices. Students with work experience aimed to develop their working competencies through the doctoral program; while the students with less work experience tended to seek personal development (Pham, 2022). Scholars also found that international PhD students retained their original self-perceptions and perceptions of teacher-student relationships (Byrne, 2017; Kumi-Yeboah, 2012). The ideas from these scholars seem to support the idea that students' current understandings are built on their previous ones; that is, there should exist cultural fluency and a coherent understanding in an individual's mind (Doucerain, 2019).

The above scholars acknowledged the importance of the development of international students' cognition in academic acculturation. At the same time, they emphasized the importance of the cognitive changes that academic acculturation can bring. For example, Dai and Hardy (2021) noted a transformation in self-identity, with students experiencing a dynamic shift toward hybrid identities. Such hybrid identities are adaptable to different cultural and educational contexts. The experience abroad prompted international students to develop new ways of thinking and understanding, fostering self-confidence, independence, and the courage to make bold decisions (Nada & Legutko, 2022). This development was essential for adapting to a different educational environment and was integrated into their personal and professional lives, enriching their academic perspectives and influencing their future decisions. This led to a more international mindset and an openness to diverse opportunities and challenges

2.5 Academic Acculturation Experiences of International Chinese PhD Students

This section narrows the focus to how international Chinese PhD students acculturate academically. Attention is then paid to academic acculturation in the New Zealand academic environment.

2.5.1 Experiences of Chinese doctoral student's academic acculturation

Similar to studies on the academic acculturation of international PhD students in general, the previous research stood on psychological, cognitive, and social interaction perspectives. By reviewing these previous studies, this section underscores the importance of studying the experiences of Chinese PhD students.

2.5.1.1 Psychological perspective, looking for psychological well-being

The previous studies indicate that, like many other international doctoral students, Chinese PhD students also suffer from psychological issues during their doctoral journey. The difference is that these psychological aspects effects interwoven with each other making their doctoral journey complicated. These psychological issues cover from lack of sense of belonging, isolation, frustration, anxiety, disappointment, homesickness, depression and distress (e.g. J. Li et al., 2019; Qi & Li, 2021; X. Wang & Freed, 2021; Y. Yang et al., 2018; S. Zhang et al., 2022). One of the factors that may differentiate Chinese PhD students' academic acculturation experiences from those of other international students is the complex set of driving forces behind their decision to pursue a PhD. Qi and Li (2021) detailed that, apart from

the pressure from their parents' expectations, Chinese PhD students are driven by the competitive nature of the Chinese social environment. These students intend to pursue a better position in China by obtaining an overseas qualification. An overseas academic qualification is regarded as essential for securing good positions, such as lecturers in tertiary education (Qi & Li, 2021). These factors seem to bring anxiety to the students but could also serve as a motivation for their PhD journey and facilitate academic acculturation. Moreover, the Chinese PhD students' academic experiences are not always negative. Chinese students are not always passive, and they actively work to overcome academic difficulties and regulate their emotions (J. Li et al., 2016; C. Y. Yang & Bai, 2020; W. Zheng, 2017). Students who established positive relationships with their supervisors and receive support from their peers have a sense of belonging and psychological well-being, and these students demonstrate a willingness to enrich experiences and improve prospects (Jackman et al., 2021; S. Zhang et al., 2022; W. Zheng, 2017; Ji Zhou, 2014).

In response to psychological challenges, previous studies have outlined various acculturation strategies employed by Chinese PhD students to overcome these issues and achieve well-being during their doctoral journey. For instance, scholars have shown that Chinese PhD students seek support from their supervisors, peers, or various social resources so that they could obtain a sense of belonging and mental health (Xiong & Zhou, 2018; X. Xu, Sit, & Chen, 2021). S. Zhang et al. (2022) showed that a good relationship with doctoral supervisors and peers helped Chinese students to build mental toughness, and such connections also gave the students a sense of belonging. Through establishing relationships with peers, faculty, and the community, the students achieved psychological well-being (J. Huang & Klinger, 2006; Li Wang, 2019).

However, scholars claim that psychological well-being is related to individual factors, achieved through self-regulation strategies. For instance, Chinese students could self-reflect in order to change their perceptions regarding tough situations (W. Zheng, 2017). Students also managed their negative emotions by thinking positively, self-appraising or taking breaks (Xiong & Zhou, 2018; C. Y. Yang & Bai, 2020). Chinese students might also adopt strategies of self-isolation, "fight for myself all alone" (X. Wang & Freed, 2021, p. 52) or try to avoid negative situations that could elicit negative emotions (W. Zheng, 2017).

The cited studies above focused on strategies related to either the social aspect or the internal aspect of acculturation. For Chinese students, their academic acculturations are

influenced by their cultural and educational traditions. As C. Y. Yang and Bai (2020) illustrated, due to their cultural tradition, they are “different from students from other cultural backgrounds in stress coping” (p. 597). Such difference is embodied as the Chinese students can use secondary control strategies, such as adjusting their perceptions and reframing realities, which are shaped by their cultural upbringing and moral education (C. Y. Yang & Bai, 2020). In addition to this, Chinese students are less likely to seek professional help and face more challenges due to insufficient emotional support and limited tailored support system (M. Yin, Aoki, Liao, & Xu, 2021).

It is important to note that these strategies are not necessarily mutually exclusive. This is because students' acculturation strategies are influenced by their personal characteristics and interpersonal conditions, which shape their approach to acculturation (Y. L. Zhang, 2016; W. Zheng, 2017). Furthermore, psychological well-being does not indicate that an individual has acculturated to the environment (Doucerain, 2019). For instance, M. Yin et al. (2021) found no strong correlation between acculturation and students' anxiety or avoidance. In other words, Chinese PhD students could be self-isolated even if the students reach psychological well-being (X. Wang & Freed, 2021; W. Zheng, 2017). Therefore, as Doucerain (2019) suggested, when considering an individual's psychological well-being, an individual's “ways of feeling, thinking, and behaving are congruent with the psychological tendencies” (pp 17-18) needs to be taken into account.

2.5.1.2 Social perspective, participation and social interaction

Scholars, from a social perspective, have highlighted the importance of various interactions and resources for academic acculturation. One group of scholars presented the idea that academic acculturation is a process of overcoming challenges embedded in the doctoral journey, and that interactions were the key strategies for overcoming these difficulties (e.g. J. Huang & Klinger, 2006; Qi & Li, 2021; Rui, 2020; Li Wang & Rähä, 2021; Ji Zhou, 2014). For instance, students would look for support from co-nationals, participate in various academic and non-academic communities, look for available supportive resources, and even find jobs (e.g. W. Gu & Usinger, 2021; J. Huang & Klinger, 2006; J. Huang & Rinaldo, 2009; Rui, 2020; Yu & Wright, 2015).

Another group of scholars noticed that Chinese students are initiative adaptors who actively look for various resources to achieve identity development, scholarly growth, psychological well-being, and personal and professional growth (Ding, 2016; Weng, 2020; Y.

Yang et al., 2018). For example, Ding and Devine (2017) noticed that students would attend Christian communities (e.g. church), which helped to build students' religious experiences. Y. Yang et al. (2018) found that Chinese PhD students regularly volunteered at a local aged-care village and tutored Chinese-Australian children; such non-academic practices formed students' multiple transitions in academic, personal, and social domains. Through looking for research projects and having interactions with various experienced people, students improved their professional knowledge and adopted academic norms (Wendan Li & Collins, 2014). By interacting with doctoral peers, Chinese students could be provided with informal mentoring, which smoothed their transition into academic independence (Y. L. Zhang, 2016).

The understanding of how Chinese PhD students acculturate academically from a social perspective can be derived from representative studies that adopted the Community of Practice (CoP) (e.g. Cai et al., 2019; Ding, 2016; Mao & Qian, 2015; Teng, 2020; Weng, 2020). A fundamental idea is that students started from the periphery of a community (Ding, 2016; Teng, 2020). The communities could be “institutional research communities”, “discipline communities”, “cultural communities”, and “communities of common interest and needs”. Each of these communities serves different functions throughout students’ doctoral journey (Cai et al., 2019). By actively engaging in these communities, students obtained development in self-understanding (e.g. identity), emotional aspects (e.g. sense of belonging, dispositions and initiative), and academic competencies (e.g. research skills) (Lihong Wang & Byram, 2019). With these developments, students moved from a marginal to a more central position in a community (Teng, 2020; Weng, 2020).

Overall, these studies from a social perspective provide a detailed understanding of how students engage with social resources, support, and communities. These various engagements shape students' doctoral journey. However, this view could not cover every possibility of the interaction (Cai et al., 2019), even though it provides a systematic view of social support or interactions. Moreover, the concept of social resources only means how students “pave their way for their overseas studies and how they cope with” their doctoral journey by using social resources (Ding, 2016, p. 122). Social interaction or looking for support, after all, is not “something that people have; it is something that people do. It denotes the engagement of actors with temporal relational contexts-for-action, not a quality of the actors themselves” (Biesta & Tedder, 2007, p. 136). In other words, the social perspective less emphasizes an individual’s factors, i.e. “it is not the brain that brings about problem-solving, but the cultural conditions in

which the very idea of solving problems and the kind of behaviour defined as problem-solving are nurtured” (Gergen, 2010, p. 803).

2.5.1.3 Cognitive perspective, identity transition and cognitive development

One of the most representative aspects is identity development or self-formation as the process of academic acculturation. For example, M. Wu and Hu (2020) disclosed that, due to the conflicts between the expectations of conforming to norms of obedience and the need for autonomy in the research process, students restructured their self-understanding as independent researchers. Ye and Edwards (2017) showed that Chinese PhD students developed new understandings of themselves and the people around them by integrating the pieces of their doctoral journey and self-reflection. The self-reflexion contributed to scholarly identity construction, facilitated intercultural adaptation, and enhanced the quality of doctoral experiences and their understanding of academic differences (Edwards, 2018; Ye & Edwards, 2017). The cited studies highlighted identity adjustments corresponding to the psychological adjustment of acculturation (Berry, 2005). Identity adjustment and development do not necessarily imply acculturation to the new environment; students could be in a situation of double exclusion even though they have developed their identities (Y. Huang, 2022). Dai and Hardy (2021) also indicated that Chinese students could construct the identity of an in-betweenener.

Another representative aspect of the cognitive perspective is the enrichment of academic competencies and adjustments of original academic cultural perceptions. The overall idea is that students brought previous educational experiences and cultural values to their doctoral practices (Lam et al., 2019). By experiencing intercultural supervision and interactions with supervisors, students developed their research competencies and adjusted their original academic-cultural values and perceptions (Lam et al., 2019; H. Zhang, Zhou, & Stodolska, 2018). For instance, Chinese PhD students developed intercultural competence, writing skills and research experiences by actively engaging in the supervision process (L. Xu, Teng, & Cai, 2021). L. Xu et al. (2021) found that engagement with supervisory feedback helped students to assimilate disciplinary norms. Students changed their Confucian values (such as deference to authorities) and demonstrated critical thinking (such as questioning supervisors’ feedback and justifying their voice and ownership of the writing) (L. Xu & Grant, 2020). These above-cited studies demonstrate academic acculturation as a dynamic and dual process, illustrated by students’ cognitive development and their interactions with supervisors. Hu et al. (2020)

specified students' perception of independence through the Zone of Proximal Development (ZPD) (Vygotsky & Cole, 1978) Supervisors help students become more independent by identifying their capacities and providing them with appropriate support, thereby, expanding students' potential and promoting independence (Hu et al., 2020; M. Wu & Hu, 2020). Correspondingly, students gained a deeper understanding of their doctoral research and were able to independently conduct research based on their existing capabilities, and “move toward greater independence” (Hu et al., 2020, p. 207). However, international students may encounter the situation that “the gap between current and former educational cultures is simply too broad, and there are no appropriate mental schemas to build on” (Holvikivi, 2007, p. 81). In other words, academic acculturation is limited within students' ZPD; if there is a great gap between an individual's previous academic experience and the academic new environment, any transition or adjustments of experiences will be difficult (Hu et al., 2020).

2.5.2 Research on Chinese doctoral students in the New Zealand Context

Compared to studies investigating international Chinese PhD students worldwide, the number of studies on how Chinese PhD students acculturate to the academic environment in New Zealand is relatively limited. It is worth noting that international Chinese PhD students in New Zealand demonstrate a similar academic acculturation process to their counterparts in other countries. This section presents studies that delve into the doctoral experiences of Chinese PhD students specifically in the context of New Zealand.

Like international Chinese PhD candidates in other countries, in New Zealand-based Chinese PhD students encounter many challenges. For instance, Qi and Li (2021) discovered that Chinese PhD students in New Zealand encountered various challenges, including academic pressure, financial pressure, stress, depression, anxiety, and loneliness. These challenges were identified as obstacles to their doctoral studies. Importantly, the role of supervisors was crucial in enhancing students' research skills and providing psychological support (Qi & Li, 2021). The university also played a significant role by offering career peer support communities, development opportunities, and access to academic resources (S. Lee, 2017; Qi & Li, 2021). Additionally, social support systems helped students integrate into society more effectively (Qi and Li, 2021). The studies mentioned primarily focused on the problem-solving and stress-coping aspects of the acculturation process, which may not fully highlight the students' agency and cognitive changes, as emphasized in the previous literature review in Sections 2.4.2 and 2.4.3. Qi and Li (2021) adopted the Push-Pull model and explored the students' motivation for

doing doctoral study in New Zealand. Their motivation could be categorized into “push” factors (F. S. Li et al., 2021), such as seeking career development, parents’ expectations and influence from friends. The motivation also includes “pull” factors, such as gaining a doctoral qualification and overseas life experience (F. S. Li et al., 2021). A person’s psychological adjustment, as well as motivation for acculturation, is complicated and often shaped by many aspects, such as “contextual, institutional and individual” factors; the push and pull factors are interconnected, and the boundary between these two factors cannot be clearly distinguished (Ding, 2016, p. 121).

Scholars also present the academic acculturation process as a development of academic competencies and a shift from marginalization to becoming central within academia. For instance, Chinese PhD students' perceptions of their PhD journey (such as epistemology, academic identity, writing skills etc.) are shaped by interacting with others (such as teachers or members of academic communities) in a specific time-space (L. Xu, 2022; L. Xu & Grant, 2017, 2020). Academic acculturation is not only a process of knowledge acquisition but also the development of the students’ expertise and cultural knowledge, such as formulation of research questions, discipline and discourse knowledge and writing conventions, academic norms, research philosophy and methods, critical reading and writing, and thesis structure and organization” (M. Li, 2016a, p. 756). Ding (2016) also noted that Chinese students were involved in a disparate power relationship with their supervisors; but with continuous interaction and supervision with supervisors, students adjusted their self-identities and the power relationship was not as sharp as it was at the beginning stage of the doctoral journey. This relates to the fact that doctoral supervisors are those who lead students (newcomers) into the academic community and help students grow both professionally and psychologically (Ding, 2018). Therefore, Ding (2016, 2018) believed that students underwent a process of moving from marginalization to the central of academia through full participation and the construction of identity in the process of academic acculturation.

However, scholars have claimed that the academic acculturation process is not a simple process from marginalization to the central of academia with competencies development. For instance, Y. Huang (2022) found that Chinese PhD students did not have a sense of belongingness to the New Zealand academic environment or the Chinese academic environment, demonstrating a dual cultural exclusion situation. Specifically, students maintained their original cultural habitus (e.g. collective-oriented communication methods) in 3-4 years of doctoral study, even though they accepted some of the New Zealand cultural

disposition (e.g. western values) during this period (Huang, 2022). Chinese PhD students' expectations were not often met; the supervision panel could also create problems for academic acculturation, especially when power dynamics, inter-subjectivity, and cultural differences stand in between supervisors and students (M. Li, 2016a).

2.6 Representative Theories Adopted in Academic Acculturation

As demonstrated in the preceding sections of the literature review, academic acculturation has been approached from diverse perspectives. These perspectives have often been limited to specific aspects of academic acculturation (e.g. either focusing on the cognitive process or the social interaction process). In order to obtain a more comprehensive understanding of existing research on academic acculturation, this section identifies seven representative theories that have been employed in previous studies. Through an examination of the perspectives offered by these theories, we can glean valuable insights into their strengths and limitations.

2.6.1 Stress and coping

The framework of stress and coping was proposed by Folkman et al. (1986). The basic idea of this theory is that an individual would encounter various acculturative difficulties and stress when studying and living in a new cultural environment. Acculturation to the new environment is a process in which an individual mobilizes internal forces and searches for external resources to cope with the stress or difficulties (Mak et al., 2015). Since this theory is effective in uncovering the individual's psychological adjustment and well-being, especially an individual's cultural understanding in relation to the appraisal process of stressors and coping responses (Karim & Hue, 2020), it was one of the dominant research perspectives for academic acculturation (Yu & Wright, 2015). Scholars who adopted this theory identified various acculturative stressors (e.g. the lack of language skills) as well as coping strategies (e.g. socialization with friends and peers) (Karim & Hue, 2020; Vyas & Yu, 2018).

However, this framework is on based on prediction of psychological adjustment; it operates under the assumption of emotion-directed or problem-originated “coping” or “solving” (Ward, 2001). Academic acculturation is not the linear process of stress-coping or problem-solving; it could be achieved by many other strategies, such as assimilation or separation (Berry, 2005). The individual's internal factors, such as pre-educational experiences (Campbell, 2015), and the process of psychological adjustment were less emphasized. Moreover, scholars also indicated that an individual may not always have to experience stress during acculturation;

acculturation is a complicated process, and it could be a positive process (Ding, 2018; Elliot et al., 2015). Therefore, “it is imperative for the field of stress and coping research to expand its current stress-coping theories and frameworks by accommodating new and more culturally and contextually informed perspectives” (B. C. Kuo, 2011, p. 1097).

2.6.2 Acculturative strategies and acculturation model

Based on the stress and coping model, Berry proposed an acculturation theory, which aims to investigate an individual’s stance or inclinations for attaching to the original or host cultures (Berry, 1997, 2005, 2019). Four types of acculturation strategies addressed the extent to which the individual maintains their original culture; these are integration, assimilation, separation, and marginalization (Berry, 1997, 2005). Integration indicates that individuals maintain their original culture and identity, but accept new values and identities. Assimilation refers to the situation where individuals give up their original culture and adopt the identity of the host culture. Separation describes a stance where individuals refuse to adopt the host culture and maintain their heritage culture and identity. Marginalization takes place when individuals are neither willing to hold onto their culture nor accept the host culture. These four orientations of acculturation are shown in Figure 2.1. The theory allows the scholars to focus on three important aspects, i.e. an individual’s self-understanding, the individual’s psychological preferences in choosing different cultures, and the strategies. In other words, the core of this theory is through cultural layers that reveal an individual’s universal psychological core (Doucerain, 2019). With this theory, scholars are able to relate academic acculturation to an individual’s psychological changes. For instance, scholars have explored the extent to which international PhD students maintain their cultural identity (e.g. Bar, 2017; Li Wang, 2019).

2.6.3 Bio-Ecological system theory

Bio-ecological theory (Bronfenbrenner, 1979, 2005) offers detailed understandings of how international students interact with different layers of the ecological system (microsystem, mesosystem, exosystem, macrosystem and chronosystem) to achieve their academic success (e.g. Elliot, Baumfield, & Reid, 2016; Elliot et al., 2015; X. Xu, 2020; X. Xu et al., 2021). The underlying ideas of such research suggests international PhD education causes a disruption in students' ecological systems at all levels (Elliot et al., 2015). The microsystem is the direct environment that immediately interplays with an individual's development (e.g. peers and supervisors). The interweaving or relationship among each microsystem consists of the mesosystem. The exosystem is an indirect environment that closely affects people who directly link to the individual (e.g. academic communities and social networks). The cultural context and social environment make up the macrosystem (e.g. cultural values, religion). Every system of the individual in the life course interweaves in a period and becomes a chronosystem (e.g. milestones and critical changes in the PhD). Students have to reestablish connections with the new ecological system at the multiple systems so that they can acculturate their doctoral education successfully (Elliot, Baumfield, & Reid, 2016).

Bio-ecological theory enables researchers to comprehensively explore international PhD students' ecological systems, especially the factors that directly or indirectly contribute to the individual's psychological development and academic acculturation (Mayne, 2019). The problem is that, during academic acculturation, do the students' original ecological system and the new ecological system coexist (Elliot & Kobayashi, 2019)? It has been shown that successful academic acculturation hinges upon the extent to which students manage their old and new ecological systems, which includes students' reflection and a critical analysis of their familiar old contexts (Elliot et al., 2015). In other words, academic acculturation also necessitates an individual's cognitive process. However, the Bioecological system implies that students' academic acculturation and development are determined by social interactions, highlighting the power of social aspects instead of internal processes. Moreover, even if emphasizing that students' development hinges on the bio-ecological system at different levels, the activities and interactions embedded in each subsystem are fluid and dynamic (X. Xu, 2020; X. Xu et al., 2021). It is difficult to separate the microsystem, mesosystem, exosystem, and macrosystem from each other (X. Xu, 2020). Thus, the interconnection among these constituents needs further clarification.

2.6.4 Legitimate peripheral participation and community of practice

There is a stream of research that uses Legitimate Peripheral Participation (LPP) and Community of Practice (CoP) to investigate cross-cultural adaptation, academic acculturation experience and transition (e.g. Cai et al., 2019; Ding, 2016; Ding & Devine, 2017). The idea of scholars who adopted CoP was that students' "psychological well-being and their academic progress (leading to successful completion) are arguably intertwined" (Cai et al., 2019, p. 28). Students developed their identities, obtained emotional support, alleviated acculturative challenges, and achieved academic success by participating in various communities (see Section 2.2.2). Scholars who adopt LPP suggest that engagement in academic activities and interaction with supervisors or members of the new academic community enables students to move from novice students to expert scholars (Ding, 2016; Palmer, 2016). Accordingly, academic acculturation can be considered a process of transiting from novice to expert, developing of research competencies, and achieving a sense of belonging to and fully participating in a community. These features can be summed up in four aspects: "Meaning", "Practice", "Community" and "Identity" (Wenger, 1999, pp. 4-6).

LPP and CoP are frameworks for considering learning from the social dimension (Illeris, 2016; Wenger, 1999), and there is no doubt that both contribute tremendous ideas for understanding academic acculturation from a social perspective. In other words, academic acculturation is achieved socially, and the student's identity, knowledge and belongingness are developed by social interaction. In particular, CoP situates learning "in the relationship between the person and the world, which for human beings is a social person in a social world. In this form of participation, the social and the individual constitute each other" (Wenger, 2010, p. 1). CoP is a "social theory of learning" (Wenger, 1999, p. 4), or is a "holistic theory of interaction" (Illeris, 2016, p. 104). Thus, LPP and CoP could explain how academic acculturation is achieved socially, but the theory leaves space for researchers to investigate acculturation from a cognitive perspective (i.e. internal process).

2.6.5 Transformative learning

Transformative learning (TL) is another theoretical perspective from which scholars have investigated academic acculturation. Since TL emphasises an individual's frames of reference, i.e. "the structures of assumptions through which we understand our experiences" (Mezirow, 1997, p. 5), scholars can portray "how learners construe, validate and reformulate the meaning of their experience" during the academic acculturation (Beaupre, 2011, p. 81). The

basic idea is that individuals obtain knowledge, skills or experiences; create meanings, then elaborate on and transform their frames of reference (Cranton & Kasl, 2012). The focus is that international students restructure or transform their established experiences, meaning perspectives, knowledge or educational practices (e.g. Kumi-Yeboah, 2012; Y. Wang, 2018a).

TL provides a way to understand the process of academic acculturation, i.e. acculturation is achieved through critical reflection accompanied by the student's understanding of adjustment. Yet, TL cannot cover the whole picture of acculturation, for TL only covers the situation where an individual acculturates by restructuring their previous frame of reference. For instance, Kumi-Yeboah (2012) found that 20.4% of international students had not experienced transformative learning during acculturation. Ritz (2010) also noted that TL did not take place when international students enriched their language competence or were unwilling to change their previous frames of reference. Importantly, TL focuses more on how an individual constructs their understanding from the cognitive dimension (Illeris, 2016). Even though TL can assist researchers to explain how learners restructure their understanding, it less emphasizes social interaction.

2.6.6 Cognitive schema and cultural schema

The underlying idea behind cognitive or cultural schema is to explore how people structure their perceptions/ideas/understandings/habits when they move from one environment to another (e.g. Bordia, Bordia, & Restubog, 2015; Doucerain, 2019; Sweller & Sweller, 2006; Zeng, 2016). Here, schema originate from Piaget's framework (1964), which refers to a block of meanings, concepts or common knowledge existing in peoples' memories. In cultural and cross-cultural contexts, the concept of schema refers to an individual's cognitive system, encompassing a set of cultural knowledge, values, beliefs, and behaviours (Doucein, 2019; Nishida, 2005). The underlying idea for the process of academic acculturation is that, if the new environment is similar to an individual's existing schema, the individual will retrieve and initiate relevant cultural schemas (Nishida (1999, 2005). If the individual is short of cultural schemas for the new situation, the individual will encounter uncertainty and will refine/change the original schemas (Wendy Li, Tse, & Chong, 2014; Nishida, 2005). However, some scholars (e.g. Zeng, 2016) preferred the process of acculturation based on the strategies of accommodation or assimilation, which are derived from Piaget's (1964, 1972) framework. In sum, this stream of scholars showed that acculturation is a process of restructuring the existing cultural schema and establishing new schemas.

Examining schema restructuring and construction presents acculturation from the perspective of how an individual negotiates previous knowledge and new content from the environment, which emphasizes the cognitive aspects. Moreover, accommodation and assimilation represent situations where an individual enriches or adjusts schemas, which means these two strategies occur only when the individual's previous schemas can be linked to the new environment (Illeris, 2016). Thus, schema theory loses its force in explaining multiculturalism and the situation of an individual refusing to change original schemas or accept new schemas. For instance: "How are these (two) processes connected to affect? Do they cause affect, are they caused by affect, or are they only accompanied by affect, with no interaction?" (Hanfstingl, Arzenšek, Apschner, & Göllly, 2021, p. 13).

2.6.7 The A, B, Cs of acculturation

Several scholars have adopted Ward's acculturation model (2001) to investigate academic acculturation (e.g. Y. X. Wang & Bai, 2021). This model is a relatively comprehensive model for acculturation, and is based on the stress and coping framework (Folkman et al., 1986; Lazarus & Folkman, 1984), culture learning (Argyle & Kendon, 1967; Argyle & Williams, 1969) and social identity theory (Deaux, 1994; Phinney, 1990, 1992). This model enables scholars to investigate affective (A), behavioural (B) and cognitive (C) aspects of individuals when they are exposed to a cross-cultural environment (Masgoret & Ward, 2006; Ward, 2001). The affective aspect (A) explores how an individual makes psychological adjustments, adopts strategies to cope with stress, finds social support to deal with psychological difficulties, initiates cognitive appraisal of life changes, etc (Ward, 2008; Y. Zhou et al., 2008). The behavioural aspect (B), through learning approaches, investigates the acquisition of cultural behaviours, norms, skills, language competence, (non)verbal components, communication and knowledge, etc (Ward, 2001; Y. Zhou et al., 2008). The cognitive aspect (C) focuses on how an individual constructs cultural identity, expectations, preferences and intergroup relationships through "social interactions between members of the host communication and various sojourner or immigrant groups" (Ward, 2001, p. 413; Y. Zhou et al., 2008).

The ABC theory highlights the importance of individuals' cognitive, affective and behavioural aspects (Matsumoto, 2001). However, this theory has two limitations. First, the theory integrates these three aspects (cognitive, affective and behavioural), but the approach for investigating these three dimensions is split. For instance, the theory investigates an

individual's psychological acculturation through stress-coping; whereas, it adopts cultural learning to deal with the acquisition of cultural skills. It is difficult to separate these three aspects and use different perspectives to investigate these three aspects individually. Because an individual's emotion and cognition are closely attached; behavioural and cognitive aspects are mutually connected as well (Damasio, 1994; Illeris, 2016; Marg, 1995). Secondly, (on cognitive aspects) to treat learning as the acquisition of cultural behaviours or skills is disputable. Indeed, cultural knowledge, cultural norms, behavioural skills, language etc., could be regarded as cultural content, something objective and outside of an individual's cognition. Academic acculturation, correspondingly, is the process of obtaining these cultural contents (i.e. knowledge acquisition). Yet, evidence has shown that learning not only includes knowledge acquisition but also involves knowledge restructuring and the construction of an individual's self-understanding, previous experiences or mental schemas (Illeris, 2016). For example, scholars adopted transformative learning (Dai & Hardy, 2021) or Giddens' theoretical framework (Ye & Edwards, 2017) in their academic acculturation research, showing that the international students' self-understanding also changes during their doctoral journey. Thus, regarding learning as knowledge acquisition would be limited to investigating academic acculturation through the perspective of obtaining cultural content.

Chapter Summary

This chapter provides a review of existing studies on academic acculturation, particularly in the context of international doctoral education. Academic acculturation is a complicated process entailing numerous contents and challenges for students to deal with. Cultural factors play a significant role in shaping academic acculturation, but these factors should not be overemphasized as academic acculturation also includes many other factors. Previous studies have employed various theoretical perspectives to understand academic acculturation, each with different focuses. Furthermore, prior research has identified various academic acculturation processes, suggesting that academic acculturation could involve many potential processes. The different focus and diverse processes imply that previous studies and theories did not fully cover the whole academic acculturation. Thus, there is a need for more comprehensive perspectives to further explore the phenomenon of academic acculturation.

Chapter 3: Theoretical Framework: Comprehensive Learning Theory

As described in Chapter 2, previous studies do not fully cover the cognitive, emotional and interaction perspectives in one theoretical framework. To address this gap, Comprehensive Learning Theory (CLT) (Illeris, 2016) was used to explore academic acculturation. This chapter justifies why CLT can be used as the framework for academic acculturation by elaborating on the definition of learning, the three dimensions of learning and four types of learning. This is followed by the elaboration on barriers to learning. Each section contains the corresponding idea in CLT, the justification for CLT to be used in exploring academic acculturation, and how CLT is used in this study.

3.1 Definitions for Learning and Acculturation

This section introduces the definition of learning, the learning process and acculturation. These definitions provide a rationale for why CLT can be used to interpret acculturation.

Before going further into the Comprehensive Learning Theory, it is important to briefly introduce Knud Illeris and origination of the theory. Knud Illeris, a Danish professor, served at Roskilde University and is currently a professor emeritus of Lifelong Learning at Aarhus University. His work has significantly impacted the fields of lifelong learning, adult education, vocational training, workplace learning, and continuing education⁸. Illeris contributed in innovative research in project studies and learning theory. His contribution is well known for his developing work on project studies in theory and practice, especially learning theory. His early works were influenced by Jean Piaget's cognitive development theory. Later, his study combined Cognitive Development Theory and the critical theory of the German-American Frankfurt School, which merges Freudian psychology with Marxist sociology. In the 1990s, Illeris expanded his theoretical framework, building on his earlier work by incorporating a broader range of theoretical perspectives (such as Kolb's (2014) Experiential Learning, Wenger's (2010) Community of Practice, and Mezirow's (1997) Transformative Learning). This evolution of his ideas was first presented in *The Three Dimensions of Learning* and further developed in *How We Learn: Learning and Non-learning in School and Beyond*. These works

⁸ <https://halloffame.oureach.ou.edu/Inductions/Inductee-Details/knud-illeris>

laid the foundation for his Comprehensive Learning Theory, offering a refined and expanded understanding of learning processes.

Definition of learning

Illeris (2016) defines learning as “any process that in living organisms leads to permanent capacity change and which is not solely due to biological maturation or ageing” (p. 3). The following key ideas embedded in this definition need to be elaborated. First, the definition does not limit where learning could take place, such as a school or non-school environment, workplace and cross-cultural context. Second, the definition gives a broad conception of “changes” that could include changes in behaviour, cognition and emotions, broadening the idea that learning causes cognitive development. Third, the definition highlights the changes that are not caused by maturation or accidents, which broadens the idea that learning leads to cognitive development or knowledge acquisition. Lastly, Illeris deliberately kept the definition of learning broad and open to avoid unnecessary limitations (2016). These are interwoven throughout his entire theory, which make the theory as 'comprehensive' learning theory.

Considering these features, the definition allowed this study apply it in the cross-cultural academic context. In particular, the inclusive nature of CLT provides an open and comprehensive scope for investigating students' experiences in academic acculturation. Although academic writing should pursue precise definitions of terms, such precision can sometimes limit the inclusiveness of conceptual expression. I acknowledge the differences between specific terms, such as 'identity' and 'self-understanding' (see Subsection 5.6), 'dissonance' and 'cognitive dissonance' (see Subsection 6.2), as well as 'psychological defense' and 'defense' (see Subsection 6.5). However, to maintain the inclusivity of this study, these similar terms will be treated as synonymous and used interchangeably throughout.

Correlation between learning and acculturation

Illeris (2016) thought that learning contains both psychological acquisition and social interaction processes. The psychological acquisition process involves the learner's psychological functionality or inner process, and the social interaction process concerns the situation in which the learning is situated, i.e. how an individual connects to the environment to make the learning happen (Illeris, 2016). These two processes do not limit learning to any particular process, such as knowledge acquisition, understanding adjustment, reflection, observation and participation in courses. Importantly, these two processes, in most cases, take

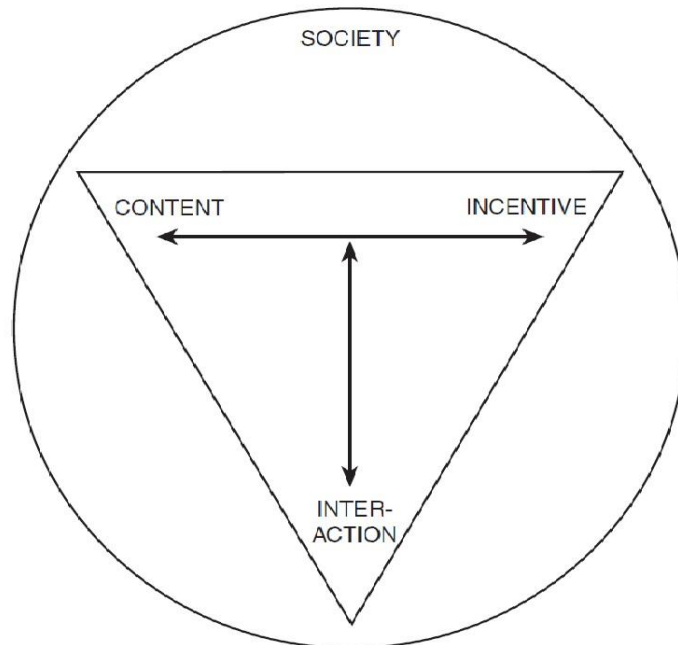
place simultaneously even though they can occur at different times (Illeris, 2016). That means both processes need to be considered when analysing learning activities. It also means that these two processes can be investigated separately.

The learning process is in line with the concept of acculturation. Acculturation is defined as “the dual process of cultural and psychological change that takes place as a result of contact between two or more cultural groups and their individual members” (Berry, 2005, p. 669; 2019). This definition highlights the idea that an individual’s psychological changes are embedded in the interactions between individuals and the environment, which has the same notion of the learning process. Since Berry’s focus was on an individual’s stance or inclinations for attaching to the original or host cultures, the definition of acculturation focuses on psychological changes, for example, cultural knowledge, attitude, or identity, which separate psychological changes from behavioural changes (Erickson-Ludwig, 2020). Compared to CLT, “any process” in the learning process does not exclude the acculturation process, and “capacity change” is not limited to the psychological aspects. The learning process broadens our horizons in investigating the changes that an individual makes during acculturation.

3.2 Three Dimensions of Learning

While these three dimensions can be examined separately, they are interwoven in any actual learning situation, “All learning involves these three dimensions, which must always be considered if an understanding or analysis of a learning situation is to be adequate” (Illeris, 2016, p. 24). The learning dimensions are shown in Figure 3.1.

Figure 3.1 Three dimensions of learning



Note. Three dimensions of learning. From “How we learn: Learning and non-learning in school and beyond: Routledge” by Illeris (2016, p. 24)

3.2.1 Content dimension: What to learn during acculturation

Learning content refers to “what” to learn. It represents an individual’s cognitive aspect, including knowledge, skills, meanings and experiences (Illeris, 2003b, 2016). Although CLT does not detail nor discuss learning content by specific categories, the learning content dimension is far-reaching. Learning content encompasses not only knowledge and skills but also insights, opinions, meanings, attitudes, a set of behaviours, working methods, and strategies (Illeris, 2003b, 2016). Learning content may also include experiences, social culture, a series of social norms, a set of thinking, learning itself (i.e. learning methods or meta-learning), qualifications, competencies, and even the learners themselves (i.e. self-understanding, one’s own inclination or preference) (Illeris, 2003b, 2014, 2016). In this sense, the learning content dimension aligns with previous studies that highlight the need for international students to acquire academic norms and improve academic and language competencies (Jian, Marion, & Wang, 2019; M. Li, 2016b). In addition, learning content extends beyond the notion of knowledge acquisition; it widely encompasses any content that individuals need to engage with, address, and adapt to (Illeris, 2016). This understanding is in line with studies that examine the various challenges encountered by international PhD students and identity adjustments, such as the transition to being independent researchers. (Dai & Hardy, 2021; Jackman et al., 2021). Therefore, the learning content dimension broadens the scope for

this study in investigating the range of contents that students need to navigate and overcome during their academic acculturation.

3.2.2 Incentive dimension: Driving forces for acculturation

The incentive dimension of learning refers to the driving force or mental energy that directs, drives or maintains the learning that occurs (Illeris, 2003a, 2016). The incentive of learning encompasses, emotional aspects, attitudes and volitions. It may also include but is not limited to “uncertainty, curiosity or unfulfilled needs that cause us to seek new knowledge or new skills in order to restore the balance” (Illeris, 2016, p. 25). Since learning processes can not only be motivated but can also be maintained and de-motivated, Illeris keeps the incentive dimension as broad as possible by adopting the term “incentives” to describe the mobilisation of learning (Illeris, 2003b, 2016).

In the context of this study, the incentive dimension offers valuable insights and is also suitable for exploring Chinese PhD students’ academic acculturation for the following reasons. Firstly, the incentive dimension supports the previous studies. The doctoral journey likely causes challenges, psychological issues, academic stress and loneliness for students. Equally, it contains the greatest potential for the students to develop and grow from these challenges (Akkerman, Admiraal, Simons, & Niessen, 2006; Elliot & Kobayashi, 2019). In this sense, stress and challenges are included in the incentive dimension. Secondly, the incentive dimension does not categorise driving forces as positive or negative, nor specify “push or pull” factors in the academic acculturation process (e.g., F. S. Li & Qi, 2019). Instead, the incentive dimension encompasses a wide range of factors. The dimension is consistent with previous studies that maintain academic acculturation does not have to be all negative; it could also contain excitement and students’ passions and desires could lead to academic acculturation (Cai et al., 2019; Yu et al., 2019). This helps to recognize that academic acculturation is influenced by a wide range of factors, allowing for a broader understanding of the factors that drive academic acculturation.

3.3.3 Interactions: How people interact with the environment

The interaction dimension is about how an individual engages with the situated environment (Illeris, 2016). The core idea is that all learning is situated and that an individual’s psychological function can only be developed in a certain context or environment (Illeris, 2009, 2016). The environment can be interpreted at both social and societal levels. The environment at the social level refers to the immediate or social situation in which learners can find

themselves situated, such as the workplace or school. The societal level refers to the situation that is influenced by the norms or the structure of the society, for example, the cultural environment (Illeris, 2016). The environment at these two levels consists of the social aspect of learning (Illeris, 2003b). The interactions between an individual and the environment can take various forms, such as perception, transmission, experience, imitation, activity, and participation (Illeris, 2003b, 2016; Poortman, Illeris, & Nieuwenhuis, 2011). These forms of interaction often overlap, but they serve to provide a basic understanding of how to interpret social interaction.

The interaction dimension is suitable for interpreting academic acculturation for three reasons. Firstly, it aligns with previous studies emphasizing that academic acculturation is formed by social support and interactions. For example, international students engage in extensive communities and social interactions to cope with loneliness, enhance language proficiency and move to the centre of academia (Ding, 2016; Elliot, Baumfield, & Reid, 2016; Y. X. Wang & Bai, 2021). Secondly, the notion of the social and societal environment presents the fact that an individual's cognition is constructed or influenced by different social factors at different levels. This is in line with the idea that the international doctoral journey is influenced by the "environment with a different societal culture, academic systems, language(s), and even weather, thereby necessitating transitions at multiple levels" (Elliot, Baumfield, & Reid, 2016, p. 1182). Lastly, the interaction dimension emphasizes that interaction can take various forms, which allows for expanding the scope of investigating how Chinese PhD students interact with the New Zealand environment.

3.3 Four Types of Learning

As described in Chapter 2, previous studies disclosed various acculturation processes, especially different possibilities for psychological development. This section details four types of learning (i.e. cumulation, assimilation, accommodation and transformation) and elaborates on the reason why these types of learning can be used in this research.

3.3.1 Mental schema and cultural schema

In CLT, Illeris adopted the phrase "mental scheme" to describe a set of coherent memories, knowledge and understanding stored in an individual's brain. This phrase is derived from Piaget's (1964) concept of 'schemes'. Illeris thought Piaget's concept of schemes only embodied knowledge, representing the cognitive aspect (Illeris, 2016). What an individual acquires (learns) should not be limited to knowledge and skills, and the results of learning may

include the acquisition of a set of behaviours and emotional inclinations (Illeris, 2003c, 2016). Thereby, Illeris adopted the concept of “mental scheme” to broadly cover the learning results that are stored in our brains in an organized manner.

In the cross-cultural and cultural adaptation context, scholars commonly use “cultural schema” to refer to an individual's pre-existing knowledge and familiar cultural framework; it is a set of generalized collections of knowledge stored in memory, relating to specific cultural domains such as relationships, behavioural rules, and cultural facts (Doucerain, 2019; Markus, 1977; Nishida, 2005). Although Nishida (2005) specified several categories of cultural schemas, the meaning of schemas is homogeneous with the meaning of “mental scheme” in CLT. To be consistent with most acculturation studies and CLT, this study adapted the term "mental schema" to widely cover the cultural knowledge, academic understanding, a set of thinking, memories and patterns of emotion and behaviour that are stored in students' minds.

3.3.2 Cumulation and cumulative learning

Cumulation refers to a type of learning where an individual establishes the first group of knowledge elements or mental schemas (Illeris, 2016). The feature of this type of learning is that an individual does not have any existing mental schemas that relate to the impression of the environment, which makes it consistent with traditional behaviourism psychology and mechanical learning. In other words, what the individual learns “is in no way connected with anything of which one has any previous knowledge (Illeris, 2016, p. 37). Illeris (2016) asserts that this type of learning often takes place in the early years of an individual's life, yet it does not mean that this type of learning would not occur throughout the different life stages. Academic acculturation or cross-cultural context may provide an opportunity for cumulative learning. Previous studies have acknowledged the acquisition of cultural knowledge, skills, or academic competencies by individuals (e.g. Li Wang & Rähä, 2021; Xing, Bolden, & Hogenkamp, 2020; H. H. Yang & Farley, 2019). Yet they overlooked the fact that students have already established mental schemas, so new impressions from the host academic environment can be built on pre-existing mental schemas. Cumulation (cumulative learning) is a key type of learning. It provides an opportunity to gain insight into the situation where international Chinese PhD students do not possess established mental schemas for their doctoral journey. It is important to note that, in CLT, the terms 'cumulation' and 'cumulative learning' are used interchangeably as they convey the same meaning. Therefore, both of these terms will be adopted throughout the following chapters.

3.3.3 Assimilation and assimilative learning

Assimilation is another type of learning, which describes how “the learner adapts and incorporates impressions from his or her surroundings as an extension and differentiation of mental schemes built up through earlier learning” (Illeris, 2016, p. 38). The key feature of assimilation is that new knowledge, skills, and experiences (representing impressions from the new environment) can be directly linked to an individual’s established mental schemas (Illeris, 2016). Moreover, the new impressions are in line with the individual’s previous mental schemas, and the individual enriches previous mental schema by adding these impressions to their existing mental schemas without making adjustments (Illeris, 2016).

Since assimilation and assimilative learning have the same meaning in CLT, this study uses them interchangeably in the following chapters. Assimilation aligns with previous acculturation studies and helps to investigate how Chinese PhD students develop their knowledge. As shown in previous studies, international students entering doctoral programs bring their existing knowledge, capabilities, and expectations. Throughout their doctoral journey, students enrich their knowledge, enhance their writing skills, and improve their research competencies (Campbell, 2015). This continuous development of knowledge and competencies presents a process of knowledge expansion and enrichment (Danso & Aalgaard, 2019; L. Xu et al., 2021), which seems to be a process of assimilation. However, these studies did not fully explore the specific interactions between students' previous knowledge and the new information from their doctoral journeys. It remains unclear whether knowledge enrichment occurs through the integration of new elements from the environment or through the adjustment and development of existing knowledge. Assimilation provides a perspective for this study to explore this matter.

3.3.4 Accommodation and accommodative learning

Accommodation presents a learning situation where an individual has to break down or restructure part of the existing mental schemas to let the incoming impressions be incorporated into the schemas (Illeris, 2016). The restructuring is due to the fact that “impulses from the environment cannot immediately be linked to the existing schemes due to some inconsistency or other, something that does not fit” (Illeris, 2016, p. 39). Although the distinct feature of accommodative learning is mental schema restructuring, it needs to be noted that this type of learning suggests a developmental process, containing restructuring and acquisition (Illeris,

2016). Therefore, accommodation requires more mental energy in restructuring mental schemas and incorporating new impressions (Illeris, 2016).

In CLT, Illeris adopted the term restructuring to describe the situation in which a learner adjusts or changes his/her mental schema. In other words, restructuring (having the same meaning as the terms: adjustment and changes) is one of the important features of accommodation (accommodative learning). Accommodation not only aligns with previous studies, but it also helps to explore the situation where students' existing knowledge does not correspond to their doctoral journey. As shown in the previous chapter, Zeng (2016) showed that Chinese international students partially changed their perceptions and patterns of behaviour when responding to cultural shock and academic differences. The adjustments suggested a feature of accommodative learning. Adjustments do not mean enrichment or development of the student's understanding, and so they cannot explain how students negotiate between the elements from the environment and their existing knowledge. Moreover, accommodation is one approach to explaining schema adjustment and development. It cannot cover the situation when students' knowledge is in line with the environment (Zeng, 2016). Nevertheless, accommodative learning still presents a possible approach for examining how Chinese PhD students react to academic differences.

3.3.5 Transformation and transformative learning

Illeris adopted the concept of transformative learning, elaborated by Mezirow (1990, 1997), and developed the concept of transformative learning in the following three aspects. Firstly, “transformative learning is extremely demanding and a strain, and only takes place when the learner is in a situation with no other way out that can be experienced as sustainable” (Illeris, 2016, p. 45). This means that transformative learning involves an individual’s personal crisis, which is one of the preconditions for transformation. Secondly, transformation entails that “the individual(’s) several important schemes are reorganized at the same time and with relation to all three dimensions of learning” (Illeris, 2016, p. 42). The reorganization of mental schemas is what Mezirow referred to as the restructuring of the “frame of references” or “habits of mind” (Mezirow, 1997, p. 7) involving not only cognitive aspects but also emotional and social aspects. The reorganization also indicates that an individual cannot maintain mental coherence by partially adjusting the pre-established mental schemas. The individual has to reconstruct a new mental schema if necessary. Finally, transformation refers to transformative learning, which involves restructuring or reconstruction of “the identity or self-understanding

of the learner” (Illeris 2016a, p. 42); it “interpenetrates with every portion of his existence” (Rogers, 1961, p. 290).

In CLT, the terms 'transformation' and 'transformative learning' are synonymous. This study employs both terms interchangeably. As demonstrated in the previous paragraph, transformation involves the reconstruction of mental schemas, where individuals deconstruct existing schemas and build new ones. Additionally, transformation encompasses situations where individuals restructure many parts of their mental schemas simultaneously, particularly their identities. In other words, the mental schema reconstruction or major adjustments in most parts of mental schemas is one of the important features of transformative learning. Considering these features, transformative learning, in alignment with certain previous studies, can be a useful perspective for exploring academic acculturation. Previous studies adopting the transformative learning perspective have shown that students undergo identity restructuring and transformations during their doctoral journey, highlighting academic acculturation as a process of “stress-adaptation-development” (Dai & Hardy, 2021, p. 252). This suggests that exploring transformation can provide valuable insights into academic acculturation. However, transformation is energy-demanding and tends to be associated with negative aspects (Illeris, 2016). Not all acculturative experiences are negative, as noted by previous scholars (e.g. Elliot, Baumfield, & Reid, 2016; Xing et al., 2020), and not all international students experienced transformation during their cross-cultural education (Ritz, 2010; Y. Wang, 2018a). Nevertheless, transformation can provide insights into situations where students undergo significant changes in their mental schemas during the process of academic acculturation.

3.4 Barriers to Learning

Sections 3.1-3.3 present the situations where learning takes place, yet, what is relevant to learning also includes the situation where learning does not occur or is restricted. This section details learning barriers and how these learning barriers relate to academic acculturation.

3.4.1 Mislearning

Mislearning refers to what an individual learns does not align with what was intended or communicated (Illeris, 2016). Mislearning can occur as a result of poor concentration or inadequate communication (Illeris, 2016) but can also occur due to the influence of the learner’s pre-established misunderstanding from previous learning (Illeris, 2016). Under this circumstance, “if one assimilates further information on a mistaken basis, the misunderstanding will naturally become more pervasive” (Illeris, 2016, p. 150). However, in some circumstances,

no one could assert if an individual's previous learning or current learning are "right and wrong" (Illeris, 2016, p. 150). This is because the learning is placed in an environment to which the individual has to relate, or the learning could lead to many outcomes. Yet, if some of the learning leads to difficulties or serious problems for the learner, the result can be seen as problematic (Illeris, 2016).

Mislearning aligns with previous studies and can be applied to the analysis of barriers that hinder academic acculturation. Previous scholars have recognised language as a prominent barrier to academic acculturation as it hampers students' understanding and communication, leading to challenges such as misunderstandings (Campbell, 2015; Gao, 2021; M. Li, 2016b). Here, language leads to misunderstandings, which corresponds to the concept of mislearning. In CLT, language is one of the factors contributing to mislearning, and there are a broad range of factors that can cause misunderstanding. In this sense, mislearning provides a comprehensive framework for analysing the factors that impede students from developing accurate understandings of their doctoral journey.

3.4.2 Defence against learning

Learning defence, also called psychological defence, refers to an individual's mental mechanisms that serve to "protect the individual against learning which can be threatening, limiting or in some other way places a strain on maintaining mental balance" (Illeris, 2016, p. 150). The defence takes place when an individual is unwilling to learn or accept the learning content, and it could also take place in a situation when an individual distorts learning content that is unacceptable but has to be accepted (Illeris, 2016). In some serious situations (e.g. unemployment, divorce, or "other sudden changes in the foundation of life") (Illeris, 2016, p. 156), an individual's existing mental schema cannot capture the impressions of the new situation, so the defence functions to maintain mental balance in order to keep up with the new situation (Illeris, 2016).

The findings from previous acculturation studies may indicate psychological defence. International students maintain their cultural heritage or original identity (Aldhahri, 2019; Shafaei, Nejati, Quazi, & Von der Heide, 2016). After several years of doctoral study overseas, international Chinese students do not accept the academic environment of the host country and also find it hard to adapt to the Chinese academic setting, placing them in a state of dual cultural exclusion (Dai & Hardy, 2021; Y. Huang, 2022). In these cited studies, the resistance or unwillingness of students to adapt or accept a new environment illustrates students'

psychological defence mechanisms. The concept of psychological defence aids in interpreting the factors contributing to students' unwillingness to accept a new academic environment. It also helps to explain why students may choose to retain their original habits or understandings.

Chapter Summary

This chapter outlined Comprehensive Learning Theory (CLT); justified why CLT can be used in academic acculturation; and how CLT will be utilised in this study. The learning definition and processes of CLT align with the construct of acculturation. CLT integrates three dimensions (content, incentive, and interaction) which provide a holistic perspective for analysing academic acculturation. Four types of learning (cumulation, assimilation, accommodation and transformation) hinge on how individuals organize mental schemas, and offer a comprehensive perspective to explore various acculturation processes. CLT also includes learning barriers, which will be used to analyse the barriers to academic acculturation.

Chapter 4: Methodology

This chapter presents the methods used to examine the process of academic acculturation among international doctoral Chinese students in New Zealand. This study is grounded in social constructivism epistemology and utilises a case study methodology. The primary method for data collection was semi-structured interviews, which were conducted with eleven participants in person. The last portion of this chapter details the process of interview data translation and data analyses.

4.1 Qualitative Research Paradigm

The research paradigm for a research study is grounded in the researcher's ontological and epistemological decisions, theoretical perspectives, and the research methods used (Crotty, 1998; Lincoln, Lynham, & Guba, 2011). These four elements respectively concern the questions about the nature of the world, how to understand reality and the way in which we experience reality.

4.1.1 Integration of constructivism and constructionism

Ontology embodies a researcher's philosophical orientation about the nature of being and reality (Creswell & Creswell, 2017; Denzin & Lincoln, 2011). My philosophical orientation is that the nature of the world can be unveiled. Academic acculturation is a form of human activity. It is historically and culturally rooted in our social practices, and it can be explored differently by various scholars. As shown in Chapters 2 and 3, my stance on academic acculturation is that academic acculturation involves people's psychological processes and social interactions. This philosophical stance aligns with both constructionism and constructivism. That is, the reality of the world stands outside of people's consciousness, and the world does not exist independently of people's minds (Cohen, Manion, & Morrison, 2018; Crotty, 1998). As an example, Burr (2015) argued the world had no meaning before people interpreted the world or constructed its meaning of the world.

Epistemology is the "theory of knowledge embedded in the theoretical perspective and thereby in the methodology... (it) is a way of understanding and explaining how we know what we know" (Crotty, 1998, p. 3). In terms of epistemology, constructivists emphasise that the reality of the world is a construction activity of the individual mind (Lincoln & Guba, 2016). In other words, "all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of the interaction between human beings and

their world, and developed and transmitted within an essentially social context” (Crotty, 1998, p. 42). Hence constructivism highlights individual construction in the internal process. In contrast, constructionists consider reality and knowledge to be socially constructed. Within this foundation, constructionists do not deny there are internal processes but they draw attention to the social construction of understanding and argue contextual interrelations are critical (Raskin, 2008). Constructionism is limited when explaining the internal process, especially knowledge construction that includes self-contained stories (Esin, Fathi, & Squire, 2014). Moreover, constructionists argue that constructivism overlooks the social situatedness of knowledge and does not explain how an individual’s identity is constructed (Brau, 2020). As Bekki Brau (2020) explained, constructivism is limited in explaining the situation if an individual did not have any beginning knowledge or initial mental schema. These perspectives highlight drawbacks to the idea of “pure” constructivism or “pure” constructionism. In my understanding, constructionism and constructivism do not oppose each other. This is because an individual’s behaviour is context-related (Cohen et al., 2018), and an individual’s understanding is socially constructed (Illeris, 2016). Thereby, this study adopts a stance that uses both constructivism and constructionism to explore academic acculturation.

Academic acculturation embodies the features of both constructivism and constructionism. As defined by Berry (2005), acculturation encompasses the individual’s “psychological adjustments” as well as the interactions “between two or more cultural groups and their individual members” (p. 698). The definition indicates that psychological adjustments result from social interaction, and embodies the basic idea of constructionism, whereas people have psychological adjustments, which indicates people’s internal processes, thus relating to the idea of constructivism. The pretext for this study is that Chinese doctoral students constructed their understandings of their PhD journey or adjusted their self-understandings as they interacted with the New Zealand educational environment. Understanding construction and interactions embodies the basic idea of both constructionism and constructivism. Moreover, constructionism and constructivism are embodied in the process by which I conducted this research and knowledge of academic acculturation. My understanding of how Chinese PhD students acculturate academically is socially constructed through the interaction between me and the participants, which presents the idea of constructionism. Additionally, I interpret the students’ perceptions of their pre-doctoral and in-doctoral educational experiences. I create new knowledge based on the student’s understanding and my knowledge obtained from the literature. The process of creating knowledge aligns with the principles of constructivism.

4.1.2 Interpretivism as the theoretical perspective

The theoretical perspective describes the assumptions underlying the selection of methodology (Crotty, 1998). This research adopted interpretivism as a theoretical foundation for the following reasons. Interpretivism aligns with both constructionism and constructivism, which keeps the design of this study consistent. As described by Mertens (2019), interpretivism is often combined with social constructivism. Interpretivists investigate people's ideas, thinking, and meanings, claiming that people's ideas can be modified through "an interpretive process used by the person in dealing with the things he/she encounters" (Crotty, 1998, p. 72). That means interpretivism embraces the idea that knowledge is constructed by people themselves. Interpretivism does not deny that people's ideas and understandings originate from social interactions (Chowdhury, 2014). People's understandings and meanings are socially constructed. Thus, interpretivism is consistent with both constructivism and constructionism, and it helps this study to interpret Chinese students' psychological processes and social interaction.

Interpretivism emphasizes the ideas, meanings or reasons behind the research data, and largely relies on the interpretation of the researcher instead of merely presenting the data itself. This feature of interpretivism is in line with the purpose of this study. Interpretivism is rooted in the philosophy of hermeneutics, adopting interpretive and subjective methods to look for the answer to people's actions and social phenomena (Alharahsheh & Pius, 2020). That means researchers give further explanations of the social phenomena or actions by disclosing people's ideas, thinking, motivations, interactions, meanings, etc, that are embedded in the phenomena (Creswell & Poth, 2016). Since academic acculturation represents a social activity, investigating people's acculturation experiences and ideas is one of the suitable approaches to unveil the activity, and, hence, requires researchers' subjective elaboration. In this sense, interpretivism provided a theoretical foundation for this study to explore academic acculturation, especially to interpret the acculturation process by which Chinese PhD students construct their understandings and interact with the New Zealand academic environment.

Interpretivism allows the co-existence of multiple viewpoints and truths for a single phenomenon, which helps this study to investigate various approaches to academic acculturation. Due to the complexity of people's ideas and the fact that social activities are contextualized, the complexity determines that reality can be interpreted from indifferent angles (Creswell & Poth, 2016; Saunders, Lewis, & Thornhill, 2009). That means

interpretivism does not limit researchers to one category of possible results. Since Chinese PhD students may demonstrate various processes and the proves could lead to different acculturation results, a researcher might have to give rich explanations. Interpretivism allows this study to explore various academic acculturation possibilities.

4.1.3 Case study as a methodological approach

Methodology relates to the rationale for the choice of methods (VanWynsberghe & Khan, 2007). It embodies a researcher's basic idea regarding "procedures for collecting, analysing, interpreting, and reporting data in research studies" (Creswell & Clark, 2017, p. 51). In this study, the research aim, strategies for selecting methods, research design and potential participants determine the case study as the methodology for this research.

The case study, as methodology, helps to carry out data collection flexibly. The case study is featured as an "in-depth study of one setting; a focus on processes, interactions and relationships; holism; a concern for the particular; multiple methods of data collection; and focus on natural settings" (Denscombe, 2017, pp. 54-57). In addition, a case study can be conducted either qualitatively or quantitatively (Creswell & Poth, 2016; Stake, 2008). That means the case study itself is on the level of research design, which contains a set of methods and research procedures, instead of a method involving a detailed examination of a bounded system. Moreover, case study design is not confined to one or two research methods nor limits the selection of the research method. It provides flexibility for this study with respect to the choice of the most suitable research methods for data collection.

The research aims and participant selection set up a clear boundary, which is in line with the case study design. Researchers should set "clearly identifiable cases with boundaries and seek to provide an in-depth understanding of the cases or a comparison of several cases" (Creswell & Poth, 2016, p. 74). The boundary can be an individual, a cultural group, an organization, an event, or a representative phenomenon (Cohen et al., 2018; R. K. Yin, 2009, 2018). This study aims to search for Chinese PhD students' academic acculturation experiences in the New Zealand (NZ) context. The Chinese PhD students who studied at a New Zealand university define the boundary to a system (i.e. a case), which helps the search for not only in-depth explanations of students' academic acculturation experiences but also the features of this particular case. Considering the sub-units in this group of students (i.e. participants may major in different subjects within the university), the participants' academic acculturation

experiences may also be different. Therefore, this study belongs to the embedded single-case design (Cohen et al., 2018; R. K. Yin, 2009).

4.1.4 Research methods

A case study may include a range of methods (such as interviews, experiments, documents and surveys) for gathering in-depth data to address the research purpose (Cohen et al., 2018; VanWynsberghe & Khan, 2007; R. K. Yin, 2018). Methods, such as experiments or observation, might not be the best methods for obtaining students' understanding, motivations and experiences of academic acculturation. Thus, this study employed semi-structured interviews combined with critical incident technique and follow-up interviews as the method for data collection.

4.1.4.1 Semi-structured interviews

The interview is a commonly used method for qualitative research because it can directly obtain “an interviewee’s thoughts, values, prejudices, perceptions, views, feelings, and perspectives” (Wellington, 2015, p. 137). Interviews may be categorised based on their rigidity of questions, and these are classified as unstructured, semi-structured or structured interviews (Bryman & Cramer, 2012; Cohen et al., 2018). Structured interviews occur when the researcher has organized a series of questions in advance and “no deviation is made from either the wording or the order of a set list of questions” (Wellington, 2015, p. 141). In contrast, a semi-structured interview has greater flexibility, which allows the researcher to modify the interview questions and the flow of the interview; the meanings and understandings are created in an interaction between the researcher and interviewee (Mason, 2017). Despite this flexibility, the researcher still needs to have the topics, themes or questions relevant to the research aims determined before the interview. In addition, the researcher should be conscious of controlling the interview and guiding the interviewees by probing for more information related the research aims (Ritchie, Lewis, Nicholls, & Ormston, 2013). The unstructured interview is extremely flexible. The researcher does not have to set a list of prepared questions in advance and can open a conversation to obtain the interviewee’s ideas that cover relevant topics (Lodico, Spaulding, & Voegtler, 2010). Considering the features of these three types of interviews, semi-structured interviews were used in my research to meet the objective of this study.

Firstly, the research aim and the nature of the data determined an interview would be the suitable method for data collection. This study aims at focusing on Chinese PhD students’ academic acculturation experiences. The students’ experiences would contain the students’

ideas and emotional aspects toward their doctoral journey, as well as how they navigated the New Zealand academic environment. The students' ideas and experiences are not easily observed or measured in natural science studies but can be obtained in a conversational approach. Thus the interview was deemed the most suitable approach for collecting such information.

Due to its flexible nature, the semi-structured interview enabled me to obtain more information about students' acculturation experiences. Participants addressed the questions listed on the questionnaire. If participants did not fully address the question or participants had talked about interesting ideas relevant to acculturation, semi-structured interviews allowed me to ask additional questions to obtain further information. Moreover, the flexibility allowed me to obtain in-depth data regarding participants' experiences and ideas. According to the three learning dimensions in CLT, if participants mentioned their acculturation experiences or a piece of a memorable event, I would further inquire about participants' understandings, attitudes, emotional aspects, etc, toward that experience.

Semi-structured interviews prevent the researcher from becoming lost and helps to maintain the participants' responses relevant to the research questions. In this study, the interview questions were designed based on CLT (the three learning dimensions and learning typologies). CLT sets a framework for designing the main interview questions, and these questions functioned as the structure for the interview. The structure would help to keep the participants' answers corresponding to the research topic, and avoid obtaining information out of topic. With relevant questions being asked, the structure would also help to pump up participants' rich experiences and in-depth ideas, and simplified data analysis.

4.1.4.2 Critical incident technique

Critical incident is a method that focuses on the significant or key events that directly link to individuals' experiences, observations and activities (Viergever, 2019). These critical incidents could significantly contribute to or impact people's development, performances, or actions (e.g. Flanagan, 1954; Gremler, 2004). In this study, I define critical incidents as a technique, for the information about incidents could be obtained through interviews or observation. As Chell and Pittaway (1998) describe, "the critical incident technique is a qualitative interview procedure which facilitates the investigation of significant occurrences (events, incidents, processes, or issues) identified by the respondent, the way they are managed, and the outcomes in terms of perceived effects" (p. 56).

The critical incidents technique is used in this study because it helps to focus on the representative acculturation events or factors that influence participants' academic acculturation. The critical incidents of participants could be very revealing to the researcher because these events often contain greater details and “typify or illuminate very starkly a particular feature” (Cohen et al., 2018, p. 551). The events might also represent “the straw that breaks the camel’s back” (Cohen et al., 2018, p. 551). The “straw”, in this study, may refer to the tiny but influential acculturation events that could bring about many changes for participants. The critical incident may represent the most typical moments of acculturation, especially, the moments that unveil the factors contributing to changes. In this sense, the critical incident technique helped in the design of the interview questions that focus on the most representative acculturation events.

Furthermore, the critical incident technique helps to obtain participants’ in-depth ideas for their doctoral journey. Sometimes, one event in acculturation could be representative and it could reveal a person’s understanding and values of the event or fact (X. Xu, 2020). That means the unusual or memorable events for an individual have a special meaning for the individual, and the individual may have a detailed insight to offer (Cohen et al., 2018). The critical incident technique helps a researcher to focus on the participants’ reasons why events are meaningful or memorable. By paying attention to the participants’ experiences and ideas of these events, information about the participants' cognitive, emotional and interactional aspects can be obtained. Examination of critical events is important because they can significantly impact academic acculturation.

4.2 Research Design

This section presents my considerations for designing this research. The section provides justifications for the boundaries set for this case study by elaborating on the research setting and participants. This is followed by a description of the procedure for recruiting participants and collecting data. The section also contains ethical considerations that could appear in this study.

4.2.1 Managing the boundaries—research site, participants and positionality

Since a case study should have boundaries, this section confines the scope of this research by detailing about the research site and participants. The section ends with an overview of my positionality as a researcher.

4.2.1.1 Research site

The original plan of this study was to investigate Chinese PhD students who were at New Zealand universities. Due to the influence of Covid-19, this study was limited to the research site at a single university. Despite the limitation, the single site simplified access to the research site, and made it easier to recruit, contact and communicate with participants (Marshall & Rossman, 2014). At the time of data collection, the research site had approximately 30 Chinese international PhD students.

4.2.1.2 Participants selection

This study selected full-time enrolled international Chinese PhD students. The following four selection criteria establish the boundaries of the case study.

The first criterion was “international students”. This criterion was a basic boundary for the participant selection. The reason for focusing on international students is that the students were exposed to different academic and societal contexts, which requires students’ intercultural competencies and makes students’ academic journey complicated and full of challenges (L. Xu & Grant, 2020). Meanwhile, the challenges also brought chances for the students to learn and grow (Akkerman et al., 2006; Elliot & Kobayashi, 2019). Moreover, this study excludes local students, exchange PhD students and the PhD students who conduct their research online. This is because the focus of this study is on learning in a cross-cultural academic environment, and local, exchange and online students may have fewer opportunities to fully experience the academic differences.

The second criterion for participation selection was the boundary of “doctoral students”. Doctoral education is featured as “the notion of making an original contribution to knowledge”, and it aims to cultivate people who can do independent research (Cornwall et al., 2019; Elliot, Baumfield, et al., 2016, p. 733). Considering this particular feature of doctoral education, this study excludes the students who are from graduate and undergraduate education levels.

Since the focus of this study is on learning in the cross-cultural academic context, the third criterion is Chinese students. Chinese students are one of the groups who experienced education influenced by the model of “Banking education”, Confucianism philosophy and teacher-centred pedagogy (Freire, 2018; Maggs, 2018; Shun & Wong, 2004; Zeng, 2016). Nevertheless, this study did not limit participants to mainland Chinese students but included Chinese from different locations in Asia (e.g. Taiwanese, Hong Kong). This is because

academic acculturation hinges on not only cultural heritage (e.g. Elliot & Kobayashi, 2018; M. Li, 2016b) but also personal factors (e.g. Ding & Devine, 2018). Only emphasizing the cultural issues may lead me to overlook individual factors. Therefore, it would be better to embrace Chinese students who came from different educational backgrounds. This also helped to maximise the number of participants.

Finally, this study included Chinese PhD students who were at different stages of their doctoral journey, including those who were about to finish. The target participants were also those in the initial stage of doctoral studies because these students are exposed to different academic contexts, and encounter cultural shock and challenges in the initial period of doctoral study (Hechanova-Alampay, Beehr, Christiansen, & Van Horn, 2002; Ward, Okura, Kennedy, & Kojima, 1998). Students at this stage provided opportunities for me to identify help-seeking or critical incidents. Students at later stages of their PhD should also be included because they would have more doctoral experiences. However, according to the U-curve theory (Heggins & Jackson, 2003; Ward et al., 1998), although difficulties might lessen after the stress of the initial period with the students becoming familiar with the environment, it does not mean that difficulties and acculturation disappear.

4.2.1.3 Numbers of participants

The number of participants was influenced by two main factors. Firstly, as this study adopts a qualitative research paradigm and focuses on in-depth interpretations of students' acculturation experiences, the sample size does not need to be as large as in quantitative research studies (Cohen et al., 2018). The second factor was related to academic structure of the university and the culture across disciplines. Since academic cultures can differ across disciplines and faculties (Brick, Herke, & Wong, 2020; J. J. Lee, 2007), it was important to include participants from a variety of disciplines. Considering these two factors, this study selected participants ensure maximum diversity within the sample. The intended number of participants based on the structure of the university from which the sample was drawn. During the data collection period from 2020 to 2021, the university was comprised of eight schools (faculties) within four discipline areas. There were 31 Chinese PhD students from Mainland China across the university. The distribution of these students across schools varied. Many Chinese PhD students studied in the School of Management and the School of Computing & Mathematical Sciences. To ensure a relatively equal number of participants from each school, the intention was to obtain at least one, and if possible, three participants from each school for

a sample range of 8 to 24. The number of participants and corresponding faculties is shown in table 4.1.

4.2.1.4 Positioning the researcher

The position of the researcher is recognized as an important factor in qualitative research because it may affect the research process and outcome (Berger, 2015). In addition, the position of the researcher may also affect whether the researcher could present in-depth ideas about social or cultural phenomena (Cui, 2015). In the case of cross-cultural studies and ethnographic studies, an insider researcher must portray an authentic view of the cultural group (Fetterman, 2019). Considering the importance of positionality, this study considers the insider/outsider based on whether the researcher shares some commonalities with the target research group, such as cultural ideas, social status, race and gender, or political identity (Breen, 2007; Kanuha, 2000; Oriola & Haggerty, 2012).

My academic and cultural identity positioned me as an insider who shares a similar background with the participants. I am familiar with the research setting, such as university regulations and resources. This familiarity allows me to understand the university resources and support that participants may have accessed for their doctoral journey. Furthermore, my experience of doing a PhD helps me to more easily interpret the challenges and doctoral journey that they might have experienced. As a Chinese student, I am familiar with the Chinese language, which contributes to the communication with Chinese participants and helps to interpret participants' ideas that cannot be clearly expressed in English. Finally, being Chinese, I have a better understanding of Chinese academic practices and cultures, which provides insight into how traditional Chinese culture may influence participants' acculturation experiences.

However, I am fully aware of the problems of being an insider researcher. Familiarity with Chinese academic culture and practices may introduce biases and assumptions, leading to misinterpretations of participants' communications (Smyth & Holian, 2008). To address this issue, I included my comments and interpretations alongside the interview data that I had uncertainties about. Then, I sent the transcription with my interpretations to the participants for confirmation. Moreover, to minimise potential biases and improve reliability, insider researchers should check the interpretation from other researchers or professionals (Rooney, 2005). In this study, I asked my supervisors to interpret the translated interview data from their perspectives, which helped to minimize bias and prevent me from over-interpreting the data.

Importantly, I understand the duality of identity in this research context (Dirkx, 2012). Considering the “familiarity with and knowledge of the participants or the research domain under study”(Cui, 2015, p. 357), I also identify myself as an outsider. I have to acknowledge that I was a newcomer to the New Zealand academic environment, and I had limited knowledge and experience compared to those participants who are more experienced in living and doing research in New Zealand. Furthermore, I had not experienced all stages of my PhD education while completing my research. Hence, I lacked a comprehensive understanding of the entire doctoral journey, which could impact my interpretation of participants' acculturation experiences, particularly for those nearing the end of their doctoral studies. To address these potential problems, I read relevant literature and documents. I also sought to enrich my knowledge and experiences by engaging with various individuals, such as peers and supervisors, who possess valuable experience. These endeavours have helped me gain confidence in approaching potential research participants and improve the quality of my interpretations.

4.2.2 Sampling procedure

In this study, purposeful sampling and snowball sampling were used to recruit participants. I used tools such as WeChat and Facebook, yet I only recruited 11 participants in total.

4.2.2.1 Access the participants

Access is the first and foremost factor that needs to be considered before data collection. It determines the feasibility and permissibility of the research, and the permit for access is guarded by people, known as “gatekeepers” who can control the researcher’s access (Cohen et al., 2018, p. 212). In this study, access to participants was governed by the Education Research Ethics Committee. I obtained ethical approval from the university’s Research Ethics Committee before I accessed my participants (see Appendix D).

To access potential participants, I adopted three approaches. The first approach involved seeking assistance from the Students’ Help Centre. The second approach entailed contacting the Postgraduate Students Association, commonly referred to as PGSA. The third was based on my personal network and social media platforms such as WeChat, Facebook, LinkedIn, and others. For the first and second approaches, I obtained approval from the staff in charge of the centre or association before they assisted me in recruiting participants (see Appendix, information letter A1 and consent form B1). As for the third approach, I obtained

approval directly from the participants (see Appendix A2 and B2). Additionally, to ensure an adequate number of participants, I also inquired if the individuals I contacted would be willing to recommend their Chinese PhD student acquaintances to participate in my study.

4.2.2.2 Sampling strategy

This study used the non-probability sampling (purposive sampling) method. Non-probability sampling determines that the researcher does not set the chances for members in the target population to be selected (Cohen et al., 2018). In non-probability sampling, the selected samples can also represent a particular population, but samples are chosen for particular reasons based on convenience, quota or purpose (Sarantakos, 2017).

One of the reasons for using non-probability sampling is the limited number of Chinese doctoral students at the research site. To obtain rich data, I chose participants who responded to my invitation and were willing to join my study. Furthermore, the focus of this study was to explore the academic acculturation experiences of Chinese PhD students, and so did not require a high number of participants. Purposive sampling was appropriate for this focus, as it allowed for the selection of participants who were in a specific position to provide the desired information (Cohen et al., 2018; Etikan, Musa, & Alkassim, 2016). Importantly, academic cultures can vary across different disciplines (Clark, 1980), which may lead to distinct acculturation experiences. Considering the cultural differences, I purposely recruited participants from different faculties as much as possible, therefore covering various possibilities of academic acculturation.

As a newcomer to New Zealand with limited PhD experience, I first accessed participants who were Chinese PhD acquaintances and PhD peers who were in the same faculty as me. These people also helped me to improve my interview questions, skills and my basic understanding of doctoral education in New Zealand as well as academic acculturation. However, this convenient sample set was limited in size and scope (Sedgwick, 2013). To mitigate these limitations, I asked participants to recommend other Chinese PhD acquaintances at the same research site as us. This way of selecting participants enabled “the nearest individuals to serve as respondents and continue that process until the required sample size has been obtained of those who happen to be available and accessible at the time” (Cohen et al., 2018, p. 218). In this way, these participants further functioned as informants, allowing me to get in touch with more potential participants who qualify to be included (Parker, Scott, & Geddes, 2019). The exact recruiting procedure is given below.

4.2.2.3 Recruiting procedure

In this study, two recruitment approaches were implemented. Approach A involved recruiting participants based on the university resources, while approach B relied on my personal and participants' networks. Between May 1st, 2020, and September 30th, 2020, a total of eleven participants were recruited using these two approaches.

Approach A

I sought assistance from the Student Support Centre (SSC) and the Postgraduate Students Association (PGSA) to recruit international Chinese PhD students. I sent an email to the staff and PGSA representative, providing a brief introduction to my research and requesting they send invitation emails to potential Chinese PhD participants on my behalf. Although they all were willing to help me recruit participants, I only obtained confirmation from the PGSA representative (see consent form Appendix B 1.1). Consequently, I provided the representative with the information letter (Appendix A2) and consent form (Appendix B2) to be included in the invitation emails sent to potential Chinese PhD participants.

By July 1, 2020, a total of three participants were recruited with the assistance of PGSA. These three participants, two from the Management School and one from the School of Computing and Mathematical Sciences, agreed to participate in the research project and signed off the consent forms and information letters (Refer to Appendix B2 and A2 for further details, as well as Appendix B2.1 for a sample signed consent form). With the participant's approval, the participant who was from Computing Sciences recommended two Chinese doctoral acquaintances who were also from Computing Sciences and Mathematical Sciences.

Approach B

I posted a recruitment notice on the university's bulletin board; however, no Chinese PhD students were recruited through the bulletin board advertisement during the data collection period. Consequently, I decided to approach Chinese PhD acquaintances who were doing research or working in the Division of Education. By the time of data collection, four Chinese PhD students were studying in the Education Division. To prevent bias, I did not include myself as a participant in this study. Additionally, one participant withdrew from the research project due to personal reasons. Two participants in the division agreed to recommend participation in the research to their Chinese PhD acquaintances. Unfortunately, these two participants were

also newcomers to New Zealand with limited personal connections, and they only recommended one participant who majored in Engineering.

By the end of May 2020, the recruited participants did not meet the expected number, and the representation across disciplines within the university was not as comprehensive as desired. To address this, I used media platforms (WeChat and Facebook) to search for potential participants. Through social media, I recruited two participants who respectively majored in Chemistry and Social Science. The student from the School of Social Science brought his acquaintance who was from the same faculty. Despite all the efforts made, 12 Chinese PhD students were initially recruited for the study. After one participant withdrew, the final number of participants was 11. Table 4.1 shows the demographic information of 11 participants. The final sample did not include all of the schools but there were participants from each of the four Discipline areas

Table 4.1 Participant Profiles

No.	Name	Gender	Discipline of Study	Year of Study	Prior educational qualification or experience
1	Alex	Male	Health Engineering Computing & Science (HECS)	Third-year	Master's degree from a public university in Mainland China
2	Cain	Male	HECS	Fourth-year	Master's degree from a public university in British
3	Caitlyn	Female	Education	Second-year	Master's degree from a private university in Mainland China
4	Danny	Female	Education	Third-year	Master's degree from a public university in Mainland China
5	Hilton	Male	Management	Fourth-year	Master's degree from a public university in British
6	Jade	Female	HECS	Third-year	Master's degree from a public university in Mainland China
7	Kelly	Female	HECS	Fifth-year	The participant did not disclose her educational qualifications from Mainland China or overseas
8	Lawrence	Male	Arts Law Psychology & Social Science (ALPSS)	Second-year	Master's degree from a private university in Mainland China
9	Nick	Male	ALPSS	First-year	Master's degree from a public university in Mainland China
10	Tom	Male	HECS	Fourth-year	Master's degree from a public university in Mainland China
11	Yin	Female	Management	Fifth-year	Master's degree from an overseas university (the participant did not disclose the specific region)

4.2.3 Data collection

To obtain in-depth information about participants' experiences, ideas and understandings of their doctoral practices, this study adopted semi-structured interviews as the primary method for data collection with the critical incident technique being used. Moreover, seven participants were interviewed twice, with an interval of approximately three months between the two sets of interviews. The data were collected during the interval between the 1st of May 2020 and the 21st of Oct 2020.

Designing interview questions

As shown in the Literature Review, academic acculturation contains a wide range of content; additionally, Comprehensive Learning Theory (CLT) also contains varieties of learning content, types of incentives, and various forms of interactions. Accordingly, the interview questions were intentionally designed to be as open as possible (see Appendix C1). The opening questions were aimed at probing critical incidents or memorable events that participants encountered during their doctoral studies. In addition, I also designed a series of prompting questions based on the three dimensions of learning (Illeris, 2016): learning content, learning incentives, and social interactions. These questions facilitated a deeper understanding of participants' cognitive, emotional, and social aspects they attached to the critical incidents or memorable events

Although the interview questions were based on Illeris' Comprehensive Learning Theory (CLT), I had to consider three important factors when designing them. Firstly, participants might not have professional knowledge or terminology related to academic culture and academic acculturation. To ensure clarity and understanding, I used simplified language and avoided specialised terms, instead focusing on participants' experiences in doctoral studies, their thoughts, and emotions. Secondly, learning is closely related to an individual's available mental schemas (Illeris, 2016). I paid attention to participants' pre-established understandings and expectations of doctoral learning and supervision. This allowed me to explore how their previous educational experiences shaped their current doctoral practices. Lastly, learning does not always take place consciously (Asma, 2019; McLaughlin, 1990). Participants may not readily identify the changes they had already made. To capture these unnoticed changes, I compared participants' academic experiences before and after their doctoral journeys, aiming to uncover any subtle transformations.

The interview questions mainly contain the following topics:

- (a) motivations and reasons for doing doctoral research in New Zealand,
- (b) research experiences and the critical incidents in the doctoral journey,
- (c) prior academic experiences, and initial understandings of the doctoral journey,
- (d) factors or difficulties that influenced participants' doctoral practice.

Topic (a) addresses the participants' motivation and corresponded to the incentive dimension in CLT. Topic (b) aims to identify the acculturation contents that participants encountered, the participants' understanding of academic practices in the New Zealand environment, and how the participants how learned to acculturate academically. This topic is consistent with the content and social dimensions. Topics (b) and (c) help to find out the changes that participants had made during academic acculturation, which aim to discover the type of learning. Topic (d) corresponds to the learning barriers as well as the situation where learning did not occur in academic acculturation. Table 4.2 presents the sample questions and correspondence between the research questions and each interview topic.

Table 4.2 Main interview topic and interview questions

No.	Interview topic	Example Interview Questions	Research questions to be addressed	Relation to CLT
1	Motivations and reasons for doing doctoral research in New Zealand	Could you please tell me why you conduct your PhD in New Zealand?	What incentive components influence Chinese PhD students to acculturate academically?	Incentive Dimension
2	Research experiences and the critical incidents in the doctoral journey	When thinking about your doctoral experiences, please describe your memorable educational practices, events, and what made them impactful.	What and how did the Chinese PhD students learn during academic acculturation? How did Chinese PhD students interact with the New Zealand academic environment?	Content Dimension Interaction Dimension
3	Prior academic experiences, and initial understandings of the doctoral journey	How has your PhD journey differed from your Master's degree journey? Are there any similarities?	What types of learning did Chinese PhD students experience during academic acculturation?	Learning Typology
4	Factors or difficulties that influenced the doctoral practice	Studying in a new educational environment can be very challenging. What memorable difficulties have you encountered during your PhD journey?	What barriers prevented Chinese PhD students from acculturating to the New Zealand environment?	Learning Barriers

Scheduling and conducting the interview

The interview questions were designed in the interval Sept 2019 to April 2020. I commenced the interviews on the 1st of May 2020; the last interview data was collected on the 26th of September 2020. During this period, each participant signed a consent form, and all the participants sent the form back to me confirming their participation. After receiving their consent form, I contacted the participants to schedule a time and venue that was convenient for them.

Scheduling

Due to the influence of Covid 19, I was unable to conduct all the face-to-face interviews with all participants. The time and venue of the interview were based on the participant's preferences and convenience. Four participants opted for interviews conducted via Zoom, and the remaining seven chose face-to-face interviews. Zoom meetings provided flexibility for scheduling the interview. For the face-to-face interviews, I selected either the participants' office, my office or a private meeting room. These selected venues aimed to provide a comfortable environment for participants to share their opinions and experiences. Additionally, the venues also prevented the interviews from being interrupted.

Data collection

As a new Chinese doctoral student in New Zealand, I was not familiar with the doctoral journey, and I was short of academic skills. Thus I tried to increase my expertise and enrich my interview experiences. Before the formal interviews commenced, I tested the interview questions to ensure their validity and effectiveness in obtaining the desired responses. To do this, I invited two colleagues—one of my office mates and a Chinese PhD student from the Faculty of Education—to review the interview questions. Both provided valuable feedback, particularly suggesting that I use clearer and more easily understandable opening questions, which would facilitate prompting further related inquiries.

In this study, I did not regard these test interviews as pilot studies. This is because, although the interview question list followed a standardized interview protocol, the actual interviews were conducted flexibly. The questions were slightly adjusted as needed to elicit better responses relevant to the research (Marshall & Rossman, 2014). Additionally, follow-up questions were tailored to each conversation based on the participants' responses.

At the beginning of the formal interviews, I ensured a comfortable and welcoming atmosphere by introducing the purpose of my research and framing the interview as a friendly conversation. Meanwhile, I emphasized the confidentiality and safeguarding of participants' information, reassuring them that the interviews would be recorded for academic purposes only. I also reminded participants that they could withdraw from this project at any time before the submission of my thesis.

Following the introduction, I proceeded to ask broad questions, such as the participants' educational background and reasons for conducting their doctoral study. These questions led to further discussions about their memorable events and experiences, both prior to and during their doctoral journey. After these opening questions, I moved forward to the questions about the participants' memorable events as well as academic experiences. Meanwhile, I took notes of the participants' experiences and ideas without interrupting their speech or making any comments. If the interview questions were not well addressed or their ideas were not clear, I encouraged them to give further explanations. Generally, each interview was conducted for around 45 mins to one hour.

Follow-up interview

In order to obtain rich data as well as to avoid misinterpretation, all the interview data were transcribed and sent back to the participants for confirmation. Participants had two weeks to confirm their interview data and send it back to me. Seven participants confirmed their interview data. Four participants did not respond to my email, so I assumed by default they had confirmed their interview data.

I invited all participants to the follow-up interview email or WeChat. Although all efforts had been made, not all participants attended follow up interview. Four participants declined to participate in the follow-up interview. Two of them were in the final stages of their thesis writing and had family responsibilities. They explained that the one-hour interview was time-consuming. One participant secured a job in China. Due to the time difference between China and New Zealand, she chose not to participate in the follow-up interview. The fourth participant did not respond to my invitation for a follow-up interview.

For the remaining seven participants, the follow-up interview primarily focused on exploring in-depth data regarding the participants' academic experiences and critical incidents. The follow-up interview also addressed any content I was not clear about. The follow-up interview scaffolded upon the previous interview, and helped me to obtain more detail about

the participants' experiences (Seidman, 2006). The follow-up interview also helped me “check to see whether the essence of the first interview has been accurately and fully captured” (Cohen et al., 2018, p. 526).

4.2.4 Ethical considerations

As per Ethical Conduct in Human Research and Related Activities Regulations, the study was conducted only after I had approval. In accordance with these regulations, I started my data collection after obtaining the participants' agreement to voluntarily participate, and I ensured the participants' confidentiality and privacy in all phases of the study.

4.2.4.1 Access to participants

One of the ethical issues was embedded in the process of accessing potential participants. To access the potential participants, I inquired if the president of PGSA was willing to recruit international Chinese PhD students by sending invitation letters on my behalf. Once I obtained a positive reply, I sent a content form to the president to confirm the permission. When accessing the participants, I informally asked for their willingness to participate in my research. Likewise, I sent out invitation emails and consent forms to the potential students who were willing to participate in my study. In the email, information letter and consent form, I emphasized that students' participation is voluntary. If students agreed to join my study, they were asked to send the signed consent form back and respond to me about a convenient time and venue for the interview.

4.2.4.2 Confidentiality

I asked the president of PGSA to send emails to the potential participants, but I did not ask the president to provide the students' contact details. I had access to the participants' contact details only after they contacted me. In addition to the contact details, I informed all participants that they were welcome to nominate pseudonyms; the pseudonym was used from that point onwards. Post data analysis, any information relevant to participants' email addresses and transcripts will be kept and then destroyed in accordance with the Ethical Conduct in Human Research and Related Activities Regulations 2008. Even by doing so, I could not absolutely guarantee confidentiality for all participants.

All the documents (information letter and consent form) informed participants that their information would be safeguarded to the extent possible. First, the interviews were located at a convenient private venue instead of an open space, and I made sure that no other people could

overhear the interview. Second, participants' information was kept and only used for academic purposes. The digital recordings were protected on my personal computer, and physical transcripts were safely stored in my office kept locked with my personal key. No other people were allowed to access the research data, except the participants themselves, my supervisors and myself. These data will be kept for a period of five years until they are destroyed. During this period, participants have the right to access their own audio recordings and interview transcripts. If any participant wants to access any form of their data, they need to inform me by email or phone. Third, after the interview, the transcripts were sent back for participants to review once I finished the interview transcripts. Participants could delete and refine any data if they felt their confidentiality was jeopardized. Participants sent their refined transcripts back to me within two weeks after the transcripts had been sent to them. Otherwise, I considered that they confirmed their data.

4.2.4.3 Potential harm and withdrawal from this study

Since this study focused on the participants' critical incidents, the incidents included participants' unpleasant experiences in doctoral learning, supervision/teaching, and even relationships between both students and supervisors. To minimize harm, in each interview, I orally informed participants that participation was voluntary and that they could leave at any time if they felt the study was harmful to them. During the interview, I did not force participants to detail the incidents that aroused their negative feelings. I did not ask aggressive questions, and I stopped asking anxiety-provoking questions when participants were not willing speak any further. I did not make any interpretative comments while participants were sharing their experiences. Participants were informed that they had the right to withdraw their data up to two weeks after they received the transcriptions of the interview. Before the interview, this was clarified both in oral form and written documentation (information forms and consent letters). Only one participant withdrew from this research because of the participant's personal reasons.

4.3 Data Transcribing and Analysis

This section includes the following contents: all the interviews were conducted in Mandarin. All interview data were transcribed, and the transcripts were analysed according to Thematic Analysis. I applied NVIVO 12 to assist with the coding and analysis procedure. Since this study is grounded on CLT, the themes were generated both deductively and inductively.

4.3.1 Transcribing and translating process

Before the interview started, I confirmed with the participants regarding their preferred language for the interview. All participants preferred Mandarin. As a Chinese speaker myself, conducting the interviews in Chinese allowed participants to express their original ideas more easily in their own language. Additionally, this language choice facilitated my interpretation and understanding of their intended meaning. All interviews, including follow-up interviews, were conducted in Chinese and were recorded. Appendix E contains sample interview data in Chinese.

During the interviews, I took notes of my own ideas and questions. I also recognized that some paralinguistic features, such as nuances and emotional tones, were embedded in the communication itself and not always expressed through language (Wylie, 2020). These features could potentially provide insights into the participants' driving forces for academic acculturation. Therefore, I made sure to also record these features when transcribing the interview data. As soon as each interview was completed, the data was transcribed into Chinese text, along with my initial interpretations, further inquiries, and the participants' paralinguistic features. These transcriptions were then sent back to the participants for review within five days, a process which helped enhance the credibility of the data (Creswell & Poth, 2016; Lincoln et al., 2011).

After conducting all the interviews, I randomly selected one participant's transcript and translated it into English to ensure the accuracy and validity of the translation. When I was uncertain about the accuracy of my own translation, I used Google Translate as a reference to check if the translated version fully reflected the intended meaning of the participants. Subsequently, I sent the translated transcripts back to the participants for further verification of the accuracy of the translated meaning. To enhance internal validity, a bilingual translator assisted in identifying any inaccuracies in the translation (Lincoln et al., 2011). As English was the second language for both the participants and myself, the translated transcripts were also reviewed by my supervision panel. Due to participants' availability, for the remaining transcripts, I only translated excerpts from the interviews into English, and these were used in the English version of the thesis.

As the interview data stem from both the primary interview and the subsequent follow-up interview, I used "part 1" and "part 2" to respectively signify data originating from the major interviews and follow-up interviews, respectively. In the findings chapters, the quoted

interview data are accompanied by the participants' pseudonyms, parts and page numbers of the transcripts. This helped me retrieve the specific data from the interview data pool.

4.3.2 Familiarising myself with the data

Prior to commencing the data analysis, I familiarised myself with the data by listening to the recordings multiple times to obtain an accurate understanding. Since the data consisted of both formal interviews and follow-up interviews, I appended the follow-up interview data for each participant at the end of the transcripts so that together they became the entire transcript for each participant. At the same time, I marked the connections between the content from the follow-up interviews and the formal interview. This ensured a comprehensive understanding of the participants' acculturation process. Once I had gained a solid understanding of each participant's interview data, I transferred the transcripts to NVIVO for the coding procedure.

As discussed in Chapter 3, CLT encompasses three dimensions of learning and types of learning. The three learning dimensions (cognitive, emotional, and social aspects) reflect the components of a learning activity. The types of learning, which relate to how an individual organizes mental schemas, demonstrate the acculturation process. Thus, these three dimensions and types of learning serve as pre-assumed themes for further data analysis.

I categorized the data in relation to the learning content that students encounter during their academic acculturation under the content dimension. The data relating to driving forces was categorized under the incentive dimension; and the ones regarding how students interact with their surrounding academic environment was placed into the social interaction dimension. Data that reflected students' psychological adjustment or development were categorized under the types of learning. I am aware that cognitive, emotional, and interaction aspects are interwoven in the learning process, and cognitive aspects are often intertwined with psychological aspects (Illeris, 2016). In other words, a participant's acculturation experience may involve these three aspects simultaneously. This means that there may be situations where one single sentence could be interpreted from different perspectives and could be coded into multiple categories at the same time. Figure 4.1 presents an example of the initial analysis of interview data. As shown in the figure, the data were initially categorized according to three dimensions.

Figure 4.1 Initial data analysis

<p>Yes. What impressed me the most was the beginning of my PhD journey...Because I obtained a master's degree in China, there is an observable contrast when I started my PhD here (New Zealand). In fact, there are lots of differences between master's and doctor's journey. When I came to New Zealand at that time, I did not know what a PhD would be like, and I did not know how to manage PhD study or in which way I needed to conduct PhD study. For example, how do supervisors take care of my study? How much guidance would teachers provide to the students? From which perspectives the teacher would support my study? And do I need to negotiate with the teacher or conduct the study by myself? Everything is definitely uncertain for me at the beginning. So I had no idea about everything when I came here.</p>	<p>Uncertain about managing study, sup' support and academic negotiation. (incentive: Motivation through disturbances and conflicts; arousal potential) (content: manage study, supervision, communication)</p>
<p>I remember that when I just started my first day of PhD study, my supervisor gave me a general research direction. After I spent several days further looking at this direction, the teacher gave me some specific chemical reactions and the specific operational methods, steps and even Chemical reactions. However, these reactions and plans that my supervisor gave to me had been remaining unsolved for a long time. Many efforts had been made on this series of chemical reactions by my supervisor not even to say my supervisor's previous PhD students; the whole team still did have not a solution to get the reaction done. Obviously, these reactions are very difficult. Since the time my teacher had provided this directly to me, I had no idea how to do that and I was wondering if I could make it in the whole PhD journey. I am also wondering...because it is a general direction and these Chemical reactions remained at the ideal/ tentative stage...whether I</p>	<p>Relying on SUP imparting professional knowledge, accumulating knowledge. (interaction: knowledge transmission) (knowledge accumulation) (content: knowledge)</p> <p>Realizing the knowledge is difficult. (Accommodative learning: be aware of the knowledge) (interaction: perception)</p>

The screenshot shows a vertical list of five posts by a user named 'Yuan, Yu'. Each post includes a profile picture, name, and three dots for options. The posts are as follows:

- Post 1:** Incentive Arousal potential, uncertainty
Content: manage study, supervision, communication
Date: 11 October 2020, 5:29 PM
- Post 2:** Interaction: knowledge
Interaction: Relying on transmitting knowledge
Knowledge accumulation
- Post 3:** By accommodation,
interaction: perceive that knowledge is difficult
content: professional knowledge
- Post 4:** incentive: Uncertainty,
content: meta-learning
- Post 5:** Content: critical reflection about knowledge
Interaction: perceive
Incentive:

Each post has a 'Reply' button below it. The interface also shows a speech bubble icon to the right of the first two posts.

4.3.3 Generating potential themes

This study adopted thematic analysis (TA) to analyse data and generate themes. I understand that (TA) is a method of data analysis used for searching and identifying themes (Clarke, Braun, & Hayfield, 2015; Cooper et al., 2012). This method allows the data to be integrated through the process of deductive analysis while allowing for themes to emerge from inductive coding (Braun & Clarke, 2012). In other words, TA is flexible in coding and analysis, and it can be conducted by both inductive and deductive approaches, as long as the identified themes can address the research question. Moreover, I realized that the theme should be a group of information that “captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set” (Braun & Clarke, 2006, p. 82). Hence, the themes are derived from a set of concepts and ideas that can address the research question, and are not generated from a set of high-frequency, meaningless data.

With an understanding of TA and theme, I aimed to identify chunks of information in the data that could provide insight into the academic acculturation process. Since the research questions are grounded on CLT (i.e. three dimensions and four types of learning), there pre-assumed themes for this study. TA was also used to identify these subthemes under the three dimensions and four types of learning. In this sense, the data analysis has a deductive feature. However, CLT only provides a framework for gaining insight into students' acculturation experiences, and it does not reflect a student's specific acculturation process. Thus, this study should identify participants' unique acculturation experiences and ideas in relation to content, incentive, and interaction dimensions. In this sense, the research is also grounded in the participants' experiences, which is also inductive.

This study generated themes under each dimension based on the participants' key ideas about their doctoral experiences. In the cognitive dimension, I classified participants' experiences according to the learning content that participants encountered during academic acculturation. In the incentive dimension, I identified various types of motivations for acculturation, and different types of motivation formed different themes under this dimension. Likewise, I identified various forms of how participants interacted with the environment, and these forms of interaction were the different themes under the interaction dimension. The typology of learning is related to the acquisition process and characterized based on how individuals organize their mental schema. Accordingly, I identified the participants' mental

schemas in terms of how they conduct their doctoral research. These mental schemas embed participants' expectations and ideas of the doctoral practices. By analysing the participants' experiences of how they conduct their doctoral research as well as how they understood the doctoral practices, I could find the ways by which participants organize their mental schemas. These themes reflect how participants organized their mental schemas.

After applying the pre-assumed themes from CLT, the interview data were coded using a two-cycle procedure (Saldaña, 2021). The interview data consisted of participants' doctoral experiences, including memorable events, unexpected moments, challenges, and coping strategies. In the preliminary cycle, I open-coded each participant's interview data (Saldaña, 2021), breaking it down into meaningful chunks that encompassed a wide range of components. For example, these meaningful chunks include terms like 'proactive', 'critical', 'meticulousness', 'approach to supervision', 'communication with peers', and 'dissonance and supervision'. In the second cycle, these meaningful chunks were further categorized into abstract and conceptual themes (Saldaña, 2021) For instance, 'proactive, critical, and autonomous' were categorized as 'learning to be independent'; 'meticulousness and responsibility' were categorized as 'Behaviours and Attached Attitudes'; 'confused' was grouped under the theme of 'dissonance'; 'observing peers' studying habits' was categorized as 'observation'; and 'experiencing doctoral study' and 'joining the academic community' were placed in the category of 'participation'. Lastly, it is important to note that meaningful chunks can be interpreted across different learning dimensions, and a single chunk may be placed into multiple learning dimensions. For example, “proactive”, “critical” and “meticulousness” reflect participants' understanding of the doctoral study, showing the cognitive aspects; meanwhile, these meaningful chunks could demonstrate how participants conducted their research and their engagement in their doctoral study. Thus, these meaningful chunks were multiply coded. The codes and themes are summarized in Figure 4.2.

It is important to clarify two points of the thematic analysis in this research. First, this qualitative study aimed to capture participants' key experiences of academic acculturation rather than quantifying the frequency of theme occurrences (Braun & Clarke, 2006). Therefore, the study did not provide specific numbers of participants expressing the same theme. In findings, I used general terms, such as “some” or “most”, to present approximate number of participants who directly conveyed the same ideas. Second, participants' quotes may be interpreted from multiple perspectives. For example, an individual's mental schemas are both

emotional and cognitive, as emotions often reflect cognitive states (Illeris, 2016). Thus, a single quote was coded under multiple themes.

Chapter Summary

I believe that Chinese students' academic acculturation experiences can be understood and interpreted. This understanding was constructed while I interacted with participants. The knowledge of how students acculturate was also constructed according to my interpretations. The epistemology for knowledge construction corresponds to constructionism and constructivism, and within the epistemology, this study uses Chinese PhD students who were doing PhD research at a New Zealand university as a case study. Since the study focused on the students' acculturation experiences and cognitive adjustment, semi-structured interviews combined with the critical incidents technique (including follow-up interviews) was the method employed for data collection. The interview data were transcribed and analysed using a thematic analysis approach.

Figure 4.2 The Hierarchy of Main Themes and Tree Nodes

The screenshot displays the NVivo software interface. On the left, a navigation pane shows the 'Coding' section expanded to 'Content'. The main area is divided into a 'Content' tree on the left and a text document on the right. The 'Content' tree lists main themes and their sub-nodes with associated file counts and reference counts.

Name	Files	References
Identity_Self as The Learning Content	0	0
- Doctoral student_had skills and competenci	8	23
- Doctoral student_social being_coleague wit	8	29
- Doctoral student_crisis situation	3	4
- Doctoral student_not pure student	8	38
Language as the Learning Content	0	0
- accents	7	27
- clarity of the ideas expressed in the thesis or	6	17
- Idioms, phrases, expressions and vocabulari	9	32
Learning Resources and Study Aids	0	0
- learning resources	6	12
- Tools and software	6	10
Workshops and Individualized tutorials	0	0
- Individual tutorials	8	29
- Workshops	8	28
Learning to learn_ Independence in Doctoral Re	0	0
- Autonomous	9	64
- Creative	8	19
- Critical	11	91
- Proactive	10	40

The right pane shows a text document with highlighted segments and associated codes. The code 'Autonomous' is applied to several segments. The bottom status bar shows '33 Items' and the current code path: 'Autonomous (Codes\Content\Learning to learn_ Independence in Doctoral Research)'.

Chapter 5: Content—What to Learn During Academic Acculturation

Due to the difference between PhD education practices in New Zealand and the master's education practices in China, Chinese PhD students had to acquire extensive knowledge and skills in order to effectively navigate their doctoral journey. To better acculturate to their doctoral journey, Chinese PhD students not only have to develop their language proficiency and academic independence but also need to master university resources and obtain a set of academic attitudes. They also have to learn to work with supervisors to manage their doctoral research effectively and adjust their self-understandings as doctoral students.

This chapter highlights the significance of six key components for academic acculturation: language proficiency, a specific set of attitudes, familiarity with university resource, academic independence, supervisory methods, and the development of an academic identity. The last section shows that academic acculturation is hindered by the student's previous academic experiences and language issues. These findings address the following research question: What and how do the Chinese PhD students learn during academic acculturation?

What Chinese PhD students learn during their doctoral journey corresponds to the content of learning in CLT, namely “knowledge, skills, opinions, understanding, insight, meaning, attitudes, qualifications and/or competence” (2016, p. 48). In a broader sense, the content could include culture, the method of working, learning itself, and personal qualities “such as independence, self-confidence, responsibility, ability to cooperate, and flexibility” (Illeris, 2016, p. 48).

5.1 Enhancing Language Proficiency

Most participants, regardless of whether they had prior experience in English-speaking countries during their master's studies, reported the importance of English language proficiency for success in their doctoral journey. This is because language proficiency directly relates to communicating with peers and supervisors, understanding people's expressions, and meeting the rigorous writing standards expected at the doctoral level. The data revealed three specific language areas (i.e. accents, expressions, and academic writing) that link to acculturation to the doctoral journey.

5.1.1 Accent familiarisation

Accent is a key component for academic acculturation, as it directly links to Chinese PhD students' comprehension of others' (supervisors and peers) ideas, and it also facilitates effective communication during interactions with supervisors. For instance, Hilton reported that “I could not always catch up with what people tried to communicate, even though I had my master’s study in British... I sometimes had to ask him to reply and I had to record the meeting” (Part 1, p. 3). Jade who did not have overseas educational experiences reported “I could not say it (making sense of what supervisors communicated) was difficult for me, but when they pronounced some of the terms differently, I, indeed, had a feeling like, something was missing in a sentence...” (Part 1, p. 2). These examples indicate the importance of accents in communication and comprehension. Even with prior exposure to English, accents and pronunciation can still pose challenges in effective communication, leading to difficulties in the doctoral journey. The slight variation in English accent could lead students to struggle to comprehend the meaning of communication.

Nevertheless, the data indicated that participants adapted to accents and they developed a clear understanding of others through continuous communication. For instance, Lawrence said he gradually understood his supervisors and adapted to the supervisors’ accents while “listening more, reading more and speaking more” (Part 1, p. 5). Moreover, participants adopted strategies, such as recording the supervision meeting and writing meeting minutes, to confirm whether their interpretations were consistent with what their supervisors intended. As Jade explained: “Recording helps, and listening to the recording repeatedly, especially I record the supervision meetings because the meetings involve my research and our plan, and the discussions will continue to affect subsequent steps...” (Part 1, p. 2). The doctoral journey provided participants with opportunities to have extensive communication with English-speaking people (mainly supervisors and peers). The participants applied strategies, such as recording and requests to repeat, to learn about the meaning conveyed by supervisors. In the communication, participants unconsciously adapted to their supervisors' accents through ongoing communication. In turn, familiarisation with accents enabled participants to easily interpret the supervisors' meaning, thereby, enhancing the quality of communication between participants and supervisors.

5.1.2 Cumulating expressions and phrases

Participants engaged in active communication with English-speaking people (particularly peers and supervisors). They sought clarification on meanings, which facilitated

their learning process and understanding. The knowledge of idioms, phrases, expressions, and vocabulary, were often important for language proficiency and communication as well as in the process of acculturating to ways of expressing ideas. Due to the differences in the way expressions and idioms are used, participants were unable to fully grasp the meaning expressed by supervisors, which caused challenges to their doctoral journey. When students became more familiar with these language components they could facilitate smoother communications with their supervisors and effectively convey their thoughts. Participants assimilated a number of expressions when they actively engaged in conversations with English-speaking people (such as supervisors). These expressions further lead to adjustments in their way of articulating ideas. For example, Nick stated: “You knew each word they express, but when these single terms were linked together as a phrase or expression, you totally did not know what people were trying to say” (Part 2, p. 6). Caitlyn explained that the terms she adopted caused her sentence and ideas to be complicated, and the expressions also made it difficult for her supervisors to understand her meaning (Part 1).

Due to the differences in the way expressions and idioms are used, participants were unable to fully grasp the meaning expressed by supervisors, which caused challenges to their doctoral journey. Participants engaged in active communication with English-speaking people (particularly peers and supervisors). They sought clarification on meanings, which facilitated their learning process and understanding.

5.1.3 Enhancing academic writing skills

Due to the different ways of expressing ideas between Chinese and English, Chinese PhD students had to make significant efforts to adjust their way of expressing their ideas in their writing. This adjustment could improve the clarity of their academic writing. This indicated that academic writing, especially the way of presenting ideas, is the learning content in the process of academic acculturation. As Yin reported:

I previously translated my writing into English, but my supervisors found it difficult to understand my thinking. The way we were taught previously (Chinese educational environment) is different from their Western way, which also makes our idea (in doctoral writing) unclear (to the Western people) (Yin, Part 1, p. 3)

Likewise, Kelly also expressed that Chinese is different from English, especially in the terms used and the ways of expression.

In writing, Chinese expression is ambiguous, such as “个人” [individual (s)] and “国家” [country (ies)]. In Chinese, these terms can be interpreted in many ways and they also are singular and plural; naturally, they have multiple meanings. However, in

English, most words are precise. Especially in academic writing, each term needs to be used very precisely to avoid ambiguity (Part 2, p. 3).

The difference in expressing ideas between Chinese and English, coupled with unfamiliarity of Western ways of thinking, would further cause their doctoral writing to be unclear.

Recognizing the difference, participants engaged in the process of thesis writing and composing academic articles, with the support of their supervisors. This enabled them to acquire knowledge of how to organize writings and shift their thoughts.

My supervisors always reminded me to shift from the Chinese way of thinking to the Western way. They encouraged me that if I start to write, I need to think and organize my ideas in English first... (Caitlyn, Part 1, p. 4).

... By practising writing with my supervisors, I recognized lots of expressions and terminologies adopted by my supervisors which helps to clarify my ideas. For the same writing content, if it is modified by my supervisor, the whole writing would show a huge improvement... Through this process, I started to know some tricks and unwritten rules for publishing articles (Alex, Part 1, p. 5, p. 9).

These two examples highlight the importance of supervisors in guiding students to notice the specific idea expressions that do not correspond to the English way of expression. In addition, doctoral supervisors played an important role in helping participants adjust their way of thinking, improve the clarity of students' academic writing, and gain a deeper understanding of expressions and terminologies used in academic writing. Moreover, to better adapt to doctoral writing, improvement in idea clarity and adjustment of ideas could also be achieved through self-effort. For instance, Kelly, after noticing the ambiguity of Chinese, re-learned disciplinary knowledge in English from the very beginning.

The more formulas I encountered, the more challenges in understanding math. It was more difficult to catch up with people's logic flow when they were programming... So, I decided to start to learn mathematics in English from the very beginning (Kelly, Part 1, p. 13).

Compared to the other examples (Caitlyn and Alex), Kelly's example highlights that differences in terminology and ways of expressing ideas would cause difficulties in understanding academic writing. More importantly, it underscores the importance of taking the initiative in addressing these challenges through self-efforts.

5.2 Acquiring a Set of Behaviours and Attitudes

Compared to the Chinese academic environment, people (especially doctoral supervisors) within the New Zealand academic environment demonstrate a strong sense of responsibility and earnestness in their pursuit of academic work. Participants were influenced

by people and learned to be more responsible, earnest, and meticulous. These behaviours and attitudes motivated participants to adopt similar attitudes in their doctoral journeys, which indicates that attitudes are a type of learning content in the academic acculturation process.

The responsibility and diligence demonstrated by others also inspired participants to adopt similar attitudes towards their doctoral studies, that is, to invest more energy and effort in the pursuit of their doctoral research. This acculturation led to participants adopting similar attitudes and ways of working as the host academic environment. For instance, Alex noted his supervisor was “still in his office” (9 pm)” and went on to say he was “sure that he always works till night. He dedicates all his enthusiasm and passion to academic research and his students” (Part 1, p. 9). Such earnestness impressed the participants a lot, which motivated them to be equally hardworking in their research. As Kelly explained

She always goes to the classroom 10 minutes in advance, waits for her students, and leaves the classroom after all the students have left, ensuring that she has answered all of their questions. It seems that diligence and responsibility have become unwritten requirements. If everyone is diligent, as students we have no reason not to do the same (Part 1, p. 7).

Likewise, Jade also conveyed the same idea: “Everyone (supervisors and PhD peers) works so hard and they devoted their focus to their research. Some of them (PhD peers) are even more talented than me, I should work harder” (Part, 2, p. 4). Participants were highly impressed and motivated by the dedication, passion, and diligence demonstrated by their supervisors and peers. Consequently, the participants internalised the work ethic and dedication demonstrated by their supervisors and peers. They were influenced by the behaviours of these more experienced people, and this shaped their own attitudes and work habits. Thus, participants were driven to work equally hard in their own research endeavours.

Likewise, a similar process also took place when participants noticed that their supervisors provided pastoral care to students, it demonstrated a strong sense of responsibility in supervision. For example, Tom noted that “My supervisor introduced the equipment (mass spectrometer) very carefully. He taught me how to use it and explained theories and reactions to me in detail. I was moved by his patience” (Part 1, p. 15). Similarly, Danny and Yin expressed that their supervisors provided detailed guidance and tracked their research progress,

(when I just arrived in New Zealand) He (my supervisor) introduced everything to me, Chinese restaurants, transportation tools, school facilities, administration staff, etc. He helped me apply for the office.... (Danny, Part 1, p. 3)

My supervisor may have noticed that I was unfamiliar with the New Zealand environment. He took me to the librarian who introduced me to the library resources.

My supervisor also introduced “Student Learning” and some workshops that may help my reading and doctoral writing. (Yin, Part 1, p. 7).

The participants were impressed by the efforts and diligence exhibited by others, and this motivated them to develop similar attitudes towards their doctoral study. This feeling was intensified, especially when participants observed that people who might not have to work so diligently (such as talented peers or knowledgeable supervisors) still worked hard. As a result, the participants became more diligent and responsible in their research, demonstrating acculturation to the earnest working approach. These attitudes could be regarded as properties of the New Zealand academic environment and were internalized by the participants. This underscores that responsibility and diligence represent forms of learning content within academic acculturation.

Finally, the data also revealed that academic rigour is another essential learning content that participants had obtained during their doctoral journey. This rigour is not only embodied in the process of reasoning for conducting research but also in the high focus on the accuracy of terminology, coherence of academic articles, and clarity of ideas. For instance, Hilton reported that his doctoral supervisors paid meticulous attention to the arguments and logical flow in the literature review, scrutinizing every detail of the writing. As examples, Hilton spent a significant amount of time revising the literature review, managing to adapt to the earnestness and rigour of his supervisors. Likewise, Tom, after going through multiple revisions of his thesis, got used to the fact that his supervisor pursued academic perfection and was exceptionally meticulous in academic writing, carefully attending to punctuation and terminology usage. Thus academic rigour can also be considered a crucial learning content for academic acculturation. It is not merely a set of skills or standards but a fundamental aspect of how participants integrate into the academic environment. It affects their thinking, writing, and approach to research. Participants demonstrated a process of adaptation to the academic rigour enforced by their supervisors. Through repeated revisions and careful attention to detail, they internalized the standards of rigour expected in their academic work.

5. 3 Learning to Use University Resources

Due to previous educational experiences, the Chinese PhD students did not have a habit of using university resources to facilitate their research, such as software, workshops, and individualized tutorials. In the doctoral journey, they learned to use tools or university resources, which directly improved the efficiency and quality of their research. Learning how to use university resources to facilitate their research indicated that university resources are crucial parts of acculturating to the doctoral journey. These resources allowed Chinese PhD

students to engage more effectively in the research process, leading to increased productivity and the production of higher quality academic work. For instance, Nick (who did his MA study in China) described that, since the MA research was neither complicated nor carried out in English, he was not introduced to the use of software to support his data analysis, and did not know how to use the learning software. “No one told me that I could use NVIVO to analyse data. Even in the classes, the teacher only showed line-by-line analysis which does not have to use NVIVO” (Part 2, p. 8). To better manage the data analysis, Nick had to learn NVIVO, indicating that NVIVO represents one of the contents for his doctoral study. Other participants also reported that they did not have experience using these tools to improve research efficiency before their doctoral studies; they had to learn to use the learning management system, software and various tools to make their doctoral studies efficient.

students here not only benefit a lot from software and were willing to use these resources to enhance their studies... (In China) it was very inconvenient to write a literature review because references needed to be recorded manually... It made the writing inefficient because many articles were either repeated or omitted. (Alex, Part 1, p. 9).

Tom also noted, “The university here (New Zealand) has rich reference resources, especially Google Scholar. I could obtain rich latest research results from the database” (Part 1, p. 11).

The lack of prior experience in using learning tools can be attributed to participants either employing different facilitative tools during their previous studies or finding their master's studies less complex than their PhDs, which did not necessitate the use of such tools to facilitate their earlier learning. Consequently, participants encountered difficulties in their PhD studies and needed to grasp additional content beyond their research focus. However, once they began using the software, participants came to the realization that conducting research without software support was inefficient. They became inclined to leverage these resources to augment their research. This progression highlights that participants adopted a similar approach to studying as individuals in the New Zealand academic environment.

Similarly, influenced by previous educational experiences, participants were not familiar with the University's resources, and did not know how to use the resources, such as the library, to enhance the efficiency of their research. Participants learned to use university resources to improve the quality of their doctoral research. This process demonstrated acculturation to the doctoral study and the university's learning environment. For instance, Danny and Lawrence reported that they had to adapt to the new rules of doing research (such as APA referencing), and they had to use unfamiliar learning systems (such as Google Scholar and University Library system) to search extensive literature in English. This is because they

did not use these the same rules or learning system to do their master's research. Caitlyn noted she "did not reckon that we could ask for help from a proofreader" because she believed "that the writing being re-written or changed by other people involved an integrity issue..." (Part 2, p. 2).

However, as the participants got in touch with university resources, the resources further facilitated their research. These learning resources not only left participants with positive impressions but also encouraged the use of these resources. As described by Caitlyn, "the librarian showed me lots of details about how Google Scholar works, such as the difference between using quotation marks and not using them, and the difference between comma-separated and space-separated" (Part 1, p. 3). Yin, as another example, reported, "The workshop could not provide personalized support for our writing composition as our supervisors did, but some basic reading and writing principles are very helpful... (Part 2, p. 7). Similarly, Jade reported the workshop is not like a conference that contains loads of students (the conference remained limited space for students to share experiences). A small number of students provides the opportunity to communicate and share their specific experiences... (Jade, Part 1, p. 4). The use of university resources (this includes interaction and communication with librarians), enabled participants to improve the quality of their writing or obtain further academic skills. This was accompanied by the further enhancement of the participants' desire for more tailored and individualised support, thus demonstrating a shift in the way of doing their studies.

5.4 Transitioning to Academic Independence

Doctoral research demands a high level of academic independence, but participants had not encountered this level of autonomy prior to embarking on their doctoral journeys. In order to manage their research, they had to learn to be academically independent, which meant shifting from relying on teachers' instructions to adopting a proactive, critical, and autonomous approach. Transitioning to more initiative and autonomy signifies the acculturation to the norms and practices of their doctoral program. This shift also indicates that participants were internalizing (or managing to fulfil) the expectations of doctoral education, where initiative and self-responsibility are valued. The shift enabled participants to navigate their research demands more effectively. Moreover, the development of independent and critical thinking demonstrates that participants were moving from obediently following instructions to critically evaluating ideas proposed by supervisors or scholars. This shift indicates that participants managed to develop independent judgment, and these changes enabled them to generate original academic knowledge.

From the perspective of CLT, learning to be independent signifies that an independent approach to doctoral research is a vital component of academic acculturation. In particular, it aligns with the concept of meta-learning or “learning to learn” (Illeris, 2016). In other words, an individual “must also learn how best to tackle it (the learning process/ itself)” (Illeris, 2016, p. 63). Additionally, individuals place their “own learning in a personally and societally general perspective” (Illeris, 2016, p. 63).

5.4.1 Taking initiative and responsibility

Eight participants reported transition from a dependent approach (characterized by relying on teachers' instructions) to an independent approach (where students actively sought out research topics and took responsibility for their studies). This transition shows that participants adjusted to meet the requirement of doctoral education. The transition also empowered participants to manage their research and pursue academic success more effectively.

Participants assumed that, to ensure the academic success, they need to conduct their doctoral research independently based on the supervisors' instructions. For instance, Nick believed that their decision for doing research should be discussed or approved by their supervisors. Kelly and Hilton also thought that they should respect their teachers' ideas and should obey supervisors' decisions or suggestions. Likewise, according to Tom and Danny assumed supervisors were experts in a particular domain, and supervisors could guarantee that “my research is on the right track” (Danny, Part 2, p. 4). The above examples of participants' preconceptions indicate their expectations of the way doctoral study is conducted. Although participants understood the notion of independence, their conceptions did not fully appreciate the level of responsibility and initiative required.

Participants' preconceptions of doctoral study and their previous educational experiences influenced their expectations of doctoral study. The preconceptions seemed to be derived from their previous education experiences. As Cain and Hilton explained, students “follow(ed) the teacher's instructions or suggestions” (Cain, Part 1, p. 4), and “students did not have to worry about what to do” (Hilton, Part 1, p. 3). Thus, they did not have to think about the research direction independently. As Alex also described,

In China, students can branch out their research from their supervisors' projects. Senior peers could also tell me how to research.... They (senior peers) could share their ideas, notes, the most frontier research results, etc. I mean our research was based either on senior peers' research or supervisors' programme (Part 1, p. 6).

Their prior experiences also further influenced how they conducted their doctoral research in the initial stage of doctoral journey.

Participants did become aware that their prior methods (i.e., relying on teacher's instruction) of study proved inadequate for effectively handling their research tasks. At the same time, they noticed the differences between doctoral studies and their previous studies. They realized the imperative to take greater initiative, autonomy and responsibility in their doctoral research instead of relying on supervisors telling them what to do and how to do it. For instance, Cain noticed the importance of being proactive. He said that doctoral supervisors would not simply transmit disciplinary knowledge or provide instructions, and students had to proactively engage in their research and not passively wait for instructions from their supervisors.

I need to read more articles and consider what to learn. That means the doctoral study demands students to have a “proactive heart”. It is totally different from the master's study where we didn't have to worry about what knowledge we needed to search for... (Hilton, Part 1, p. 8).

Supervision is not teaching; it is more related to “guiding” and “being guided”... In the doctoral program, the roles turned around. The student should be the locomotive, and doctoral supervisors were the train cabins... (Jade, Part 1, p. 10).

As Hilton and Jade highlighted, the ideas of “proactive heart” and “guide and being guided” demonstrate new insights into the ways of doing research. The term “proactive” refers to learning where participants took the initiative to obtain knowledge instead of waiting for doctoral supervisors to instruct them how to do the research. The “heart” Hilton describes represents his passion or self-motivation in doctoral study. Together they illustrate that being proactive or taking initiative in one's doctoral study is an important part of academic acculturation.

As a result of recognising the significance of responsibility and autonomy in doctoral research, participants were able to navigate their research demands more effectively. Nick came to understand that doctoral supervisors do not expect blind obedience nor do they make decisions for students. As he recalled: "Supervisors told me that: 'it is your research, not mine; you are not asking for my permission'..." (Part 1, p. 12). This realization enabled Nick to do "what I really want to study, instead of making my study to please him" (Part 1, p. 12). Jade also came to a similar realization, noting, "What my supervisors always asked me to do is to give them reasons why I need to do this and provide justifications" (Part 1, p. 5). This understanding led Jade to adapt her study approach and alter her approach to research; she recognized that supervisors were not there to supply ideas but rather to encourage independent

thinking. Cain and Kelly shared a similar idea, expressing that by acknowledging the need for initiative and responsibility in their research, they adjusted their approach to conducting research. Cain found that “writing an article (including the doctoral thesis) is absolutely an energy-consuming process” that required him to “decide everything and make the whole writing coherent” (Part 1, p. 5). Similarly, Kelly stated, “it’s a self-determination process, for all the research directions, methods and theoretical frameworks, I need to decide everything by myself. I came up with several versions of the research question and problems” (Part 1, p. 1).

These examples demonstrate a clear shift in the participants' understandings of doctoral research. The participants shifted to understand the importance of responsibility and autonomy in doctoral research. Their realization empowered them to take ownership of research that genuinely interested them, rather than trying to cater to the supervisor's preferences. The understanding could further foster independent thinking and critical evaluation. In addition, the understanding also facilitated participants to shape their research, such as making decisions independently regarding research directions, methods, and theoretical frameworks. Overall, transitioning to initiative and responsibility empowered students to navigate the demands of their research more effectively.

5.4.2 Cultivating independent thinking and judgment

Initially, participants demonstrated obedience to their supervisors and lacked independent thinking. However, as they progressed through their doctoral journey, they learned to develop independent thinking. The shift to critical thinking and independent judgment enabled participants to logically critique people's (supervisors and scholars) ideas. This further empowered participants to offer unique insights and contribute original academic knowledge.

Influenced by their prior educational experiences, initially participants held the belief that adhering to and respecting their supervisors' instructions would pave the way for success in their doctoral journey. For instance, participants (such as Tom and Lawrence) expressed they were taught to follow teachers' instructions. Nick and Kelly further added that they came from an environment where teachers centralised power (Kelly) and were regarded as “the authority of knowledge” (Nick). Influenced by their previous experiences, participants thought they should respect and obey their doctoral supervisors' suggestions as well.

After obtaining the feedback, do you need to revise the writing accordingly? For respect reasons, I should change it immediately... The problem is that after I addressed all their comments and sent it (the writing) back to them, shall I revise the writing again? For the simple literature review, I revised it 18 times... (Hilton, Part 1, p. 12).

Likewise, Tom also thought that his supervisor was an expert in the research domain, and he should follow the supervisor's suggestions, assuming that the supervisor's suggestions could guarantee success in the doctoral research.

I followed my supervisors' instructions (in the stage of developing a research proposal), but then I quickly entered a dead end. Because I noticed that these reactions were not easy at all, they won't work... as long as I chose the research direction, my research was limited in the direction that could not produce any results... (Tom, Part 1, p. 2)

As shown in the comments above, the perception of teachers as highly authoritative figures was deeply embedded in the participants' mindsets. This, in turn, led them to hold a strong sense of respect and obedience towards their doctoral supervisors. The participants' preconceptions revealed a dependence or reliance on the teacher's guidance; these preconceptions also disclosed that participants lacked critical thinking. This preconception echoed the idea of "respectful obedience" (L. Xu & Grant, 2017). That is, students have to conform to their supervisors' ideas either to please their supervisors or to demonstrate loyalty to authority.

However, the participants realized that even suggestions from experts did not always lead to successful research outcomes. This realization prompted participants to evaluate their research, which further enabled them to understand that critical thinking and independent judgement were the fundamental of contributing original knowledge to academia. For instance, Hilton learned that supervisors' ideas may not ensure the success of his research and that supervisors were not the "authority" who impart authentic knowledge for students to follow. "As far as I know, none of my peers did this like me, and theories did not instruct that researchers should translate all the transcripts, which push me to think: is my supervisor's decision correct?" (Part 1, p. 9).

Caitlyn followed her supervisor's instructions to narrow down the research direction. Yet, she still faced difficulties in fixing the research topic. This led her to question her supervisor's instruction and prompted her to consider the fundamental issue: "If I don't have a clear understanding of the research direction, how can I collect relevant data for my study?" (Caitlyn, Part 1, p. 10). The above participants demonstrated a reflection process as they reevaluated their supervisors' suggestions and the way doing research.

Reflection further caused adjustments in their understandings of supervision and research approaches. For instance, Cain realized the critical thinking is the fundamental for generating unique ideas:

To think independently in the research is not an easy thing. It requires a person to have a critical mind but not criticise everything. Criticizing everything is the cynical

status...To think independently does not really mean criticising every idea of other people...it is about thinking with a more objective view or being fair (Part 1, p. 10).

Alex noticed that his supervisors provided loads of suggestions to him, but the supervisor did not have a clear instruction on which one he need to do. He explained:

(In China) I just need to follow their research direction and explore something further. But in New Zealand, all these are gone, no one could give me the answer and no one could provide an existing knowledge frame. I need to grope for everything step by step... then to find an idea and a way that is different from others (Part 2, p. 3).

Likewise, Caitlyn said her supervisor urged her to think instead of commanding her obedience.

Then I calmed down and thought about my research aims; I create a word to describe this phenomenon, which is "story-based recalling". Only this phrase can describe the phenomena that I want to investigate. However, there is no relevant research strictly defined relevant phenomenon. (Part 1, p. 12)

Through the development of understanding that doctoral research requires critical thinking and independent thinking, participants were able to use 'unbiased' ideas to review other scholar's ideas. This understanding empowered participants not only to analyse others' ideas but also to generate fresh perspectives based on their analyses. Moreover, independent thinking enabled participants to refine their study methods and place greater reliance on their own critical thinking abilities to generate innovative concepts and contribute original knowledge to their respective fields. In doing so, they were better equipped to chart a clear path through their research.

5.5 Learning to Work with Supervisors

All participants acknowledged the distinctions between doctoral supervision and the supervision experienced during their MA studies. The differences were particularly evident in the supervision approach and student-supervisor relationship (role of doctoral supervisors). Having a clear understanding of doctoral supervision and a strong relationship with their supervisors significantly influenced participants' ability to collaborate effectively and manage their doctoral research efficiently. This knowledge of supervisory approaches and the student-supervisor relationship can be seen as part of what participants learned during their academic acculturation. This section presents how the participants learn about the supervision approach and student-supervisor relationship.

5.5.1 Understanding the supervision approach

Doctoral supervision emphasizes independent learning, self-directed research, and a collaborative relationship between supervisors and students, experiences that participants had

not encountered previously. After experiencing the doctoral supervision, participants adjusted their understandings of supervision. The adjustments further enabled the participants to better work with their supervisors in managing their research.

According to Nick and Yin, the educational practices in China are that teachers instructed: “procedures or guidance for students to follow” (Part 2, p. 3), whereas doctoral supervisors do not “instruct the specific content knowledge or theories” (Yin, Part 1, p. 5), and doctoral supervisors teach students how to obtain the knowledge. As Hilton described:

I thought that supervision is to transmit knowledge. The difference is that the master’s teachers in China taught that one plus one equals two, but the doctoral supervisors taught students how to calculate one plus one. That is, the doctoral supervisor would not tell students what the phenomenon is, but would teach students how to understand the phenomenon (Part 1, p. 5).

Four additional participants added that doctoral supervisors facilitated the students’ research competence and trained students to be scholars in a particular research domain (Jade). Cain interpreted this style of doctoral supervision as an “apprenticeship” wherein students can not only obtain subject knowledge but acquire the teacher’s experiences, skills, values, ways of thinking and wisdom. As similarly described by Danny:

She (the chief supervisor) assisted me in refining the research framework, linguistic issues, phases and even punctuation marks in my writing... the guidance and supervision were very valuable... They trained me to become more competent in the research domain; for example, they trained me in research capacities and broadened my horizon... (Part 2, p. 1).

Another three participants highlighted that doctoral supervision differed from previous teaching approaches they experienced because supervisors and students collaborated and shared responsibilities in managing the student’s studies (Danny). As Caitlyn explained,

...his (chief supervisor) feedback is closely related to the perspective of chemical engineering; my secondary supervisor focused on the perspective of psychology... they focused on different perspectives, which just put my study on the right path. (Part 1, p 6).

Lawrence and Kelly interpreted doctoral supervision as a form of collegiality because students could communicate with supervisors on an equal footing, and the supervisors and students consisted of a community, which provided the members of the community with mutual learning and adaptation (Lawrence).

The above data demonstrates participants’ understanding of both master supervision and doctoral supervision approaches. The participants highlighted the initial teaching approach they experienced in their masters, which involved direct instruction and guidance from teachers

or supervisors. This teaching approach contrasts with the doctoral supervision approach, where supervisors do not provide disciplinary knowledge or offer explicit instructions to students. The participants engaged in interactions and experiences with their doctoral supervisors during the supervision, which led participants to develop an understanding of the approaches used by the doctoral supervisors. By obtaining an understanding of doctoral supervision, participants not only distinguished doctoral supervision from the previous teaching approaches but also enabled them to adjust their learning approach (independent and self-directed learning) and better work with their supervisors.

5.5.2 Understanding the supervisor-student relationship

One of the differences between the Chinese academic environment and the New Zealand environment is embodied in the student-supervisor relationship. Through the doctoral journey, participants constructed an understanding of the student-supervisor relationship. Understanding the student-supervisor relationship is essential for effective communication and collaboration, enabling participants to appropriately interact with their supervisors academically and non-academically. From the perspective of CLT, acculturation is the learning process, and the supervisor-student relationship indicate the learning contents of the learning process.

First and foremost, participants gathered what they perceived in their doctoral journey to construct an understanding of the student-doctoral supervisor relationship, which also allowed them to recognise the distinctions between the student-supervisor relationships in China and New Zealand. For example, Nick, Kelly and Hilton explained the Chinese educational environment emphasized the teachers' role as the "authority of knowledge" (Nick, Part 1, p. 10), leading to a strong emphasis on following the teachers' guidance and suggestions. The classroom setting reflected a centralized structure of the whole Chinese society, where the teacher, acting as a boss, could command obedience from students and students had to listen to their teacher's instruction (Tom). Within this environment, the prevailing notion was that "teachers are the authority of knowledge, and students should not question them (teacher) but rather conform with their peers" (Kelly, Part 1, p. 5). Compared to this hierarchical relationship, the student-supervisor relationship in New Zealand was largely non-hierarchical and collegial. As described by Caitlyn,

He (supervisor) respects me and would not devalue my ideas. He would find something shining from heaps of "rubbish" (the writing submitted to the supervisor)... they never imposed their opinions on me, and they would discuss ideas with me till I can solve the problem (Part 1, p. 6).

Nick, as another example, learned his supervisor's qualities and described,

He (supervisor) came to my office and inquired about my progress and gave me suggestions. Although our conversation is informal, it seems he is very close to the students... he is amiable and approachable acted as 'Liang Shi Yi You' (both teacher and friend '良师益友') (Part 2, p. 15).

The above statements suggested participants' perceptions of the student-supervisor relationship in the Chinese and New Zealand context. Specifically, the relationship in China tends to be more hierarchical, whereas the relationship in New Zealand is characterized by a more collegial and equal partnership. These perceptions indicated that participants noticed the difference in the two educational environments. In addition, the above quote indicates that participants perceived every aspect of their doctoral journey and integrated these aspects into an understanding of the student-supervisor relationship. The construction of the student-supervisor relationship could be interpreted as a learning process in which participants incorporated elements from their doctoral journey. Since the elements embedded in the doctoral journey differed from the elements of their educational journey in China, participants seemed to construct two different systems of understanding the student-supervisor relationship.

The newly constructed understanding of the student-supervisor relationship enabled participants to better position themselves with respect to communication and to effectively work with their supervisors in managing the doctoral research. For instance, by being involved with supervisors in the process of the academic article writing, Alex reflected on the relationship with his supervisors and adjusted the supervisors' identities: "Just like a guide... they are training me from an ordinary student to a person who can do independent research" (Part 1, p. 9). Likewise, Danny changed her self-understanding as a student and also changed her understanding of her supervisor: "She (supervisor) was like my relative and friend who provided lots of support in my social life and my study, especially when everything was uncertain for me at first the beginning" (Part 1, p. 6). Hilton also adjusted his understandings, highlighting his supervisor served not only as a teacher who was also "parenting" and giving instructions to follow, but also as a friend who would invite "his students to his house on Christmas..." (Part 1, p. 2).

Participants' understanding of the student-supervisor relationship facilitated their interactions and collaboration with their supervisors. Participants realized that the student-supervisor relationship is akin to that of trainers and trainees, in which the trainee strives to become an independent researcher. This understanding empowered participants to take a more active role in communicating and collaborating with their supervisors effectively. Moreover,

recognizing that supervisors play a significant role in providing pastoral care, this also allowed participants to feel more comfortable and confident in their interactions with their supervisors. By comprehending that students have various types of relationships with supervisors, participants could navigate both academic and non-academic aspects of their relationship with their supervisor effectively.

5.6 Constructing Academic Identity

The data revealed that participants related to every aspect of doctoral experiences, such as learning actions, independent study methods, current skill sets, and supervisor relationships, and self-understanding. This process led to adjustments to and development of their academic identities. Participants developed their academic identities, signifying self-understanding as one of the learning contents (Illeris, 2016). Consistent with the openness of CLT (see Subsection 3.1), the terms “self-understanding” and “identity” will be treated as synonymous and used interchangeably throughout this study. Academic identity development facilitated academic acculturation across four key dimensions: clarifying roles and expectations and integrating into the academic community, adapting to academic independence, promoting effective interaction, and navigating crisis situations.

5.6.1 Academic identity development- adapting to academic independence

By understanding the learning actions they were undertaking, participants realized that they were being trained to become independent researchers. Thus, they identified themselves as students involved in this process of transition. This self-understanding helped them navigate and fulfil the expectations and responsibilities associated with their academic roles in doctoral education. Furthermore, this self-understanding deepened their comprehension of conducting independent research, enabling participants to adjust their study approaches (i.e. independent, autonomous and critical) to align with the demands of their doctoral education.

Due to learning in doctoral study being different from that in MA study, participants thought that they were different from the student they used to be. Hilton, for instance, identified himself as a student because he believed he was fulfilling the role of a student by engaging in the learning process. As he explained, “doing what a student should do, the identity, such as worker or scholar, is not consistent with what I am now doing” (Part 1, p. 11).

Likewise, Alex also said he was still in a learning phase during their doctoral journey and was still acquiring knowledge and research experiences:

My supervisors imparted a series of skills and unwritten rules in academia... These skills and rules can only be obtained when one experienced doctoral research. In other words, they are training me from an ordinary student to a person who can do independent research (Part 1, p. 9).

Although participants considered themselves to be students, their identity as students during their doctoral journey differed from that of "ordinary students" who "sit in the classroom, learning for examination and obtaining knowledge from the teacher" (Lawrence, Part 2, p. 5). Kelly also expressed a similar idea that the pre-PhD identity was of "pure students" (Part 1, p. 3). The term "pure student" also stemmed from their continuous engagement in learning, which was a core characteristic of being a student. Nevertheless, the content and nature of their learning experiences during the doctoral program set them apart from "pure" or "original" students. This is because the participants' journey in their doctoral studies exposed them to more specialized, research-driven learning, which differed from the traditional classroom-based or content knowledge-based learning approach. This distinction in their learning experiences contributed to a unique identity as students, differentiating them from what they perceived as conventional students. Participants distinguished themselves from their previous identity as students, which indicated participants adjusted their self-understandings. With this self-understanding, participants, in turn, had a deeper insight into the meaning of doctoral education, especially how they fulfill the requirements for independence and autonomy in doctoral research. As Cain pointed out, a doctoral student should "have more ownership in their research and define a research scope" (Part 1, p. 4). This indicated that self-understanding is one of the important learning contents embedded in the academic acculturation.

5.6.2 Academic identity development - clarifying roles and expectations, and integrating into the academic community

Acknowledging the importance of cultivating research competencies and skills in academia, participants identified themselves as learners who were being trained to become proficient researchers specializing in a specific research domain. This self-understanding further promoted participants to consistently dedicate themselves to developing their writing skills, deepen their professional knowledge, and advance their research abilities. These efforts were geared towards not only meeting the requirement of doctoral research but also providing them with a sense of becoming integral members of academia.

Participants viewed themselves as individuals who shifted from students to researchers. This self-understanding was a result of the continuous development in their research competencies and skills. "The most important capacity I obtained from my doctoral journey

was a series of methods to solve problems... to think as a researcher means that the person should solve the problem independently and analytically” (Kelly, Part 1, p. 4). Likewise, Danny noted “I can only say that I am a learner... although I have many ideas, I still do not know the frontier of this research domain nor know about the skills for publishing articles” (Part 2, p. 5). Participants placed academic competencies and research skills as a yardstick for evaluating their identity. In other words, participants developed their research skills (such as independent thinking and analytical skills, as emphasized by Kelly) to succeed in their research. This indicated that participants managed to meet the requirements of doctoral education (i.e. enriching skills to become a qualified researcher).

The development of research capacities, in turn, led to an adjustment in their academic identities. For instance, Jade recognized that she had acquired a set of research methods and, at the same time, identified herself as a 'prospective scholar,' acknowledging that she was still in the process of accumulating research methods (Part 2, p. 7). Similarly, Nick mentioned that he had developed his disciplinary knowledge and skills in academic writing. He understood that doctoral education aims to equip students to become "proficient researchers in a particular domain, with advanced language skills in expressing ideas" (Part 1, p. 6). In other words, participants acknowledged that they had accumulated specific research skills; thereby, distinguishing them from students. However, terms like 'in the future' and 'prospective scholar' indicated that, despite acquiring these research skills, participants did not yet consider themselves fully-fledged researchers. With this self-understanding, participants dedicated more effort into developing their research skills and competencies to fulfil the role of a member of academia. Therefore, the development of self-understanding underlined an ongoing process of academic acculturation, and it motivated participants to engage in developing their research skills to become a qualified members in academia.

5.6.3 Constructing multiple identities for the various interactions with supervisors

Due to academic and non-academic interactions with their doctoral supervisors, participants constructed multiple self-understandings. These multiple self-understandings, in turn, enabled participants to engage more effectively with their supervisors, allowing them to better position themselves in academic discussions, as well as facilitating social communication and interactions.

Participants engaged in a range of interactions with their supervisors, leading to the development of diverse self-understandings. Alongside the self-understanding as students (detailed in Section 5.5.2), participants recognized numerous additional academic and non-

academic connections with their supervisors. These included collaborative efforts on article publication and informal interactions like coffee meetings. As highlighted above, participants experienced a diverse range of interactions with their supervisors. These interactions enabled participants to construct understandings in many aspects, such as their supervisors' roles, connections with supervisors, and how to interact with supervisors within these connections. These understandings functioned as elements for constructing their self-understandings (such as student, colleague and friend).

However, it appeared that these elements could not be fully integrated into a singular identity, this is, the identity of 'student' or 'colleague'. This is because a single identity (such as students) could not adequately encompass all the situations they encountered during their doctoral journey (such as celebration and collaboration in academic publication). To address the diverse interactions, participants had to develop their multiple self-understandings, such as "friends" or "colleagues", to cater for the multiple connections with their supervisors in the specific context. For instance, the role of "friends" aims to cater for a more informal and friendly relationship with their supervisors; whereas, in academic situations, the identity of "students" or "colleagues" aims to cater for the interaction in the supervision and working situation, acknowledging academic interactions. These multiple identities co-existed and enabled participants to shift from one identity to another as appropriate. This demonstrated that the multiple identities allowed participants to navigate their doctoral journey successfully and engage more effectively with the different aspects of that journey.

5.6.4 Restructuring academic identity navigating crisis situations

The doctoral journey also entails hardships and intense pressure. These challenging situations led participants to reconstruct their self-understandings as doctoral students. This process of reconstruction enabled them to become more resilient and adaptable, which, in turn, aided them in navigating challenges and crisis situations effectively. Resilience, in particular, played a crucial role in helping participants adjust their attitudes and perspectives towards obstacles, enabling them to overcome challenges.

Participants (Nick, Tom, Hilton and Lawrence) encountered significant challenges in their doctoral journey, which caused them to self-reflect and reconstruct their self-understandings. For instance, Tom assumed that his supervisors' guidance would ensure his research success. However, he found himself "quickly entering a dead end" despite following their instructions (Part 1, p. 2). As a result, he began to reflect on the true meaning of being a doctoral student. Likewise, Hilton believed that he should unquestionably adhere to his

supervisors' decisions. However, this assumption impeded his research progress and resulted in repetitive revisions in his literature review. As a consequence, Hilton started contemplating the appropriate approach he should adopt as a doctoral student:

The most important is that we should voice up and speak out our wishes and our needs. This is not the same in the Chinese environment, if we do not express our needs, no one would know our intention. Especially at this stage, we are not the students being commanded, and supervisors do not command our obedience... (Part 1, p. 14)

Participants recognized that challenging situations threatened their academic journey, compelling them to take action to overcome these obstacles. Their initial response was to reflect on their supervisors' decisions and to contemplate potential solutions as doctoral students. This reflection also led to adjustments in their self-understanding. The reflection helped the participants to navigate through difficult circumstances. As described by Lawrence:

I was expecting that my supervisors could tell me: 'ok, this direction is feasible, and this part needs to be more specific in a particular direction' or something like that. But I could not obtain such responses... doctoral students should have their own ideas thinking about our research. Although we are students, we are not students obeying the teacher's order...(Part 1, p. 3)

As shown in the above comments above, participants' experiences presented a similar resilience process. Their prior academic experiences (including their expectations) did not adequately prepare them for their doctoral journey, instead, caused challenges to their doctoral studies. These challenges further triggered participants to reevaluate their roles as doctoral students and every aspect of their journey. Through this reflection, the participants realized the need to take ownership of their research, with supervisors serving as facilitators rather than sole guides. This shift indicated a crucial aspect of self-understanding reconstruction. This shift also demonstrated participants' resilience in crisis situations through cognitive adjustments and making adjustments in learning strategies, thereby allowing them to better navigate their doctoral research.

5.7 Misunderstanding as a Barrier to Academic Acculturation

The data analysis revealed that participants constructed understandings that did not match their doctoral journey. These understandings were derived from the participants' prior educational experiences or inadequate communication with supervisors. The misunderstandings challenged participants in their doctoral journey. From the perspective of CLT, these understandings set barriers to their doctoral journey from the cognitive aspect.

5.7.1 Previous educational experiences caused misunderstandings

Due to the differences between participants' previous educational experiences and their doctoral studies, their previous experiences could potentially shape expectations and perceptions that do not align with the doctoral study. These understandings can subsequently lead to barriers hindering academic acculturation. As described earlier, the Chinese educational setting operates within a centralized system where students and teachers adhere to a hierarchical structure. Within this environment, students tend to follow their supervisors' instructions and rely on their supervisors' guidance throughout their doctoral research process. As Kelly elucidated, within classroom interactions, “teachers hold authoritative knowledge; students are discouraged from challenging the instructors and are encouraged to conform to their peers” (Kelly, Part 1, p. 5). Participants like Tom and Alex, who specialized in natural sciences, also presented a tendency to rely on their supervisors' chosen research projects or topics. Their rationale for this reliance stems from the belief that their supervisors possess expertise in specific areas. Supervisors' expertise could grant suitable support and accurate guidance for students, and the students could conduct research without huge challenges. Alex's explanation further supports this notion, “their (senior peers) studies are the branches of their supervisors' programme as well... Thus, my research is based either on senior peers' research or supervisors' programmes” (Part 1, p. 6).

Influenced by his past educational experiences, Tom also held the assumption that his doctoral supervisors would provide explicit suggestions or directives for him to follow. Tom explained: “I thought he should be experienced in the domain of Coordination Chemistry. The research path and the proposed (Chemical) reaction should not have any issues” (Part 1, p. 2). Likewise, Lawrence articulated “My (doctoral) supervisors would make suggestions about various aspects. The supervisory approach was quite didactic, mirroring the guidance style I was accustomed to during my Master's studies” (Part 1, p. 5).

However, participants' expectations and understanding caused problems for their doctoral research. For instance, Tom, after following his supervisors' suggestions, failed to work out a proper research direction.

I quickly entered a dead end. Because I noticed that these reactions were not easy at all, they won't work... as long as I chose the research direction, my research was limited in the direction that could not produce any results... (Tom, part1, p. 2)

Hilton was influenced by the concept of a hierarchical relationship. He held the belief that he needed to secure his supervisors' approval in order to proceed with his work.

For respect reasons, I should change it immediately [address the feedback and revise the writing]. After that, I shall send the adjusted writing to them. Once I got their feedback again, I should revise the writing again. For the simple literature review, I revised it 18 times (Hilton, Part 1, p.12)

Likewise, Caitlyn assumed that her supervisors are experienced in doing research and if she followed her supervisors' instructions, her research could be in a "controllable" direction. Yet, her assumption was incorrect, so she failed to work out a proper research proposal. Thus, she commented on the early period of her doctoral journey: "like a black hole, it is boundless and bottomless; I neither know the bottom nor know where to go" (Part 1, p. 12)

5.7.2 Language caused misunderstandings

The data showed that limited English proficiency, coupled with a restricted vocabulary and unfamiliarity with various modes of expression, often resulted in participants' inadequate comprehension of their supervisors' ideas. As a result, they did not obtain adequate support to navigate their research effectively. For instance, Alex presented,

I elaborated on the algorithm in this meaning. However, my supervisor interpreted my ideas into other meanings. This also happens in my writing. My supervisors always comment: 'is this what you mean?'. Sometimes, I have to spend a long time explaining a single idea or spend the whole on discussing the idea. In the end, we went back to what I originally meant...(Part 1, p. 15).

Due to the language issue, participants encountered challenges in establishing effective communication with their supervisors, and this impeded progress in their doctoral journey. In other words, the language led to participants' misunderstandings, which created barriers to academic acculturation.

However, the data indicated that not all instances of misunderstanding were immediately discernible during the course of communication. These misunderstandings could also cause further challenges that significantly impacted participants' progress in their doctoral journey. As described by Danny:

I was quite sure I understood his suggestions. However, in the end, my chief supervisor seemed to be unsatisfied with the research results. We finally had to go back to the ideas that I intended to do. We spent a long time dealing with this direction; my study was detoured a lot (Part 1, p. 4).

Participants only realized that they had misunderstood their supervisors' perspectives after they noticed something wrong in their own research. In essence, participants initially failed to completely comprehend their supervisors' ideas. Alternatively, the participants constructed an understanding that did not align with their supervisors' original intentions.

From the statement did not give a clue that if participants learned was correct or wrong. Yet, the terms, such as “detoured” or “wrong”, indicated that participants had mislearned something and this led to problems or difficulties for the academic acculturation. These outcomes serve as evidence that participants had internalized misconceptions or erroneous information, which in turn gave rise to challenges and difficulties in the context of academic acculturation.

Chapter Summary

This chapter presented content that Chinese PhD students learned for academic acculturation. Six main learning contents were identified from the interview data. These learning contents were language, behaviours and attached attitudes, learning resources, independence, supervision, and academic identities. These learning contents enabled participants to better navigate their doctoral journey. These contents also indicated that, when acculturating to their PhD journey, Chinese PhD students “needed to not just recognise but learn, even master, the new rules of the new game” (Elliot, Baumfield, & Reid, 2016, p. 1192).

Chapter 6: Incentive—Driving Forces for Academic Acculturation

The doctoral journey is driven by complicated incentive factors. The findings within this chapter address the research question: *what are the key incentive components that influence Chinese PhD students to undergo academic acculturation?* Through data analysis, this study found that emotional factors, cognitive dissonance, and personal desires served as foundational incentives that facilitated academic acculturation. The Chinese PhD students exhibited rich emotional reactions towards their doctoral journey. These emotional aspects, in turn, acted as driving forces that promoted the students to engage in their research and navigate through challenging situations. Cognitive dissonance, as another incentive factor, prompted the students to make necessary adjustments in their understanding, enabling them to meet the demands of doctoral studies. Additionally, the Chinese PhD students had a strong desire for self-development and knowledge acquisition. These desires motivated the students to overcome challenges and actively engage in their doctoral studies. However, students' motivation systems could sometimes be contradictory, yet this internal conflict could also help the students clarify their goals and persevere in their doctoral journey. Lastly, feelings of disinterest, fatigue, and resistance to self-adjustment acted as barriers to academic acculturation.

6.1 Emotional Aspects as the Incentives for Academic Acculturation

This section is divided into two parts and demonstrates how the doctoral journey can trigger participants' emotional responses. In turn, these emotions motivated the participants to acculturate academically in the following four aspects: initiate dedication to engage in doctoral research; facilitate student-supervisor interaction; initiate development of academic identities; and enhance navigation in challenging situations.

6.1.1 The doctoral journey shapes students' emotional aspects

This subsection presented that the doctoral journey aroused the Chinese PhD students' emotional aspects. Participants underwent both negative and positive emotional reactions throughout their doctoral journey. Participants demonstrated negative emotional reactions when they encountered critical situations. For instance, Lawrence said the confirmation stage was one of the most “difficult and stressful” periods because he faced unforeseen issues, ranging from “being unfamiliar with doctoral research” to “language issues” as well as “confirming doctoral candidature on time” (Part 2, p. 3). Alex was both disappointed and panicked about his research during his doctoral study in New Zealand.

(In China) I just need to follow their research direction and explore something further. But in New Zealand, all these are gone, no one could give me the answer and no one could provide an existing knowledge frame. I need to grope for everything step by step... then to find an idea and a way that is different from others (Part 1, p. 13).

As shown, Alex noticed that his supervisors did not provide clear instructions on what to do, which made him unconformable and uneasy. Additionally, Alex also found his doctoral study lacked a research community similar to the one in the Chinese academic environment. This further triggered his panic. Likewise, Caitlyn, after knowing that relying on her supervisors' guidance did not assure success in her research, became depressed by the pressure. She described the process of developing a research proposal as "a black hole", and the process made Caitlyn under stress and panicked (Part 1, p. 12).

In contrast, participants also experienced warm-hearted moments, such as obtaining peer support and pastoral care. These supports evoked participants' positive emotions, including hope, gratitude, and excitement. For example, Cain and Tom exuded enthusiasm and joy upon discovering the wealth of learning resources available to them. Cain found the accessibility of learning resources beneficial, stating, "It's quite convenient for my studies. Whenever I encountered software difficulties, I could simply schedule individual assistance with the librarian..." (Part 2, p. 3). Cain found the learning resources enabled his study. The terms "convenient" and "simply" suggested the participants were pleased with the learning resources, as they facilitated their research. These terms also indicate the participants' positive emotional reactions to the learning resources. Similarly, Danny, Nick, and Yin were "very moved, grateful and surprised" (Yin, Part 1, p. 4) and expressed their appreciation for the dedication and enthusiasm exhibited by their doctoral supervisors. As Danny explained, "She (supervisor) was like a parent who took care of me and treated me like a child... I am so lucky she could treat me like this" (Part 1, p. 6). The terms, such as "moved" "grateful" and "lucky", indicated participants' positive emotional aspects as they obtained sufficient support from their supervisors. In Danny's statement, she expressed deep gratitude for her supervisors, noting that the supervisors considered her as a kid who needs comprehensive care and detailed support in an unfamiliarity academic environment. These sentences also indicate that experiences that exceeded their expectations could also trigger their positive emotional reactions.

6.1.2 Emotional aspects functioned as incentives

This subsection presents the functions of the participants' emotional aspects. The data revealed that the participants' emotional aspects, whether positive or negative, promoted participants to actively engage in various aspects of their doctoral journey. The emotional

aspects functioned as an important driving force for participants to acculturate to their academic journey.

Firstly, emotional aspects could make participants more willing to work with supervisors and devote more energy to their research. For instance, participants (such as Danny, Jade and Kelly) were moved and grateful for the supervisors' dedication and friendliness. This subsequently initiated participants' willingness to invest efforts into their academic pursuits. For Danny's example, as described in the Subsection 6.1.1, Danny appreciated the detailed and comprehensive support by her supervisors. The appreciation and gratefulness promoted Danny to make efforts to her doctoral journey. As she said: "Considering the solicitude she made for me, I would work hard and not let her down" (Part 1, p. 6). Participants were motivated to work hard not only because they did not want to disappoint their supervisors but also because participants were moved by the supervisors' pastoral care. Participants (like Lawrence, Kelly, and Alex) were impressed and influenced by supervisors' earnestness and dedication. As Kelly said: "she (supervisor) always went to the classroom and waited for her students and left after answering all the students' questions" (Part 1, p. 7). The doctoral supervisors' commitment left a lasting impression on Kelly, and it inspired her to reciprocate with equal earnestness in her academic pursuits: "professors, staffs, peers... everyone does like this, we have no reason not to do like this" (Part 1, p. 7). Participants expressed gratitude and appreciation for their supervisors' dedication and friendliness. This emotional response indicates a strong positive connection between participants and their supervisors. Danny's statement, "I would work hard and not let her down," demonstrates a mutual commitment between her and her supervisors. The supervisor's care and support motivated Danny to work hard on her research. Moreover, this can also be interpreted as participants' desire to avoid disappointing their supervisors (further discussed in Section 6.3). Nevertheless, this desire also stems from the emotional connection and gratitude they feel towards their supervisors. They want to live up to the expectations set by their supervisors, which drives them to invest more effort into their academic pursuits.

Furthermore, emotional aspects also facilitated acculturation to the student-supervisor relationship, thus enhancing equitable interactions between students and supervisors. For instance, Nick said his doctoral supervisor was amiable and approachable, and he was "not nervous when getting along with him (supervisor) or discussing ideas during supervision" (Part 1, p. 7). This made Nick more willing to "go to his (supervisor's) office to have a short chat or catch up with him occasionally" (Part 1, p. 7). Nick's statement indicates a high level of comfort and trust in the student-supervisor relationship. This allows for open and honest

communication, which is crucial for effective supervision and acculturation. Yin and Caitlyn also reported a friendly relationship with their doctoral supervisors. The relationship stemmed from the fact that supervisors did not command obedience from students. Instead, it prompted students to willingly engage in discussions with their supervisors, thus fostering both courage and openness to exchange ideas. As stated by Caitlyn:

My chief supervisor respects me and does not devalue my ideas. He would find something shining from heaps of “rubbish” (the writing submitted to the supervisor) and encourage me to think... I very much value this form of supervision as it provides an opportunity for all the members to discuss ideas... (Part 1, p. 6)

The statement, “very much valued”, demonstrated Caitlyn’s gratefulness toward how the doctoral supervisors managed her research. Caitlyn's statement highlights the importance of feeling valued and respected, which leads to a positive emotional connection. This emotional response in turn motivated her to actively engage in discussions with her supervisor.

Moreover, emotional aspects can initiate the development of academic identities. Specifically, emotional aspects prompted participants to engage in self-reflection regarding their identities in response to the challenges they encountered, and, in some cases, the resulting panic. For instance, Lawrence, Danny, and Caitlyn appreciated the constructive supervisory approach as well as the non-hierarchical student-supervisor relationship, which promoted them to think about who they are going to be in the future. As Lawrence explained that if he were a lecturer in the future, “I would like also to do as she did” (Lawrence, Part 1, p. 8). The participants envisioned themselves adopting a similar approach if they were to become a supervisor in the future, which demonstrates how positive emotional experiences with supervisors stimulate participants to reflect on their potential identity. Another example of participants' emotional aspects driving self-reflection is their admiration for their supervisors' diligence. Participants (such as Kelly, Alex, and Yin) were deeply moved when they observed that the doctoral supervisors worked hard and dedicated efforts to students. Moved by their supervisors, participants projected themselves as future scholars, which led them to spare no effort in fulfilling the requirements of that identity and to invest more effort in their research. As Yin expressed: “The supervisor had set a good example of what a scholar looks like. As a novice, I have to work hard” Part 2, p. 10). Similar cases can be seen in Kelly’s and Alex’s experiences (Section 5.3). As shown, participants stimulated their emotional response as they experienced their doctoral journey. The doctoral journey led them to self-reflect and examine their aspirations as scholars, which further promoted them to set high standards for themselves.

Lastly, emotions acted as moderators, aiding participants in navigating difficulties and initiating solutions for problem-solving. In particular, when participants faced difficulties, their emotional responses drove them to seek solutions and develop coping strategies. For instance, Tom, Nick, and Caitlyn were depressed and worried about whether they could continue their doctoral journey. Depression and worry also promoted them to contemplate solutions to the challenges they faced, especially how to deal with the challenges as doctoral students. Tom was under extreme, panic, pressure and stress when he failed to develop his research proposal. These emotional aspects functioned as a types of forces, promoting him to thinking about the solutions for working out research proposals quickly.

I thought, as students, we need to follow teachers, as this pathway might be the one he wished me to do... I followed my supervisors' instructions, but then I quickly entered a dead end... I knew panic did not work, I needed to find a feasible pathway by myself... I may not be the student who should follow the teacher's instructions (Tom, Part 1, p. 3)

The data showed that the worries and panic, provoked by the challenging situations, initiated participants' reflection. Participants shifted their perception of doctoral learning, supervision and even the student-teacher relationship after such reflection. Meanwhile, they realized the importance of independence. In other words, these cognitive adjustments were a result of emotional aspects and difficult situations; the emotions functioned as one of the incentives for finding solutions in the crisis situation. As illustrated above, the findings indicate that an individual's emotions are one of the components of incentives, which can mobilize learning to take place (Illeris, 2003c, 2016). At the same an individual's emotional aspects do not simply function as driving forces for learning; they accompany the cognitive aspects being developed, thus functioning as a regulation mechanism (Illeris, 2016).

6.2 Dissonance as the Incentives for Academic Acculturation

More than eight participants revealed that the doctoral journey sometimes did not correspond to their expectations. The misalignment represents participants' cognitive dissonance (Berlyne, 1960; cited by Illeris, 2016, p. 86). It was one of the important driving forces for participants to initiate reflective thinking which further adjusted participants' understandings. Consequently, participants adapted to the expectations of their doctoral programs. This process enabled participants to shift from passive compliance to an independent approach to learning, which are essential elements of academic acculturation.

First, this dissonance arose from discrepancies between participants' expectations (they should obey supervisors' instructions or respect the supervisors' authority) and what they

encountered (independent learning). The misalignment between these expectations and the actual experience caused cognitive dissonance. For instance, Hilton and Kelly initially thought that the supervisors' suggestions were instructions. As Kelly explained, "as his student, I do not want to make conflicts and I should obey his instruction" (Part 2, p. 7). Hilton also thought that he should obey or respect his supervisors' instructions to translate all the research transcriptions. Hilton found that "none of my peers did this like me" (Part 1, p. 9) and that transcribing the data was time-consuming, which made him realize there was something wrong with his study process. The cognitive dissonance initiated thinking about whether it is reasonable to unconditionally follow the supervisors' instructions. As Hilton described, he suspected if his supervisor's suggestion is correct or not and reflected on himself "Do I need to unconditionally follow their suggestions?" (Part 1, p. 9). Participants' initial belief that they should obediently follow their supervisors' instructions indicated a passive compliance or dependent way of learning (see Section 5.4). This belief also presented participants' initial expectations toward their doctoral journey, and this belief seemed to be derived from their previous educational experience. However, the doctoral study did not take place as participants expected, which further elevated participants' cognitive dissonance.

Second, cognitive dissonance triggered participants' reflective thinking, encouraging them to critically reflect on their approach to doctoral research and doctoral supervision. They began to question their initial assumptions about compliance and authority, which led to adjustments in their understanding. For instance, Cain initially thought that he could rely on this supervisors' detailed guidance for narrowing down the research proposal. Yet, his supervisors only gave suggestions instead of providing clear directions or goals (Part 1), and this led Cain to think about what he should do. This demonstrates that the cognitive dissonance triggered participants to reevaluate their approach to their research. Similarly, Lawrence and Danny were used to adhering to supervisors' instructions for research. They anticipated clear guidance from supervisors on research domain identification, but actual supervision didn't align with their expectations. Their confusion, at the same time, prompted them to reflect on their supervisors' intentions.

He (supervisor) always provoked me to think by asking critical questions, he seldom told me what I should do next... (Lawrence, Part 1, p. 4).

They (doctoral supervisors) offered multiple options (potential research directions) for the advancement of my research. Upon receiving their feedback, I pondered: do they intend for me to proceed in this manner? (Danny, Part 1, p. 5)

This suggests that the actual doctoral study did not take place as participants had anticipated. Danny's statement, in particular, revealed that she questioned her initial assumptions about

compliance and authority. In other words, participants gave a further thought not only to their pre-established understandings but also to their approach to conducting research.

Through the reflective process, participants recognized the necessity of a proactive, critical, and autonomous approach in their doctoral research, thus demonstrating an adjustment to the independent way of doctoral research. For instance, Tom and Caitlyn failed to work out a research proposal after following their supervisors' guidance. These participants provided further insight into how to do their research as well as how to deal with supervisors' suggestions. The reflection enabled them to realize that doctoral study requires a high level of independence. In Tom's case, he explained that he began to think his supervisors' suggestion was not correct, especially, he thought the research direction proposed by the supervisor had something wrong:

I need to find a feasible pathway by myself. Although the research path he (the supervisor) provided was wrong, the research direction is not worthless... (Part 1, p. 3).

Likewise, Cain, driven by cognitive dissonance, also reflected on his research. He realized that, in doctoral research, he should be proactive in searching resources instead of waiting for his supervisor's instruction:

Most of the time, he (my supervisor) guided me to develop a source code, and then, he became so critical after I could develop a code independently. I did not understand the purpose of why he did this. Maybe he observed my progress and I reached to another level of research (Cain, Part 1, p. 6).

It's my study; I need to confine a scope for my study according to my intention instead of theirs. As a doctoral student, I should have been very clear about what I am looking for... (Cain, Part 1, p. 7).

As shown above, as participants experienced cognitive dissonance, they began to question whether relying on supervisors' authority and instruction was effective or even reasonable. This questioning process promoted participants to give further thought to many aspects of their doctoral study, resulting in the adjustment of their understanding of the doctoral research and supervision approach. Furthermore, participants also recognized the need for a more engaged and self-driven approach to their research. This reflection allowed them to better manage their doctoral studies and adapt to the supervision they received. The participants came to realize the independent nature of doctoral research. They understood the importance of taking the initiative and shaping their research direction according to their own intentions and goals.

Changes in doctoral supervision panels also caused cognitive dissonance, prompting participants to reflect on and adjust their academic identities. For example, Nick and Hilton encountered adjustments in their doctoral supervision panels. Since new supervisors employed

different supervisory strategies, guidance, and ideas compared to their previous supervisors, the change of supervision caused challenges. Hilton explained:

The new supervisors' expectation was different from my previous supervisors. This make my research difficult to move on. It seems my proposal was worthless (Part 1, p. 10).

The difficulties encountered in progressing with the research suggested that the participant's initially planned research content did not align with the current supervisors' expectation. The misalignment between expectation and research content further caused participants to reflect on their established research. Participants sometimes found themselves confused about the direction of their research or experienced cognitive dissonance. The dissonance further promoted participants to reflect on their identities. As Nick said:

The new supervisors asked me to think about my theoretical contributions... Why do I have to return back to the starting point? ... I was very nervous and often had insomnia... Although I am his student, I am not his employee nor doing research for him. If in that case, why don't I stick to my ideas? (Part 1 p. 6 and p. 9).

Correspondingly, Nick and Hilton self-reflected and had an understanding that they, as a doctoral student, should be independent and autonomous, and this led to them taking more responsibility in their own research.

6.3 Desire and Needs as the Incentives for Academic Acculturation

The research participants exhibited strong desires regarding self-development, pursuit of knowledge and academic success, and the need for self-esteem. These desires and needs assisted participants to overcome challenges, enhance research skills, and improve language proficiency and competencies. From the perspective of CLT, desire, determination, resilience, and self-esteem could be respectively categorized into “self-actualization” and “self-esteem” (Illeris, 2016). These desires functioned as a form of incentives for acculturating to doctoral journey.

6.3.1 Doctoral journey as a pathway for self-development

The data showed that participants desired both self-development and professional development. Their desire functioned as a driving force for participants to make efforts in their doctoral research and to overcome difficulties in their PhD journey. For instance, Hilton recognized the restricted opportunities for career development with an MA degree, thereby, prompting him to consider a PhD as a means to facilitate a shift in his career trajectory. As Hilton articulated:

considering dissatisfaction with previous careers, being devalued and having no further development in their previous positions, I would rather take up the challenges here...as this is my last hope (for searching for a better position) (Part 1, p. 1).

Hilton viewed doctoral education as a pathway to personal development, enabling him to pursue better job opportunities. This understanding further solidified his desire to pursue doctoral studies. Similar attitudes can be seen in other participants (such as Caitlyn, Danny and Yin). Yin described that seeking a “bright future” prompted her to start her PhD. With this aim, she was psychologically prepared “to handle the difficulties in the research content because I know doctoral research is the better approach to improve my capacity” (Part 1, p. 3). In other words, the desire for professional development encouraged Yin to pursue her doctoral education, and this desire equipped her with the determination to solve challenges in her doctoral journey. Likewise, Caitlyn expressed a similar idea; she would like to broaden her career opportunities by undertaking a doctoral education. This ambition gave her the energy to overcome difficulties embedded in her doctoral journey. She said, “Get a higher salary and be valued, but before all these, there would be an uneven process” (Caitlyn, Part 1, p. 5). Danny desired to enrich her knowledge and sought wisdom to navigate through life's complexities, as well as the various struggles and problems that she encountered. Consequently, she chose a doctoral journey to develop her knowledge. As she said:

The doctoral journey is undeniably challenging. It requires a substantial amount of knowledge to navigate... overcoming difficulties is the approach to improve our skills and broaden our horizon; this is the meaning of doing doctoral research, isn't it?... (Part 1, p. 7).

Participants demonstrated a strong determination in their doctoral education. The determination was derived from their desire for professional development (i.e. searching for better career opportunities). The determination further empowered participants to overcome uncertainties (especially at the confirmation stage). Furthermore, participants' desire for self-development could motivate them to find solutions when faced with challenges during their doctoral journey, and it could change participants' attitudes as they encountered challenges embedded in this journey. This means that participants' desire for their career development is one of the incentives initiating their determination, so this desire played a crucial role in navigating the complexities of doctoral research and academic acculturation.

6.3.2 Desire for knowledge and development of competencies

Participants had a desire to acquire knowledge and enhance their research competencies. This desire motivated participants not only to actively engage in their research but also to enhance their professional knowledge and research skills. Kelly recognized that the

significance of her research is to improve the practical value of her research, and she wanted to enrich her knowledge base to bring new knowledge to the industries. This further drove her to actively engage in research and to enhance her research capabilities.

some advanced ideas and innovations would be revolutionary, which would lead the whole industry to prosper. That is the reason why I am still here seeking further formulas and cutting-edge ideas (Part 2, p. 5)

Likewise, Tom wanted to enhance his research capabilities for his future research career. At the same time, he also believed that only a high-quality doctoral education could fulfil his need for acquiring knowledge.

The reason why I do not want to have my research in China is that most of the Chinese supervisors are very busy; they own a private chemical company. I do not believe these “entrepreneurs” could really deliver a high-quality supervision. Students were recruited to provide labour for the entrepreneurs. We could not learn anything in this process. (Part 1, p. 9).

Jade, in her capacity as a teacher, chose to pursue doctoral research with the aim of enhancing her knowledge to better serve the requirements of her current position.

Especially the position of teacher, I always encountered situation when students already possess the knowledge I was imparting, the current students are very smart... In such situation I strongly noticed that my current knowledge isn't sufficient. I was thinking to expand my knowledge pool, but it would be more beneficial to go in-depth in a specific area of knowledge and master it thoroughly (Part 2, p. 2).

The statements above illustrate the participants' strong desire for knowledge acquisition and their eagerness to learn. Specifically, Kelly sought to enrich her knowledge in order to contribute revolutionary ideas to industry, Tom aimed to enhance his research capabilities for a future research career, and Jade aspired to deepen her knowledge to better serve her role as a teacher. Although the participants had different reasons for acquiring knowledge, the commonality was that expanding their knowledge was an essential pathway to achieving their respective goals. To achieve goals, doctoral education became the only pathway for them to obtain “in-depth” knowledge or to enhance their competencies. Thus, participants’ desires to enrich their knowledge directly served as one of the incentives for engagement in doctoral research. Such desires facilitated participants' commitment to their learning process (such as expertise enhancement and knowledge contributions in Kelly's and Jade's cases), and it also led to active interactions (such as with his supervisors in Tom's case). These further contributed to their success in their doctoral pursuits.

6.3.3 Self-esteem needs as the incentives

Participants were driven by a desire to demonstrate their capacities, and they were reluctant to disappoint their supervisors or create an impression of inadequacy. Their avoidance of disappointing others showcased participants' need for self-esteem. They actively sought to evade any potential shame from others. These self-esteem needs acted as incentives for participants to improve their research skills and enhance their discipline knowledge.

For instance, participants (such as Nick) were reluctant to seek support from their supervisors, fearing that asking “stupid questions” in front of them would be embarrassing. Consequently, Nick preferred to find solutions on his own. Hilton expressed a similar sentiment, believing that asking questions might portray him as “incompetent or unprofessional”. He asserted, “As a PhD student, it is my responsibility to get the questions solved” (Part 1, p. 17). Both Nick's and Hilton's experiences showed a strong sense of self-esteem which, on the one hand, hindered their interaction with supervisors, but, on the other hand, it motivated them to put more effort into independently enriching their knowledge. In other words, self-esteem acted as an incentive for knowledge acquisition and expertise enhancement. As another example, Caitlyn's self-esteem needs prompted her to develop her research capabilities.

I am not willing to ask the supervisors questions in terms of the subject knowledge, methods for data collection, etc. It would be a shame if ask these questions from the supervisors; they might think: this student is not qualified. The answers are written in the literature or books...(Part 1, p. 5).

The statement presented Caitlyn's projected self-understandings, that is, her assumption of herself and a situation. This assumption suggested Caitlyn's strong self-esteem. Specifically, the term, “shame”, highlighted her need for respect, showing that she made conscious effort to avoid being labelled as unprofessional or unqualified. In a sense, this self-esteem stemmed from the participants' perceived self-worth, and it served as a yardstick by which they measured themselves. This, in turn, motivated them to enhance their research capacities, as seen in Caitlyn's case with subject knowledge and methodology proficiency. These sentiments were echoed by other participants who used terms like “save face” (Lawrence) and a desire “not to disappoint supervisors” (Danny, Part 1, p. 4). These instances further demonstrated the participants' robust self-esteem needs. Such needs propelled them to independently tackle challenges and excel in front of others, particularly supervisors. To a large extent, this self-esteem enabled participants to pursue independent learning and self-development, prompting them to invest more effort into honing their competencies. This, in turn, allowed them to meet the rigorous standards of doctoral education.

Furthermore, the participants' self-esteem, intertwined with their projected self-understanding, propelled them to enhance their language proficiency and research competencies. Participants, exemplified by Nick, recognized themselves as doctoral candidates destined to become accomplished researchers. Nick expressed the belief that a doctoral student's work should exemplify a high standard of research competence, emphasizing the need for thorough training (Nick, Part 2, p. 12). In other words, participants, during their doctoral journeys, developed an academic identity for both their present and future selves. Concurrently, they engaged in self-reflection, acknowledging that, at this stage, they may not yet possess the full spectrum of research skills necessary to align with their projected academic identities (as researchers).

The articles written by a doctoral student should demonstrate that the student was well-trained. I think being a researcher or a doctoral student means being professional, at least in academic writing. As a doctoral student, I do not want to give people the illusion that my thesis is written by a primary school student (Nick, Part 1, p. 12).

Due to the gap between their projected future selves and their current capacities, participants' self-esteem motivated participants to enhance their research competencies and English proficiency. Similarly, other participants, such as Lawrence and Kelly, echoed these sentiments. Driven by the belief that "it would be shameful if a graduated doctoral student still had poor English proficiency" (Part 1, p. 11), Kelly managed to improve her academic writing skills and research proficiency in English. Lawrence presented his previous teaching experiences: "Some master's students even presented a good English proficiency in both oral and written assignments. What would these students say, if their lecturer cannot write better than them?" (Part 2, p. 4). These comments showed participants' understanding of the essence of doctoral education; that is, doctoral education aims to train individuals with substantial academic prowess, including research competencies and proficiency in academic writing. This belief not only demonstrated their projected self-understanding for the future but also reflected their understanding of the anticipated outcomes of doctoral education. Failing to fulfill these standards would lead participants to perceive themselves as unqualified, potentially leading to a blow to their self-esteem or inducing self-blame. This further illustrates that participants' self-esteem served as a driving force, compelling them to enhance their skills and expertise to meet the demands of doctoral education.

6.4 Ambivalence— Complexity of Incentives

The data also showed situations in which the Chinese PhD students encountered ambivalence. That is, participants were motivated to engage in their doctoral journey, but, at

the same time, they did not want (were demotivated) to engage in their doctoral studies. This section presents two situations where participants felt strong ambivalence. The first was the beginning stage of their PhD during which participants' desires are countered by pressures. The second was thesis revision (including academic article revision) in which participants wanted to develop their writing skills, but simultaneously, they were exhausted and wanted to escape from their doctoral journey. Ambivalence not only indicated participants' complicated incentives for their doctoral journey but also demonstrated the dynamic balance between motivation and demotivation as participants pursued their academic success. This dynamic balance played an important role in participants finding ways to navigate their academic journey and make important decisions. It also triggered participants' persistence to maintain their doctoral journey. From the perspective of CLT, the split of motivations corresponds to ambivalence (Illeris, 2016). "Our psychological reality is just as controlled by conflicting desires as the social reality is pervaded by contradictions. In both cases 'mixed feelings' express subjective and objective conflicts" (Illeris, 2016, p. 158).

In the initial phase of academic acculturation, participants encountered pressure and uncertainty when confirming their candidature, but their strong desires and determination to achieve success empowered them to adjust their attitudes and overcome this challenging period. For instance, Caitlyn encountered uncertainty and extreme stress when confirming her candidature, which not only demotivated her but also led her to think about giving up her study.

I think the proposal stage was one of the most difficult and stressful times of my whole PhD study... The stress was not really from the fact that I should work out a proper research proposal on time, but it was the lack of sufficient guidance. Sometimes, I just want to get out of this stage (Part 2, p. 4).

The statement highlights Caitlyn's initial reluctance to engage in her doctoral journey, primarily because her supervisors did not provide specific and directive instructions for her to follow. At the same time, Caitlyn was also motivated to continue her doctoral journey. As detailed in Section 6.3.1, she had a strong desire for self-improvement and career development, which bolstered her mental readiness. Furthermore, Caitlyn was moved by the encouragement provided by her supervisors (see Section 6.1.2). Faced with this dynamic, Caitlyn recalibrated her approach to doctoral study and devised an innovative strategy to navigate through this challenging period (see Section 5.4.2). Similarly, Nick exhibited a split in his motivations. The uncertainty and energy-demanding phase of confirming candidature undermined Nick's enthusiasm, leading him to contemplate withdrawing from the doctoral journey. However, family expectations and the support from his family reinforced Nick's determination to persevere and overcome the challenges.

I was thinking to give up because this stressful state may last for three years. However, my family supported me a lot. If I suddenly gave up and returned back with nothing. Every effort was in vain (Part 2, p. 1).

As shown in the two representative examples above, participants experienced significant stress when confirming their candidature. They were uncertain about their ability to carry on with their research and complete their doctoral studies. The uncertainty and stress-initiated participants' thoughts of withdrawing from their doctoral pursuits. However, participant's desire for success, including the drive for self-development, reinforced their determination, this was coupled with other factors, such as encouragement from supervisors, support from family and emotional aspects. Together, these drivers allowed participants to clarify their goals for doing doctoral research. This motivated participants to devote more effort to their research, and it also inspired participants to take action (such as adjusting their study approaches) to navigate the uncertain phases of their doctoral journey, such as confirming candidature.

Furthermore, participants displayed remarkable persistence in the face of ambivalence, allowing them to persevere in their doctoral journey even when the desire to withdraw was strong. For example, Tom and Yin exemplified this ambivalence during the final stage of their doctoral journey, particularly in the thesis revision process. As Yin described:

The writing skills ensured the ideas being expressed accurately, which determines whether the thesis meet the requirement. In addition, a researcher should demonstrate a good writing skill. I have no reason not to improve my writing skills... The problem is that there is no end in revision and skill improvement. But our time is not unlimited. After a long time of immersing in the thesis revision, I have begun to hate my research...What can I do? Nothing. I could not give up at this stage (Part 2, p. 6-7).

Recognizing the demands of academic writing and the expectations of being researchers, Yin was eager to improve her writing skills to meet these requirements. However, her desire and determination were countered by her fatigue and negative emotions. Yin realized that she should not give up on her research, signifying her positive incentive for conducting research. However, the repeated revisions made her tired and unwilling to proceed with her research. The use of terms like 'hate' conveyed her negative motivation towards the research. In essence, her ambivalence is shown by her desire to halt the research, while simultaneously feeling compelled to remain involved. Tom also expressed his ambivalence, especially when he engaged in his thesis revision with his supervisors. On the one hand, he wanted to finish his thesis as soon as possible, as he knew he was about to finish. On the other hand, Tom was tired of his thesis revision.

The more I revised my thesis, the more I was afraid of seeing his feedback. The printed paper (thesis) can accumulate as a small hill... How I wish my supervisor to stop reading my thesis (Tom, Part 1, p. 14).

Fatigue and negative emotional reactions toward thesis revision expressed through terms, such as 'disgust' and 'afraid'. These terms conveyed the participants' demotivation. They found themselves in a situation where they wanted to stop their research, but they still wanted to finish it. This situation indicates participants' ambivalence. The examples also show that the participants persisted in continuing their research without giving up, showcasing their remarkable persistence. This persistence enabled them to overcome the negative emotions and complete their thesis revisions. For instance, Hilton and Cain wanted to improve their language proficiency even though they were tired of their research, demonstrating their persistence while they had ambivalence. Their persistence empowered them to navigate the challenges of revising academic articles.

Although my language and understanding of research improved a lot, revision is really time-consuming... In fact, it is unnecessary to revise the writing over and over again (Hilton, Part 1, p. 12).

Writing an article (including the doctoral thesis) is absolutely an energy-consuming process, I need to decide everything and make the whole writing coherently, as a contributor, I should make my part as good as possible... I feel like my energy is “burning” (Cain, Part 1, p. 5).

Participants expressed that the process of writing academic articles or doctoral thesis was an energy demanding process. The phrases, such as “time-consuming” and “energy is burning”, demonstrate that participants regarded the academic writing as an energy demanding process. Especially, the term, “burning” illustrated Cain was running out of energy and the revision process drained his excitement and energy. But he had to continue engaging in this process. Participants displayed persistence, demonstrating a strong volition to struggle through the “energy-consuming” process.

6.5 Defence Against Academic Acculturation

In this section, two themes emerged regarding the participants' psychological factors that hindered their doctoral pursuits. Firstly, participants experienced fatigue and a loss of interest during their doctoral journey. This resulted in a reluctance to engage fully in their research and even led them to contemplate giving up on their doctoral pursuits. Secondly, participants resisted making adjustments to their understanding and identity. They exhibited an unwillingness to interact with others to adapt to their doctoral journey.

From the perspective of CLT, if an individual is unwilling to learn because the individual foresaw the situation threatening their mental balance or leading to results that he/she could not accept, then the unwillingness presents as a learning defence (Illeris, 2016). In other words, learning defence is “unconscious mental mechanisms serving to protect the individual against learning which can be threatening, limiting or undermining mental balance” (Illeris, 2016, p. 150). In this study, loss of interest and resistance to adjustment only represent factors that pose barriers to academic acculturation. However, they do not signify that academic acculturation did not take place. The balance between factors facilitating acculturation and the factors hindering academic acculturation will be further discussed in Section 9.3.

Participants including Cain, Nick, Tom, Hilton, and Lawrence expressed that the process of revising articles and theses had reduced their interest. They had become tired of their research, making them demotivated to engage in their research or academic writing revision. Cain, for example, described the dedication and effort he put into research and academic writing revision. Yet, with intensive revisions, he lost his energy and willingness to carry on with his research.

I was enthusiastic at the beginning, but, along the process, I felt that my energy was consuming, and my enthusiasm was running out... I needed to care about every detail of the structure of the writing, ideas, and grammar. Everything (ideas) needs to be linked together, which makes the article publication a terrible process (Cain, Part 2, p. 7)

Echoing Cain's experiences, Hilton, Tom, and Nick also expressed similar experiences in doctoral thesis revision at the final stage of their doctoral journey. They said that their energy was running out due to the endless thesis revision. Consequently, they lost interest and raised negative emotional responses towards their research and the revision process (see Hilton's and Tom's statements articulated in Section 6.4). Nick also expressed he was “afraid of his (supervisors') perfectionism. I have been tired of this revision. I am not going to pursue a Nobel Prize. Why shall I revise again and again?” (Nick, Part 2, p. 6). As shown in the above comments, due to the tiredness, participants expressed negative emotions and were unwilling to engage in their doctoral journey, indicating psychological factors against their progression. Yet, as presented in previous subsection (6.4), The Chinese PhD students also exhibited strong persistence, which enabled them to overcome fatigue and continue their doctoral journey.

The data also revealed that four participants rejected adjusting their academic identities as students. They were inclined to maintain a distance from their supervisors and preferred a hierarchical relationship. This reluctance to adjust provided them with an excuse to avoid investing effort into their research. Additionally, it also served as a barrier to acculturating to

collegial supervision. When asked about the differences between supervision in New Zealand and teaching in China, participants mentioned the student-supervisor relationship as well as the identities. Participants (such as Hilton, Kelly, Lawrence, and Tom) found that supervision in New Zealand was characterized by a collegial style, and supervisors were friendly. Yet, the participants still preferred to identify themselves as students and their supervisors as teachers. They wanted to maintain a certain distance from their supervisors. This is because participants thought other identities (such as colleagues or friends) were not consistent with their identity (as students) nor consistent with what they were doing (learning and studying). As Kelly and Tom described:

Keeping an interpersonal distance is my principle. I did not mean I do not want to be my supervisor's friend; students and teachers always have a distance... The students and supervisors do not have to be too close. (Kelly, Part 1, p. 8).

my supervisor has his own family, friends and social contacts; we (students) are just foreigners to the local people (Tom, Part 1, p. 13).

The participants had a concrete understanding that they were in a student-teacher relationship with their supervisors and that this relationship was separate from friendship. The student-teacher relationship was based on learning and teaching; that is, supervisors impart knowledge to students or guide students to do the research. As Hilton explained: "As a teacher, he was 'parenting' me in my research; I should follow his instruction" (Part 1, p. 2). Lawrence also said,

Regardless of how they collaborate with me on my research or how friendly they are. In essence, they are teachers, and I am a student. As a student, my role involves listening and studying under their guidance (Part 1, p. 9)

In both Hilton and Lawrence's cases, they had already constructed an understanding that supervisors acted as teachers to provide guidance and instructions, even though they might be involved in a collegial supervision process where supervisors collaborate with students on the student's research. Likewise, Tom was unwilling to accept the supervisors as "colleagues" or "friends" because he knew that supervisors' identities (such as colleagues and friends) was "contradictory to my (the participant's) understanding" (Tom, Part 1, p. 7). As shown, Tom noticed the identities of his supervisors, but he was unwilling change because the new identity was different from his established perception of his supervisor. This indicated Tom's psychological defenses. The defense can also be seen in Cain's case, "If regarding the supervisors as friends, how would you identify yourself as a student to these "friends"?" (Cain, Part 1, p. 10). The above cases suggested that, due to the change in identities conflicting with the already established self-understandings, the participants were willing to keep their

established understanding unchanged. The unwillingness to adjust prevented participants from adapting to collegial supervision. Moreover, this defense gave the participants an excuse for reserving energies and not to engage in their research. As Tom stated, 'His perfectionism and meticulousness exhausted me. I mean, as a student, especially one whose English is a second language, we don't have to be too meticulous and perfect like this; we still have lots of things to learn along our academic journey.' (Tom, Part 2, p. 5). Tom's statement reveals that he maintained his student identity. Within this identity, he felt he didn't need to attain the same level of proficiency in English as an experienced native speaker. In this sense, the participants were willing to preserve their student identity, using it as a psychological defense mechanism to avoid expending excessive energy.

Chapter Summary

This chapter presented incentives that underpinned the process of academic acculturation for the Chinese PhD students in my study. Emotions, cognitive dissonance, and personal desires were identified as three forms of incentives shaping the students' doctoral journey. The doctoral journey triggered students' emotional reactions, and the emotions acted as incentives for active engagement and problem-solving in the face of challenges. Cognitive dissonance served as incentive for necessary adjustments in understanding, allowing students to align with the demands of doctoral studies. Moreover, desire for self-development and knowledge acquisition motivated students to overcome obstacles. Despite occasional motivation conflicts, these contradictions served to clarify goals and initiate persistence. The doctoral journey was also hindered by psychological factors. Disinterest, fatigue, and resistance to self-adjustment emerged as potential barriers to academic acculturation. These intricate layers of motivation and barriers provide deeper insights into the complex interplay of incentives that shape the academic acculturation experience for Chinese PhD students.

Chapter 7: Interaction—Interacting with The Academic Environment

This chapter presents observation, communication and participation as three basic forms of interaction that helped the Chinese PhD students achieve academic acculturation. Through observation, participants familiarised themselves with supervision approaches, learned about research strategies, and acquired knowledge for efficiency of their research. Communication with peers, supervisors, and support staff not only offered research competencies and emotional support but also fostered student-supervisor relationships and multiple identities. Active participation in various academic activities (doctoral study, supervision, conferences and academic article publication) enhanced students' research competencies, understanding of the doctoral journey, confidence, and a sense of belonging to academia. These findings embodied the underlying idea in CLT: “All learning is situated” (Illeris, 2016, p. 91) in a certain context; an individual could have various forms of interactions with the context so that the learning could take place (Illeris, 2016). The chapter addresses the research question: *How did Chinese PhD students interact with the New Zealand academic environment?*

7.1 Observing People’s Behaviours

The data indicated that observation played a significant role for the Chinese PhD students acculturating to the doctoral journey. Observing people's behaviours served three functions for academic acculturation. It enabled participants to be familiar with supervision approaches, to adjust their actions and attitudes in research to meet the requirements of doctoral education, and to acquire knowledge in ways to enhance research efficiency. From the perspective of CLT, observation is categorized as a form of interaction in which “the surrounding world comes to the individual as a totally unmediated sense impression” (Illeris, 2016, p. 94). This subsection presented that observation had three aspects of functions for academic acculturation. That is, it helped the Chinese PhD students enhance their capacities in managing their research; helped students learn about a certain attitudes embedded in academic activities; and assisted students in acquiring research skills.

Firstly, by observing doctoral supervisors' actions of managing the participants' own doctoral studies, the participants became familiar with the strategies employed by supervisors. This familiarity enabled participants to align their actions with their supervisors' expectations, leading to more effective collaboration. For instance, participants (such as Alex, Nick and

Danny) experienced and observed that their supervisors conducted weekly supervision meetings at the beginning stage of their doctoral journey so that the supervisors could help keep their research on track.

At this (doctoral) level, students can receive more guidance from their supervisors. I have regular meetings with my supervisors. Especially, during the confirmation stage, my chief supervisor scheduled 9:00 in the morning every Tuesday as my dedicated supervision time (Alex, Part 1, p. 1).

My chief supervisor used the physical archive and labelled the archives; the archive contains the student's writing from time to time. My secondary supervisor was the same; she created a Google document and asked me to upload the meeting minutes and my writing into this folder so that everyone in the panel can see them (Danny, Part 1, p. 2).

These statements indicated that the participants witnessed their supervisors' strategies regarding how to manage students research, such as organizing periodical meetings and categorizing students' research. The observation provided participants with basic ideas of how they were supervised and how to react to doctoral supervision. As Nick explained,

They (supervisors) conducted periodical (weekly) meetings with me and instructed me on what to do in the following week... At that time, I was struggling to identify a research direction; however, they would not instruct a research topic for me, and they kept telling me how to think (Part 1, p. 3).

Nick experienced the doctoral supervision and observed his supervisors' actions and interactions in that context. This enabled him to understand how he was being supervised and what his supervisors' expectations were. The supervisor's behaviours could be interpreted as the impressions embedded in the environment. Through observation, these impressions were transferred to the participant's perception. As a result, Nick obtained better understanding of supervision, and he was able to respond to their supervisors in an appropriate manner.

Additionally, when observing the actions of both supervisors and peers in their academic work, participants perceived the behaviours and attitudes of these people. This further encouraged participants to adjust their own research actions and adopt similar behaviours and attitudes in their own doctoral pursuits. The adjustments helped them fulfil the demands doctoral study. For instance, Alex observed his supervisor's behaviours of doing academic work, and he noticed the supervisors' meticulousness, earnestness and diligence: "He is now still in his office (9 pm)" (Part 1, p. 8). "He dedicated all his enthusiasm and passion to academic research and his students. I have to admit he is a diligent scholar" (Part 1, p. 9). Similar to Alex, Kelly engendered earnestness and diligence into her doctoral research after observing her supervisor's academic work ethic. As Kelly reported: "She always went to the classroom and waited for her students and left after answering all the students' questions" (Part

1, p. 7). In addition to academic work, the supervisors' other behaviours were also observed by the participants. Influenced by these behaviours, participants subsequently demonstrated a similar working style in their doctoral journey. This phenomenon is exemplified in Lawrence's case:

She (supervisor) can manage her research and life in good order. It seems that she has a very strict schedule, arriving at her office early in the morning and going to the gym after finishing up her job. I think the PhD journey is not about the research only, it should be more. If I would be a teacher in the future, I would also do as she did (Part 1, p. 8).

The above examples illustrate a process of learning through observation. Participants observed their supervisors' behaviours and, in doing so, formed their own opinions about what they saw. Through this observation, participants came to appreciate the diligence and earnestness of their supervisors (as seen in Alex's and Kelly's cases), or gained insight into the working styles of their supervisors (as shown in Lawrence's case). While observing these behaviours, participants were influenced not only by the actions themselves, such as working outside regular hours and adhering to a strict timeframe, but also by the attitudes associated with the behaviours (diligence and self-regulation). Consequently, participants invested more energy into their doctoral research and adopted similar working styles as their supervisors. This learning process exemplifies academic acculturation. Through observation, the supervisors' behaviours and attitudes were transferred to the participants as impressions. Simultaneously, participants were influenced by these behaviours, adopting similar actions and attitudes, and conforming to the norms of the academic environment.

Finally, participants observed their peers' behaviours in conducting research. Through this observation, participants acquired practical skills for effectively managing their own doctoral research and learned how to use learning tools to enhance their research efficiency. Yin observed that one of her peers was able to effectively manage time and optimize her energy to produce a high-quality thesis, leading Yin to adopt similar strategies in her own research.

One of my peers who came from Sri Lanka locked herself in the office doing writing till 2 pm. She said she did not even reply to her supervisors' emails in the morning because she believed the most efficient time for writing was in the morning... I never saw her at the weekend. She said the weekend was the time for refreshment, even though she knew the research tasks had not been finished (Part 1, p. 6).

Alex saw that many students in the University used many study resources so that they “not only benefit(ed) a lot from these resources and were willing to use learning resources (such as library workshops, Endnote, QuillBots and Grammarly) to facilitate their studies” (Part 1, p. 9). Upon seeing these practices, he reflected on his approach to managing references and

realized that his previous method (manually managing references) was inefficient. This realization encouraged him to shift to a more efficient method by using EndNote. Alex observed that many students in the University use various learning resources, such as library workshops, Endnote, QuillBots, and Grammarly, to enhance their studies. Witnessing other students' learning practices, Alex adjusted his approach to managing references and showed a similar approach to his study (i.e. using tools). Nick presented the specific process of learning by observation. After observing peers using tools to analyse data analysis and categorize literature, Nick recognized the significant convenience and benefits that EndNote and NVIVO offered. This encouraged him to approach his peer and ask him to showcase the techniques for using EndNote and NVIVO:

He manipulated the steps of using a PDF file, transforming it into an XML file, and then uploading it to NVIVO to code the text.... It was so clever; I hadn't even thought of that... I had to note this method down, because... the trick of operating software is easy to forget. The function of each button and the sequence of each step (Part 1, p. 5)

Nick learned the specific steps of using tools to facilitate the efficiency and practicality of this approach by observing his PhD peers' demonstration (including communication). Although these experiences of the participants indicate that they engaged in communication with peers and engaged in reflections, they all exhibited a similar acculturation process; namely, participants observed the practices demonstrated by their peers and incorporated these observations into their own research strategies. This process led to adjustments in the participants' learning strategies. Through observation, they learned and adapted their study methods, ultimately establishing working styles similar to those of their peers.

7.2 Communication and Interactions

The Chinese PhD students had extensive communication and interactions with peers, supervisors, and academic support staff. These communications played an important role in the process of academic acculturation. Communication with peers enhanced participants' research experiences, provided participants with orientation to the doctoral journey, and offered essential emotional support. Non-academic interaction and informal communication with supervisors fostered a friendly student-supervisor relationship and enabled the construction of multiple identities for transitions between academic and non-academic settings. Furthermore, engaging in communication with academic support staff provided students with the knowledge and skills for effectively using learning tools and university resources, thereby improving the quality and efficiency of participants' research. From the perspective of CLT, communication presents one of the important forms of interaction; this form of interaction allows people to

pass their knowledge, understandings, meanings, or experiences, to other people through communication in a linguistic way (Barnlund, 2017; Illeris, 2016).

7.2.1 Communicating with PhD peers

The Chinese PhD students in this study engaged in extensive academic and non-academic communication with their peers during their doctoral journey, which served two fundamental functions for academic acculturation. Firstly, this communication not only enhanced the participants' research experiences but also provided them with an orientation to their doctoral journey. Secondly, communicating with peers offered emotional support, which helped participants alleviate pressure and recover from psychological stress. This support system enabled them to better prepare for the challenges within their doctoral journey.

In addition, communication and discussions with their PhD peers, served as a form of informal supervision for participants and provided them with valuable research experiences. This interaction not only helped participants gain a deeper understanding of the doctoral research process but also assisted in navigating the confirmation of their candidature. For instance, Lawrence said that he had extensive discussions with his officemate which helped him to narrow down the research direction.

He (office mate) told me some tricks to identifying the research gaps, such as looking at the limitations or the discussion parts (in articles). The trick was really helpful for thinking about the significance of my research (Part 1, p. 10).

Engaging in communication with peers allowed the participants to obtain practical advice on doing research. This implies that participants could gain valuable research experiences through these interactions. Armed with this knowledge, participants were better able to navigate their confirmation stage more efficiently. Likewise, through searching for help from peers and discussing research content, Nick clarified the research paradigm and specific methods for data collection. "He (PhD peer) suggested I simplify the research by using one or two methods instead of adopting various methods as more methods means complexity, more efforts I need to devote" (Nick, Part 2, p. 7). Nick's experiences echoed the idea that communication with peers enabled the peers' research experiences to be passed on to the participants, and the experiences made participants' research easier. Communication with peers became especially crucial when participants encountered uncertainty. Such communications helped participants gain valuable insights into both their research and doctoral supervision. This, in turn, enabled them to make necessary adjustments to better align their research and supervision. Kelly, as one example, said PhD peers helped her to identify grammar faults and clarify ideas in her research.

I also asked for their (peers') comments and even asked them to help me to read my proposal. They helped me to identify several grammar faults. They also raised several critical questions regarding my ideas and the process of composing codes etc. (Part 1, p. 15)

Yin initially did not know why her supervisors always asked critical questions: “These questions made me uncomfortable, which gave me a sense that I should not do it or that. I just want them to tell me what methods I should choose...(Part 1, p.7). After communicating with peers, Yin came to realize that posing questions served as a deliberate supervisory strategy. Moreover, she learned that the questions were intended to help clarify ideas. As Yin said:

She (the PhD peer) said to me that there was no correct or wrong, but, as a doctoral student, I shall give the supervisor a sound reason. Asking questions is the supervisor's job... (Part 1, p. 7).

As shown in the above examples, participants benefitted from communication with peers. This communication provided informal supervision or orientation for participants' doctoral journeys. Through communication, peers' research experiences and understandings of the doctoral journey (including the understanding of doctoral supervision) were transmitted to the participants, providing participants with insights into their own research (as presented in Kelly's example) and doctoral supervision (as illustrated in Yin's case). With these new understandings, participants were able to modify their strategies for research and adapt to the demands of doctoral supervision.

In addition, peer communication is pivotal for providing emotional support; it helped to alleviate participants' stress and assisted participants in handling the challenges embedded in their doctoral journey. For instance, Caitlyn encountered difficulty in working out her research proposal in the confirmation stage. She shared her pressure with Chinese PhD peers, looking for academic support and psychological support. She realized that:

I was so stressed at that time, but I could not tell my worry to my families. My colleagues calmed me down when I expressed my concerns. Their (peer) support may not always help to deal with the difficulties; after all, they do not know the research content. At least, I would not be so pessimistic after speaking out my feelings (Part 1, p. 10).

Similarly, when Danny faced frustration due to a lack of progress in her studies, she sought support from her PhD peers. Through these communications and learning about others' doctoral journeys, Danny's perspective not only shifted regarding her current situation but also brought about a change in her thinking.

Her (peer) idea was reasonable. Compared to the students who mismatch with their supervisors, I should feel lucky because, at least, my supervisors continuously gave coherent guidance (Danny, Part 2, P. 10).

The term "lucky" reflected the participant's positive emotional aspects on her current situation. This suggested that peer communication positively influenced her perception of the doctoral journey, fostering her resilience in the studies. Nick gained valuable research experiences and skills through discussions with his PhD peers. This enabled him to effectively navigate challenges, leaving him both impressed and appreciative of the process.

My Vietnamese friend taught me some tricks to write the methodology section, which made me quickly finish this part. I very much appreciated her help and was moved at the time. These people are very kind (Nick, Part 1, p. 13)

The experiences of these three participants demonstrate that engaging in peer communication effectively reduced their stress levels and helped them regulate their emotional well-being. This communication provided a valuable source of emotional support, offering a space for participants to share concerns and seek advice. Additionally, peer communication served as an outlet for emotional support and could take place in the following ways: adjusting their mindset based on the communication content, leading to corresponding changes in participants' emotional state, and adopting suggestions from peers to directly address challenges or problems, resulting in stress reduction. In sum, communication with peers provided participants with emotional support for overcoming the challenges for doctoral journey.

7.2.2 Non-academic interaction and communication with supervisors

This part presents communication between participants and their doctoral supervisors outside of formal supervision. Academic communication and interactions will be detailed in Section 7.3.2. Informal and non-academic communication played a crucial role in fostering academic acculturation in the following two aspects. It fostered a friendly student-supervisor relationship, allowing participants to construct multiple identities to transition between academic and non-academic settings when communicating with their supervisors. Furthermore, informal communication allowed participants to obtain wisdom and experiences from their supervisors. This acquired wisdom contributed to a deeper comprehension of their doctoral journey and a clearer sense of their academic identity.

Informal and social communication could foster student-supervisor relationships, and it also enabled participants to construct multiple identities, which further enabled participants to effectively navigate various levels of communication with their supervisors. For example, Nick mentioned that he shared time with his doctoral supervisor at the coffee shop several times. These non-academic communications served to strengthen the bond between him and his supervisor, and the communications also enabled him to establish multiple understandings of himself. Moreover, informal communication helped participants to gain a more profound

understanding of their doctoral journey and refined their academic identity. Cain engaged in a non-academic discussion with his supervisors about a broader social issue. These conversations prompted Cain to initiate his critical thinking skills and led him to reflect on the significance of independence in his doctoral journey:

Once I went out with my supervisor. Seeing the cars passing ours and I asked unintentionally: “Why do these cars overtake us?”. He said: “it's not our fault... we've reached the speed limit”. At that point, I was thinking: yes, what he said is a good example of a critique of conformity. It was the same in the research. Sometimes, especially back in the Chinese environment, we tended to pursue conformity lacking independent thinking... they (doctoral supervisors) would not only teach students how to do research but also transfer their experiences and wisdom to students imperceptibly; students would be somehow influenced by the supervisors (Part 1, p. 9).

The informal interaction with the supervisor initiated the participant's critical thinking, which further influenced the student to adopt a more independent approach to his doctoral research. In other words, non-academic communication could also contribute to a student's growth and development throughout their doctoral journey. Similarly, Jade also had a discussion regarding her career development, which helped adjust her attitudes toward the doctoral journey and fostered her identity.

The doctoral study was a small Part of my life. He wished me to finish the thesis as soon as possible, and then engage in publishing articles. His thought was that the PhD thesis is just the beginning of my academic journey. As an emerging researcher in the future, there remained lots of content to learn for my future research and publishing (Part 2, p. 2).

As shown in Jade's experiences, the communication helped her clarify a long-term perspective on her academic journey, which changed her perceptions of doctoral education. The supervisor instilled in the participant a sense of lifelong learning, and the student regarded her doctoral study as the beginning of larger, ongoing academic endeavours. This also suggested that the informal communication contributed to the student's identity development as an emerging researcher and set a foundation for her future contributions to academia Overall, the experiences of the three participants highlighted that informal communication between students and supervisors played important role in their academic acculturation. Specifically, it facilitated the transfer of supervisors' experiences and knowledge to the students. This enabled students to adjust their attitudes and perceptions towards their doctoral journey, as well as helping participants to clarify their self-identity as future researchers.

7.2.3 Communication with academic staff

Chinese PhD students also engaged in wide communication with academic staff, such as librarians and lecturers. These communications and interactions enabled participants to gain crucial knowledge, skills, and experiences that were instrumental in their research. The knowledge and skills not only boosted efficiency but also contributed to the overall quality of the research, which suggested that these interactions contributed to adaptation to the academic environment.

For instance, unsatisfied with the search results in his literature review, Nick engaged in the personalized tutorial.

(the librarian said) the issue lies in the fact that a single search using a combination of keywords can generate thousands of results, many of which may not be directly relevant to my research. Quite confused about how to use the search engine... Of course, I noticed that I can go to librarians to search assistance. The librarian said the use of keywords and punctuation determined the search results, which no one told me before. He taught me some tricks in searching for documents, such as using quotation marks and spaces, commas, etc, even the function of Endnote (Part 2, p. 3).

, Alex had similar experiences; with the librarian's individual support he learned to use Endnote, and "I can quickly manage the reference and save time to concentrate on the research contents" (Alex, Part 1, p. 9). Participants lacked experience and skills in using learning facility tools, such as Google Scholar and Endnote, before embarking on their doctoral journey. A shortage of relevant experiences caused inefficiency in doctoral research, such as being confused by high number of search results. Thus, participants sought assistance and engaged in personalized tutorials (especially having communication with librarians), where they acquired skills (such as conducting effective literature searches and using Endnote to effectively organize the references). These skills greatly boosted participants' efficiency in doing research, leading to an overall enhancement of their research process. The two examples above illustrate that participants acquired knowledge of using learning tools from librarians. A similar scenario occurred when participants sought guidance on managing their research. Kelly serves as a representative example in this regard. After attending doctoral orientations and engaging in discussions with staff from student learning, she improved her skills in managing doctoral research. These skills enabled her to navigate her doctoral research more effectively and maintain a better balance throughout her academic journey. Kelly stated:

I attended a workshop last year, which was about the strategies for managing doctoral research as well as cooperating with supervisors, etc... the plan for the doctoral journey was very helpful, such as setting up a goal for a year and splitting the goal into several sub-goals for months (Part 1, p. 4).

The academic support staff in the workshop offered participants an overview of doctoral research, and provided insights into how doctoral students work with their supervisors. The interaction also provided participants with practical tools and strategies for effectively managing research. In other words, through communicating and interacting with academic staff, participants gained essential skills and knowledge related to their doctoral journey. This knowledge assisted participants in their academic progress, offering them insights into the expectations and demands of doctoral studies, and ultimately helping them to navigate this academic path more effectively.

7.3 Participating in Academic Activities

The data revealed three interrelated but distinct categories of academic activities in which the Chinese PhD students were engaged. The first category was the doctoral study itself, involving the process of individual self-endeavour under a supervisor's guidance. Engaging in the study activity enhanced the Chinese PhD students' research competencies and understanding of the doctoral journey. The second category focused on the interactions within the doctoral supervision. Interaction in supervision not only facilitated participants' research competencies but also bolstered their confidence and academic identities during doctoral research. This interaction could also provide opportunities for both supervisor and student with mutual adaptation. The last category concerned the interaction between participants and scholars in a disciplinary area (i.e. academia) in a broad sense. Participants participated in conferences and the process of preparing academic articles for publication, which deepened participants' subject knowledge and research skills, and built a sense of belonging within the academic community. Participation in activities conforms with ideas in CLT that “the interaction dimension of learning can often take many forms where what is important is that the more activity and engagement the learner involves in the interaction, the greater the learning possibilities are” (Illeris, 2016, p. 115).

7.3.1 Self-endeavours: Engaging in doctoral study

The data highlighted the importance of active engagement with supervisors' feedback during doctoral studies. This engagement assisted the Chinese PhD students in acculturating to their doctoral journey in two ways. Firstly, it empowered Chinese PhD students to enhance their research skills and competencies. Secondly, it provided students with a deeper understanding of doctoral research.

Engaging in doctoral research with the feedback and support of doctoral supervisors enabled the Chinese PhD students to acquire crucial research skills and competencies,

including writing skills and professional knowledge. These skills greatly assisted participants in effectively navigating their academic journey. For example, Kelly explained that the doctoral research topic was built upon her previous knowledge. Through reading literature and receiving feedback from doctoral supervisors, she enriched her professional knowledge and expanded her understanding regarding the specific domain, which enabled her to make an original contribution to the research domain:

Their (supervisors') opinions and other scholars' ideas, to some extent, could expand the practical use of algorithm system in the health care domain (Part 1, p. 5).

The core computer algorithms and data processing were basically derived from my master's study. The whole algorithms system is universal; thus, there was a lot of consistency in my research. I just needed to deepen the research problem (referring to the research topic and thinking) (Part 1, p. 2)

Kelly's comments illustrated that she engaged in a self-endeavour process within proper guidance with supervisors, which allowed her to obtain more specialized knowledge and deepen her understanding of a research domain. Other participants also expressed similar sentiments. Tom mentioned that his doctoral supervisors suggested different approaches to thinking about his experiments as he wrote his proposal. The engagement in doing research under guidance from supervisors further enhanced his research competencies: "PhD education entails fostering independent thinking and methodologies for rapid knowledge acquisition" (Part 1, p. 14). Alex also learned academic writing skills when he was involved in the process of article writing and obtaining supervisor's feedback (see detailed quote in Section 5.1.3). Cain acquired writing skills and deepened his understanding of this research when he was writing his thesis and an academic article with his supervisor.

He (the chief supervisor) told me that academic writing followed the rules of 'one-two-three'. One section represented an argument, followed by two signposts at the beginning and the end as well as three supporting examples (Part 1, p. 6).

The examples above all demonstrate a form of interaction where students actively engaged in the practice of doctoral research. This presents as participation in activities such as a literature review, thesis writing, and conducting experiments. Simultaneously, candidates receive supervisor feedback and guidance, indicating a dynamic interaction with their supervisors. For the participants, an interplay between self-endeavours and supervisors' support helped them acquire essential research skills and specialized knowledge, expressed as the development of research competencies and skills. The engagement in this form of interaction enabled the students to have greater proficiency in their research, which allowed them to meet the requirements of doctoral education, that is, contributing original knowledge.

Furthermore, engagement in doctoral research with the feedback and support of doctoral supervisors allowed participants to deepen their understanding of the doctoral journey. This, in turn, assisted them in effectively managing their research in line with the provided guidance and meeting their supervisors' expectations. Lawrence came to realize the level of autonomy, which included more responsibilities in his doctoral research, required as he was involved in the process of writing the research proposal and with feedback from supervisors:

I understood that doctoral study is highly independent. Students carried out their research independently based on the teachers' instructions. This was much like what we did in our master's studies. However, in my doctoral study, I noticed that our supervisors became more involved and dedicated more time to our studies. Whenever I sent them any piece of writing, they would provide detailed feedback. Their comments were not prescriptive, but rather question-based like "What do you mean by..." and "Is it appropriate to think..."... I should dominate my research as I am more familiar with the knowledge than my supervisors did (Part 1, p. 7).

Danny presented the engagement process through which she conducted her research and responded to her supervisors' feedback: "On receiving their feedback and suggestions, I normally address the ones that were useful and move forward" (Part 2, p. 6). Danny's statement not only reflected engagement in the thesis writing but also underscored the support of supervisors. Furthermore, Danny's statement signified her perceptions of independent judgment; that is, she considered her response to her supervisors' suggestions. Likewise, Cain engaged in the process of composing an academic article. Upon receiving initial feedback from his supervisor, he came to recognize that writing an article is an energy-consuming endeavour (refer to the detailed quote in Section 5.4.1). Through a careful review of the feedback provided by his supervisors and contemplation of his research, Cain realized the need for increased responsibility in the research process. As a doctoral student, he acknowledged the importance of "have more ownership in their research and confined a research scope" (Part 1, p. 4). The examples above show that participants engaged in their doctoral studies, including writing a thesis and conducting research. These processes embody the engagement in learning activities, which were guided by the support of supervisors. This engagement provided participants with an in-depth perception of the way of doing doctoral research (i.e. independence). This perception allowed participants to collaborate more effectively with their supervisors and adapt to the expectations of doctoral education. This process embodied the idea in CLT that the learning activity itself is a social interaction as it involves people's actions or "goal-directed endeavours" (Illeris, 2016, p. 55). The structure of an individual's cognition is linked to the structure of his/her activities (Illeris, 2016).

7.3.2 Interacting with supervisors in doctoral supervision

The data revealed three distinct supervision approaches employed by supervisors in managing participants' research. These approaches indicated how the interaction between participants and their doctoral supervisors enabled participants to acculturate to the New Zealand academic environment.

The first approach involved supervisors breaking down the research tasks into manageable tasks and holding regular meetings with students. Participants worked on these tasks with the necessary support and guidance from their supervisors. This supervision approach allowed participants to develop their research competencies as well as their confidence in conducting their research, which further enabled participants to gradually become more dominant in their research. For instance, Cain's doctoral supervisors guided him in attaining specific research targets. As Cain proceeded with these tasks, he recognized his capability to undertake more intricate research.

In the beginning, he (the supervisor) introduced a simple source code; a year later, he asked: "Are you still satisfied with the original source code? I said: "No". He said: "then, you write one by yourself". The supervision gave me a sense that I was "dragged" by my supervisor to a sophisticated area...(Part 1, p. 6)

The quote displays a progressive supervision process throughout the participant's doctoral journey. This supervision approach helped the participant to develop his ability to tackle more complex research content and to become more proficient in conducting research independently. Likewise, Kelly reported that she had regular meetings with her supervisors. With her supervisors' regular support, she could gradually deal with her research content independently.

The regular meeting is very important as it kept me and my supervisors on track. Importantly, they (supervisors) would know the difficulties that I could deal with in each stage. With the difficulties being solved, the following procedure is getting easy to deal with (Part 1, p. 16).

The approach to supervision Kelly described entails structured support, enabling the participant to develop her competence in addressing research challenges, starting from simpler ones to more complex ones. The consistency in these meetings not only ensured that both Kelly and her supervisors were aligned in their understanding of her research progress, but also provided Kelly with the necessary confidence to tackle the potential challenges embedded in her research. Likewise, Nick said his supervisor conducted regular supervision and provided feedback, which helped him improve his writing skills. As Nick described,

I could learn how a native English user (supervisor) presents the idea in their way... my academic writing was enhanced a lot through his feedback, and the doctoral thesis is not as horrible as I assumed..." (Part 1, p. 7).

Nick's example showcases the development of his academic writing skills and English proficiency through ongoing support and guidance from supervisors. This clear progression in his academic writing further provided him with confidence. From the perspective of CLT, these participants demonstrated the interaction that students acculturate to their doctoral journey within the Zone of Proximal Development (ZPD) (Vygotsky & Cole, 1978). In other words, supervisors divide the research into several achievable tasks, which demonstrated that support was based on a student's current competencies to deal with difficulties. The continuous and periodical support showed that the students could not handle their research with current competencies independently. Yet, after obtaining proper guidance from supervisors, the students could handle difficulties in their research and develop writing skills as their competencies developed. With enhancement of their research competencies and skills, participants could better navigate their research.

The second supervision approach demonstrated academic acculturation with the feature of Legitimate Peripheral Participation (LPP) (Lave & Wenger, 1991). Within this supervision approach, at the beginning stage doctoral supervisors take a dominant position in guiding students to do the research. The supervisor facilitates students' research, but students gradually take more responsibility for their research as their research competencies develop. The interaction between students and supervisors contributes to various developments, especially the development of academic identity. For instance, Lawrence, Caitlyn and Yin did not have enough expertise and experience when they started their doctoral journey. Thus, their supervisors took a dominant role in participants' research at the beginning stage. "Supervisors suggested me to have explorations on many possibilities, which was quite didactic..." (Lawrence, Part 1, p. 5). The supervisors dominated and guided the students in their research, which means that the students were in a passive position when engaging in their research. In other words, students were in a subordinate position during the initial phase of their research and during discussions with their supervisor. The students were at the peripheral position of their research as well as the margin position of the supervision panel.

By fully engaging in their research with guidance from their supervisors (such as composing research proposals, incorporating supervisors' feedback, and engaging in discussions), participants adjusted and developed in various aspects, such as including subject knowledge, research acumen and academic identity. For instance, Tom and Hilton obtained a further understanding of the doctoral research and supervision approach. As Hilton said: "The

doctoral supervisor would not tell students what the phenomenon is but would teach students how to understand the phenomenon” (Part 1, p. 5). Likewise, by participating in composing the research proposal, Yin obtained a better understanding of her research content as well as how to conduct doctoral research.

Although their feedback was very hard to address, the feedback helped me to think about the details and every step of data collection... It took us a long time to fix the specific methods to measure the statistical results. Indeed, it was worth doing that, for the method was very reasonable and I obtained rich data through this method (Part 1, p. 9).

As shown in the example, the participant gained further insight into the way of research methods, indicating development in her specialized knowledge (as well as research competencies). With knowledge and competencies development, participants also adjusted their self-understandings. As Alex explained, through working on the research with his supervisors, they establish mutual trust, and he not only obtained a better understanding of supervision and his research but also a self-understanding.

It seems they (supervisors) knew about my research. They seemed to trust that I had the ability to carry out this research. Importantly, we built up the skeleton of my study, the following procedure was easy. Thus, they did not strain my research... like I was unleashed. In turn, I told them what I was going to do next and what problems needed to be solved (Part 1, p. 8).

As shown in the quote, Alex's perception of his status as a student underwent an adjustment. He recognized that he was gradually assuming greater control and autonomy in his research. This also signifies that participants were gradually moving to the central role in their research. Jade's experiences similarly demonstrated this process.

It is more related to “guide” and “being guided”. Like a train, the supervisor, at the master's level, acted as a locomotive; students acted as the train cabins... In the doctoral program, the roles turned around. The student should be the locomotive, and doctoral supervisors were the train cabins. Especially at the last stage of PhD, the doctoral supervisors would no longer lead students' research (Part 1, p. 10).

The analogy of the locomotive and the train cabins serves as a metaphor for the adjustment of Jade's self-perception in relation to her supervisors. Initially, she approached her research passively, positioning herself on the periphery of the doctoral journey and the supervision panel. However, by actively engaging in her research and as her research competencies developed, Jade began to shift her perception of her self-understandings, and became a central member of the supervision team. This adjustment exemplifies an academic acculturation process. From the perspective of CLT, participants, through fully participating in the research and having interactions with the members of the supervision panel, obtained comprehensive development and dominated their research. This form of interaction indicated that the students obtained a

recognized position in the community and transited from novice to more experienced (Illeris, 2016; Lave & Wenger, 2001).

The last approach of supervision involves collaborative learning between supervisors and students. This supervision approach contributes to a dynamic and adaptive research environment, allowing both participants and supervisors to explore diverse ideas. By exploring various ideas, it allows team members to mutually adapt to each other. For instance, Caitlyn learned that she and her supervisors shared different responsibilities. The supervisors respectively contributed feedback from different perspectives, and she implemented her research.

...his feedback is closely related to the perspective of chemical engineering. However, my secondary supervisor focused on the perspective of psychology... well, I would say we were a team; they focused on different perspectives, which just put my study on the right path. (Part 1, p. 6)

Likewise, Danny said her chief supervisor assisted in directing the research, and the co-supervisors provided feedback on different chapters of her thesis:

everyone had heaps of ideas... The direction of my research was basically on my chief supervisors' idea; I only revise the writing according to the suggestions from the other two supervisors" (Part 1, p. 3).

Caitlyn's and Danny's experiences both demonstrated that supervisors created a dynamic discussion environment by sharing different responsibilities. This collaborative approach contributed various ideas, allowing participants to obtain ideas; at the same time this approach also required participants to navigate these ideas. This is because this form of supervision might include inconsistent ideas among the team members, leading to "detours" in the participants' research and causing the "adjust(ment) in the (research) ideas and even re-analyse the data" (Hilton, Part 2, p. 10). However, the "detours" also contained great possibilities for both supervisors and students to make progress toward success. Through exploring different possibilities, both supervisors and participants would reach a consensus and obtain further insight into the research contents. As Danny explained,

once I tried these possibilities, I am clearer about my study. Meanwhile, their (supervisors') ideas became more consistent with each other. If I had been able to develop more independent thinking about my initial ideas, I wouldn't have taken so long to finalize this pathway. Nonetheless, in the end, it turned out well. It's possible that the examiner might also question why I chose this pathway over others. At this stage, all of them are familiar with my study; we are proceeding so fast... (Part 1, p. 4)

The examples above illustrated that participants, by exploring the various ideas put forth by their supervisors, were able to refine and enhance their research concepts. This process of idea

exploration also enhanced the participants' independent thinking. Simultaneously, the supervisors gained a deeper understanding of the participants' research content, which enabled the supervisors to provide efficient support to the students. In essence, the students conducted research and explored research with support; while the supervisors gained a better grasp of the students' research as this took shape and were able to offer tailored support. This process not only signified a process of mutual adaptation but also a collaborative learning experience. That is, an interaction within a group enabled members to learn mutually, exchange viewpoints and work together in order to pursue the same goal or a common project.

7.3.3 Participating in workshops to be a part of academia

Participants interacted with scholars within their discipline through participation in conferences and academic article publications. This engagement deepened participants' subject knowledge, improved their research skills, and fostered a stronger sense of belonging in academia. For instance, Alex was involved in article publication with supervisors, and the process not only deepened his ideas but also enhanced his academic writing skills.

Lots of research content were remaining as ideas, and these ideas need to be expressed in their (western) logic and habits. Because reviewers, after all, are western people, their way of thinking is different from ours. Even though I thought what I have written is perfect, the writing itself is under the habit of Chinese expression. Once the article is submitted to reviewers, they interpreted the content differently; in their interpretation, the article did not contain the core ideas. In this case, the quality of the idea are largely decreased (Part 1, p. 6).

Through writing academic articles and receiving feedback from both supervisors and peer reviewers, Alex realized that he struggled to express ideas persuasively and in a manner consistent with academic norms. This encouraged him to develop his academic writing skills so that he could satisfy the demands of academia. Similarly, Lawrence's experiences of attending conferences and receiving feedback from experts in his field enabled him to gain valuable insights into his research. This experience enabled him to develop deeper into specific research areas, ultimately allowing him to make a more substantial and original contribution to the field.

To my embarrassment, a man asked a very sharp question during the conference, which I could not answer. Yes, the question itself was very good... We had several discussions through email, and he gave some very good ideas. Honestly, these ideas are quite up-to-date and encompass the new knowledge I intend to contribute. Nevertheless, the ideas inspire me to go even deeper into this area (Lawrence, Part 1, p. 11).

Alex's and Lawrence's examples exemplified the acquisition of research skills and specialized knowledge through their participation in academic conferences or the process of publishing

academic articles. In essence, this participation further enabled participants to enhance their research competencies to meet the requirements for entry into academia. Kelly also emphasized that this type of involvement could deepen the PhD students' sense of belonging as a researcher and solidify their belief that they currently are (and will continue to be) members of a specific research domain.

I felt a strong sense of resonance. Experts in the research field and other audiences seem to easily comprehend the content of my research, and I do not need to provide excessive explanations. In comparison to those without a similar knowledge background, they could easily understand what I communicated. A professor pinpointed the shortcomings of my study and advised me to address the limitations of critical theory... (Part 2, p. 11).

Participation in conferences not only provided Kelly with valuable insights into her research but also fostered a sense of belonging within the disciplinary community. By engaging in activities such as article publication and conferences, participants involved themselves in discussions and received feedback from scholars within their discipline. This facilitated the acquisition of subject knowledge, research competencies, and writing skills, and integrated participants into the academic community. Such active engagement and acculturation processes were embodied through article publication under the guidance of supervisors, thus emphasizing “learning as doing” (Wenger, 1999, p. 5). Attendance at conferences and interactions with scholars and reviewers reflected dynamic connections between participants and the disciplinary community. As participants deepened their expertise, transitioning from novices to experienced researchers, they moved from the periphery to the central place of academia, symbolizing the process of academic acculturation.

Chapter Summary

In this chapter, observation, communication and participation emerged as three basic forms of interaction facilitating academic acculturation. Through observation, participants acquainted themselves with supervisory approaches, refined research strategies, and gained insight into their research practices. Moreover, communication with peers, supervisors, and support staff not only provided essential research competencies and emotional support but also enhanced student-supervisor relationships, thus fostering the participants' identities. Engaging in doctoral studies, supervision, conferences, and academic article publication served as approaches for enhancing research competencies, deepening understanding of the doctoral journey, improving confidence, and initiating a sense of belonging within the academic community. These forms of interactions enabled participants to navigate their doctoral journey to achieve academic success.

Chapter 8: Types of Learning—Organisation of Mental Schemas in Academic Acculturation

This chapter presents the process by which participants structured their mental schemas during academic acculturation, aiming to address the research question: What types of learning did the Chinese PhD students experience during academic acculturation? The findings revealed five distinct approaches. The first approach was that students cumulated basic knowledge for their doctoral journey, presenting a cumulative learning feature. Students also demonstrated assimilative learning when the students' previous research skills and knowledge assisted them in their doctoral journey and were enriched. Furthermore, students could also establish multiple self-understandings, which enabled them to navigate various interactions and communications with their supervisors. The data also showed that students' previous research experiences and preconceptions did not always align with the demands of doctoral study; students adjusted their previous understanding regarding research. The adjustments demonstrated an accommodative learning process. Lastly, fewer than half of students experienced transformative learning while experiencing extreme hardship, which caused restructurings in the students' established understandings.

8.1 Cumulation— Establishing Foundations for the Doctoral Journey

The data revealed a situation in which the Chinese PhD students lacked the necessary mental schemas (presenting as prior experiences) to effectively navigate their doctoral studies. This situation was particularly evident in using the university resources, such as learning management systems, Endnote and NVIVO. After learning how to use the software and resources, participants were able to enhance the efficiency of their research. In such situations, the participants constructed the first group of elements of knowledge for their doctoral journey. This type of schema construction corresponds to cumulative learning in CLT (Illeris, 2016).

Five participants encountered uncertainty and noted a steep learning curve during the early stages of their PhD journey. This was attributed to the need, in addition to developing specialised knowledge, to acquire various other skills and knowledge, including an understanding of doctoral education regulations and proficiency in using the learning system they encountered in New Zealand. These additional skills and knowledge were crucial for ensuring the successful progression of their doctoral studies. For instance, Alex mentioned he did not have knowledge about the school regulations for formatting the writing; thus, he had to learn about the regulations as well as how to properly cite his references:

It was very inconvenient to write a literature review because many references needed to be recorded manually, basically relying on taking notes, recording the titles and organising the articles. It made the writing inefficient because many articles were either repeated or omitted (Part 1, p. 6).

Likewise, Nick lacked experience in using learning tools. Recognizing the potential efficiency the learning tools could bring, he learned to use university resources and learning tools to facilitate his data analysis. As he highlighted, “the (master's) teacher only showed line-by-line analysis which does not have to use NVIVO” (Part 1, p. 8). In a similar vein, realizing the breadth of knowledge she needed to acquire, Jade expressed her sense of panic: “there are so many things to learn... I was really afraid that there suddenly appeared anything that I could not control, and it again would delay the progress of the proposal” (Part 1, p. 5). These statements indicate that participants lacked experience in using the necessary learning tools and resources to support their doctoral research, adding to their anxiety. This gap in knowledge seemed to be attributed to the fact that, within the Chinese educational context, there were no specific tools designed for referencing management and formatting or for data analysis. It may also suggest their Master's research was not complicated and the previous research was not conducted in English (see Section 5.3).

Through attending library workshops and individual tutorials, and seeking assistance from their peers (observing how the peers use the tools) (see Sections 7.1 and 7.2.1), participants accumulated knowledge of using these learning tools, which further enabled them to enhance the efficiency and quality of their research. The learning process seemed to have features of memorizing and mechanical learning but it was also strategic. For example, As Alex familiarised himself with using Endnote. He noted that he did “not have to be proficient in operating the whole software” and “only learned the specific functions” he would “frequently use.” Alex went on to conclude “these functions became familiar with daily use” (Part 2, p. 1).

Similarly, Nick obtained informal tutorials from peers and observed how his peers demonstrated to the use of the learning tools: “the trick of operating software is easy to forget. The function of each button and the sequence of each step.” (Part 1, p. 5). Tom also mentioned that he did not use a mass spectrometer in the previous study, thus he did not know how to use the equipment. He had to learn everything “bit by bit” when his supervisors detailed the operating procedures of the equipment (Part 1, p. 15). Alex focused on specific functions that are frequently used and showed practicality and repetition. Nick adopted the strategy of note-taking, which reflected a memorization-based process. Tom's learning experience detailed the procedures emphasizing a step-by-step approach; this also aligned with the process of memorization.

As shown from the experiences of these participants, their lack of knowledge of relevant learning tools and resources indicated a gap between participants' mental schemas and their doctoral journey. Participants had to cumulate the relevant knowledge to navigate their doctoral journey. Given the lack of knowledge, participants had to take notes and memorize the specific steps of how to operate the software. By obtaining knowledge of operating these learning tools, the participants could efficiently build the competencies needed to navigate their academic environment. This acculturation process highlights the participants' formation of the initial cluster of knowledge centred around the use of software and learning resources. This learning pattern aligns with the cumulative learning principle in CLT (Illeris, 2016).

8.2 Assimilation—Expanding Knowledge

Participants already possessed certain knowledge, competencies and educational experiences prior to their doctoral journey. Throughout their doctoral education, they further enriched this knowledge. Knowledge enrichment was involved in the following aspects: English language proficiency, research skills, and an understanding of supervision. This enhanced knowledge facilitated the navigation of their doctoral journey and empowered participants to better manage their research. The development showed an example of assimilative learning: “The learner adapts and incorporates impressions from his or her surroundings as an extension and differentiation of mental schemes built up through earlier learning” (Illeris, 2016, p. 38).

8.2.1 Developing language skills

The Chinese PhD students had already achieved a level of proficiency in English (such as ability to communicate, comprehend ideas, and compose academic writing in English) before commencing their doctoral programs. Through interactions with English-speaking people and engaging in thesis writing with feedback from supervisors, the participants enhanced their ability to express and understand ideas, as well as write academically. This developed proficiency in English empowered them to communicate their ideas, comprehend intended ideas in conversations, and meet the demanding standards of academic writing. The enhancement of English proficiency demonstrated a process of the assimilative learning process.

Nine participants disclosed that while they had achieved specific scores on the IELTS exam before embarking on their doctoral programs. They still faced challenges in comprehending peoples' (such as supervisors and students) accents and effectively expressing their thoughts in academic writing. These difficulties were embodied in unfamiliar terms,

expressions, accents, and clarity of academic writing (see Section 5.1). For example, Hilton experienced difficulties in communicating with people in New Zealand: “I could not always catch up with what people tried to communicate” (Part 1, p. 3). Hilton’s communication difficulties stemmed from the unfamiliar accents he encountered. Since Hilton was familiar with the British accent (see Section 5.1), it made it difficult for him to catch up the specific terms and even people’s idea when people adopted an accent with which he was unfamiliar (other than British accent). Similar to Hilton, Nick and Kelly also encountered difficulties when understanding the meaning in communication and reading:

You knew each word they express, but when these single terms were linked together as a phrase or expression, you totally did not know what people were trying to say (Nick, Part 2, p. 6).

The more formula I encountered, the more challenges in understanding math. It was more difficult to catch up with people’s logic flow when they were programming... So I decided to start to learn mathematics in English from the very beginning (Kelly, Part 1, p. 13).

The experiences of these two participants suggest that they had already attained English proficiency before their doctoral journey. However, due to a lack of expressions or vocabulary in English, they faced challenges in understanding the intended meaning of others and in reading academic articles. These participants’ experiences demonstrate the difficulties they faced due to missing parts of their language knowledge. Participants possessed specific mental schemas in English that were beneficial in their doctoral journey; however, these schemas appeared insufficient to allow navigation of all the situations they encountered.

Active involvement in learning activities (such as doctoral research and communication) was the main approach taken to enriching the mental schemas and overcoming these difficulties. Participants engaged in their research activities. The research activity itself can be interpreted as a self-endeavour process through which the Chinese PhD students worked on their research. In the words, the students made efforts to improve their writing skills by engaging in academic writing by themselves. The sentiments expressed by Kelly, Alex, and Lawrence clearly indicate the process through which they acquired academic writing skills, tricks, and expressions (see Section 7.3). Furthermore, Kelly’s experiences highlighted the importance of active participation in the research process. She actively avoided using Chinese to learn mathematics but “learn(ed) mathematics in English from the very beginning” (Part 1, p. 13). Participants also highlighted the importance of communication and assistance from other people. These participants were involved in communication with English speaking people. For instance, Lawrence reported that he was accustomed to his supervisors’ accents unconsciously through

continuous communication: “listening more, reading more and speaking more” (Part 1, p. 5). This enabled him to gain a better understanding of his supervisors’ ideas. Likewise, Jade stated that she recorded the discussion in the supervision meeting and listened the recording, which helped her to comprehend the task of supervision (see Section 5.1.1). Hilton also actively engaged in communication with supervisors and peers throughout the initial stage of his PhD, and he asked people to repeat or clarify ideas. This communication also helped him to become familiar with accents and increase his vocabulary.

As a result of these efforts, participants were better able to understand accented English; obtain English expressions; and facilitate their writing skills. Enhanced English language proficiency enabled participants to meet the demands of academic writing and more easily comprehend conversations with surrounding people. This adjustment presents as acculturation to the academic journey. As Kelly explained, she learned how “(mathematics) formulas were expressed in English”. This process gave her a feeling that she “re-learn the whole mathematics because the formulas did not change” (Part 1, p. 13). Understanding how these ideas were expressed in English made it easier for her to grasp the meanings of mathematical formulas and, subsequently, aided in the development of the theoretical foundations for her study. Nick obtained clarification about the meanings of English phrases. Likewise, Alex obtained a number of writing tricks in publishing articles, especially acquiring the skills “to organise ideas academically and how to organise writing” (Part 1, p. 9). These skills made his writing “in line with Western habits” and “easy to be accepted” (Alex, Part 2, p. 6). Language proficiency development demonstrated a process in which participants integrated language elements (such as expressions and skills) into their existing language proficiency (mental schemas) as extensions, although these elements did not cause restructuring in the participants’ existing schemas. Through acquiring these language elements, students could navigate communication and academic writing more effectively, ensuring they met the requirements of doctoral education. Thus, the development of language proficiency by acquisition of new language skills or elements represent an assimilative learning process.

8.2.2 Understanding doctoral supervision

Prior educational experiences created expectations and preconceptions about participants’ doctoral supervision. Although these expectations and preconceptions were general, abstract, and often unclear, they served as a foundation for participants to work with their supervisors to manage their research at the beginning of their doctoral journey. Through engaging in the supervision with their supervisors, participants gained a clearer understanding of how doctoral supervisors managed the students’ research. The clearer understanding

enhanced communication and collaboration between the participants and their supervisors, which further helped participants to pursue academic success. The expectations generally aligned with the actual doctoral supervision process, wherein supervisors provided suggestions and support while students managed their research with their supervisors' guidance. As Danny stated,

I knew (assumed) the supervisors would assist my study and provide guidance, but I just did not have a clear idea of how they would support me. I could only think about it based on my previous experiences that the supervisors may give general support (Part 1, p. 5).

Participants' statements reflected their initial expectations of doctoral supervision, where they anticipated support from their supervisors. This initial understanding reveals the participants' pre-existing mental frameworks prior to embarking on their doctoral journey, which were shaped by their prior educational experiences. Alex also explained he had preconceptions toward the doctoral supervision. He highlighted his preconceptions were in line with the actual supervision.

I only had a general understanding of the situation of doing research here. Students conducted their research. If they encountered any difficulties or issues during their research, they sought assistance from their supervisors. Indeed, they provided loads of support, especially deepening my research goals and improving my academic writing. Although there were some difficulties when communicating with them (in the beginning stage), I did not encounter serious problems when working out my research proposal (Part 2, p. 1).

In addition, Yin also said that she expected support from her supervisors, but the reality was that the supervisor not only provided suggestions but also detailed support. These participants' statements all suggested that the students formed preconceptions about their doctoral supervision based on their prior educational experiences before actually experiencing it. However, these pre-existing understandings seemed abstract and in a need of clarification through the actual doctoral journey.

They (supervisors) may provide support or give me some suggestions or ideas. Then, I adjust my work accordingly. Indeed, their comments were very detailed, and their suggestions were incredibly helpful. Thus, I can't recall any significant issues when I was setting up my research aims and methods... (Part 2, p. 5).

These instances illustrate participants' initial understanding of supervisory engagement, wherein supervisors provide academic support, and students conduct their research independently. These initial anticipations were derived from their previous educational experiences, indicating their existing mental schemas for doctoral supervision. Although these initial mental schemas seemed to be abstract, the schemas provided foundations for the participants to establish interactions with their supervisors. These initial expectations even

enabled participants to work with supervisors and overcome difficulties when developing a research proposal.

As participants engaged in ongoing interactions with their supervisors and addressed the feedback provided, they developed their initial understandings and had a clearer understanding of supervision, leading to a better collaboration with their supervisors. This further helped participants establish sense of belonging and better manage their research. For instance, after experiencing doctoral supervision and working on the research proposal with support of his supervisors, Alex noted: “the supervisors here managed fewer doctoral students. Therefore, the supervisors could spend a lot of time managing my research, which ensured I could have regular, periodic, continuous communication with supervisors” (Part 2, p. 1). Similarly, Jade engaged in both non-academic and academic interactions with her supervisors. These interactions provided her with a clearer understanding of doctoral supervision; that is, the level of support and pastoral care she received from her supervisors exceeded her initial expectations. The supervisors’ support fostered Jade’s willingness to engage in interactions with the supervisors.

...maybe she knew I am unfamiliar with this environment. She, in each supervision, inquired about: have you settled down? How about the food ... her inquiries made me warm. I was not afraid of expressing my ideas in front of her (Part 2, p. 2)

Yin expressed that the continuous interactions with her supervisors enabled her to better work with her supervisors:

The longer we worked together, we seemed to establish mutual understanding or rapport... I wanted to do something, like adding a research method that wasn't entirely clear to me. Even when things weren't expressed very clearly, they were able to grasp my thinking sharply and provide me with accurate suggestions (Part 2, p. 5)

These participants shared a common process wherein their initial mental schemas aligned with what participants experienced in their doctoral journey, helping them to familiarise themselves with doctoral supervision. Upon sustained engagement with doctoral supervision, participants enhanced their comprehension of the supervision, but they did not adjust their initial understanding of supervision. Compared to their initial perceptions, participants had a clearer understanding of supervision (such as the extent to which supervisors managed students' studies, provided emotional support and pastoral care). This understanding subsequently led to improved cooperation with their supervisors (such as fostering motivation and communication). From the perspective of CLT, the interaction with supervisors enabled participants to incorporate elements (such as specific actions of how they were supported) into their pre-established understandings. These elements helped participants to clarify their initial

understandings of supervision. Participants incorporated new elements into their established mental schema, which demonstrate assimilative learning.

8.2.3 Enriching research skills

Participants' pre-existing research skills and competencies played a pivotal role in their successful adaptation to the initial stages of their doctoral studies. The doctoral research process enhanced participants' existing research skills, which, in turn, assisted them in tackling more complex research tasks and navigating obstacles more effectively throughout their academic journey. The process of developing research skills presents as a feature of assimilative learning.

Participants already had certain research skills (such as the ability to categorize research literature, time management, and methods of knowledge acquisition) before their doctoral journey. These skills established a foundation for participants to navigate their doctoral research as they developed a research proposal and confirmed their candidature. For instance, Lawrence knew how to manage his study and daily life before his doctoral journey:

Normally, I spent five hours intensive reading and writing for my (masters) thesis after I wake up. However, I limit this study period to no more than five hours. Afterwards, I ensure to fully rest and prepare myself for the next day. I know the time of the day when I can maximize the efficiency of my learning” (Part 1, p. 9).

Lawrence adopted a similar approach to manage his doctoral research. This method allowed him to “ensure productivity” (Part 1, p. 9) in his doctoral research, and it also enabled him to better handle the intensive and most demanding periods, particularly during the confirmation stage. Similarly, Kelly had already developed skills in reading articles and categorizing literature during her MA journey. This skill proved invaluable in her doctoral journey, making the literature review a smoother process for her. Likewise, Tom had “known most of these methods when I was working in a chemical enterprise. “Thus, for me, working out an equation and research proposal was nothing difficult” (Part 1, p. 7). These examples demonstrate that participants possessed pre-established research skills before starting their doctoral journeys. These skills represent the participants' pre-established mental schemas. Due to the similarity between master's and doctoral research, participants could transfer these established skills into their doctoral research. As Kelly said: “doctoral research is more complicated but in a similar way” (Part 1, p. 3). In other words, the participants' pre-established mental schemas could be linked to what they experienced in the new learning context, helping participants to manage their doctoral research at the beginning stage of their doctoral journey in a new education environment.

Although participants' pre-established knowledge provided a foundation for them to deal with their doctoral journey, the knowledge did not address all the demands of the participants' doctoral studies. Through their doctoral research experiences, participants enhanced their skills, enabling them to better navigate complex situations in their doctoral studies. For example, participants had accumulated certain research skills prior to embarking on their doctoral research. This knowledge not only aided them in conducting their research but also continued to evolve and expand throughout the research process. As Kelly noticed, her skills in categorizing literature fell short of addressing the massive reading demands. She added to her skills for completing a literature review, "... (putting) articles within a table, showing the author, name of the article, methodology, theoretical framework, findings and suggestions..." (Part 1, p. 5). Kelly's research skills for doing literature reviews were enriched as she encountered complicated research tasks. The enrichment indicated that Kelly possessed research skills before her doctoral journey, and the research tasks added more elements to Kelly's skill sets.

Apart from research skills, participants also enriched other skills related to research. For instance, Lawrence enriched his competencies in managing his research. He was influenced by the working styles of his supervisor, and he realised the importance of responsibility and self-regulation in doctoral studies. He put more effort into his research and harnessed his most productive hours (8:00 am to noon) for focused work while allocating other times to unrelated tasks like publishing articles. Lawrence had already possessed capacities or skills for time management. He obtained further insight into how to manage the study as he conducted his research. Tom, as another example for developing the independence in doing research, developed his skills. The updated skills he enabled him to obtain knowledge faster:

I think my research is a sequential process. Once the initial steps can yield a product, the steps can be verified feasible, and it also demonstrates the feasibility of the entire research endeavour. Thus, I believe that PhD education isn't about tackling complex tasks, but it develops an individual's thoughts. Especially, PhD education entails fostering independent thinking and methodologies for rapid knowledge acquisition (Part 1, p. 14).

In Tom's statement, the term "sequential process" did not imply that his doctoral research unfolded without challenges or was a smooth process. Instead, it signified the progressive development of research skills and methods. It showed his PhD education, by adding new elements into his existing knowledge base, enriched his skills or abilities to obtain knowledge. In sum, these experiences indicate that participants enriched their pre-established research skills by adding new elements (such as new dimensions for categorizing the articles). The

newly obtained knowledge was incorporated as extensions to existing mental schemas without causing restructurings. The enrichment in the participants' research skills helped participants manage complicated learning tasks and situations. This process demonstrates a feature of assimilative learning.

8.3 Constructing Multiple Identities

Participants engaged in diverse interactions with supervisors across academic and non-academic contexts, which led participants to construct multiple self-understandings. These self-understandings co-existed and were activated according to the specific interaction situations, ensuring participants' responses and actions aligned appropriately in the specific interaction situations. Prior to their doctoral research, participants initially regarded themselves as students and their supervisors as teachers. The self-understanding and understanding of supervisors (which was based on teaching and learning) represented the participants' preconceptions or initial mental schemas. The mental schemas played a fundamental role for participants when interacting and forming a relationship with their supervisor. As Hilton expressed:

As a teacher, he was 'parenting' me in my research; I should follow his instructions. They (supervisors) guided us to finish our research. This relationship has been established since the moment when they agreed to supervise our study (Part 1, p. 2)

Similarly, participants (such as Kelly, Danny and Yin) identified their doctoral supervisors as teachers, thereby, the student-supervisor relationship was based on a traditional "teaching and learning" paradigm (see Sections 5.6.3 and 7.2.2). Participants initially thought of their supervisors as teachers. This thought not only reflected their pre-existing mental schema regarding the role of their supervisors, but also represented their understanding of the supervisor-student relationship and their self-understandings (i.e. student). This mental schema influenced participants' expectations regarding supervision (as shown in Hilton's case, where he anticipated guidance from supervisors). Correspondingly, it also shaped their actions in terms of engaging in studies and acquiring knowledge (see Sections 5.6.1-6.6.2).

However, extending beyond the student-teacher relationship and learning activities, participants were also involved in academic and non-academic interactions with their supervisors. These connections encompassed participation in research projects, collaborative article publications, informal interactions like coffee breaks, and daily communications. These diverse interactions led to participants constructing additional self-identities. For instance, Yin articulated that she was involved in her supervisor's research project; at the same time, her supervisor also managed her study. She identified herself as her supervisor's colleague and also as an adult learner, noting her supervisor enabled her to collaborate on a research project

and that the relationship with her “supervisor was not about “teaching” and “learning” (Yin, Part 1, p. 10). In describing her relationship with her supervisor, Yin became cognizant that doctoral students need “to deal with various social issues and relationships.”

Perhaps not surprisingly, there was a duality to students’ academic relationships with supervisors. For example, at one level, Danny saw herself as a 'colleague' of supervisors, as the supervisors managed her study as a collaboration (see Section 7.3.2). However, she was still in a learning phase, which defined her as a student. Hilton and Kelly also saw themselves as supervisors' students. Yet, in non-academic interactions, they considered the supervisors to be friends, As Kelly said: “It felt like a form of mentorship. I did not feel stressed or perceive a power distance from her; it was more like conversing with a friend” (Part 1, p. 7. See Kelly’s and Hilton’s detailed quotation in Sections 7.2.2 and 5.6.3).

As shown in these comments, participants’ self-identities emerged in response to the array of interactions, presenting a more intricate view of participants' roles within the doctoral environment. Moreover, participants described themselves as student, colleague, friend and social being. These identities were not integrated as a new identity, but they coexisted. These identities were activated according to the interaction situations, which helped participants shift between various interactions with their supervisors so that they could better position themselves in academic discussions as well as engage in social communications properly. From the perspective of the CLT, the terms, such as “colleague”, “friend”, “social being” and “student”, indicate participants’ different identities, representing the participants’ mental schemas regarding self-understandings and understandings toward their supervisors. The identity of the student indicates participants' pre-established mental schemas. Through their interactions with supervisors, additional identities (such as "social beings" or "friends" of supervisors) were acquired and incorporated as new elements into participants' mental schemas of self-understanding. These newly acquired elements did not induce restructurings of the participants' pre-existing mental frameworks; rather, they co-existed with the participants' identity as students, to be activated corresponding to the specific interactions with supervisors.

8.4 Accommodation—Restructuring Understandings

The data reveals situations in which participants' initial educational experiences and expectations did not align with the actual doctoral journey. Through experiencing doctoral studies, participants restructured their original understandings, including their approach to doctoral study and supervision, as well as their academic identity. These adaptations enabled participants to conduct their research in accordance with the demands of doctoral education,

which emphasises independence and greater responsibility. With these adjustments, participants obtained a more comprehensive understanding of doctoral supervision, enabling them to align their research with supervisors' expectations. The adjustments also provided participants with a deeper self-awareness of who they were going to be, allowing them to meet academic expectations. The adjustments reflect an accommodative learning process, indicating an individual adjusts his/her mental schemas as the new incoming impressions were integrated (Illeris, 2016).

8.4.1 Adjusting an understanding of doctoral supervision

Participants' expectations regarding doctoral supervision were different from the actual doctoral supervision they experienced. Through engaging in discussion and interaction with supervisors in supervision meetings, participants shifted to understanding that doctoral supervision was supportive, individualised, and collegial. This realization further facilitated participants in establishing rapport with their supervisors, aligning their research approach with the style of doctoral supervision, and working better with their supervisors to achieve the success in their doctoral research.

Initially, participants anticipated that supervisors would impart knowledge and provide explicit instructions for them to follow. However, the actual supervisory approach aimed to teach students how to acquire knowledge, which differed from participants' initial expectations. The differences further prompted participants to reflect on their approach to research and doctoral supervision. For instance, Lawrence initially thought that doctoral supervision is similar to working on a research project, where the supervisor instructs the student on how to proceed and what steps to take. After conducting research, Lawrence realised that:

The supervision differed from traditional teaching, where students sit in classrooms and teachers deliver knowledge to them. It was neither the same as the guidance I had previously expected. In the initial stage, the supervision was somewhat didactic, but my supervisor also emphasised to me, 'It is your research' (Part 1, p. 3).

Lawrence's preconception of doctoral research reflected his initial understanding of doctoral supervision. This preconception showed his prior experiences and cultural norms, which indicated a form of teaching that involved supervisors giving clear and explicit instructions to follow. Whereas the actual supervisory approach was that supervisors provided guidance which required students' critical thinking and initiative. Similar to Lawrence, other participants assumed that the doctoral supervisors would not fully engage in the student's research: "the doctoral supervisors would be very busy, like my master's supervisors; they could not spend a lot of time on the students' study" (Nick, Part 1, p. 2).

These cited examples highlight that participants' pre-conceptions of doctoral supervision were constructed based on their previous educational experiences. These preconceptions embodied participants' pre-established mental schemas regarding supervision. That is, doctoral supervisors would provide general tutorials or guidance, and the guidance functioned as students' instructions or orders that students should obey. This mental schema played an important role for participants when interacting with their supervisors in the beginning stage of their doctoral journey. Nevertheless, the pre-established mental schemas also caused difficulties for the participants. Some believed they should unconditionally obey supervisors' suggestions, and for participants such as Hilton, this obedience made the doctoral journey difficult: These difficulties suggest that participants established mental schemas were inconsistent with what they experienced, indicating cognitive dissonance.

After engaging in doctoral supervision and interacting with supervisors, the participants noticed that doctoral supervision was different from what they expected. Participants restructured understandings of doctoral supervision. For instance, Caitlyn expressed gratefulness when she noticed that her supervisors not showed dedication to academia and provided detailed support but also maintained interactive relationships with students rather than commanding students' obedience. "He would find something shining from heaps of "rubbish" (the writing submitted to the supervisor) and encourage me to think... I very much value this form of supervision as it provides an opportunity for all the members to discuss ideas..." (Part 1, p. 6). Cain said that doctoral supervision resembles apprenticeship; unlike MA supervision, "the supervisors were not the "output" of the knowledge... their wisdom, values, way of thinking, behavioural habits and even attitude were passed on to the students" (Part 1, p. 9).

As shown, participants adjusted their understandings from viewing the supervisor as an authority whose instructions should be unconditionally followed to seeing supervisors as mentors engaging in interactive and supportive relationships. These mental schema restructurings were accompanied by emotional adjustments on the part of the participants. In other words, the new understanding of doctoral supervision and student-supervisor relationships formed a sense of belonging and appreciation. Additionally, these restructurings enabled participants to gain a better understanding of how to collaborate with their supervisors in alignment with the expectations of the new environment. As Jade explained, the supervisor, at the master's level, "acted as a locomotive" students were dragged by the supervisors; in the doctoral program, "the student should be the locomotive" (Jade, Part 1, p. 10). Likewise, Hilton realised the essence of doctoral supervision

The master's teacher in China taught that one plus one equals two. The doctoral supervisors taught students how to calculate one plus one. That is, the doctoral supervisor would not tell students what the phenomenon is, but would teach students how to understand the phenomenon (Hilton, Part 1, p. 5).

Participants adjusted their understanding that supervisors aimed to guide students in thinking, rather than providing direct instructions. This shift in understanding indicates that participants had become attuned to the specific practices and norms of supervision in doctoral education, emphasizing autonomous and independent research. This enabled participants to grasp doctoral supervision fully and manage their research in line with their supervisors' expectations. From the perspective of CLT, adjustments in the participants' understanding of supervision indicates a process of accommodative learning. The process involves participants perceiving doctoral supervision as supervisors providing detailed support and maintaining an interactive relationship with students. Yet, what they perceived differed from their pre-established mental schemas and further led to a restructuring of their pre-established schemas.

8.4.2 Restructuring the understanding of independence

Participants expected they could rely on their supervisors' guidance to independently do their doctoral research. However, after engaging in doctoral research and interacting with their supervisors, participants recognised the need for greater responsibility and more critical thinking in doctoral research. The restructuring within the participants' understanding of doctoral study empowered participants to conduct their research in line with academic norms. The adjustments also enhanced participants' critical thinking skills and enabled them to work better with supervisors, and to achieve academic success. Additionally, it led to adjustments in the participants' emotions. These restructurings suggest an accommodative learning process.

Participants initially expected that doctoral study would be a process wherein students implement their research independently based on the supervisors' guidance. However, as the participants progressed in their doctoral journey, they noticed their initial expectations were misaligned with their actual experience, causing a range of emotional reactions and cognitive dissonance. For instance, Caitlyn expected to rely on her supervisors' detailed support, believing that they would guide her study to success. However, the high level of independence required in doctoral study differed from her expectations. This was especially apparent when she realised the difficulty of doctoral research and found that her doctoral supervisor did not provide the anticipated guidance, which led to negative emotional responses. As Caitlyn said: "The doctoral study would be like reading by myself, writing by myself, and thinking by myself..." (Part 1, p. 10). She also noted it was "...a black hole, it is boundless and bottomless... the situation was even worse, and the PhD was challenging because my

supervisors were not familiar with this domain as well. I panicked as no one I can rely on (Part 1, p. 12).

The first quote reflects Caitlyn's initial understanding of the research approach, which emphasises the idea of students conducting research independently. This independence implies that students engage in research activities based on their own efforts, but participants' expectations for research ideas and direction were based on active guidance from a supervisor. Consequently, upon realizing they could not rely solely on the supervisors' ideas, participants experienced frustration. Similarly, Jade assumed that supervisors would provide general guidance, while "students should do their research based on the proposal" (Part 1, p. 4). Yet, the doctoral research was a self-directed and proactive process (see Jade's detailed comment in 5.4.1). Tom also had similar opinions. He expected that students conducted the research according to the supervisors' guidance. This was because "the supervisors were knowledgeable and experienced in leading students to success" (Part 1, p. 6). Influenced by this initial expectation, Tom struggled to develop a research proposal (see Tom's dilemma in Section 5.4.2 and 8.5). Cain also experienced this cognitive dissonance. Cain was confused about his research: "I shall read more, but the articles are unlimited. Where shall I start?... Everything needs to be well considered by myself" (Cain, Part 2, p. 3).

In the cited examples, participants' preconceptions encapsulated the idea that students conducted their research with the guidance of their supervisors. This idea illustrated dependence in that students do not have to assume responsibility and initiative in the conduct of their research. The direction and ideas for the research relied on the guidance provided by the supervisors. This preconception presented itself as participants' initial mental schemas of the approach to doctoral study. However, these mental schemas did not ensure success. Terms, such as "confused", "bottomless" and "panicked", demonstrate participants' stress. The examples (e.g. "Where shall I start?") also indicated that participants underwent cognitive dissonance, which then initiated participants' reflective thinking (see Section 6.2). The emotional aspects and cognitive dissonance illustrate participants' emotional reactions as they experienced something they were not familiar with or could not control in the new academic environment.

As a result of reflective thinking, participants adjusted their initial understanding of independence and constructed meanings of independence. The adjustment process enabled participants to align their research practices with expectations of doctoral education, facilitated better collaborations with supervisors, and led to adjustment in emotions. For instance, realizing the fact that supervisors only gave suggestions instead of instructing students how to

do the research, Cain understood that “everything needs me to check and make sure the ideas were coherent and consistent... It is absolutely a self-directed process, which requires the students to spend time and involves lots of energy” (Part 1, p. 6). Similarly, Hilton noticed that the doctoral supervisor would no longer lead students. As Hilton described: “doctoral study demands students to have a “proactive heart”. It is totally different from the master's study where we didn't have to worry about what knowledge we needed to search for” (Hilton, Part 1, p. 8). Danny also noticed the importance of responsibility and critical thinking in her research process.

They (supervisors) focused on different perspectives, which just put my study on the right path. I really appreciated that they could provide me such sufficient support and pastoral care to me. Whereas, even the doctoral supervisors provided loads of guidance and support, I should think which suggestions were most reasonable and suitable for my research. This is because any suggestions could lead to different results, and some might detour my process (Part 1, p. 6).

The above examples show that participants adjusted their interpretations of independence. They realised the importance of being autonomous, proactive and critical during their doctoral education. Compared to participants' initial preconceptions, their new understanding of the doctoral study represented a restructuring. From the perspective of CLT, participants adjusted and constructed an understanding of independence indicating a process of accommodative learning. This process appears to be that, as engaging in doctoral study with doctoral supervisors, participants realised the need for responsibility, autonomy and critical thinking in their research. This further led to partial restructurings in the participants' understanding of independence. In other words, participants incorporated new impressions from their doctoral journey, such as knowing that supervisors did not impart knowledge, and students have to do more than what is instructed. With these impressions being incorporated into participants' mental schemas, participants restructured their understanding of independence. With adjustment of their understanding, participants also adjusted their emotions toward their doctoral study, which signified a growing comfort and familiarity with the academic environment. The adjusted understanding also implies that participants started to consider research directions independently and autonomously, leading to better collaboration with their supervisors. This adjustment reflects adaptation to the academic norms and practices of their new environment.

8.4.3 Adjusting and developing self-understanding

This section presents the process of developing self-understanding. Before undertaking their PhD, most participants regarded themselves as students. Through doctoral studies,

participants shifted to regard themselves as researchers or learners. The adjusted self-understanding played a pivotal role in guiding Chinese PhD students to fulfil academic expectations and responsibilities (also see Section 5.6). Especially, it also functioned as a driving force for the enhancement of academic writing, professional knowledge, research abilities and a sense of belonging in academia. Through adjusting self-understanding, the participants became more resilient and adaptable and were able to navigate challenges and crises.

Initially, participants regarded themselves as students before commencing their doctoral education. This identity encompassed the participants' understanding of their learning actions, skills, and expertise. As Lawrence and Hilton explained:

The role was a pure student, with the primary focus being on learning: learning for exams, learning to secure a good job, and accumulating knowledge within the school environment. The daily routines were largely dominated by studies, from attending coursework to engaging in various educational pursuits (Lawrence, Part 1, p. 7).

That status was a passive learner, in the school, who learned something from the textbook and sat in the classroom obtaining knowledge (Hilton, Part 1, p. 3).

As shown in these two representative statements, participants presented their self-understanding of who they were based on the learning activities they engaged in. This self-understanding embodied their initial self-understandings. In other words, self-understanding was closely linked to academic actions and pursuit, such as exam preparation, securing future employment, and obtaining knowledge. This self-understanding exhibited two characteristics: 'pure students' and 'passive learners'. These characteristics were projected through their prior education, where students predominantly devoted their time to acquiring knowledge from textbooks and classroom lectures without delving into matters beyond their studies.

However, participants' initial self-understanding evolved as they became involved in complex research processes with their supervisors. Although participants thought of themselves as students, the identity referred to those who learned to do research and explore new knowledge. For instance, Danny identified herself as a student or a learner who "learn(s) to do research" (Part 1, p. 4); this is because she spent time learning. Yet, at the same time, she also found it hard to identify herself as a student because she was different from the student who "learned subject knowledge for exams" (Part 1, p. 4). Likewise, Jade described:

What I am now learning and doing was different from what in my Master's study. I would say that I am learning to contribute new knowledge. This differed from the status of learning the subject knowledge and attending courses. At this stage, no one could

teach subject knowledge based on the curriculum, and students do the test or the homework (Part 1, p. 3).

Lawrence also did not identify himself as a pure student. He believed that doctoral study was to “explore new knowledge, which is different from attending courses, doing homework and obtaining the knowledge” (Part 1, p. 5). According to these three quotes, it implies that participants expressed a common sentiment: they identified themselves as students because the doctoral program is a process of “learning to do research” and “learning to contribute new knowledge.” This emphasised the active, independent, new knowledge exploration nature of doctoral education experience. Compared to traditional learning activities where students are involved in attending courses, doing homework, and obtaining subject knowledge for exams. Participants realised that doctoral study was about exploring and generating new knowledge. This realization highlighted a shift in focus from traditional classroom-based learning to independent research. Due to the change of learning activities, doctoral learning activities were perceived by the participants as different. The participants still regarded themselves as students but different from “pure” students. In other words, participants regarded the nature of doctoral education (i.e. creating new knowledge) as their yardstick to reflect on themselves as students. The participants perceived themselves as students who were actively learning to conduct research and contribute to the creation of new knowledge. This changes implied acculturation to the unique demands and expectations of doctoral education. From the lens of CLT, what participants perceived (learning to do research) was integrated into their initial mental schema as new elements. The incorporated elements were inconsistent with the pre-established mental schemas (as being pure students), which led to the restructuring of their self-understandings (being doctoral students). This process of identity development suggests accommodative learning.

Similarly, other participants restructured their academic identities as they developed their research skills and competencies in doing research. The process of restructuring academic identities also presents a feature of accommodative learning. These participants positioned themselves in a transitional phase from being learners to becoming researchers. For instance, Kelly reported that she was learning and had already acquired specific research skills, such as critical thinking and independent thinking skills, from her doctoral journey. These research skills enabled her to deal with more practical mathematical issues related to industry. As she said: “you need to think about the problems as a researcher” (Part 1, p. 4). Similarly, Alex elaborated on his writing and publishing skills. The skills facilitated a smoother process for publishing his research and helped him to be a part of an academic community. He also

recognised that the gap between his present identity and that of an independent researcher lay primarily in his writing abilities.

I could generate one, two and more ideas, and some (of my) thoughts are even better than my supervisors'. However, when these ideas were put into writing, they (the ideas) could not be as clear as my supervisors wrote. This (writing skills), further, hindered the potential acceptance of my research outcomes. Even though I have better ideas, it is another story to make the idea persuasive and comprehensible (Part 2, p. 5).

Tom noted that his PhD education equipped him with an array of methodologies that enabled him to efficiently acquire desired knowledge and engage in more autonomous research. This competency distinguished him from his previous self. According to these above examples, the research competencies functioned as yardsticks for participants to evaluate their academic identities.

Participants realised that critical and independent thinking skills empowered them to address more complicated practical and research problems. At the same time, compared to the actual research competencies a researcher should have, participants also recognised their current competencies were not equivalent to those of an experienced researcher. This realization made participants identify themselves as being in a transitional phase, where they were still developing their competencies (such as academic writing skills). In turn, this realization also encouraged participants to forge their competencies. In other words, the development of research competencies enabled participants to reflect on themselves and distinguished themselves from their previous selves. From the perspective of CLT, when participants obtain skills and competencies in relation to doing research and thinking, these obtained skills and competencies caused the restructuring in their academic identities, making participants different from the “pure student”. In other words, research competencies and skills were integrated into their initial mental schemas as new elements. Since these new elements were different from the disciplinary knowledge and could not match their original identity (i.e. pure student), participants had to adjust their existing identities to accommodate these new elements. Therefore, it appears that the process of obtaining new knowledge caused adjustments in the participants' self-understandings. This demonstrates the process of accommodative learning.

8.5 Transformation—Reconstruction

Four participants experienced hardship or crisis in their doctoral journey. Within these crisis situations, participants constructed or reconstructed many aspects of their understandings (such as understanding of doctoral study and supervision), particularly in relation to their self-

perceptions. Through this reconstruction process, participants shifted to academic independence, developed their sense of responsibility, improved their critical thinking skills, enhanced resilience and re-gained confidence (also refer to Section 5.6.4). This process of reconstruction enabled them to become more resilient and adaptable, which, in turn, aided them in navigating challenges and crisis situations. This doctoral process demonstrated characteristics of transformative learning.

8.5.1 Resilience from the crisis at the confirmation stage

The transformative learning could take place in the beginning stage of doctoral journey where participants' initial assumptions posed significant challenges and difficulties. In addition, participants were under intense stress due to the deadline for candidature confirmation. In such a situation, participants intensified their study efforts, sought support from peers and supervisors and reflected on many aspects of their doctoral research. These efforts subsequently led participants to restructure their understandings in terms of doctoral study, supervision and being doctoral students. Consequently, the new understandings enabled participants to further navigate their research, overcome challenges and confirmed their candidature.

Early on, participants had a belief that following supervisors' guidance would ensure the success of writing out a research proposal. However, this initial assumption did not enable participants to work out a proposal and put them in a challenging situation with respect to confirming their candidature.

I thought, as students, we need to follow teachers, as this pathway might be the one he wished me to do. On the other, I thought he was the expert and should be very familiar with this domain... I followed my supervisors' instructions, but then I quickly entered a dead end (Tom, Part 1, p. 2)

I was expecting that my supervisors could tell me: 'ok, this direction is feasible, and this part needs to be more specific in a particular direction' or something like that. But I could not obtain such responses... and everything was in mass (Lawrence, Part 1, p. 3),

Supervisors are experienced; they should have supervised many students. It cannot be wrong if following their orders...they wait for me to tell them what I want to do... It took me three months to identify a topic (Nick, Part 2, p. 3).

The above examples illustrate that the participants initially placed a high level of trust in their supervisors' expertise and assumed that following their guidance would lead to success. This trust also indicated a certain dependence on their supervisors' provided direction and instructions. This trust also revealed the participants' initial mental schemas toward the research and supervision approach, which was that participants lacked a realization of self-directedness and independence in the research process.

However, participants' initial mental schemas did not align with the actual experiences of their doctoral studies, which further caused challenges for the students. The situation became worse, particularly when participants failed to select appropriate research topics, run out of time for the confirming doctoral candidature, and faced issues of inadequate communication. Participants, hence, were under extreme anxiety, pressure and stress. This situation further promoted participants to restructure their understandings of their doctoral journey.

I was quite surprised and also panicked when he said so (the research is yours, you have to figure it out by yourself)... and I was hanging there. At that time, I only got 2 months left, and the research direction was still not clear (Caitlyn, Part 2, p. 8).

I was under huge pressure at that time... They discussed with me if I could start with master's courses first because it was challenging for me to continue my doctoral study. (I thought)...Every effort was in vain (Nick, Part 1, p. 3).

I was anxious and frustrated because I needed to re-start research from the very beginning, and there were only three months for submitting my research proposal (Tom, Part 1, p. 2)

The above examples all demonstrate the severe difficulties and pressure participants faced when their initial mental schemas did not align with the actual doctoral studies. The difficulties and pressure increased at the moment there was a shift of responsibility in the study (where students should take more responsibility and independence in their research than the teacher does). In addition, the time constraint and supervisors' disappointment further exacerbated the situation, leading to a sense of pressure, urgency and uncertainty about their doctoral journey. This situation prompted the participants to recognize the need to make adjustment so that they could continue their doctoral journey. In other words, these participants' doctoral journeys were unable to continue unless the participants needed to make adjustments.

In such crisis situation, participants engaged in reflection on their doctoral experiences; and they intensified their endeavours in their work and actively sought assistance from their peers in order to navigate the challenges they faced. These actions resulted in restructurings in the participants' mental schemas in many aspects.

She [supervisor] advised me that stress and panic would only make the situation worse. At that period, she acted as my elder sister, asking about my situation regularly and emphasizing the importance of diet and enough sleep. Additionally, she offered assistance in reviewing the justification of my research (Caitlyn, Part 2, p. 4)

I could not do anything except spare no effort. I thought once I had the draft of my proposal, the rest part would be easier... Normally, I would put these suggestions aside and, meanwhile, respond to the reasonable ones. After finishing everything, I would rethink the unreasonable suggestions (Lawrence, Part 1, p. 6).

I need to find a feasible pathway by myself. Although the research path he (the supervisor) provided was wrong, the research direction is not worthless. It still has something I can explore more... I may not be the student who should follow the teacher's instructions (Tom, Part 1, p. 3).

These examples exemplify the participants' responses to the crisis situation they encountered during their doctoral studies. Faced with challenges that stemmed from a misalignment between their initial expectations and actual experiences, participants sought peer support, devoted more efforts to their research, and reflected on their research. These actions further led to the restructurings of the participants' mental schemas in many aspects. These aspects included the way of doing research, supervision approaches, self-understandings as well as emotions. As Tom and Lawrence explained:

It still has something I can explore more... In addition, my supervisor did not say that I must follow this research path. At that time, I was thinking that, at this stage, I may not be the student who should follow the teacher's instructions. (Tom, Part 1, p. 3).

Doctoral students should have their own ideas thinking about our research. Although we are students, we are not students obeying the teacher's order...(Lawrence, Part 1, p. 3)

Tom's and Lawrence's cases demonstrate that they changed their perceptions of doctoral education, particularly in terms of their self-understandings and how they deal with crisis situations. Caitlyn added: "After the confirmation, I had a sense of accomplishment, and I felt that every devoted effort was worth it..." (Part 1, p. 4). Likewise, Lawrence also explained that, through that period, "I felt like obtaining a new life, reviving from that crisis..." (Part 1, p. 7). The examples showed they realised doctoral students should take greater responsibility in their research rather than relying solely on supervisors' instructions, which indicated a new understanding. It signified a growing recognition of the need for responsibility and independence in doctoral research under their self-understanding as doctoral students. This understanding aligns with the academic expectations for doctoral students, who are seen as independent scholars responsible for driving their research. These examples also demonstrated participants' strong resilience and emotional adjustments. Participants experienced a sense of accomplishment, a feeling of revival and confidence after overcoming the challenges. These indicate an emotional response, and signified a transformation in attitudes towards their doctoral studies. Compared to the participants' initial understandings (i.e. doctoral students should rely on the supervisors' guidance to conduct research), the new understanding indicated significant restructurings in the participants' mental schemas. That is, participants adjusted from being students who relied on teachers' directives to being independent learners who took ownership and responsibility for their academic journey. They also adjusted their emotional

aspects accordingly. That means, participants re-gained confidence and overcame the crisis, presenting as acculturating to their doctoral journey. This process involves transformative learning.

8.5.2 Re-adapting to supervision

The data revealed that transformative learning could also take place when participants experienced critical incidents, like changing supervision panels. Through participating in communication with disciplinary scholars, reflecting on their research, and communicating with supervisors, participants adjusted their self-understanding and understanding of doctoral research and even their emotional aspects. These adjustments enabled participants to become more resilient and adaptable, which, in turn, aided them in navigating challenges and crisis situations.

The changes in the doctoral supervision panels resulted in a mismatch between the participants' existing research and the new supervisors' expectations. This mismatch posed a significant challenge, cognitive dissonance and stress for participants. For instance, in Nick's case, the expectations of his new supervisors did not coincide with his ongoing research, prompting him to redefine his research topic. This led to insomnia and psychological distress for Nick.

I thought I had already presented it in my research proposal. Why do I have to return to the starting point? Other peers were making progress, but I was moving around in the same place. I was very nervous and often had insomnia. Re-developing a research topic was very stressful (Part 1, p. 6).

Hilton also shared similar experiences, where he had to incorporate his supervisors' suggestions and ideas so that he could continue his research progress. This made him feel that the efforts he had previously invested were now seemingly wasted.

I was so sad and pessimistic at that time; not really because my secondary supervisor went abroad but because he contributed lots of ideas to my research when I analysed my data... Now I was recommended to analyse the data from a new direction, which means what I did was in vain... it was really a waste of time (Part 1, p. 9).

Hilton and Nick highlighted the need to redevelop research to ensure continuation of their doctoral journey. At the same time, they experienced distress, sorrow and pessimism. This situation indicated a significant mismatch between the participants' research content and the new situation. In other words, their existing mental schemas were experienced as being unsustainable, or the schemas could not ensure their research continued as planned. Participants' stress and sorrow embodied their emotional reactions to the crisis situation. However, this situation promoted participants to find a way out.

The first and foremost action that participants took was to critically reflect on what they experienced across many aspects (e.g. their research contents, supervisors' decisions, the approach to doing research, how to respond to the supervisors' feedback, and even who they are in the doctoral programme and in the future). Meanwhile, participants actively participated in various forms of academic interactions. As Nick and Hilton explained:

After attending a conference, one expert raised her idea that the idea of my study could go further...her suggestion was very specific and I know how to develop my study... the expert's suggestions made me think about my supervisors' ideas (Nick, Part 1, p. 10).

After obtaining the feedback, do you need to revise the writing accordingly? For respect reasons, I should change it immediately... it is unnecessary to revise the writing repeatedly. I, then, discussed with my supervisor that I just wish to graduate and let's send it to the examiner to see their comments (Hilton, Part 1, p. 12).

Participants participated in conferences and discussions with supervisors. Engagement in communication with scholars in a subject community or discussion with supervisors indicated social interaction of academic acculturation. Moreover, these examples also demonstrated participants' reflective thinking. That is, they placed the doctoral supervision in a critical perspective, and participants also reflected on who they are and how they do research. By doing so, participants adjusted their understanding of their doctoral research content, and they adjusted their understanding of themselves and the way of supervision.

I was thinking that, since it is my research, and I am doing my research. Although I am his student, I am not his employee nor doing research for him. If in that case, why don't I stick to my ideas? (Nick, Part 1, p. 9)

The most important is that we should voice up and speak out our wishes and our needs. This is not the same in the Chinese environment, if we do not express our needs, no one would know our intention. Especially at this stage, we are not the students being commanded, and supervisors do not command our obedience... (Hilton, Part 1, p. 14)

The examples above exemplify the shifts in participants' mental schemas. within contrast to their prior mental schemas, which dictated an obligation to heed supervisors' instruction, participants shifted to think that supervisors do not command students' obedience as Chinese teachers did. Moreover, participants also restructured their self-understandings. As Hilton described: "What they did was to train me to be a scholar who could conduct independent research in the future" (Part 1, p. 10). Similarly, Nick expressed, "Although we are students, we are not students obeying the teacher's order..." (Part 2, p. 3). These adjustments enabled participants to have an inclusive understanding of doctoral supervision and themselves as doctoral candidates, allowing the participants to be more confident in their doctoral journey. Nick noted that supervisors assisted students "to do something more interesting and to explore

further. Although the challenge made me uncomfortable, this is his supervision style" (Nick, Part 2, p. 9). Hilton became less anxious and depressed, and he shifted to grateful for his new supervisors who could criticize his study and train him to be an independent researcher. In essence, participants underwent restructurings in their emotional patterns, identities, and understanding of doctoral supervision. These examples also demonstrated that participants shifted towards accepting the new doctoral supervision model, adjusting their attitudes, and displaying greater confidence and independence in their doctoral pursuits. This indicated a significant restructuring of their mental schemas, as well as an increase in their resilience and adaptability. This restructuring process presents as a feature of transformative learning.

Chapter Summary

This chapter presents five approaches by which participants organised their mental schemas during their doctoral journey. Not all the participants had relevant knowledge for their doctoral journey (such as skills in using learning tools). For these participants, they cumulated knowledge for their doctoral research during the academic acculturation. As to the research skills, language and doctoral supervision, participants' previous education experiences helped to project expectations for their doctoral journey. Through the doctoral journey, participants enriched their knowledge and research skills. Yet, participants' previous experiences and knowledge were not always consistent with their doctoral journey, which could lead to restructuring their understandings (such as understandings of independence, supervision and self-understanding). The adjustments present as a feature of accommodative learning. In some extreme cases, academic acculturation was painful and distressing. Participants' pre-established knowledge did not help and caused serious problems. Participants had to restructure their mental schemas across many aspects to ensure the success of their doctoral study. However, once these adjustments were made, participants regained their confidence and obtained a more inclusive understanding of their doctoral journey.

Chapter 9: Discussion

The purpose of this study was to examine academic acculturation demonstrated by Chinese PhD students studying in New Zealand. Chapters 2 and 3 (Literature Review and Theoretical Framework) identified the theoretical and research gaps in the previous studies related to this topic. These two chapters also theoretically illustrated the feasibility of using Comprehensive Learning Theory (CLT) in understanding academic acculturation. Findings Chapters 5 through 7 revealed the components (learning dimensions) of academic acculturation and Chapter 8 showed five types of processes by which Chinese PhD students developed their mental schemas during their doctoral journey.

This chapter interprets and evaluates the findings within the context of relevant prior research, and proposes a theoretical framework for academic acculturation. This chapter starts with an overview of the findings from Chapters 5 to 8. The overview illustrates four distinct acculturation processes based on the findings and CLT. The second section interprets these four academic acculturation processes from cognitive, driving forces, and interaction aspects. Next is a discussion on the situations in which acculturation was hindered. This chapter ends with an overarching theoretical framework for academic acculturation and an evaluation of this framework.

9.1 Categorizing Academic Acculturation

This section synthesizes and summarizes findings (from Chapters 5 to 8) to provide an interpretation of academic acculturation among the Chinese doctoral participants in my study. It begins with an overall summary and integration of the key findings. The first subsection identifies four distinctive acculturation processes and the subsequent sections provide further examination of these acculturation processes, offering a more in-depth interpretation by comparing the findings with relevant previous studies. By doing so, this section addresses the central question: How do international Chinese PhD students learn to acculturate academically in a New Zealand university?

9.1.1 Overview of the research results

Chapters 5-7 respectively detailed the elements of academic acculturation. Chapter 5 focused on the learning content that the Chinese PhD students encountered during their doctoral journey. Chapter 6 explored the driving forces for academic acculturation. The approaches by which students interacted with their surroundings were illustrated in Chapter 7. In Chapter 8, approaches through which participants structured their mental schemas embodied the learning

types that they experienced during the academic acculturation. These findings addressed the research sub-questions:

- (1) What and how did the Chinese PhD students learn during academic acculturation?
- (2) What incentive components influenced the Chinese PhD students to acculturate academically?
- (3) How did the Chinese PhD students interact with the New Zealand academic environment?
- (4) What types of learning did the Chinese PhD students experience during academic acculturation?
- (5) What barriers prevented the Chinese PhD students from acculturating to the New Zealand environment?

Table 9.1 illustrates the relationships among learning dimensions, key findings, and their relevance to the research questions. The key findings indicated that academic acculturation involves diverse learning contents, requires various incentives (or driving forces) to occur, and is achieved through various social interactions.

To acculturate to doctoral education in a New Zealand university, the Chinese participants learned substantial content during their doctoral journey. Chinese PhD students had to enhance their English language proficiency to comprehend people's ideas and to express their own ideas academically. They had to learn to enhance academic attitudes (responsible, earnest, and meticulous) that they came to understand an academic should have. They needed to be able to use university resources to facilitate research efficiency and to learn to be academically independent (taking initiative and being responsible, having critical and independent thinking) in their research. They had to become familiar with the doctoral supervision process to better work with supervisors in order to achieve academic success. In addition, the students had to establish a clear self-understanding of who they are and who they are going to be in order to fulfil the requirements of being a part of academia.

Table 9.1 Acculturation Components, Key Findings and Research Questions

Finding Chapters	Key Findings	Research Questions
Chapter 5: Content	(1) Enhancing language proficiency; (2) Acquiring a set of behaviours and attitudes; (3) Learning to use university resources; (4) Transitioning to academic independence; (5) Learning to work with supervisors; (6) Constructing academic identity; (7) Misunderstanding as barriers to academic acculturation	What and how did the Chinese PhD students learn during academic acculturation? What barriers prevented the Chinese PhD students from acculturating to the New Zealand environment?
Chapter 6: Incentive	(1) Emotional aspects as the incentives for academic acculturation; (2) Dissonance as the incentives for academic acculturation; (3) Desire and Needs as the incentives for academic acculturation; (4) Ambivalence— Complexity of incentives; (5) Defence against academic acculturation	What incentive components influence the Chinese PhD students to acculturate academically? What barriers prevented the Chinese PhD students from acculturating to the New Zealand environment?
Chapter 7: Interaction	(1) Observing people’s behaviours; (2) Communication and interactions; (3) Participating in academic activities	How did the Chinese PhD students interact with the New Zealand academic environment?
Chapter 8: Types of Learning	(1) Establishing Foundations for Doctoral Journey; (2) Expanding Knowledge and Skills; (3) Constructing multiple identities (4) Restructuring understandings; (5) Reconstructing understandings	What types of learning did the Chinese PhD students experience during academic acculturation?

When experiencing the learning content for the doctoral journey, participants aroused both negative and positive emotional aspects. Since the participants were moved by the detailed pastoral care from the supervisors, these emotional aspects contributed to fostering adaption to the less hierarchical student-supervisor relationship and collegial interactions. Participants' existing expectations of doctoral research were different from what they actually experienced, which aroused participants' negative emotions and further led to reflective thinking. The self-reflection process then led to adjustments in the participants' understandings and fostered academic acculturation, such as a recognition of the need to be proactive, approach their research critically, and adjust to independent research. The desire for self and professional growth initiated students' efforts and resilience to overcome challenges. The desire for professional development and self-esteem also enhanced research engagement, research skills, language proficiency and research competencies. There were moments when some participants wanted to give up their doctoral journey; at the same time, they wanted to persist to complete their research. In such situations, the participants' volition, determination, and persistence became crucial sources of strength, enabling them to overcome challenging periods within the doctoral journey.

In the interaction dimension, the Chinese PhD students observed their supervisors' supervision strategies when experiencing doctoral supervision, which helped the students align their actions with their supervisors' expectations, leading to more effective collaboration. Additionally, observing peers and supervisors in academic endeavours shaped students' academic behaviours and attitudes. Communication with peers provided orientation, emotional support, and enriched research experiences. Informal supervisor interactions established a friendly rapport, aiding transitions between academic and non-academic settings. The doctoral study itself, presented as one activity, involved independent effort with proper guidance of supervisors, and fostered students' research competencies and perceptions of the doctoral journey. Supervision interactions boosted research skills, confidence, and academic identities. Importantly, engagement with scholars in the disciplinary field enriched students' subject knowledge and research skills; it also nurtured students' sense of belonging in the academic community.

Overall, the findings in Chapters 5-7 present academic acculturation from the perspective of the content, incentive and interaction dimensions. The components of these three dimensions are interwoven into students' mental schemas in the academic acculturation. Hence, the structuring approach of the mental schemas defined the distinctive feature of the academic acculturation. This is because each participant's mental schemas includes their previous

experiences and knowledge, and the individual structured their mental schemas based on what their previous experiences, knowledge and what they experienced in their doctoral journey. These experiences and knowledge also determined the content that the individual needed to learn in the new academic environment. The acculturation process also hinges on an individual's incentives that drive them to acculturate. The process is situational; it also links to the interactions that students have with their surroundings.

In Chapter 8, the analysis revealed that the Chinese PhD students demonstrated five distinct types of organising their mental schemas (namely "cumulation," "assimilation," "multiple identity construction," "accommodation," and "transformation"). Cumulation occurred when students lacked relevant knowledge/skills, which they cumulated (such as technical skills and requirements) for their doctoral (such as research skills and language proficiency). The mental schemas provided a foundation for their doctoral journey and were enriched during the doctoral journey. Assimilation was present when students had already established relevant mental schemas. Multiple identity construction indicated that students built two streams of understanding, one for navigating complicated academic interactions and the other for non-academic interactions. Additionally, students' prior knowledge and experiences didn't align with the demands of their doctoral journey, triggering restructurings in their mental schemas (such as independence, supervision, and self-perception). The restructurings were categorised as accommodation. Transformation took place in extreme situations where participants doctoral studies were challenging and distressing, requiring a significant restructuring in students' mental schemas.

These five processes of mental schema organisation respectively marked academic acculturation with specific features: establishment of a knowledge base, knowledge expansion, construction of multiple schemas, and the restructuring and reconstruction of mental schemas. These mental schema structuring approaches aligned with studies that focused on people's psychological changes that occur when two groups interact (Berry, 2005). This is because the psychological changes emphasise individual's internal processes.

Among these five mental schema organization processes, cumulation needs to be further elaborated upon. In Section 8.1, cumulation indicates that students obtained a group of knowledge that they did not have before their doctoral journey. Specifically, some participants (such as Alex, Jade, and Nick) did not have knowledge in and experience of using university resources (e.g. software). They had to cumulate skills and knowledge regarding the use of learning tools and resources. The newly obtained knowledge enabled participants to enhance the efficiency of doing their research. New knowledge acquisition means that participants

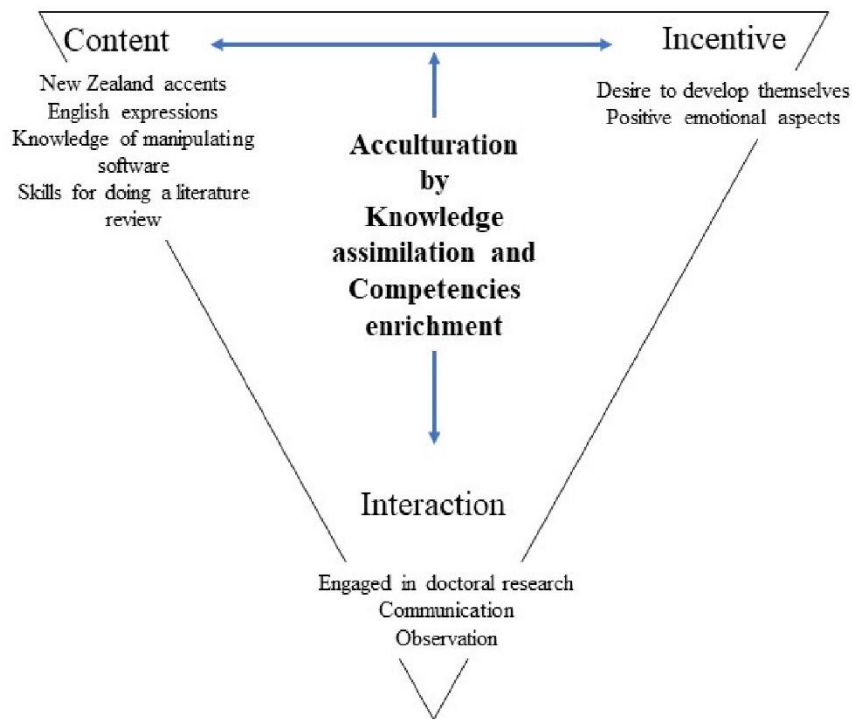
cumulated knowledge and skills. The knowledge functioned on the participants' doctoral journey, which indicates that participants adopted the new knowledge in their doctoral journey. The students connected the newly obtained knowledge with their existing experiences of doing research; the newly obtained knowledge is transferred or connected to the doctoral journey. The connection presents as a feature of assimilation for academic acculturation. In this sense, cumulation cannot be regarded as a solely acculturation process, but it set a foundation for their academic acculturation. Participants cumulated knowledge and adopted the knowledge to their doctoral journey, which demonstrated a feature of assimilation.

9.1.2 Assimilation

Assimilation presents a type of acculturation process characterised by knowledge expansion and skills acquisition. According to the findings from Chapter 8, students' pre-established mental schemas helped their doctoral research and interactions with supervisors in the initial stage of PhD journey. While undertaking their doctoral study, students enhanced their pre-established experiences leading to a better fit into their doctoral journey, such as handling more complicated research tasks, managing their research and quickly identifying the knowledge required for their research.

Figure 9.1 integrates the findings from Chapters 5 to 8 and outlines this acculturation process. The figure shows three dimensions included in this process. According to findings from Chapters 5 to 8, participants were motivated by their strong desire to develop themselves. Having relevant experiences, participants did not report serious challenges in their doctoral journey, and demonstrated positive emotions about this journey. By fully engaging in research, communicating with supervisors and observing how peers did their research, participants enriched relevant knowledge and their competencies (such as understanding New Zealand accents, knowledge for manipulating software, skills for doing a literature review and methodology). This knowledge and skills helped participants better manage their research and tackle more complicated learning tasks.

Figure 9.1 Assimilation



As described above, academic acculturation through assimilation features knowledge acquisition and enrichment. This acculturation process echoes ideas of cultural learning or socialization (e.g. Danso & Aalgaard, 2019; Russell, Gaudreault, & Richards, 2016). Specifically, individuals acquire cultural knowledge, academic skills, and values that enable them to fit into new cultural environments (Wendan Li & Collins, 2014). With academic expectations, standards, and norms of academia being internalised, students moved from “outsider” to “insider” status (Austin & McDaniels, 2006, p. 400) and could fulfil the requirement of the future research (Russell et al., 2016). In line with previous studies, participants acquired academic writing skills; expanded their knowledge of using learning tools; and obtained further insight into the doctoral supervision. However, in this study, the assimilation process emphasised the importance of students' previous educational experiences, knowledge and research skills (i.e. pre-established mental schemas). The students’ existing mental schemas provided a fundamental base for conducting doctoral study. The students became more proficient in their doctoral research, only after they integrated the new knowledge into their existing mental schemas.

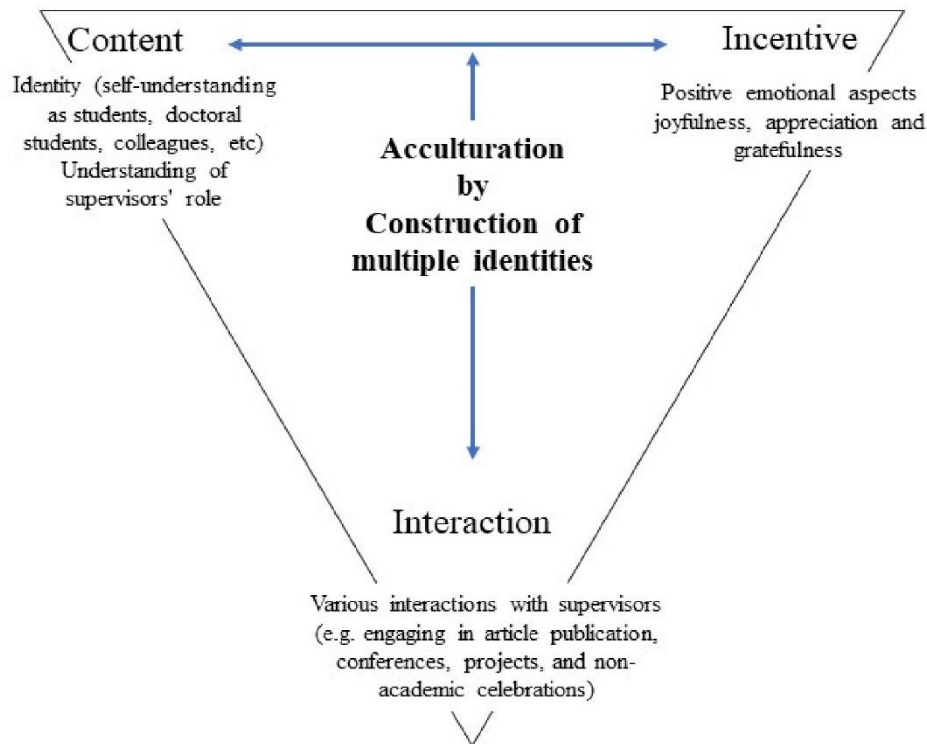
Students (such as Kelly) became more proficient in academic research by enhancing their research skills, and the acquired knowledge enabled them to do more complicated research. A similar situation could be observed when participants knew about the doctoral supervision approach. The situation also took place when the participants improved their ability

to communicate and understand others by learning new expressions or enhancing their English skills. These situations presented a process that students can better navigate the specific part of their doctoral journey by enriching their knowledge. This process is relatively even and smooth, compared to adjustments and transitions (in Section 9.1.2 and 9.1.3). This process may relate to the alignment between students' pre-existing mental schemas and their doctoral journey. The alignment enabled students to use their mental schemas to navigate the initial stage of their doctoral journey. This claim is in alignment with following ideas from previous studies. First, the approach to studying, as well as the willingness, decisions, and desires of students to pursue education abroad, are influenced by their previous educational experiences (e.g. Campbell, 2015; Gonzalez, Wester, & Borders, 2019; McAlpine, Castello, & Pyhältö, 2020). These influences were particularly evident in the way previous experiences assisted students in perceiving the doctoral process (Lynch & Kuntz, 2019). Students who had rich overseas experiences, disciplinary knowledge, research skills and a high level of English proficiency were advantaged in their studies (J. J. Park, Chuang, & Hald, 2018). Second, not all students acculturated to new academic practices through adjusting their original inclinations or experiencing critical reflection (McAlpine et al., 2020; Ritz, 2010; Y. Wang, 2018a).

9.1.3 Multiple identities construction

The construction of multiple identities constituted an acculturation process, characterised by students developing multiple self-understandings to effectively navigate interactions with their supervisors in various contexts. Students had numerous academic and non-academic interactions with their supervisors during which the supervisors played various roles, so these roles cannot be integrated into a single entity. Furthermore, the students' pre-established mental schemas (e.g. understandings of supervisors as teachers and their self-understandings as students) were insufficient to accommodate all the varied interactions with supervisors. Consequently, the various interactions led students to construct self-understandings that could cover the interactions and the supervisors' roles, such as regarding themselves as friends, colleagues, and students of their supervisors. During interactions with supervisors, the students expressed positive emotional aspects (e.g. joyfulness, appreciation and gratefulness), and they accepted their multiple self-understandings. These multiple self-understandings were activated in particular interactions with their supervisors. Figure (9.2) which is based on findings from Chapters 5-8 outlines this acculturation process.

Figure 9.2 Construction of multiple identities



Within CLT, Illeris did not detail how an individual constructs multiple identities by structuring mental schemas. Yet, this study tried to interpret multiple identity construction through the perspective of assimilation or accommodation. If we consider multifaceted self-understandings as distinct but independent schema units/elements within an overarching mental schema, the process of multiple identity construction can be seen as participants integrating new elements into their entire mental schema. In other words, acquiring new knowledge, such as a new identity, doesn't necessarily cause changes in an individual's existing mental schema but rather integrates into a specific identity (such as student or colleague). These identities differ from each other, and they can be activated in various interaction situations, allowing the individual to react and behave accordingly. From this perspective, multiple identity construction process displays characteristics of assimilation.

However, if participants' self-understanding is considered as a whole mental schema, the construction of multiple identities demonstrates a process in which participants subdivided the whole mental schemas into subsections. These subsections facilitated interactions between participants and supervisors in different situations, aligning participants' self-understandings with interactions and supervisors' roles to specific situations. From this perspective, this multiple identity construction demonstrates a strong feature of mental schema restructuring. Thus, academic acculturation can be interpreted as an accommodation process.

The construction of multiple identities aligns with previous studies that acknowledge international students who relocate to a host country may have developed multiple cultural identities and multicultural awareness (e.g., Doucerain, 2019; Jang, Woo, & Henfield, 2014; P. Kuo, Washington, & Woo, 2021; Y. Yang & MacCallum, 2022). The findings from this study are in line with previous studies in the following aspects. Firstly, multiple identities or cultural schemas enable individuals to respond appropriately to various cultural activities and contexts (Doucerain, 2019). Secondly, multiple identities and various interactions play a crucial role in overcoming acculturation challenges and enhancing the student-supervisor relationship (Hemer, 2012; P. Kuo et al., 2021). Finally, this study acknowledges that multiple identities are socially constructed in diverse academic and non-academic interactions. This echoes the idea that interactions with multi-worlds (e.g. academic, personal, and social) causes the formation of multiple identities (Y. Yang & MacCallum, 2022). It also lines up with the idea that supervisors have multiple roles in their relationships with doctoral students (Hemer, 2012).

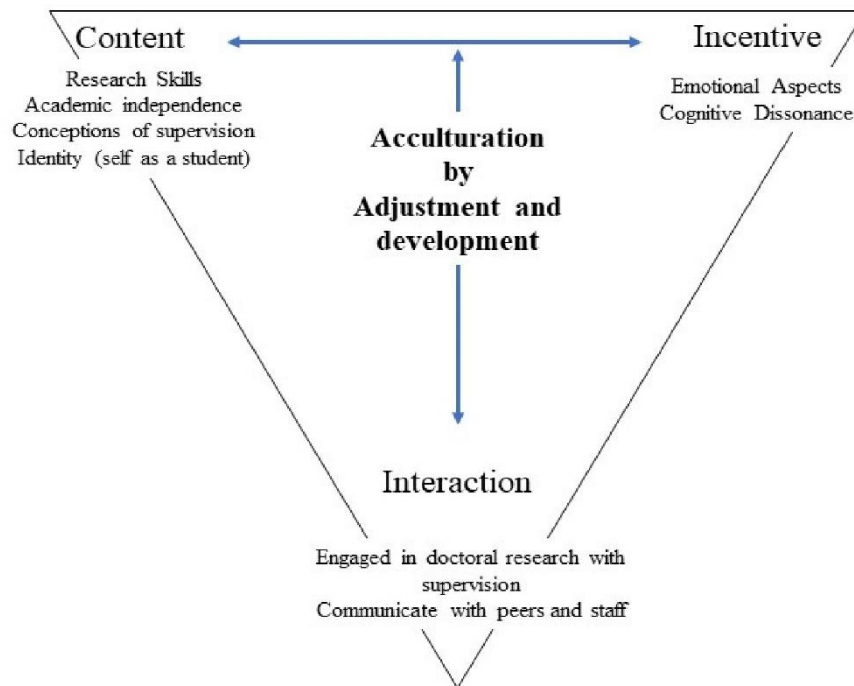
Different from previous studies, which primarily emphasised the development of multiple identities through diverse interactions, this study elaborated on the psychological process of multiple identity construction. The study reveals that the construction of multiple identities among the Chinese PhD students is linked to the interplay between their pre-established mental schemas and the self-understandings they formed in current interactions. The Chinese PhD participants initially identified themselves as students, reflecting their pre-established mental schema, which was rooted in their previous educational experiences (i.e. hierarchical student-teacher relationships and traditional learning activities). However, this pre-established mental schema was insufficient for navigating the diverse interactions encountered during the doctoral journey. Importantly, newly formed identities were unable to integrate into the pre-established mental schemas. Consequently, multiple identities (such as colleagues, researchers, friends and students to their supervisor) were established to cater to these various interactions. By elaborating on the psychological processes, this study helps to explain the previous studies that students' multiple understandings enable students to transit across academic research, personal, and social interactions (Y. Yang & MacCallum, 2022). Moreover, this study emphasizes the crucial role of students' pre-existing mental schemas in academic acculturation, addressing the theoretical gap: "How are new and old schemas organised cognitively"? (Doucerain, 2019, p. 21).

9.1.4 Accommodation

In the findings of Chapters 5 to 8, the Chinese PhD students demonstrated adjustments/restructurings in their understandings. The adjustment arose from the

inconsistency between the students' pre-existing mental schemas (i.e. previous educational experiences and learning experiences) and the actual doctoral journey. These adjustments demonstrated accommodative learning, indicating an academic acculturation process that has a feature of accommodation. The specific acculturation process was that the participants transferred their pre-established mental schemas (such as preconceptions about the independent way of research, and expectations about supervision) into their doctoral journey. However, these mental schemas misaligned with their actual doctoral experiences, impeding smooth research progress and even leading to challenges (this will be further discussed in Section 9.3). This inconsistency triggered participants' cognitive dissonance and negative emotions, which triggered reflective thinking on many aspects of the participants' doctoral education (such as the research content, the independent way of research, and doctoral supervision). At the same time, participants fully engaged in their research, sought peer support, and actively engaged in communication with both peers and supervisors. The reflective thinking and interactions further led to restructurings in the students' perceptions of the doctoral study approach and supervision methods, and participants also realised the importance of autonomy, critical thinking and responsibilities in their doctoral research. This comprehensive process of acculturation is encapsulated in Figure 9.3.

Figure 9.3 Accommodation



This academic acculturation process featured adjustments, and it highlighted restructurings in the students’ mental schemas (such as the approach to doing research, expectations of doctoral supervision and academic identities). The adjustment supports previous studies, which showed that international students encountered psychological adjustments, academic transition (to be autonomous and independent), personal transition and the adjustment of identity during their academic acculturation (e.g., Edwards, 2018; Elliot & Kobayashi, 2019). Similar to these two cited studies, participants credited supervisors and peers with having positive influences in helping them navigate different academic cultures, which could significantly enhance their adjustments and ultimately lead to academic adaptation and meaningful academic experience.

However, it is worth noting that the adjustments emphasised in previous studies appear to be a transition or transformation, which differ from the adjustments referred to in this study in the following two ways. First, the adjustments in this study tended to line up with the previous scholars’ (2016) claim: “individuals would have partial modifications on their conceptions” (Zeng, 2016, p. 7). In other words, the adjustments in the accommodation process emphasised partial changes, which distinguished this process from complete reconstructions (refer to Subsection 9.1.5). This is because the academic practices and expectations of doctoral education in New Zealand were not the same as the students' previous educational experiences.

Yet, students were still able to transfer certain parts of their educational experiences that were relevant to their doctoral research in order to navigate their doctoral journey. Hence students only had to adjust the parts of their expectations that were different from the expectations of doctoral education, instead of reconstructing mental schemas or creating entirely new ones to adapt to the new academic environment. Second, the adjustment highlighted in the accommodation process also included the notion of development by adjustment. Restructuring indicates adjustment and expansion because “assimilation and accommodation are more or less linked together and they are at any rate mutually dependent processes” (Illeris, 2016, p. 41). The adjustments stemmed from the students' recognition that the doctoral journey differed from their initial expectations and previous experiences (such as the approach to doctoral study and supervision style). The process of perceiving the doctoral journey inherently involved acquiring new insights from the environment. In this sense, adjustment in the accommodation process further elaborated the process by which students adapted to the doctoral journey.

The accommodation process disclosed that students encountered elements in their doctoral journey that differed from their prior experiences. These differences, as shown in the findings, were embodied as cognitive dissonance. This dissonance played a crucial role in triggering reflections on doctoral experiences, especially the parts in contrast to their previous experiences. The reflection consequently led students to make adjustments for their doctoral journey. In other words, these academic or cultural differences did not make the academic journey straightforward, even posed challenges for participants, and aroused negative emotional reactions (such as panicked, depressed and worried). However, the differences (arousing cognitive dissonance and emotional reactions) exerted positive effects on the overall trajectory of the doctoral journey. The participants' actual experiences differed from their expectations and previous educational experiences, which resembles the idea of cultural shock or academic differences (e.g. Ai, 2017; Lynch & Kuntz, 2019; Xiong & Zhou, 2018). For instance, Xiong and Zhou (2018) mentioned that the differences in beliefs, values, and social behaviours between East Asians and Americans hindered students' psychological adjustment. In these cited studies, scholars preferred to regard cultural or academic differences as barriers and challenges for adjustments or adapting to a new academic environment (Lynch & Kuntz, 2019; Vyas & Yu, 2018), which will be further discussed in Section 9.3. The academic differences (such as teaching and learning practices) indicated that students lost their familiar signs and symbols, resulting in their anxiety, distress and unhappiness (Q. Yang, Orrego Dunleavy, & Phillips, 2016). In this study, academic differences did not necessarily lead to anxiety and unhappiness among the Chinese PhD students. For instance, participants exhibited

positive emotional responses when experiencing a collegial and less hierarchical relationship with their supervisors, different from the hierarchical and didactic student-teacher relationship in Chinese educational settings. These differences also motivated participants to dedicate themselves to their doctoral studies and increased their willingness to interact with their supervisors. Thus, this study suggests that cultural and academic differences should not be viewed solely as negative aspects. This is because academic differences led to students' cognitive dissonance; the dissonance and emotional aspects together aroused students' countermovement or response-seeking behaviours (Illeris, 2016).

9.1.5 Transformation

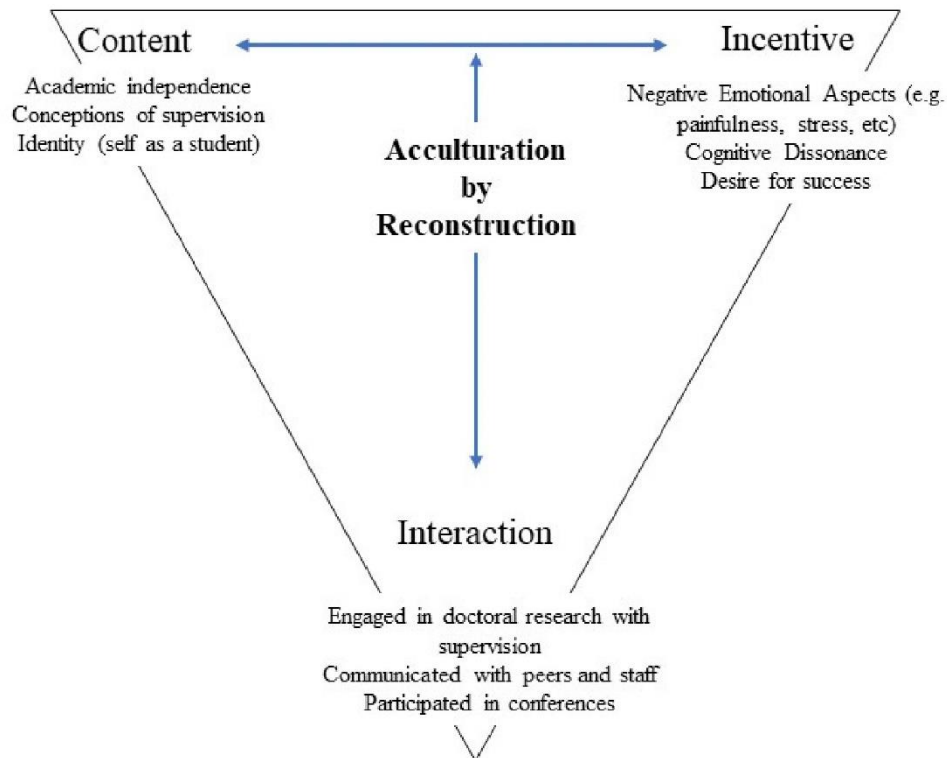
Transformation is a stressful academic acculturation process during which participants such as Nick, Tom and Hilton restructured most of their mental schemas (including their approach to doing research, understanding of supervision, and identities) to continue their doctoral journey. Figure 9.4 outlines the transformation process that the Chinese PhD students went through. This process arose from serious inconsistencies between students' previous experiences and their doctoral journey. Although participants had rich research experiences and skills, the experiences did not apply to their doctoral research and caused serious challenges (or crises) within the doctoral journey. Moreover, participants were situated in crisis circumstances when they approached the deadline for confirming their candidature or their research process stagnated, which further increased the students' stress, disorientation, and distress.

The cognitive dissonance, coupled with stress and the desire for success, drove students to find a way out of the crisis situation. The first action was that students initiated critical reflection on their supervision and existence as doctoral students. Meanwhile, the students also fully engaged in academic activities (such as discussions with supervisors and peers, and discussions with disciplinary scholars), which allowed students to gain new ideas and rethink their experiences. As a result, students made significant restructurings or reconstructions of their mental schemas, from cognitive and emotional aspects to self-understandings as doctoral students. With the schemas being restructured, students became more confident and resilient, and they could better work with their supervisors in navigating the doctoral journey.

As illustrated above, participants exhibited several key features for the transformation process during their academic acculturation. Firstly, participants found that their previous educational experiences were not applicable to their doctoral journey. Secondly, they faced an extreme crisis and experienced negative emotions. Lastly, participants underwent a

restructuring of their most interrelated mental schemas and self-understandings. These features of transformation share similarities with accommodation. Thus, there is a need to detail the distinctions between transformation and accommodation.

Figure 9.4 Transformation



One of the differences between transformation and accommodation is that students who experienced transformation reported considerable challenges in their doctoral journey. For example, some participants (such as Tom) experienced challenges in their doctoral journey because their previous research experiences and expectation significantly differed from their doctoral experiences. In contrast, participants who demonstrated accommodation, such as Caitlyn, Cain, and Alex, indicated that their previous research experiences and expectations were somewhat compatible with their doctoral experiences. Nevertheless, they needed to adjust these experiences and expectations to better align with the demands of doctoral research.

Additionally, participants experiencing transformation encountered significant pressure, characterized by extreme stress and uncertainty. They confronted a situation where their existing experiences or knowledge could not help them in their doctoral studies unless they underwent substantial changes in their mental schemas, including expectations, self-understandings, and approaches to research. Compared to the accommodation process, participants such as Jade, Yin and Danny adjusted their expectation of doctoral study and the

way of doing research, and the participants did not report that they experienced highly stressed or had a crisis situation. The adjustments made by these students were not derived from situations where the doctoral journey was unsustainable or stagnant, and the participants did not report a serious negative emotional reaction.

Furthermore, transformation encompassed comprehensive adjustments in students' mental schemas across multiple aspects, often accompanied by shifts in their self-understandings in a single learning process. For example, some participants (such as Tom and Nick) had to adjust their approach to research and their understanding of supervision in order to overcome the challenges hindering the continuation of their doctoral journey. With these challenges addressed, students displayed changes in their emotional state, such as an increased sense of confidence; and the students also shifted in their self-understandings, such as realizing they were learners training to become independent scholars. In comparison, during the accommodation process, participants primarily adjusted their perceptions of doctoral supervision and took on greater responsibility and independence for their research. These adjustments were characterised by a more limited scope, focusing on specific aspects within their mental schemas.

In sum, the adjustments made during a transformation (as opposed to accommodation) were more comprehensive and extensive, accompanied by crises, stress and pain. Thus, participants had to make changes across multiple aspects so that they can continue and better adapt to their research.

As illustrated above (i.e. the transformation was painful, and was accompanied by students' serious cognitive dissonance and extreme pressure), transformation suggested an academic acculturation process with a stress feature. In addition, this feature accompanied significant restructurings or reconstructions of mental schemas. A significant restructuring with painful experiences echoed previous studies on transformation that transformation took place when students' "continuous flow between past, present, and future is momentarily broken down" (Hoggan, Mälkki, & Finnegan, 2017, p. 50). Dai and Hardy (2021) adopted a tuned transformative learning theory (Gill, 2007) to investigate the academic acculturation. They concluded students changed their values and identities as they went through uncertainty and anxiety. In other words, previous studies and this study all acknowledge that academic acculturation could be painful and stressful. Such stressful experiences stemmed from serious inconsistencies between students' pre-established mental schemas and their doctoral journey. This idea can be found in this study; that is, participants made adjustments in response to stress situations. However, this does not mean academic acculturation only takes place in stressful

situations. The results show the transformation process only took place in situations where students' prior experiences led to significant challenges and stress, necessitating students to find a way out of crises such as confirming doctoral candidature and the change of supervision panel. Not all participants went through a transformation process, which differed from previous studies, showing most international students experienced transformation during academic acculturation (Y. Wang, 2018a).

The differing ideas regarding transformation between this study and previous studies can be attributed to two factors. Firstly, it may be related to the data provided by the participants. The participants did not offer sufficient evidence for me to categorize their acculturation as transformation. Although participants might have undergone significant changes and adjusted many aspects of their understanding, they could not exhaust every aspect of their challenging and painful experiences within a one-hour interview. Participants only presented significant challenges, which could be connected to a fact that transformation enables individual's minds to be more inclusive (Illeris, 2016). Consequently, participants might have viewed the similar difficulties as normal routine for the doctoral journey, perhaps considering these challenges unworthy of sharing, despite my attempts to probe during interviews. Secondly, this study revealed that transformation did not take place in every participant, which could also be linked to differences in the theoretical stance adopted in this study compared to previous studies. The previous studies adopted Mezirow's TL theory (1997) or transformation in acculturation (Gill, 2007), which highlights the transformation in an individual's understanding. However, from CLT, Illeris maintains that transformative learning "takes place when the learner is in a situation with no other way out that can be experienced as sustainable" (Illeris, 2016, p. 47). Therefore, this study reviewed various learning processes occurring during academic acculturation, only categorizing crisis situations and significant adjustments as transformations.

Importantly, the transformation process emphasises the reconstruction and adjustments in many aspects of students' mental schemas. Such reconstruction supports the conclusion that "continual negotiation of multiple internal expectations and conflicts from opposing cultural viewpoints led to cultural adjustment and change in frames of reference" (Kuiper, 2017, p. 31). The various adjustments also embody the aspect that the Chinese PhD students experienced changes in their emotional states (such as regaining confidence), which also echoes the "stress-adaptation-development" emphasised by Dai and Hardy (2021). The acculturation process fostered students' confidence, helped them obtain a sense of belonging and allowed them to rebuild their identity (Bui, 2021; Zhao & Liu, 2022). The notion that the transformation involves comprehensive restructuring in students' mental schema resonates with the findings

of the studies cited. In other words, only when there are major modifications in an individual's understandings can these adjustments be regarded as transformative experiences (Nada et al., 2018); "minor changes with minimal affects to one's meaning perspective do not merit the descriptor of transformation" (Hoggan et al., 2017, p. 51).

9.2 Academic Acculturation Process Embedded in Doctoral Journey

Although Section 9.1 outlined four distinct academic acculturation processes (assimilation, multiple identities construction, accommodation and transformation), it is crucial to note that these processes were highly individualised and contextualised. The Chinese PhD participants did not follow a uniform pattern throughout their doctoral journey. This section begins with interpretation by placing these four academic acculturation processes into the students' entire academic journey. It is, then, followed by explanations of why the students did not demonstrate uniform academic acculturation processes. The explanations consider the perspectives of cognition, driving forces and interactions. This section aims to better address the sub-questions: (1) What and how did the Chinese PhD students learn during academic acculturation? (2) What incentive components influence the Chinese PhD students to acculturate academically? (3) How did the Chinese PhD students interact with the New Zealand academic environment?

9.2.1 Complicated process of academic acculturation

Throughout their entire doctoral journey, the Chinese doctoral students exhibited diverse and complicated acculturation processes. A student could experience multiple acculturation processes during different stages of his/her doctoral journey, each student underwent a unique acculturation process, and not all students demonstrated transformation processes. Thus, for further interpretation, it is necessary to place the four academic acculturation processes within the entire doctoral journey.

An individual participant could experience multiple academic acculturation processes throughout their entire doctoral journey. These multiple processes suggests that the doctoral journey consisted of several stages, and acculturation to the doctoral journey was a continuous process. For instance, during the initial stage of his doctoral journey, Nick acquired skills and knowledge, which allowed him to manage his research more effectively. This stage of acculturation represents the assimilation process. Whereas, when noticing the demands of higher academic independence and responsibilities while developing a research proposal, he restructured his understanding of doctoral research. This stage demonstrates the accommodation process. After confirming his candidature, Nick's doctoral journey faced an

unexpected obstacle due to a change in the doctoral supervision panel. This change posed a threat to his status as a doctoral student. Thus, he adjusted his way of doing research; consequently, his self-understanding as well as his attitudes and understanding of supervision, showed a transformation process. The example of Nick's acculturation process indicates that participants' entire doctoral journey could encompass multiple processes of acculturation. This means that acculturation to the doctoral journey is both a dynamic and continuous process. Any issue arising during the doctoral journey (e.g. change of doctoral supervision panel) could result in knowledge acquisition, understanding restructurings, or re-adaptation. This result does not line up with previous studies that simplified acculturation follows a single pattern, such as knowledge and skills acquisition for adapting to a new environment and U-curve pattern (Ward, 2001; Ward et al., 1998); instead, it supports ideas that academic acculturation involves complex shifts and reorientation (Elliot, 2016).

In addition, the complexity of academic acculturation is also embodied in the fact that academic acculturation is an individualised process. Each participant experienced a distinct doctoral journey. Contrasting with Nick's doctoral journey (as illustrated in the last paragraph), Alex did not demonstrate obvious stress or crisis during the first three years of his doctoral journey, reflecting a relatively smoother acculturation process. While due to pre-existing research experiences and preconceptions of doctoral supervision differing from the reality of doctoral education in New Zealand, Tom experienced stress and had to make significant adjustments when confirming his candidature. Compared to Tom's acculturation experiences, Kelly enhanced her research competencies and worked effectively with her supervisors when developing her research proposal, primarily showcasing an assimilation process in the initial stage of her doctoral journey. The above examples indicate that acculturation to doctoral journeys seemed to be individualised, and the acculturation is related to each participant's experiences and understandings. This also echoed the idea that doctoral practice is a process of refining one's personal perspective on the world (May & Sleeter, 2010), and the process is closely related to environmental influences and an individual's life experiences (Shaffer, 2004).

Acculturation also exhibited a contextualised process. From assimilation to transformation, these processes did not suggest a progression of academic acculturation. Not all participants experienced a transformation process, and likewise, not all participants moved from assimilation to transformation. As presented in the findings, Alex did not undergo a transformation process. Compared to Alex, Tom encountered significant stress during his confirmation stage, even though he possessed years of research experience in an industrial company. He better navigated his doctoral research after he restructured his perceptions of

research (i.e. involving more responsibilities) and consequently restructured his self-understanding, demonstrating a transformation process. Moreover, Tom's transformation began at the beginning stage of his PhD. These two contrasting examples showed that participants did not have to undergo transformation throughout their doctoral journey, and academic acculturation did not follow the route from assimilation to transformation. This could be related to the situations that participants encountered, such as the supervision approach, the research content, supervisors' expectations, and change of supervision panels.

Overall, this study presents four academic acculturation processes. However, it does not mean every student has to experience these four processes. These acculturation processes suggest they could co-exist in every participant's doctoral journey, demonstrating that acculturation could be achieved through various pathways. Importantly, these four processes do not indicate that academic acculturation follows a progression pattern from assimilation to transformation. The potential reasons why these the Chinese PhD students demonstrated some or variable aspects of the academic acculturation processes and why the academic acculturation process displayed a complicated nature will be further discussed in the following subsections 9.2.2 to 9.2.4.

9.2.2 Cognitive aspects in four processes of acculturation

This subsection gives further interpretations of academic acculturation from the cognitive perspective and aims to elaborate on why the findings demonstrate complex acculturation processes.

The first reason why participants demonstrated complex acculturation processes is related to the various learning contents they have to engage with during their doctoral journey. As demonstrated in Chapter 5, participants encountered a range of contents and knowledge (such as academic writing skills and academic independence) that they needed to acquire for their doctoral journey. Acquiring various knowledge and skills enabled participants to succeed in their doctoral journey and to better manage their doctoral research, presenting as acculturating to the doctoral journey. The enrichment of knowledge for acculturating to the doctoral journey aligns with the fundamental ideas of previous academic acculturation studies: academic acculturation is a process of "learning a set of academic culture, writing conventions, unwritten rules of the game" (M. Li, 2016b, p. 38). Students need to learn the new rules and take advantage of available university support to increase their chances of successful completion (Elliot, Baumfield, & Reid, 2016). What this study adds to previous acculturation research is that it emphasises the fact that, to acculturate academically, the learning content

extends beyond language, research skills, or conventions. In this regard, the study expands both the range of themes to be learned and the cognitive aspects considered in academic acculturation studies.

The second reason why each participant displayed a unique doctoral journey (with academic acculturation processes differing from one participant to another) is embedded in the fact that different knowledge requires distinct cognitive processes. This argument is supported by the content dimensions of these four academic acculturation processes (see Subsections 9.1.2 to 9.1.5). For instance, the learning content (such as research skills and attitudes) appears straightforward in the assimilation process. By contrast, the content became more intricate in the reconstruction process (such as academic independence). This argument also resonates with findings derived from earlier studies. For instance, Nomnian (2018) found that, when adapting to communication in an English context, international PhD students can naturally acquire slang through activities such as listening to the news or engaging in more frequent communication. As a result, they tend to experience fewer difficulties in communication. However, transitioning to academic independence necessitates students to navigate between their own comprehension and their supervisor's expectations, which involves continuous back-and-forth efforts and adjustments (Elliot & Kobayashi, 2018; Hu et al., 2020). The cited studies present both a smooth and an uneven acculturation process. These two different processes are supported by the acculturation processes identified in this study; that is, assimilation and accommodation (or transformation). The findings of this study include both processes, showing that academic acculturation can involve various cognitive pathways.

Lastly, not all participants experienced all these acculturation processes, which may relate to the alignment between students' existing mental schemas and their doctoral journey. For example, participants (such as Kelly) whose mental schemas were congruent with doctoral practices in New Zealand typically excelled after enhancing their research skills (more details in Sections 8.1 and 8.2). In contrast, those whose mental schemas did not align with the demands of doctoral education (see Section 8.5) required significant adjustments and even self-understanding restructuring before achieving success in their doctoral studies. Therefore, the smoothness of an acculturation process seems to hinge on the consistency between established mental schemas and the doctoral journey. In addition, having rich mental schemas does not necessarily guarantee a seamless academic acculturation process.

9.2.3 Driving forces for acculturation processes

This subsection provides insight into why the participants exhibited complex acculturation processes. This complexity may be attributed to the unique driving forces of individual participants, which were intertwined with the participants' pre-established mental schemas.

First of all, each participant's prior experiences were unique, which made the reason for doing their doctoral study different. These prior experiences and purposes further shaped participants' attitudes and emotions when participants encountered challenges (see Danny's, Tom's and Caitlyn's cases in Sections 6.1 and 6.4). Additionally, some participants exhibited ambivalence toward their doctoral journey. The driving forces for the doctoral journey supports the previous idea that push and pull factors (such as career development, family expectations, pursuing overseas experiences, etc.) influenced students' PhD journey (F. S. Li et al., 2021). Nevertheless, this study did not categorize the incentives according to “push” or “pull” factors because an individual's motivation is influenced by “contextual, institutional and individual” factors, which are hard to distinguish between (Ding, 2016, p. 121). Importantly, many of the driving forces displayed in this study, such as searching for career development and the pursuit of higher-quality doctoral education or learning opportunities, were rooted in participants' prior experiences. These experiences, in turn, had a profound impact on participants' emotional responses when they encountered challenges, leading to varied doctoral journeys.

Another factor contributing to the complexity of the acculturation process may be related to the mental energy (Illeris, 2016) required for the participants' approaches to organising mental schemas. As shown in CLT, the mental energy required by different types of learning varies due to the extent of consistency between a learner's existing mental schemas and the current learning content (Illeris, 2016). In this study, acculturation by assimilation shows that participants were driven by their need for knowledge acquisition, while acculturation by transformation shows that participants were situated in crises, indicating participants' most experiences (mental schemas) were incompatible with their doctoral study. Participants had to adjust many aspects of their mental schemas, which required them to spend more energy on adjustment than simply acquiring knowledge. Participants whose previous experiences are aligned with doctoral practices did not need to expend much mental energy to adjust his/her pre-established mental schemas. The idea of mental energy is similar to the mental toughness mentioned by S. Zhang et al. (2022) showing: mental toughness influences students' academic journey (such as academic goals); and the Chinese students who have higher levels of mental toughness demonstrate psychological well-being when encountering

challenges. By using CLT, this study can give further elaboration on how incentives (e.g. mental energy or mental toughness) influence students' doctoral journey. Adjustment and transformation requires extra energy to adjust relevant parts of existing mental schemas, or even reconstruct the whole mental schemas, before the new impressions (such as the independent way of doing research) can be incorporated (Illeris, 2016).

9.2.4 Interaction in the academic acculturation processes

The complexity of the academic acculturation process is linked to the dimension of interaction. This section offers a further interpretation of the various forms of interactions embedded in academic acculturation processes. The reason why the Chinese PhD participants demonstrated complicated acculturation processes is linked to different learning contents and the way they learn the contents. This is because learning or cognitive processes are situated in interactions, and the forms of interactions have a certain parallels with the learning content and cognitive processes (Illeris, 2016). In other words, more complex learning content requires more activity-engaged interactions. The acculturation process embodies this idea in CLT. Simpler learning content (such as accents, expressions and university resources) can be obtained through less engagement-involved activities, such as observation and communication (see Hilton's or Alex's experiences in Chapter 7). Participants came to understand accents and expressions, and they learned to utilise resources through engaging in communication and observations. The results of these processes (i.e. understanding accents and using resources) facilitated acculturation to the doctoral journey, and the acculturation process manifested as a feature of assimilation. For the more complex learning content (such as academic writing skills and academic independence), participants often were involved in more activity-based interactions (such as conducting research, having discussions with supervisors, and being involved in research projects), and they experienced adjustments (mental schema restructurings) during these activities, demonstrating accommodation or transformation.

Another factor contributing to the complexity of acculturation processes is the specific contexts of interaction. Participants such as Hilton and Yin engaged in various interactions, including communication, discussions, and participation in research projects, with their supervisors in both academic and non-academic settings. These interactions across multiple contexts resulted in diverse self-understandings, aiding participants in navigating various interactions with their supervisors. The interactions echoed an idea: PhD students engaged in multiple activities to gather the fragments of their PhD journey (Edwards, 2018) and constructed their self-understandings through these fragments.

Finally, the forms of interaction identified by this study need further elaboration. These forms of interaction support previous acculturation studies that focused on the social aspects. For instance, observation, as a form of interaction, echoes Nguyen's (2021) results that students can learn from others and avoid repeating the same mistakes by observing how people overcome obstacles. Engaging in doctoral practice is also consistent with the notion that research itself is a higher-order purposeful action that enhances students' scholarly competencies and independence (H. Zhang et al., 2018). Participants practised their doctoral research with guidance from supervisors, and with the development of research competences, participants can take more responsibilities to conduct their research and can be more academic independent. This research practices (e.g. shift from dependence to independence) supports the idea that students moved from the periphery of the supervision to the dominant place of their studies (Cai et al., 2019; Ding, 2016; Palmer, 2016). Nevertheless, each form of interaction is not a matter of 'either/or', but rather a matter of 'coexisting'. This is because the more activity-based interactions (such as being involved in a research project with supervisors and interacting with disciplinary scholars) may also include communications. In this sense, analysis for academic acculturation should not be limited to a single form of interaction.

9.3 Barriers to Academic Acculturation

Previous sections (9.1-9.2) identified four acculturation processes, which related to how the acculturation took place. This subsection discusses situations when acculturation was hindered or did not take place. These situations related to students' misunderstanding and unwillingness to engage in their research. The discussion in this section addresses the research question: What barriers prevented the Chinese PhD students from acculturating to the New Zealand environment?

9.3.1 Misunderstanding as the barriers

Misunderstandings, on the content dimension, reveal that the inconsistency between students' existing schemas and doctoral practice made acculturation problematic. The findings identified two sources of misunderstandings. One was students' prior educational experiences/mental schemas (e.g. research experiences, skills, etc.), and the other was language issues.

Firstly, some participants' (such as Tom, Lawrence and Nick) previous educational experiences hindered acculturation, which supports the idea that cultural and academic differences are challenges, and they negatively influence students' academic performance and doctoral journeys (e.g. Lynch & Kuntz, 2019; Vyas & Yu, 2018). Specifically, the adaptation

to “partnership supervision” (i.e. supervision that is rooted in support and entails a less hierarchical power dynamic between students and supervisors) was hindered by the students’ power distance-related perceptions (Elliot & Kobayashi, 2019). Secondly, language issues hindered academic acculturation, which is in line with previous studies that language prevented students from communicating with supervisors and peers, assimilating academic rules, and establishing social networks (e.g. Ye & Edwards, 2017; Y. L. Zhang, 2016).

This study stresses that academic/cultural differences and language are the factors/sources creating misunderstanding that could detour the doctoral journey. Focusing on misunderstanding from the cognitive perspective helps to further reveal the mechanism of how cultural factors and language hinder students from acculturating academically. In other words, the construction of misunderstanding reveals that: “the emergence of various differences in expectations and understandings of academic practices” (Cutri et al., 2021, p. 7) results in difficulties for the transition to independence (Hu et al., 2020), giving students a sense of being stalled and distressed. Lastly, mislearning and misunderstanding further support the argument in Section 9.2.1: The richness of mental schemas does not necessarily guarantee a smooth academic acculturation process. Students who had rich prior experiences could also go through the reconstruction process.

9.3.2 Defence against acculturation

As shown in the findings (from Section 6.5), most participants were unwilling to engage in their research at times during their doctoral journey. Three participants explicitly stated their reluctance to change their identities. One reason could be that students were tired (of their doctoral journey) and had lost patience and interest. Another was that students realised that what they experienced was different from their understanding, and they did not want to change their existing understanding. The above two reasons indicate that students’ driving forces were countered by inner factors that functioned as barriers to acculturation. The loss of interest and getting tired of doctoral study aligns with earlier findings that that students’ inner factors (e.g. low self-efficacy, lack of personal interest, low confidence, tiredness, loss of patience or interest, etc.) prevented students from professional development and academic acculturation (Gonzalez et al., 2019). Also some students were unwilling to adjust their understanding and identities, preferring to maintain their original conventions and original identities (Li Wang, 2019).

According to CLT, the inner factors that hindered academic acculturation for the participants are related to psychological defence. Psychological defence is activated against the

learning activities that may threaten, limit or disrupt the individual's mental balance (Illeris, 2016). In this sense, demotivation or loss of interest could be regarded as a form of psychological defence, which helped participants reserve energy in their research process (such as the endless thesis revision, and academic article revision). Moreover, those participants who were unwilling to change their student identity could also be interpreted as showing a form of defence. Participants being were unwilling to change their student identity may relate to the fact that, as explained by Hilton, other identities (other than student) didn't align with their existing self-understandings. In other words, identity restructuring might cause mental imbalance or inconsistency in the participant's self-understandings, which leads participants towards maintaining their existing identity. However, keeping student identity unchanged doesn't imply that academic acculturation didn't occur. As illustrated in the multiple identity construction approach, participants also constructed other identities (such as colleagues, friends, etc) to navigate various interaction situations with their supervisors. For example, they identified themselves as students and their supervisors as teachers during supervision sessions, but regarded themselves as colleagues when collaborating on research projects with their supervisors. In this sense, the notion of psychological defence elaborates further on students' occasional unwillingness to devote energy to their research and to adjust their original identities.

9.4 Evaluating the Acculturation Framework

Sections 9.1 to 9.3 provide insight into academic acculturation processes, and the factors that hindered these processes. This section provides a theoretical framework for academic acculturation and evaluates the theoretical framework. It is followed by a comparison between the created theoretical framework and theories used by previous studies, and discusses whether the created theoretical framework could give a comprehensive perspective in understanding academic acculturation.

9.4.1 A framework for academic acculturation

Chapters 5-7 delineate the components of academic acculturation, encompassing various learning domains, incentives, and interactions.

Integrating the findings from Chapters 5 to 8, this study categorises four acculturation processes; these are given in Section 9.1. These processes, consisting of three dimensions, can be synthesised into an overarching theoretical framework depicted in Figure 9.5. The created figure draws inspiration from both research findings and Illeris' 2016 original framework (refer to Figure 3.1 in Chapter 3). In Chapter 3, this framework stated that learning contains contents,

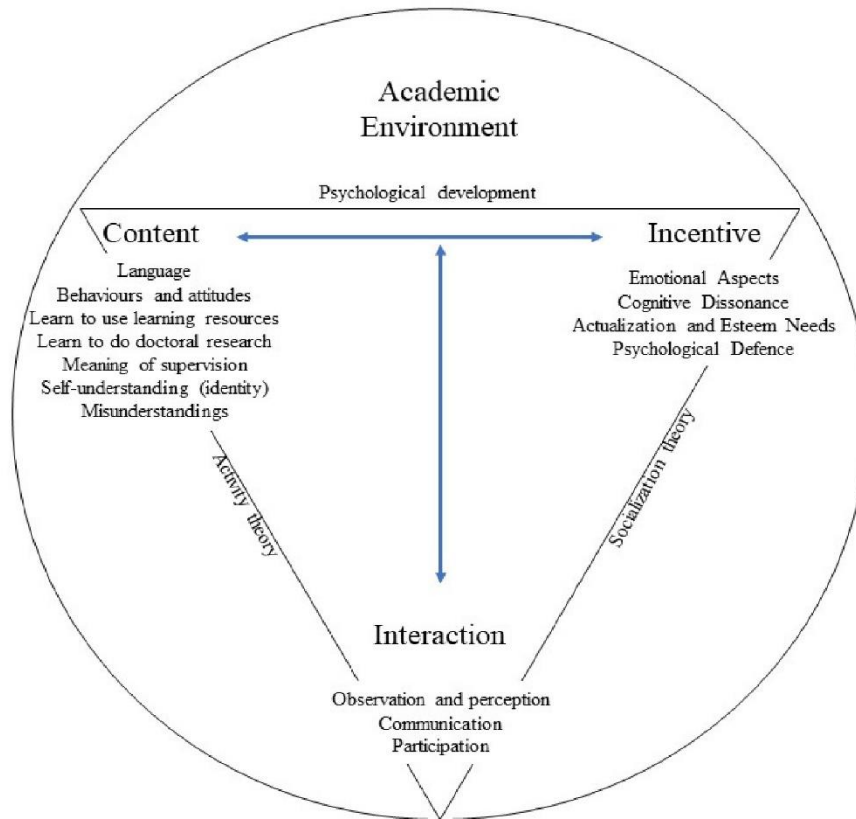
incentives and interactions. The triangle is enclosed by a circle, signifying that all learning activities occur within a specific environment.

The proposed theory (Figure 9.5) presents three dimensions, each with specific components, that are essential to any academic acculturation process. These dimensions include the academic acculturation content, driving forces, and interaction methods, corresponding to the content, incentive, and interaction aspects of CLT. Figure 9.5 suggests that the dimensions in the CLT triangle can be broken down into more specific elements within the context of academic acculturation. As students apply their existing knowledge, are driven by certain factors, and interact with others, the elements within these three dimensions interweave in various ways, leading to different approaches to academic acculturation within New Zealand PhD education.

In CLT, Illeris (2016) presented four types of learning, each corresponding to a specific mental schema structure. This study adopted these to analyse students' academic acculturation and found supporting evidence for these four types of learning. Additionally, this study also identified an additional approach to mental schema construction (i.e., multiple identities construction, Section 8.3), which is outside the four types of four types of learning. In other words, the findings offer a new perspective on CLT, contributing to its enrichment and further development. Moreover, these findings not only exceed Piaget's (1965) idea of Assimilation and Accommodation but also show an individual can experience multiple learning types during their academic acculturation. These findings further indicated the complexity of academic acculturation.

As illustrated in the previous paragraph, the specific academic acculturation approach can unfold through various pathways depending on how individuals structure their mental schemas. Figure 9.5 does not intend to embody the academic acculturation processes. Nevertheless, the created figure, with its three dimensions (the components from dimensions of content, incentive, and interaction), can provide an overview of the academic acculturation process. The created framework for academic acculturation also indicates that the specific components from the three dimensions could be combined in many ways each forming a distinct acculturation process. I would use a circle to surround an individual's mental schema (three dimensions shown in Figure 9.5). This can better indicate all academic acculturation processes occur within a specific academic environment.

Figure 9.5 Academic acculturation framework



These four types of academic acculturation processes align with and cover the paths of psychological adjustment that are evident in previous studies. For instance, assimilation and multiple identity constructions correspond to studies that suggested academic acculturation encompasses cultural learning, socialization, cultural knowledge acquisition, and multicultural identity development (e.g. Danso & Aalgaard, 2019; Doucerain, 2019; Russell et al., 2016; Y. Yang & MacCallum, 2022). Accommodation and transformation presented acculturation by schema adjustment and transformation. These two processes correspond to previous studies that claim academic acculturation includes perception adjustments, identity adjustments, psychosocial adjustment and transformation (e.g. Elliot et al., 2015; Y. Wang, 2018a; Ye & Edwards, 2017; Zeng, 2016).

The foundation of this proposed theoretical framework is to view academic acculturation as a learning process. This process involves three key elements: the content of what is learned, the driving forces behind the learning process, and how learning is achieved through interaction with the environment. For the international Chinese students in this study, their learning encompasses not only professional knowledge and research skills, but also academic independence, language proficiency, supervision approaches, and self-understanding.

Their acculturation is interwoven by a range of desires related to academic success, emotions, and cognitive dissonance.

In response, these students observed and learned from others while engaging in extensive communication and various academic activities to achieve these learning objectives. However, not all students needed to learn every aspect (e.g., using university resources), nor did they all exhibit every element of the incentive dimension (e.g., strong cognitive dissonance or panic) as the driving forces of their acculturation process. Additionally, not all of them participated in every form of interaction (e.g., collaborating closely with supervisors). Despite this, all participants demonstrated elements of these three dimensions, reinforcing the idea in CLT that a comprehensive learning process should consider all three. The variation in their acculturation patterns can be attributed to the different mental schemas they had established before entering their PhD studies in New Zealand. Especially in Chapter 8, the finding shows five distinct types of learning within academic acculturation. These types of learning suggest that academic acculturation can lead to many ways of adjustments in the mental schemas of the participants. These ways indicate that academic acculturation can follow various pathways, depending on the student's pre-existing mental schemas and their actual doctoral journey, as well as how students organise these schemas.

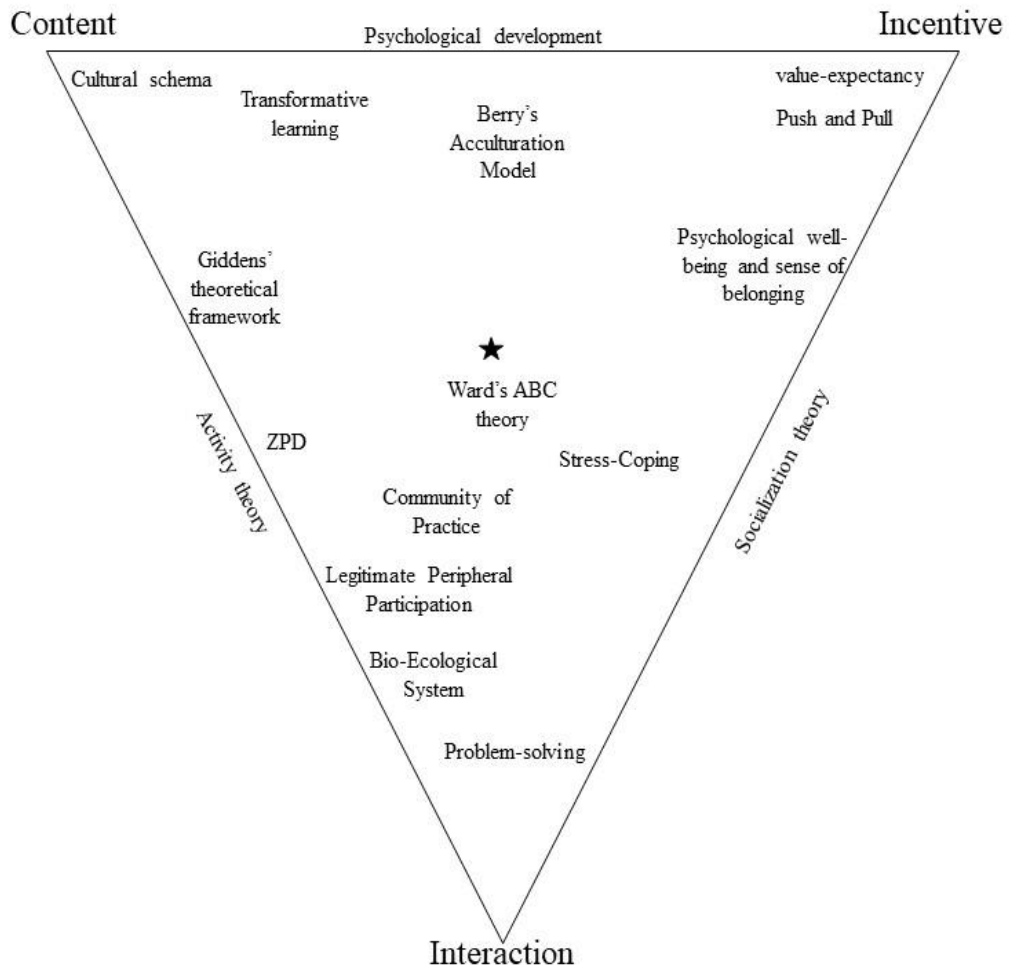
9.4.2 Theoretical positions in three dimensions of acculturation

With the theoretical framework for academic acculturation established (Figure 9.5), this subsection serves the following three key purposes. Firstly, it aims to evaluate whether the proposed framework can address the theoretical gaps identified in Subsection 1.2 and 2.6. To achieve this purpose, I compared the new framework with previous theories by assessing whether the framework covered the main focuses of previous theories. Second, this section enables further discussions for future researchers, particularly regarding the strength and limitations of this proposed theory (including previous theories) in exploring academic acculturation. Lastly, the section provides an organisational tool or an overview for future researchers interested in the specific domain of academic acculturation, thereby, helping them understand academic acculturation comprehensively and identifying research gaps.

As shown in the theoretical framework (Figure 9.5), the fundamental idea is that academic acculturation processes encompass three dimensions: content, incentive, and interaction. I simplified the framework and retained three dimensions at the angles of the triangle and schools of theories on the triangle sides (see Figure 9.6). I attempted to fit representative theories into a three-dimensional triangle. Based on the theories evident in the

literature review, this framework could cover previous theories and aid in interpreting the characteristics of the theories that have been adopted by previous scholars. The fundamental concept is that the position of previous theories placed within the triangle indicate the approximate extent to which each theory emphasized the tension of content, incentive, and interaction. A position closer to the pole of each dimension indicates that the theory places more emphasis on that particular dimension within acculturation.

Figure 9.6 Theoretical positions in the tension of three dimensions



On top of the triangle, the line that links the content and incentive dimensions represents the school of psychological development. This stream of theories (e.g. Piaget's theory and Kolb's Experiential Learning) emphasises cognitive and psychological development, but social conditions and interactions are briefly considered (Illeris, 2016). The left-side line connects the content and interaction dimensions, which are represented by theorists (such as the theory from Vygotsky and Engeström) who emphasise cognitive development and societal conditions, thereby, labelled as activity theory (Illeris, 2016). The right-hand line presents the theoretical

stances that focus on the incentive and interaction of learning, i.e. socialization theory (Illeris, 2016).

In light of this background, I have placed cultural schema theory (Nishida, 2005) in the pole of content dimension, for this typical perspective predominantly focuses on people's cognitive adjustment and development, especially Zeng's (2016) research that used a developmental approach to investigate students' cognitive development (e.g. Zeng, 2016). Transformative Learning Theory concerns cognitive development; consequently, it is close to the content pole but slightly towards the incentive and interaction. Corresponding studies can be found in studies (e.g. Dai & Hardy, 2021; Y. Wang, 2018a), which focus more on people's cognitive adjustment (e.g. students' identity, agency and values, as well as obtained belongingness) but less on interaction. Berry's (2005) acculturation model and similar studies (e.g., Y. Huang, 2022) (showing students' sense of belongingness and dual cultural exclusion) were placed between the content and incentive dimensions, but weighted slightly towards interaction pole. This is because these theories/studies dominantly stress the individual's inclinations for attaching to the original or host cultures (especially identities), even though social interaction was acknowledged.

Along the line that connected content and interaction dimensions, Giddens' theoretical framework (1991) was placed close to the content pole but in the direction of the interaction pole. Although Giddens' position is that an individual's identity is socially constructed and reflexive (Edwards, 2018; Illeris, 2016) (focusing on social conditions), scholars (e.g. Ye & Edwards, 2017) have emphasised scholarly identity formation, showing more tension in content dimension than interaction dimension. Toward the direction of interaction, the Zone of Proximal Development presents the tensions between cognitive development and interaction, which helped scholars (e.g. M. Wu & Hu, 2020) to present the transition to independence relying on the supervisors' perceptions and proper assistance. Wenger's Community of Practice (CoP) (2010) and Legitimate Peripheral Participation (LPP) (Lave & Wenger, 1991) are situated close to the pole of interaction dimension but show a little focuses on the content and incentive dimensions. This is because CoP and LPP were used to investigate an individual's psychological changes (especially identity changes) influenced by social interactions. This feature of CoP and LPP demonstrates a major focus on interaction instead of students' cognitive processes. The representative studies (e.g. Cai et al., 2019; Ding, 2016) have elucidated the functions of various communities and supervision for academic acculturation (including identity development). Finally, the Bio-ecological system (Bronfenbrenner, 2005) helps scholars (Elliot, Baumfield, & Reid, 2016; X. Xu et al., 2021)

detail the different layers of the ecological system (such as social conditions and interactions with supervisors) for academic acculturation. Although scholars have presented cognitive and emotional aspects (such as students' personality adjustments and identity development), the underlying ideas are that development is socially oriented (focusing on social conditions). Therefore, these scholars' focus takes them close toward the pole of interaction dimension.

In the triangle, the top angle on the right side covers studies that emphasised students' motivations and emotional aspects. Theories, such as the Push-Pull model and Value-Expectancy, are placed at the pole of incentive dimension. This is because the scholars (e.g. F. S. Li & Qi, 2019; Ji Zhou, 2015), who adopted these theories explored students' motivations or factors for the doctoral journey, predominantly related to the incentive for academic acculturation. I positioned scholars who disclosed academic acculturation from students' sense of belonging closer to the pole of the interaction dimension. This is because the focus was largely on a psychological basis (e.g. students' psychological well-being and sense of belonging), while less on the cognitive adjustments and functions of interactions with supervisors and support from their peers (e.g. S. Zhang et al., 2022). Finally, Stress-coping (Berry, 1997) was placed in the middle of incentive-interaction tension slightly toward the middle of the triangle. The reason is that this model highlights acculturation stress (incentive), individuals' cognitive appraisal of stress (content), and coping strategies (interaction) (Karim & Hue, 2020). This model is grounded on how individuals achieve psychological well-being by searching for solutions, which, thereby, is psychologically oriented. Yet, this model still includes focuses of interaction and cognitive elements. At the bottom of the triangle, I positioned scholars who investigated academic acculturation through a problem-solving perspective. This approach primarily focuses on how students navigate and overcome the challenges embedded in their overseas experiences. Although scholars acknowledged that international Chinese students encounter challenges related to cognitive and psychological aspects (such as cultural difference and loneliness), the emphasis of these studies was on the supports and methods students used to address the challenges. This focus had strong feature of the social interactions. (e.g. Qi & Li, 2021; Vyas & Yu, 2018).

Compared to the theories adopted by previous scholars, Ward's (2001) A(affection), B(behaviour) and C(cognition) aspects of acculturation covered all the dimensions. This model consists of three different theoretical lenses, which cover the content, incentive and interaction. Yet, the ABC model seems to explore acculturation respectively from the Affective, Behavioural and Cognitive aspects. The ABC model considers these three aspects, so it should be placed in the centre of the figure.

In sum, this subsection evaluates CLT by comparing theories used by previous scholars. A triangle figure shows the proximal tension positions for the theoretical stances adopted by a range of scholars. The evaluation suggests that academic acculturation research tends to encompass these three dimensions, focusing not on one or two dimension but on . The evaluation not only presents the focus of each theory but also showed that the CLT encompasses three dimensions, and thus explores academic acculturation comprehensively. Theoretical perspectives and studies that took three dimensions into account could be placed close to the centre of the figure.

Chapter Summary

My research demonstrates that academic acculturation covers three dimensions (content, incentive and interaction). The elements from these three dimensions can be organised in various ways, depending on how students structure these elements (mental schemas). The Chinese PhD students demonstrated four distinct processes by which they organised mental schemas during their academic acculturation. These processes have features of knowledge assimilation, multiple identity construction, adjustment and reconstruction.

The four processes further mean that acculturation can be achieved through various pathways, indicating that acculturation is situational. The specific pathway is largely related to the consistency/inconsistency between a student's pre-established mental schemas and doctoral practices, as well as the student's mental energy and available social support/interactions. Importantly, these four acculturation processes of acculturation do not imply a progression of acculturation, and not all students experience all these processes. Among these four academic acculturation processes, a single process may not cover the complicated acculturation. Finally, acculturation involves affective, cognitive, and behavioural aspects, which need to be considered if the understanding of acculturation is to be adequate.

Chapter 10: Conclusions and Implications

To conclude the thesis, this chapter outlines the contributions of this research. This is followed by the implications for international Chinese PhD students and suggestions for people who are dedicated to promoting international PhD education. I acknowledge some limitations of the research; thereby, a recommendation for future research is posted. The chapter ends by concluding remarks, providing my reflection on the thesis and my doctoral journey.

10.1. Contributions

This study extended the applicability of Illeris's (2016) Comprehensive Learning Theory (CLT) to the context of academic acculturation, and it demonstrated that the use of CLT is feasible in the field of acculturation. The fundamental idea is that academic acculturation is a highly individualised and contextualised learning process, which does not adhere to a uniform pattern. Each international Chinese student encounters unique content for acculturating to their doctoral education. The students require motivations and interactions with the environment to address these learning contents, so as to acculturate to their doctoral journey. With this fundamental idea, the findings of this study have four contribution to the theory.

This study extended the applicability of CLT to academic acculturation, contributing to the development of CLT. By adopting CLT in the context of academic acculturation, this research justifies that academic acculturation encompasses more than mere assimilative learning (such as the acquisition of knowledge). Academic acculturation involves complex learning types, including accommodative learning, transformation, and the construction of multiple identities. Specifically, multiple identity development as a crucial aspect of mental schema construction in academic acculturation is further disclosed. Multiple identity construction stems from diverse interactions that a student is involved in. These interactions lead to the formulation of distinct self-understandings that may not necessarily integrate with each other. However, CLT does not elaborate on how individuals organise their mental schemas to construct these multiple identities. In this sense, this study enriches CLT by introducing multiple identity development and broadens the exploration of possibilities for schema structuring.

Regarding academic acculturation as a learning process, this study creates an academic acculturation framework, which encompasses cognitive, incentive and interaction dimensions. This framework provides a holistic view, addressing the issue of inadequate understanding and the split of acculturation caused by the focus on either one or two dimensions. To view acculturation as a holistic process does not mean that investigation of academic acculturation

cannot still be undertaken from each individual dimension. Yet, it indicates that concentrating on one or two dimensions may result in an incomplete understanding.

In addition, this study provides a flexible framework for investigating the specific elements of each dimension embedded in academic acculturation. The created framework does not prescribe specific components for each dimension, but it enables researchers to maintain an open mind when exploring the various components of each dimension, such as the specific content that students need to acculturate and the driving forces for acculturation. For instance, the framework does not limit interaction to any particular form of participation in various communities but allows researchers to explore various forms of interaction (e.g. observation and activities, etc). In this sense, the framework contributes to “specify the types of influences or aspects of the environment that impact on the individual” (Sarmiento et al., 2019, p. 21).

The four acculturation approaches not only suggest the existence of multiple ways of schema structuring but also provide a flexible framework for uncovering the psychological mechanism embedded in the academic acculturation process. These four acculturation approaches do not confine mental schema structuring to one or two specific methods. Instead, they provide an inclusive viewpoint for researchers to explore the diverse possibilities of mental schema structuring. For example, scholars, who studied academic acculturation from the perspective of transformation, suggested that transformation did not explain the acculturation situation in which students did not go through critical reflection nor experienced major adjustments in their minds (Ritz, 2010). This study creates a framework that encompasses the various processes of academic acculturation and addresses the limitation of previous singular theories.

10.2 Implications

As we exit the pandemic, the student population of western universities appears to be shifting. There has been unprecedented growth in the numbers of international students attending these universities. As an example, in 2022, the number of international students enrolled in New Zealand universities stood at 23,255, constituting approximately 14% of the total university student population in the country. Although the number of students decreased from the pre-pandemic era when the percentage was slightly above 19%,⁹ international students still make up a considerable proportion of the NZ student population. Based on the number of international students, the universities also need to find ways to best support this

⁹ [Tertiary participation | Education Counts](#): Provider-based enrolments: Domestic and international students by qualification type/NZQF level and sub-sector. Ministry of Education, 2022 data (updated April 2023).

influx. Noticing the large number of international students, this study highlights the importance of international Chinese PhD students' academic acculturation, especially paid attention to the students' pre-established mental schemas for their doctoral studies.

Within the New Zealand context, doctoral education is characterized by individually developed projects without coursework (Elliot & Kobayashi, 2019), and students' previous experiences and preconceptions significantly influence the initial stages of a doctoral journey. Despite rich educational experiences and concrete knowledge for research, Chinese PhD students still could face unexpected difficulties. They often need to acquire additional learning to ensure the success of their doctoral research, such as understanding accents, research skills, and academic independence. This is because their previous educational experiences, such as a tendency towards dependence and obedience to authority figures, might not align with the actual requirements in doctoral practice. In such situations, students' prior experiences could inadvertently become obstacles to their doctoral studies.

10.2.1 For future international Chinese doctoral students

To facilitate the success of future international Chinese students, as well as other international students who would embark on their doctoral education different from their educational backgrounds, this study recommends students that familiarise themselves with the regulations and expectations of doctoral education before starting the doctoral journey. These preparations would enable them to establish a solid cognitive foundation for the challenges that lie ahead in their doctoral journey. Additionally, it is advised that students gain insight into their supervisors' expectations, preferred styles of supervision, and strategies for carrying out doctoral research (especially to communicate with supervisors to reach mutual agreements on supervision). Early communication with supervisors and alignment of expectations might minimise potential mismatches between supervisors and students, and it could also help to minimise misunderstandings and fosters efficient student/supervisor collaboration. Lastly, this study encourages students to continue enhancing professional knowledge, English proficiency and research skills prior to commencing their doctoral journey. The professional knowledge gained would form a concrete foundation for dealing with unexpected encounters, such as changing supervision panel, or mismatched expectations between supervisors and students.

In the psychological aspects, a doctoral study follows an uneven path, demanding a lot of energy and potentially leading to negative emotions and even demotivation. A sense of uncertainty, unease, disorientation, helplessness, and loneliness is unavoidable, especially when an international student enters an unfamiliar environment or faces new challenges. In

addition to challenges from academic cultural differences and the research , psychological issues can pose additional difficulties for international Chinese PhD students in acculturation to their doctoral journey. However, these psychological issues, along with negative emotions, can also lead to important decisions and adaptations critical for PhD success, for example, initiating adjustments and reflection. The participants in this study demonstrated a strong desire to overcome psychological issues and to pursue their academic dreams. Therefore, this study suggests that future Chinese students should be psychologically prepared to confront challenges. It would be beneficial to have a clear purpose and a strong desire to pursue a PhD. These psychological preparations could help form a strong will and provide the necessary motivation to overcome challenges, as well as maintain a positive attitude when faced with hardships.

Negative emotions and demotivation were common aspects of doctoral life for all participants. This does not mean that the whole doctoral journey is full of misery and stress. Participants also experienced warm-hearted moments with PhD fellows and received pastoral care from supervisors. These interactions provided positive energy for students to navigate the challenges in their doctoral journey. This study also suggests that challenges and psychological issues resulting from the doctoral journey do more good than harm. Remaining in a 'comfort zone' might prevent personal growth and development. Challenges, hardship, isolation, discouragement, loneliness, and confusion might be signs of stepping out of that zone. These hardships can activate a countermove, facilitating learning and the development of competencies. Emotional support, psychological assistance, and academic help from PhD peers or family members is essential. Future students need to be aware that seeking emotional support does not indicate incompetence; instead, it is an approach to replenishing mental energies and preparing for the next challenge.

In terms of social aspects, the findings of this study indicate that the Chinese PhD students engaged in observing people's actions and participated in academic and non-academic communication and activities, which contributed to the success of their doctoral journey. These led to improvements in research efficiency, the acquisition of research skills and emotional support. Observation was identified as one of the important methods for acquiring knowledge and experiences. It is recommended that students use successful senior doctoral students as a benchmark to learn how to navigate challenges and achieve success in their own journey. Non-verbal cues, attitudes, and valuable insights can be gleaned from the experiences of others by observing their actions and behaviours. Such insights are valuable for adjusting oneself to meet the requirements of doctoral education.

Additionally, engaging in research itself is a valuable practice to enhance research skills. Thus, future Chinese students are encouraged to actively participate in a diverse range of academic and non-academic activities with their supervisors or peers and engage in communication with a broad spectrum of people. This engagement is important not only for generating new ideas for research but also for benefiting from emotional support that comes with engagement.

The study's findings indicate that some of the Chinese students were influenced by their previous educational experiences, which led to hesitancy in asking questions for fear of appearing uninformed or being embarrassed. The students also tended to maintain a distance from supervisors due to the pre-perception that supervisors are knowledge authorities. These thoughts hindered the establishment of a collegial supervisor-student relationship and could lead to learning approaches that did not align with the doctoral education in New Zealand. Therefore, future Chinese students are advised to overcome this reluctance, as diverse ideas and perspectives contribute to problem-solving from various angles.

10.2.2 For people engaged in international doctoral education

A key finding of this study is the pivotal role of interactions with doctoral supervisors in students' doctoral journeys. Interactions with supervisors not only enhanced students' research competencies and academic writing skills but also facilitated the transition to academic independence and the formation of their academic identity. Nevertheless, the interaction between supervisors and students, the requirement of independence in doctoral education, and the actual supervision the Chinese PhD students experienced did not always align with the student's expectations, resulting in challenges during their doctoral research. This difficulty could also appear among students whose previous educational experiences were different from the host country or due to mismatched student/supervisors expectations (e.g. Leung & Yu, 2020; X. Xu, 2020). Such mismatched expectations can lead to mutual misunderstandings, which, in turn, can pose difficulties in a student's doctoral journey. In light of this, this study recommends that both doctoral supervisors and international students reach a consensus on their expectations before formally initiating their collaboration. For instance, doctoral supervisors and students could communicate their expectations and responsibilities. This transparent communication and introduction process can help minimise any gaps in expectations between students and supervisors, specifically regarding the extent of independence and responsibilities that students should be involved in during their research.

Secondly, the study suggests that doctoral supervisors could offer more guidance at the initial stages of the doctoral journey to Chinese and other international students who might have been accustomed to hierarchical relationships or reliance on the teacher's instruction. As students' research capacities develop, supervisors can allocate more space for students to assume responsibilities and take the initiative in their research. This approach to supervision could be helpful to reducing students' uncertainty and increasing confidence. Furthermore, the study proposes that providing proper pastoral care and emotional support will undoubtedly aid students in better acclimating to their doctoral journey. This is because a supervisor's patience and empathy can serve as a source of gratitude and motivation for students, driving them to fully engage in their doctoral research.

Support from PhD peers and academic staff is also important for Chinese PhD students acculturating to their doctoral journey. As per the findings of this study, academic staff, such as librarians, offered students tricks and skills for conducting research. The skills improved the students' research efficiency, leading to positive emotional reactions, such as confidence and a sense of being supported. Similarly, peers provided not only informal supervision, research experiences, and research skills, but also emotional support. In light of this, the following aspects can be implemented to support international PhD students.

In addition to continuously enriching learning resources at the university level, the university can also develop language and research support resources or systems at each faculty level, such as individual-specific tutorials and proofreading support. Compared to the general learning resources and support system at the university level, the support from each faculty can be more direct for those who have less experience related to their research background. This support system would help international students navigate their beginning and end stages, and students can quickly clarify their expectations for their doctoral study and reduce misunderstandings, ultimately making the process of confirming their candidature smoother.

Lastly, it would be beneficial to establish an informal academic and psychological support system for international doctoral students. For example, administrators or coordinators in each faculty could create a support system that pairs a senior doctoral student with an incoming student who is in the same/similar research domain as the senior students. This support system could function as an informal mentorship program, providing first-hand experiences of doctoral study and helping new international students transition into their research more smoothly.

10.3 Limitations and Recommendations

Due to the methodology and theoretical framework adopted in this study, there exist limitations in this study. Thus, this section also presents recommendations for future research to address these limitations.

10.3.1 Limitations

This study may contain a degree of subjectivity and potential bias, which are derived from the nature of interpretive studies, (Chowdhury, 2014). For instance, each participant's opinions, ideas and experiences can be interpreted from different perspectives, generating various meanings. In addition, although I was able to interview the participants in their first language, the translation of interview data from Chinese to English may not completely capture the intended meaning due to disparities in expression and logic between the two languages. Subjectivity and bias are particularly evident when data analysis and interpretation are highly contingent on the researcher's "personal, cultural, and historical experiences" (Creswell & Poth, 2016, p. 21). Despite the analysis being grounded in the CLT, and various techniques (such as data verification by supervisors and participants) being employed to minimise misinterpretation, it remains impossible to entirely eradicate all biases and understanding limitations. The last factor that could cause bias is related to the application of theory. As a single idea from a participant can be interpreted within each learning dimension, subjectivity in interpretation is unavoidable. For the above aspects, I acknowledge that these limitations are inherently challenging to surmount.

The second limitation in relation to methodology derived from the fact that this research was confined to a small sample of Chinese PhD students from a single university. Given the limited sample size and single context, this study documents and analyses the experiences of a number of individual cases. The intention was to gain insights into the students' learning experiences within a new academic environment that students had not experienced before. As such, the restricted sample size enables a detailed exploration of individual learning experiences through the lens of CLT in the context of academic acculturation. This exploration did provide detailed insights into participants' learning experiences and cognitive development. From this perspective, the small sample size may not have been a limitation in itself. Instead, employing a case study with a small sample size could be a beneficial approach, particularly for research aimed at focussing on in-depth data regarding how individuals constructs their cognition.

From the perspective of the theoretical framework, there are two limitations embedded in the research results. Transformative learning is often considered to occur under highly demanding circumstances and involves a certain level of stress (Illeris, 2016). As a result, the transformation process of academic acculturation is characterized by negativity and pain. However, previous studies suggested that transformation can be a prolonged process that does not necessarily involve pain or stress. For instance, Threshold Theory claims that such personal crises and difficulties are regarded as a “Learning Threshold”, which indicated a “stuck place”. As students overcome these thresholds, they gain new insights. The process can be “exhilarating but might also be unsettling, requiring an uncomfortable shift in identity, or, paradoxically, a sense of loss”(Land, Meyer, & Baillie, 2010, p. 2). In some circumstances, such process may be “protracted over a considerable period of time, with the transition to understanding often involving ‘troublesome knowledge’”(Land et al., 2010, p. 2). In other words, transformation can occur as a joyful, rather than painful, process over an extended period. If transformation is viewed from this perspective, the academic acculturation process may require further development and refinement.

The second limitation within the theoretical perspective is that it was difficult to distinguish assimilative learning from accommodative learning. Accommodative learning, by its nature, encompasses assimilative learning, and it pertains to adjustments and enrichment of knowledge (Illeris, 2016). This study identified situations in which assimilative learning took place in the academic acculturation process because the data showed students did not experience knowledge change, and the students' current understandings were not different from their previous knowledge. Nevertheless, some knowledge changes were unconscious (Li Wang, 2019), and if students underwent changes but were not aware of the changes, the situation, then, could also be seen as accommodative learning. Another reason why it was challenging to distinguish assimilative learning from accommodative learning was that adjustments could occur at any stage of academic acculturation, and it would require a longitudinal study to determine if students experienced assimilation or accommodation. Since academic acculturation is a continuous process (X. Xu, 2021), by the time the data was collected, the students expressed that they did not undergo any adjustments (indicating that students experienced assimilative learning). However, this does not necessarily mean that students would not alter their relevant understandings in the later stages of their PhD. If students adjusted their relevant mental schemas, this situation could also be identified as students experiencing accommodative learning.

10.3.2 Recommendations for further research

There is a debate about the suitability of interpretivist studies for generalisations (Williams, 2000). This case study is contextualized, and its results cannot be used to draw generalizations. However, generalization lies in how meaning is constructed and whether its applicability extends beyond the original context (Lewis, Ritchie, Ormston, & Morrell, 2003). In addition, a broader the range of perspectives would enhance generalizability (Larsson, 2009). Although this case study focused on a specific New Zealand university, the theoretical framework is constructed from CLT. The framework offers an open perspective, allowing future researchers to widely explore acculturation contents, driving forces, interactions, and various academic acculturation processes for Chinese students.

As such, the findings can serve as a valuable starting point for future research. Future studies could investigate whether similar findings emerge in other contexts, such as doctoral programs in American universities where students are required to complete coursework.

The data for this study was based on eleven mainland Chinese PhD students' academic acculturation experiences. Although this study obtained in-depth data from these participants, it is an inescapable pity that the samples did not include other Asian Chinese, such as students from Hong Kong, Taiwan, Malaysia, etc. Future studies could include a wider range of international doctoral students. The diversity of participants would help the future research explore if aa these students demonstrate a similar pattern of learning.

Finally, this study has provided detailed results regarding what international Chinese PhD students need to learn (content), why they need to learn it (incentive), and how they can learn it (interaction and schema change) to acculturate academically. This study aims to disclose students' academic acculturation experiences, so the results only originate from the students. As per Berry (2005), acculturation is a dual process; that means academic acculturation is a process in which both doctoral supervisors and students mutually adapt to each other. Hu et al. (2020) also showed that academic acculturation is a dynamic process that requires collaboration and effort from both students and supervisors. Therefore, future research could encompass students' supervisors as participants to provide insights into the dynamic process of how supervisors and students adapt to each other.

10.4 Concluding Remarks

This study aimed to uncover how international Chinese PhD students learned to acculturate to their doctoral journey in the New Zealand academic environment. Based on a review of previous studies and theoretical perspectives, this study was grounded in

Comprehensive Learning Theory (CLT) and adopted a qualitative research paradigm. Data were primarily obtained through semi-structured interviews. The study gained insights into the learning content, incentives, and interactions embedded in academic acculturation, as well as the situations where academic acculturation was hindered or did not take place. Further attention was paid to investigating how the Chinese PhD students structured their mental schemas during their academic acculturation. The findings revealed that students demonstrated five approaches to organising their mental schemas, resulting in four distinct academic acculturation approaches. The acculturation approach was contextualised and individualized, which involved specific learning contents, was activated by driving forces, and was achieved through various interactions.

As to the contribution, this research provides a new perspective on understanding academic acculturation. It contributes not only to the integration of three dimensions (affective, behavioural, and cognitive) of academic acculturation but also to the elaboration of the elements of each dimension. Importantly, this study presents four acculturation processes based on how students organise their mental schemas. These acculturation processes undermine previous notions that academic acculturation is achieved solely through knowledge acquisition, adjustment, or transformation. Although the research was confined to a New Zealand university, it offers an in-depth and holistic description of international Chinese PhD students' learning experiences during academic acculturation, as well as the barriers they face.

Conducting this research also offered me the opportunity to reflect on my own doctoral journey as a learner, researcher, and someone who adapted to academic environments. While this study focuses on the academic acculturation experiences of international Chinese PhD students, I found that it resonated with my own experiences as a doctoral student. In this way, my research was not only informative but also personally meaningful.

Regarding academic acculturation as a learning process, I realized that I had learned a tremendous amount from my PhD journey, and there was still a wealth of knowledge yet to be acquired. This included not only disciplinary knowledge and research skills but also independence, understanding academic cultures, and honing the ability to learn. Like many other PhD students, I also experienced moments of amusement, puzzlement, challenges, and even periods of depression in my doctoral journey. Although hardship at times demotivated me and led to feelings of anxiety, nervousness, and even desperation, my initial determination, perseverance, and gratitude carried me through to the end of the PhD journey. The doctoral journey is unquestionably not an individual endeavour; it involves support from supervisors, peers, family, friends and many others. Especially my supervisors, peers, and experienced

individuals in academia, provided not only academic support but also assisted my transformation from an ordinary student to a researcher and a more social being. Remarkably, as I approached the end of the doctoral journey and stood on the threshold of a new one, this research became more significant to me, as well as to many other doctoral students. Much like acculturating to the doctoral journey, adapting to the next phase also entails a wealth of learning, requiring energy and perseverance to overcome challenges. Only through interactions with various people can our minds become enriched and inclusive.

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Appendixes

Appendix A1: Information Letter for International Support Staff

Project: Learning to be: Academic Acculturation as a Learning Process—A Case Study of International Chinese PhD students at a New Zealand University

Date:

Dear _____

My name is Yu Yuan. I am a PhD candidate at the Division of Education at the University of Waikato in Hamilton, New Zealand. I am conducting a research project on how international Chinese PhD students learn to acculturate academically for my doctoral degree. The research will involve the participation of PhD Chinese students and their supervisors at the University of Waikato, Hamilton.

Purpose of the research

My research project aims to understand the process of academic acculturation through a learning perspective. Specifically, the study will investigate how international Chinese PhD students learn to acculturate their doctoral journey, the potential topic may include doctoral learning, supervision, students' previous expectation, and how to interact with people in the academic environment. Additionally, the study will examine factors that may influence academic acculturation.

Data collection procedure

One-to-One Semi-Structured Interviews

I expect around 8-12 Chinese PhD students and 8-12 Chinese PhD participants' supervisors to be engaged in semi-structured interviews. The one-to-one interview is expected to take no longer than one hour.

For Chinese PhD students, I will ask about their academic experiences and understanding of how they navigate their academic journey as doctoral students; how they feel about their doctoral journey; and how they interact with the New Zealand academic environment. If it is possible, I will also interview the students' supervisors about their experiences when interacting with international Chinese PhD students; and how they supervise their Chinese PhD students to become scholars.

Follow-up Interviews

International Chinese PhD students who participated in one-to-one interviews will be invited after a break of three to five months to participate in follow-up interviews.

This interview will be divided into two sections. The first section will be based on the previous interview data and initial data analysis. I will ask students questions that I missed in the previous interview and ask further questions regarding cognitive, emotional and social

aspects. The second section will ask students to supply more critical incidents and memorable moments that they experienced during their doctoral journey.

Confidentiality

The identity and data generated from students and their supervisors in this research will be safeguarded. The participants will be asked to nominate their own pseudonyms before or during the research. Their pseudonyms, data, and information will only be used for academic purposes. All the data generated from the study will be kept in accordance with the University of Waikato Ethical Conduct in Human Research and Related Activities Regulations 2008, under section 12 for a period of five years until they are destroyed. While every effort will be made to protect the anonymity and identities of all participants, this cannot be guaranteed.

I would be very grateful if you could assist me in sending invitation emails with information letters to international Chinese PhD students at the University of Waikato. If very few students have replied after two weeks, I would be appreciated it if you could also send follow-up invitation emails. Should you wish to discuss any issues relating to the research project, please contact me or my chief supervisor via email or the telephone numbers below.

Best regards,

Yu Yuan, PhD Candidate

My contact details:

Yu Yuan, PhD Candidate

Faculty of Education, University of
Waikato Hamilton, New Zealand

Phone:

(+64) 021 02693116

Email:

yy331@students.waikato.ac.nz

Contact details of my Chief supervisor:

Professor. Brian Findsen

Faculty of Education, University of Waikato
Hamilton, New Zealand

Phone:

(+64) 021 08195972

Email:

brian.findsen@waikato.ac.nz

Appendix A2: Information Letter for International Chinese PhD Students

Project: Learning to be: Academic Acculturation as a Learning Process—A Case Study of International Chinese PhD students at a New Zealand University

Date:

Dear _____

My name is Yu Yuan. I am a PhD candidate at the Division of Education at the University of Waikato in Hamilton, New Zealand. I am conducting a research project on how international Chinese PhD students learn to acculturate academically for my doctoral degree. The research will involve the participation of PhD Chinese students and their supervisors at the University of Waikato, Hamilton.

Purpose of the research

My research project aims to understand the process of academic acculturation through a learning perspective. Specifically, the study will investigate how international Chinese PhD students learn to acculturate their doctoral journey, the potential topic may include doctoral learning, supervision, students' previous expectation, and how to interact with people in the academic environment. Additionally, the study will examine factors that may influence academic acculturation.

Data collection

There are two stages of interviews in this study, with an interval of approximately three to five months. Each interview is expected to take no longer than one hour.

You are invited to contribute to two stages of the study

One-to-One Semi-Structured Interviews

I would like to know about the memorable moment of your PhD journey. We will mainly discuss the following topics: (a) motivations and reasons for doing doctoral research in New Zealand; (b) research experiences and the critical incidents in the doctoral journey; (c) prior academic experiences, and initial understandings of the doctoral journey; and (d) factors or difficulties that influenced participants' doctoral practice.

Follow-up Interviews

After transcribing and analysing our previous interview, I would like to conduct a follow-up interview with you. During this interview, we will focus on any further questions that arose from the previous interviews, as well as your memorable experiences that have influenced your PhD journey. This includes any significant, interesting, or successful experiences or events. We will also discuss any changes in your understanding of your doctoral journey.

After the interviews, I will send you your own interview transcript(s). You can voluntarily check or refine the data. But please send it back within a two weeks period. If I do not hear from you, I will assume that you have agreed with me analysing the data you have provided.

Confidentiality

Please note that your participation in this research project is voluntary. You are welcome to nominate your own pseudonym before or during the research. Your identity and data will only be used for academic purposes. All the data generated from the study will be kept in accordance with the University of Waikato Ethical Conduct in Human Research and Related Activities Regulations 2008, under section 12 for a period of five years until they are destroyed. While every effort will be made to protect the confidentiality and identities of all participants, this cannot be guaranteed. Since this study also may involve students' own supervisor, your identity and academic behaviours might be referred.

Thank you very much for your cooperation. If you decide to join this study, please notify me whether you will join my research via email or the telephone numbers below. Once I receive your reply, I will send you the interview question sheet and arrange an appropriate time and venue based on your schedule. Should you wish to discuss any issues relating to the research project, please contact me or my chief supervisor via email or the telephone numbers below.

Best regards,

Yu Yuan, PhD Candidate

My contact details:

Yu Yuan, PhD Candidate
Faculty of Education, University of
Waikato Hamilton, New Zealand
Phone:
(+64) 021 02693116 (New Zealand)
Email:
yy331@students.waikato.ac.nz

Contact details of my Chief supervisor:

Professor. Brian Findsen
Faculty of Education, University of Waikato
Hamilton, New Zealand
Phone:
(+64) 021 08195972
Email:
brian.findsen@waikato.ac.nz

Appendix B1: Consent form for International Support Staff

Project: Learning to be: Academic Acculturation as a learning process—A Case Study of International Chinese PhD students at a New Zealand University

Researcher: Yu Yuan

Dear International Chinese PhD students,

Thank you for agreeing to join my study. According to the University of Waikato Ethical Conduct in Human Research and Related Activities Regulations 2008, it is recommended that you read this consent form carefully. Please tick in the boxes that you agree to statements, and sign to indicate your consent.

In signing this form, I understand that:

- The purpose of the research has been explained to me.
- I agree to help the researcher to recruit International Chinese PhD students at the University of Waikato.
- My participation in this study is voluntary.
- I am prepared to recommend my Chinese PhD acquaintances studying at the University of Waikato.
- I have the right to withdraw from the project at any stage.

Declaration by International Support Staff

I hereby consent to take part in this research study

International Support staff's signature:

DATE:

Appendix B1.1: Sample Consent Form from International Support Staff

Project: Learning to be: Academic Acculturation as a learning process—A Case Study of International Chinese PhD students at a New Zealand University

Researcher: Yu Yuan

Dear International Chinese PhD students,

Thank you for agreeing to join my study. According to the University of Waikato Ethical Conduct in Human Research and Related Activities Regulations 2008, it is recommended that you read this consent form carefully. Please tick in the boxes that you agree to statements, and sign to indicate your consent.

In signing this form, I understand that:

- The purpose of the research has been explained to me.
- I agree to help the researcher to recruit International Chinese PhD students at the University of Waikato.
- My participation in this study is voluntary.
- I am prepared to recommend my Chinese PhD acquaintances studying at the University of Waikato.
- I have the right to withdraw from the project at any stage.

Declaration by International Support Staff

I hereby consent to take part in this research study

International Support staff's signature: *GEORGE LAU*

DATE: 3/07/2020

Appendix B2: Consent form for International Chinese PhD Participants

Project: Learning to be: Academic Acculturation as a learning process—A Case Study of International Chinese PhD students at a New Zealand University

Researcher: Yu Yuan

Dear International Chinese PhD students,

Thank you for agreeing to join my study. According to the University of Waikato Ethical Conduct in Human Research and Related Activities Regulations 2008, it is recommended that you read this consent form carefully. Please tick in the boxes that you agree to statements, and sign to indicate your consent.

In signing this form, I understand that:

- Due to Covid-19, I can choose an online interview (e.g. Wechat or Zoom).
- The purpose of the research has been explained to me.
- The information I provide will be used for academic purposes only.
- My participation in this study is voluntary.
- I may participate in two rounds of interviews if the researcher had further issues to discuss.
- I am prepared to recommend my Chinese PhD acquaintances studying at the University of Waikato.
- Every effort will be made to protect the anonymity of all participants but this cannot be guaranteed.
- I have the right to refine/withdraw any data up to two weeks after I receive the interview transcripts.
- I have the right to withdraw from the project at any stage.

Declaration by participant

I hereby consent to take part in this research study

PARTICIPANT'S SIGNATURE:

DATE:

Appendix B 2.1: Sample Consent Form from a Participants

Consent form for International Chinese PhD Participants

Project: Learning to be: Academic Acculturation as a learning process—A Case Study of International Chinese PhD students in a New Zealand University

Researcher: Yu Yuan

Dear International Chinese PhD students,

Thank you for agreeing to join my study. According to the University of Waikato Ethical Conduct in Human Research and Related Activities Regulations 2008, it is recommended that you read this consent form carefully. If you agree to statements, please tick in the boxes and sign to indicate your consent.

In signing this form, I understand that:

- Due to Covid-19, I can choose an online interview (e.g., Wechat or Zoom).
- The purpose of the research has been explained to me.
- The information I provide will be used for academic purposes only.
- My participation in this study is voluntary.
- I may participate in two rounds of the interviews if the researcher had further issues to discuss.
- I am prepared to recommend my Chinese PhD acquaintances studying at the University of Waikato.
- Every effort will be made to protect the anonymity of all participants but this cannot be guaranteed.
- I have the right to refine/withdraw any data up to two weeks after I receive interview transcripts.
- I have the right to withdraw from the project up to the time of transcripts being returned and without giving reason.

Declaration by participant

I hereby consent to take part in this study

PARTICIPANT'S SIGNATURE:



DATE: 07/08/2020

Appendix C1: Indicative Interview Questions for International Chinese PhD students

Learning to be: Academic Acculturation as a learning process—A Case Study of International Chinese PhD students at a New Zealand University

第一部分：您的学习/教育背景概况

1. 您的性别：

男 女

2. 请您选择您的年龄范围：

25-29 30-34 35-39 40+

3. 您有在英语国家学习的经验吗？

如果有，您在哪个国家/地区获得学士和硕士学位？

如果没有，您是否有过在英语环境教学的大学中学习的经历？

4. 您攻读博士之前，是否参加过语言测试？是否能够分享您的语言测试的分数？

5. 在开始博士学习之前，您是否参加过 pathway college 的培训课程？

是 否

6. 您在怀卡托大学攻读博士学位已有多长时间了？

少于1年 1-2年 2-3年 3年以上

7. 您的学士和硕士专业是什么？

8. 您博士的专业和研究方向是什么？

第二部分：中国博士留学生是如何适应博士生涯的？

请您考虑一下，您的博士学习经历（例如，博士日常的学习，导师的指导，师生之间的关系，以及作为博士生的身份，同学的帮助等等）。当您在想到这些经历的时候，请您分享一下关于您是如何适应博士的学术环境的。

1. 请您告诉我您参与到博士研究的动力是什么？您为什么选择攻读博士？
2. 请您回想一下，您在博士学习经历中，那些学术实践，是让您难忘的？或是您在之前在中国没有经历过的？例如，日常的学习，老师的指导风格，师生关系。
3. 在您上博士的前，您是否设想过您的博士生涯是什么样子的？当您刚经历这些事情的时候，您当时的感受是什么？
4. 您在之前的学习中是否有过相似的经历？它们的相似的地方和不一样的在哪？
5. 对比于硕士阶段来说，您的博士研究学习的过程和硕士的学习有什么区别？
6. 您在博士阶段中，是否遇到让您非常难忘的困难？
7. 您是如何克服这些困难的？您的动力是什么？您当时的动力是什么？
8. 您是否能给我分享一些您的经历，关于您是用什么样的方法来完成您的博士学习的？例如您是如何掌控您的时间的，您的学习的动力是什么？您是如何克服学习中的困难的？
9. 在您学习遇到困难的时候，您的导师和同学是怎么样帮助您的？什么样的问题您会寻求同学的帮助，什么样的问题您会寻求老师的帮助？这样的方式与硕士阶段有什么不一样的吗？
10. 请您给我分享一个关于您的博士生导师是怎么指导您学习的例子的？
11. 当您第一次经历与导师的会议的时候，您的感受是什么？
12. 您和导师之间的关系是怎么样形成的？
13. 您希望的师生关系是什么样的？
14. 在您的博士生涯中，您怎么样去定义您老师的角色的？为什么这么认为？
15. 那您是如何定义自己是一个博士研究生的角色的？为什么？

Learning to be: Academic Acculturation as a learning process—A Case study of International Chinese PhD students at a New Zealand University

Indicative Interview Questions for International Chinese PhD students

Part One: Profile of doctoral students

1. Could you please identify your gender?

- Male Female

2. Please select your age range

- 25-29 30-34 35-39 40+

3. Have you had experiences studying in English-speaking countries?

If yes, in which country(ies) did you finish your bachelor's and master's?

If not, did you have experience studying at English-medium universities? Which university(ies) did you finish your bachelor's and master's?

4. Please provide the name of the language test you used when applying for the PhD program and the score you achieved.

5. Have you attended a pathway programme before beginning your PhD journey?

- Yes No

6. How long have you been enrolled in your PhD at the University of Waikato?

- Less than 1 year 1-2 year(s) 2-3 year(s) More than 3 years

7. What was your major in your bachelor's and master's?

8. Which Division are you situated in and what is your PhD research domain?

Part 2: How do international Chinese PhD students adapt to academic cultures at the University of Waikato?

Please think about your experience as a doctoral student (such as your daily studies, doctoral supervision, relationships you're your supervisor, peers' support, and your identity as a doctoral student, etc). When thinking about these, I would like you to share your thoughts and how have you adapted to your doctoral study

1. Could you please tell me why you conduct your PhD in New Zealand? What motivated you to participate in doctoral research?
2. When thinking about your doctoral experiences, please describe your memorable educational practices, and events, and what made them impactful.
3. Before starting your doctorate, have you ever thought about what your doctoral study would be like? What were your feelings at the time when you first experienced your doctoral study?
4. Have you had similar experiences in your previous studies in China? What are the similarities and differences?
5. How has your PhD journey differed from your Master's degree journey? Are there any similarities? Could you please give me some examples?
6. Studying in a new educational environment can be very challenging. What memorable difficulties have you encountered during your PhD journey?
7. How did you overcome these difficulties? What motivated you to overcome these difficulties?
8. Could you please share some of your experiences on how did you navigate your doctoral studies? For example, how did you manage your time, how did you motivate yourself?
9. When you encountered difficulties in your studies, how did your supervisors/peers help you?
10. Could you please share examples of how your supervisors manage your study?
11. How did you think about this way of supervision? Could you please tell me about your emotions when experiencing this supervision?
12. How did you think the relationship between you and your supervisor, and How is this relationship formed?
13. What kind of relationship did you expect to have with your supervisors before you embark on your journey?
14. How do you define the role of your supervisor in your doctoral journey? Why?
15. How would you identify yourself as a doctoral student? Why?

Appendix D Ethics Approval

Te Kura Toi Tangata
Faculty of Education
The University of Waikato
Private Bag 3105
Hamilton, New Zealand, 3240

FEDU Ethics Committee
fedu.ethics@waikato.ac.nz
07 8384500 ext. 7870
www.waikato.ac.nz/education



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

29/7/2019

Dear Yu Yuan

FEDU Ethics Application Approved FEDU050/19

I am pleased to advise you that your ethics application for the project entitled "Learning to be: Acculturation as a learning process-A Case Study of International Chinese PhD Students in a New Zealand University" was approved by Te Kura Toi Tangata Faculty of Education Ethics Committee on July 29th, 2019.

Please be aware that the Te Kura Toi Tangata FEDU Ethics Committee must be advised (by memo) of any changes to the details recorded in your ethics application. Please send any such advice to fedu.ethics@waikato.ac.nz. You will receive a memo of approval once the change(s) has been considered.

Kind regards

Co-chair

Te Kura Toi Tangata Faculty of Education Ethics Committee

Appendix E: Sample Interview Data in Chinese

请您回想一下，您在博士学习经历中，那些学术实践，是让您难忘的？或是您在之前在中国没有经历过的？例如，日常的学习，老师的指导风格，师生关系：

嗯……我觉得比较里程碑式的学术活动就是……大概 18 年的时候我曾去发过一个 conference paper。那个 paper 的准备过程是超出我的预期的，其实……当然我不是说发 conference paper 很简单。但是这个发 conference 的过程和修改的过程那种细密的那种程度，怎么讲，就是有点让人有点儿消耗体力的感觉 (exhausting)，这种消耗的程度超过了我的预期。所以说，我觉得可能是在 quality control 上面，对自己的意志和耐心有一个非常消耗和磨人的感觉，反正这是让我印象深刻的一个点。然后，当然了，这个数据的收集，文章的写作程度，以及内容一丝不苟，这毫无问题的，因为我做的是一个质的研究。然后……我是想把研究做得好一些，怎么讲，我们有一个概念 object biography，翻译过来叫做文物的传记。这个 concept，是从考古和博物馆学那边借过来的。我想用这个概念来除发，来看这个概念能不能被应用在博物馆文物的信息电子化的这个部分。就是说，现在那些电子化后的信息没有让人得到益处，怎么讲，就是现在博物馆给人传授的信息没有意思。说白了就是非常 flat。就比如说，拿这瓶做个例子打个比方，这瓶子是 18XX 年的，然后他的 physical 的 dimension 是 xxx，就是这种基础的信息，还有就是说可能传授给别人这个东西是哪个厂制造的，在什么时候，在哪个作坊做的，例如，伦敦某个地方这样的信息，也就这些了，没别的信息了。我就想利用文物传记去看看，看看这个领域能不能让博物馆的信息传达更有趣，能不能让文物机构更有教育意义。所以，我首先就去到不同的博物馆，去找那些我的研究对象，看看他们能不能给予我更多的信息。而不是仅仅是我们在博物馆里面看到的小牌子，或者是小牌子上写的一点点东西。整个操作的过程……就是约人，设计，联系博物馆，等等各方面……前后……大概前后，从头一年的 11 月到第二年 8 月，将近一年的时间，当然发 paper 的时候，卡在了七月底，如果按照人数来说，数据收集的不多。当然质性研究不是要求数据收集很多，即使这样，整个过程是非常辛苦的。然后就是 coding，coding 本身又花了我两个月的时间。其实，在这个过程中就是 quality control 的过程，quality control 就是在那个地方，整个论文的 quality 就是那么高，如果我自己觉得，这些东西没有做到一定的高度，没有做到一



Yuan, Yu



在你认知或是预期里，发表文章是怎么样的？

Reply



Yuan, Yu



发表论文的时候，当时你对“quality control”或是从不断修改论文的过程中，你从中收获到了什么？

这个过程和你之前预期的有什么区别？这个过程与你的预期相抵触，还是扩充了你的认知？

18 August 2020, 5:21 PM

Reply