

Resolving the Diversity Paradox

An analysis of the diversity-conflict-performance paradigm in an Australian context

By

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Abstract

Despite the intensive efforts to measure and predict the effects of group diversity on performance, research has produced extremely inconsistent and mixed results. This state of knowledge has presented a diversity paradox suggesting coexisting and conflicting effects of diversity. In order to explain the paradox and therefore improve our understanding of diversity, a three-way relationship (i.e. diversity-conflict-performance identified as a paradigm) has been suggested as a promising explanation.

This thesis explores the effects of diversity via the paradigm, thereby offering a deeper insight into the diversity paradox. To do so, this survey-based research administered questionnaires to 45 work groups from 6 organisations in Victoria, Australia (N=280). Confirming the paradigm, the results show that different types of diversity do indeed cause different forms of conflict, resulting in different effects on performance at the individual level with respect to perceived diversity. These expected and unexpected findings are explained, followed by contributions to the literature. Implications for practitioners are also discussed. At the end of this thesis there is a discussion of a possible direction for future research.

List of Abbreviations

EEO----Equal Employment Opportunity

AA ----Affirmative Action

SEM ----Structural Equation Modelling

SCT ---- Social Categorisation Theory

SIT ---- Social Identity Theory

KSAOs---- Knowledge, Skills, Abilities, and Other characteristics

OTC ---- Objective Task Performance

STC ---- Subjective Task Performance

OCP ---- Objective Contextual Performance

SCP ---- Subjective Contextual Performance

SWOT ---- Strengths, Weaknesses, Opportunities, and Threats

USA ----United States of America

OB ---- Organisational Behaviour

MLM ---- Multilevel Linear Modeling

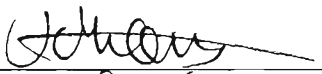
AMOS ---- Analysis of MOment Structures

LISREL ---- LInear Structural RElations

SPSS ---- Statistical Package for the Social Sciences

Statement of Authorship

Except where explicit reference is made in the text of the thesis, this thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma. On other person's work has been relied upon or used without due acknowledgement in the main text and bibliography of the thesis.

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Chapter 1. Introduction

1.1 The Research Background

1.1.1 A brief history of workplace diversity

In workplaces across the world employee diversity has become widespread and continued to increase with social, economic and global changes. Diversity in the workplace has occurred for two primary reasons: first from the changing labour market resulting from increased numbers of dual-income families, the aging population, immigration and so forth; and second from modern organisational strategies driven by increasing technological complexity and global competition that require more interaction among employees of different functional backgrounds (Amla, 2008; Chatman & Spataro, 2005). The changing nature of workplaces has prompted governments and organisations to develop diversity-related initiatives (Rangarajan & Black, 2007).

Diversity-related initiatives evolved through three stages of development, these being: equal employment opportunity (EEO)/affirmative action (AA) (Stage One: 1960s-1970s), managing diversity (Stage Two: 1980s), to the business case of diversity (Stage Three: 1990s - present).

- Stage One (1960s-1970s). During this stage, following the launch of legislations (e.g. the Title VII of the U.S. Civil Rights Act of 1964), organisations were required to provide their employees with a discrimination-free work environment (equal opportunity initiatives) and to make an effort to recruit, hire, and promote people in underrepresented groups (AA initiatives) (McMillan-Capehart, 2003). At this stage, EEO was the goal and AA the tool used to reach that goal. Diversity was normally considered to be characteristics that could result in workplace discrimination, such as race, gender, age or physical disability (O'Leary & Weathington, 2006).
- Stage Two (1980s). The cost to businesses of implementing diversity-related legislations increased as a result of compliance (Pless & Maak, 2004). In order to

reduce costs, organisations paid great attention to diversity-related training that recognised differences, encouraging all employees to contribute to organisational goals (Kramar, 2005). At this stage, recognised diversity attributes began to expand beyond legally-protected characteristics to include a much larger and broader range of individual differences, such as education and values (Jayne & Dipboye, 2004).

- Stage Three (1990s to the present). During the stage, a ‘business case’ for diversity has been presented suggesting that actions, such as increasing diversity would enable organisations to utilise the talents and abilities of all employees, which may be critical to success in an increasingly complex and dynamic business environment (O’Leary & Weathington, 2006). The increasingly diverse workforce was assumed to benefit organisations from the possible unrealised potential offered by diversity (i.e. valuing diversity) (Simons & Pelled, 1999a). For example, higher levels of diversity in an organisation may increase the variety of personal viewpoints, skills and knowledge available to an organisation. At this stage, attributes that have been referred to as diversity cover the entire spectrum of human differences (Mannix & Neale, 2005).

1.1.2 Effects of diversity: a paradox

As described in the brief outline, the nature and impact of diversity in organisations has attracted increasing interest and discussion amongst both academics and management practitioners. Despite intensive efforts by researchers to measure and predict the outcomes of diversity, our understanding of diversity is still relatively limited and much is still unclear about the effects of diversity (Harrison & Klein, 2007). In particular, the empirical evidence in relation to the impact of diversity on performance highlights a pattern of inconsistent, mixed and often contradictory results, as demonstrated in three review studies examining diversity research over fifty years.

In the first of these reviews, Milliken & Martins (1996, p402) noted that ‘diversity appears to be a double-edged sword, increasing the opportunity for creativity as well as

the likelihood that group members will be dissatisfied and fail to identify with the group'. Similarly, K. Y. Williams & O'Reilly (1998, p120) found that 'diversity is a mixed blessing and requires careful and sustained attention to be a positive force in enhancing performance', while more recently, Jackson and her colleagues (2003, p810) concluded that '[diversity] studies have yielded few discernible patterns in the results...findings were mixed'. This state of knowledge regarding the relationship between diversity and performance therefore presents us with a paradox – resulting in significant challenges for diversity management (Haidt, Rosenberg, & Hom, 2003).

Despite the academic concerns, diversity continues to be a practical reality in organisations regardless of beliefs about the nature of diversity (Kochan et al., 2003; K. Y. Williams & O'Reilly, 1998). This reality suggests that managing diversity is likely to remain one of the main challenges for organisational practitioners in the 21st century if the paradox persists (Barkema, Baum, & Mannix, 2002; Bookman, 2005; Mannix & Neale, 2005; J. E. Sawyer, Houlette, & Yeagley, 2006; Sommers, 2006; Zatzick, Elvira, & Cohen, 2003). For these reasons, numerous researchers (e.g. Haidt et al., 2003; J. E. Sawyer et al., 2006; Sommers, 2006) have shown great interest and have taken great efforts to explain and therefore produce a deeper insight into the diversity paradox.

1.1.3 Approaches to dissect the diversity paradox: what is known

Diversity researchers have tried to dissect the nature of the diversity paradox addressed above from various perspectives. In general, these perspectives are related to diversity conceptualisations, diversity theoretical frameworks, group processes, research contextual factors, and methodologies. In Chapter Two, these perspectives will be examined in detail. Here an overview will provide a brief background.

Diversity conceptualisations have received increased attention from researchers who attempted to dissect the diversity paradox. For example, it has been argued that the positive or negative effects of diversity may not just be a function of variables or contexts examined but may also be a function of the way in which diversity was

conceptualised (Bunderson & Sutcliffe, 2002). It was directly suggested that different conceptualisations of diversity might lead to different results (Harrison, Price, Gavin, & Florey, 2002; Harrison & Klein, 2007). This perspective was promising in that comparisons among research ought to produce mixed results because diversity has been referred to as different things in different research.

The second perspective relates to theories used in the research. For instance, K. Y. Williams & O'Reilly (1998) explained the mixed results by linking them with the theoretical frameworks. They treated the mixed results as an outcome of the different or, sometimes, contradictory predictions associated with the three commonly-used theories i.e. similarity-attraction theory, social categorisation theory (SCT), and the information/decision-making approach (K. Y. Williams & O'Reilly, 1998). This explanation seems reasonable because these theories predict different effects of diversity: similarity-attraction theory and SCT predict negative effects of diversity on groups while the information/decision-making approach forecasts positive effects of diversity on groups (Harrison & Klein, 2007).

The third perspective for explaining the diversity paradox is relevant to group processes. This perspective is also called the open-black-box approach (Lawrence, 1997) or the intervening theory approach (Pelled, 1996). According to this perspective, it is incorrect to assume (but not directly measure) the intervening variables between diversity and performance (Bayazit & Mannix, 2003; Chatman & Flynn, 2001; Lawrence, 1997). Specifically, it is argued that intervening processes (i.e. group processes) may account for the relationship between diversity and performance (Lawrence, 1997) changing the two-way relationship (i.e. diversity-performance) to a three-way relationship (i.e. diversity-group processes-performance).

Research contextual factors are the focus of the fourth perspective suggesting that, to fully understand the effects of diversity on performance, the influence of contextual settings on individuals and groups in which they work should be considered (Haidt et al., 2003; Jehn & Bezrukova, 2004). Research contexts help to explain some inconsistent

results (Spataro, 2005) because contextual factors affect how individuals react to working with people who are similar or different from them (Spataro, 2005).

The fifth perspective in explaining the diversity paradox is concerning methodological aspects. It has been asserted that current diversity measurement is limited because it does not measure multiple identities of individuals at one time. Accordingly, the full meaning of diversity might not have been assessed (Lau & Murnighan, 1998; Lau & Murnighan, 2005) yielding a variation of the impact of diversity. In addition, various performance measures made it difficult to compare the research results. For example, one study may link diversity with performance measured by job satisfaction, while other research may link diversity with performance measured by turnover. This is likely to suggest different effects of diversity due to the differential measurement of the two aspects of performance.

Although the five perspectives mentioned above are more or less helpful in dissecting the diversity paradox, none of the perspectives have adequately explained the diversity paradox. In order to understand better and therefore resolve the diversity paradox, it seems reasonable to combine some or all the perspectives. Moreover, contributions will also be significant if a specific perspective is further advanced with respect to its particular strengths that have been addressed above.

1.2 The Research Problems: What We Need to Know

As the preceding discussion demonstrated, researchers have struggled to conceptualise and study diversity effectively resulting in a diversity paradox. Whereas it is possible to resolve the diversity paradox by adopting an alternative approach, the present research focuses on a number of areas that reside in the five perspectives addressed above.

1.2.1 Problem One: diversity conceptualisation

With respect to diversity conceptualisation, research opportunities exist in at least two outlets: the first relates to the typology of diversity and the other depends on whether diversity is conceptualised objectively or subjectively.

First, research approaches that class different types of diversity are highly regarded. As shown in the brief outline of diversity history, there is a large number of attributes that have been referred to as diversity, spanning from legally-protected attributes such as race or gender to education or tenure. While the number of diversity attributes being studied continues to grow, researchers noted that different attributes of diversity may have unequal effects on organisations or groups, or individuals, and they have started to classify different diversity attributes into types (Mannix & Neale, 2005). Classification has been based on properties such as visibility (reflecting social aspects of the diversity attributes) or job-relatedness (indicating the informational dimension of a diversity attribute) (Pelled, 1996). In practice, research has focused mainly on six attributes: race, age, gender, education, functional background and tenure (van Knippenberg, De Dreu, & Homan, 2004). Although classifying diversity based on visibility or job-relatedness may offer researchers a greater power in explaining unexpected results (Christian, Porter, & Moffitt, 2006), diversity continued to be assigned to a single attribute (e.g. diversity of race or gender).

Second, diversity needs to be examined as a subjective construct. It has been increasingly argued in the literature that diversity is a subjective experience of social categories to which members feel they belong and these categories, or social attributes, may become more or less salient in different contexts and at different times (Garcia-Prieto, Bellard, & Schneider, 2003). The development of attribute salience will largely depend on how people interpret the attribute/s (Randel, 2002). That said, what matters is whether individuals note the differences and, accordingly, how people interpret the amount of variation in multiple attributes (Harrison & Klein, 2007; Sorensen, 2004). In addition, diversity has not been defined in a way where the interpretation is based on a

group of attributes that are of similar properties (e.g. social attributes such as race, age, and gender) rather than a single attribute (e.g. race or age).

1.2.2 Problem Two: the theoretical frameworks

New theoretical diversity framework/s has/have been called up due to both negative and positive effects predicted by commonly-used theories that have been separately applied in research. In particular, it has been argued that it is almost impossible to understand the dynamic of diversity without integrating all three theoretical frameworks (K. Y. Williams & O'Reilly, 1998).

Specifically, lacking are theoretical frameworks that can predict how different types of diversity operate differently to impact on performance. For example, a framework that integrates the three commonly-used theories would be particularly helpful in dissecting the diversity paradox because the theory would be able to explain both the negative and positive effects of diversity.

1.2.3 Problem Three: group processes

One emerging consensus in the literature is that group processes may account for the relationship between diversity and performance (Lawrence, 1997). Whereas a number of group processes have been examined in the relationship between diversity and performance, conflict has been suggested as a particularly powerful group process compared to other group processes such as communication and cohesion/social integration (Jehn, 1999; Pelled, 1996; Pelled, Xin, & Eisenhardt, 1999). This particular relationship has been termed as the diversity-conflict-performance paradigm (Kulik, 2004). The significance of conflict in the relationship between diversity and performance may be a product of three factors.

First, conflict has a duality i.e. it impacts on performance both negatively and positively depending on its sub-type, either relationship or task conflict (Jehn, 1995). This dual

nature may be particularly useful in explaining the diversity paradox. Second, conflict may be a proxy for communication and social integration as the latter are always associated with the former but not vice versa (Pelled, 1996). The last factor is that diversity may have a great potential to promote conflict (Jehn, Chadwick, & Thatcher, 1997; Jehn, 2000).

While the diversity-conflict-performance paradigm might be a particularly useful explanation of the diversity paradox, only two studies to the present researcher's knowledge (Jehn et al., 1997; Pelled et al., 1999) have examined the paradigm, but indirectly. Moreover, the two studies, once again, produced mixed results. For instance, both negative and positive effects of diversity on performance have been found (Jehn, 1997; Pelled et al., 1999). This state of knowledge highlights the need for further research on the paradigm.

1.2.4 Problem Four: contextual factors

Contextual factors have attracted increasing research attention given the argument that similar demographic characteristics might yield different work-related attitudes or/and behaviours. Although a number of contextual factors have been examined with respect to their moderating effects on the impact of diversity (Haidt et al., 2003; Jehn & Bezrukova, 2004), further research is still needed. Specifically, as researchers have paid increasing attention to the role of group processes on the relationship between diversity and performance, contributions will be particularly significant from research exploring whether research contextual factors are moderating the three-way relationships such as the diversity-conflict-performance paradigm.

1.2.5 Problem Five: methodologies

The quality of research depends largely on the overall research design and on how data are collected and analysed on the basis of that design (Aaker, Kumar, Day, Lawley, & Stewart, 2007). Indeed, it has been suggested that the mixed results were actually

methodological artefacts and that research designs and methodologies that overcome the limitations associated with the existing approaches are likely to produce meaningful results (Tonidandel, Avery, Bucholtz, & Mckay, 2008). In particular, highly regarded is research that takes the following approaches in diversity measurement and data analysis.

One of the critical limitations in diversity measurement is that there is no method that measures multiple attributes of one individual (for example, a white male sportsman) simultaneously - i.e. they do not deal with the ‘combined effects of diversity across multiple dimensions’ (Pelled, 1996, p626). This is problematic because people’s behaviours may not be just determined by one measured attribute (e.g. the gender attributes in the example), but also by other unmeasured identities (e.g. the attributes of race and occupational background in the example). This situation is demonstrated below.

Figure 1-1 People's multiple attributes



A male



**A white person
or**



A sportsman



A white male sportsman

Whom should we see him as?

Therefore, diversity measurement should capture the impact of the individual’s multiple identities (Rico, Molleman, Sanchez-Manzanares, & Van der Vegt, 2007). For example, when studying a subject who is a white male sportsman, the researcher may treat the participant as a **white male sportsman**, rather than just a white person, or a male or a sportsman.

New initiatives in data analysis have been called for in diversity research. In particular, new initiatives need to deal with two major challenges presented in diversity data:

1. the aggregation issue. the data might be collected from individuals, but analyses are carried at the unit level (Mohammed & Angell, 2004; Stewart & Barrick, 2000);
2. the assumption of non-independence. most traditional statistical methods assume independence of samples (Kline, 2005).

Data in diversity research are normally collected from individuals who are clustered in larger units, which may themselves be located in even higher-order variables (Kline, 2005). Therefore, normality is often violated in diversity research given the multilevel nature of diversity data (Harrison & Klein, 2007). Responding to these challenges requires analysis techniques that are able to simultaneously examine the effects of variables at both the individual and group levels and to test complex factorial measurements in nested-data structures.

1.3 Research Aims and Objectives

As addressed above, diversity presents an array of opportunities and challenges for organisations and the knowledge of diversity is still limited largely due to the diversity paradox indicating mixed and inconsistent research results. The paradox has been dissected from various perspectives and further research is still needed due to the inadequate explanations.

In response to the problems identified above, this research will extend the existing literature by resolving the diversity paradox in an Australian context. By doing so, the researcher hopes to articulate the processes through which group members perceive various types of diversity, and how variations in their perception influence different forms of group conflicts and, accordingly performance. In this way, the researcher seeks to contribute to an improved understanding of the diversity paradox.

1.4 The Research Question

While the focus of this research is on the diversity-conflict-performance paradigm, this researcher intends to answer a primary research question. This is:

How does the process of group conflict influence the relationship between diversity and performance?

In addressing the above question, a number of subsequent second-order questions are likely to emerge and these questions will be described in the sections accordingly.

1.5 Significance of this Research

However, built upon prior research, the present research extended previous studies from different perspectives. The significance of this research is at least twofold. Theoretically, this research will contribute to the knowledge of diversity by improving the level of understanding of the diversity paradox. In particular, a theory that describes how different types of diversity operate differently, via different forms of conflict, and their impact on performance will be developed and tested. Moreover, to the researcher's knowledge, this will be the first research that **directly** examines the diversity-conflict-performance paradigm in a confirmative way by using a multilevel statistical technique.

In a practical sense, by distinguishing between the negative and positive effects of diversity, this research will have significant implications for diversity practitioners. As a result, organisations could improve their diversity initiatives through promoting the positive effects of diversity on performance on the one hand, and managing diversity that exerts a negative influence on outcomes on the other.

1.6 Limitations

While the researcher made his great effort to the overall research design, the present research has a few limitations, which are articulated in section 9.4. Considerations should be given to the issues when interpreting the research results.

1.7 The Organisation of the Thesis

Before introducing a number of definitions of terms, this brief structure of the thesis will serve as a site map. In total, the thesis is structured in nine chapters.

- Chapter 1: **Introduction**. In this chapter, a general background of the research was firstly presented with a brief historical backdrop of diversity and an overview of contemporary theoretical development in the research area. Then, major problems to be addressed by the research were outlined briefly. A statement of research aims as well as the primary research question was provided.
- Chapter 2: **Literature Review**. This chapter will review the research into diversity, examining both the conceptual and empirical literature. It focuses, in particular, on how the diversity paradox has been explained from various perspectives. By articulating what has been achieved in the diversity literature and what areas need to be further explored, the discussions will suggest possible research opportunities.
- Chapter 3: **The Present Research and Hypothesis Development**. This chapter extends the preceding discussion to the current research. In particular, the focuses of the research will be introduced and the research question will be framed. To address the research questions, a number of hypotheses will be developed.
- Chapter 4: **The Research Design and Ethics**. This chapter articulates the rationale of an appropriate research strategy as well as identifying a research method identified to answer the research question. A plan of data collection and data analysis will also be presented. The chapter will consider ethical issues.
- Chapter 5: **Measurement Construction**. This chapter will describe how the questionnaire was designed, what the structure of the questionnaire is, and how the questionnaire was pretested and, as a consequence, was revised (i.e. piloting).

- **Chapter 6: Data Collection.** The chapter will describe the research context and the characteristics of samples. Related issues such as the questionnaire administration and questionnaire return rates will also be mentioned.
- **Chapter 7: Data Analysis.** In this chapter, how the data were processed will be described. There will also be an introduction to the preliminary analysis that allowed the researcher to become familiar with the data and to understanding it. Most details will be about the processes of data analyses in hypothesis testing and the presentation of results.
- **Chapter 8: Discussion.** In this chapter, the discussion will focus on how the research results fit into existing knowledge with respect to the consistencies and inconsistencies. Additional findings will be also discussed.
- **Chapter 9: Conclusion.** In this chapter, contributions of the research to knowledge of the topic will be articulated. After that, implications for practitioners will be pointed out and the potential limitations of the present research will be examined. Possible directions for future research will be presented at the end of the chapter followed by concluding remarks.

1.8 Definitions of Terms

Before any further discussion, it would be useful to define the major terms that will be used in this research.

- **Perceived diversity¹.** Perceived diversity is classified into two types and it is a construct at both individual and unit levels. At the individual level, perceived social diversity is individuals' **perceptions** of **social dissimilarity** towards others within a social unit based on a **group** of **social-related** attributes such as race, sex, and age. Perceived information diversity is individuals' perception of members' **perception**

¹ The rationale of the definition will be provided in section 3.1.1.

of **informational dissimilarity** towards others within a social unit based on a **group** of **job-related** attributes such as tenure, education, and functional background (Allen, Dawson, Wheatley, & White, 2008; G. B. Cunningham, 2007; Hobman, Bordia, & Gallois, 2004; Pelled, 1996; Riordan, 2000).

At the unit level, perceived social diversity is the **total amounts** of members' perception of social dissimilarity towards others within a unit based on a group of social-related attributes such as race, sex, and age. Perceived information diversity is the **total amounts** of members' perception of informational dissimilarity towards others within a social unit based on a group of job-related attributes such as tenure, education, and functional background (Allen et al., 2008; G. B. Cunningham, 2007; Hobman et al., 2004; Pelled, 1996; Riordan, 2000).

- **Objective diversity**². Objective diversity is classified into two types and it is a construct at both individual and unit levels. At the individual level, objective social diversity is **individuals' dissimilarity** in relation to others within a social unit based on a **group** of **social-related** attributes such as race, sex, and age; objective information diversity is **individuals' dissimilarity** in relation to others within a social unit based on a **group** of **job-related** attributes such as tenure, education, and functional background (G. B. Cunningham, 2007; Pelled et al., 1999; Riordan, 2000).

At the unit level, objective social diversity is the **average** of individuals' dissimilarity in relation to others within a social unit based on a group of social-related attributes such as race, sex, and age; objective information diversity is the **average** of individuals' dissimilarity in relation to others within a social unit based on a group of job-related attributes such as tenure, education, and functional background (G. B. Cunningham, 2007; Pelled et al., 1999; Riordan, 2000).

² While the researcher is interested in perceived diversity, objective diversity was also measured and analysed in comparison with perceived diversity.

- **Conflict.** In this research, conflict will be defined as perceived incompatibilities or perceptions by parties involved that they hold discrepant views or have interpersonal incompatibilities (Amason, Thompson, Hochwarter, & Harrison, 1995; Jehn, 1995). There will be two forms of conflict: the relationship conflict that reflects a perception of interpersonal incompatibility and typical tension, irritation and hostility among group members and the task conflict indicates a perception of disagreement among group members about the content of their decisions and involves differences of opinions, ideas, and viewpoints (Guerra, MartAnez, Munduate, & Medina, 2005; Jehn, Greer, & Rupert, 2008; Medina, Munduate, Dorado, Martinez, & Guerra, 2005).
- **Performance.** Performance is the accomplishment of organisational objectives, group work assignments or individuals' responsibilities and the contributions to individual/group/organisational goals (Bowers, Pharmer, & Salas, 2000; Levy, 2003; Otley, 1999). It has four sub-domains (i.e. objective task performance, subjective task performance, objective contextual performance, and subjective contextual performance), it is both the result of behaviours and behaviours themselves that create the results and it differs from performance measures as well as group processes.
- **A group and a 'psychological group'.** A group can be defined as any collection of interdependent people, while a psychological group is a group that exists psychologically for the members (Turner, 1985). A group is where subjects physically locate because of group interdependence (e.g. a common task), whereas the psychological group is the sub-group to which members subjectively belong due to perceived similarities (e.g. a common race).
- **Group processes.** Group processes are members' interdependent acts that convert inputs to outcomes through cognitive, verbal, and behavioural activities directed towards organising task work to achieve collective goals (Hinds & Mortensen, 2005).

Chapter 2. Literature Review³

The introduction briefly outlined the research background and problems to be addressed in the research. The broad research objectives and research have also been described. Following on from the introduction, this chapter reviews the research into diversity, examining both the conceptual and empirical literature. It focuses on what has been achieved in the diversity literature and what areas need to be further explored.

As shown in the introduction, the current inconsistent results in diversity research have been examined from five perspectives. This chapter will identify the gaps in the all related areas in diversity research. To achieve this goal, this chapter is structured in eight sections accordingly. The first section gives a definition of performance. The second section presents the “diversity paradox” from the perspective of inconsistent research findings in relation to the effects of diversity on performance. The third to seventh sections will discuss all possible perspectives of the diversity paradox including perspectives from diversity conceptualisations, diversity theoretical frameworks, group processes, research contexts, and methodologies. The discussions also suggest possible research opportunities. The chapter then concludes with a summary.

2.1 Understanding the Meaning of Performance

Despite the frequency of using the word ‘performance’ in all areas of research, its precise meaning is rarely explicitly defined by authors (Lebas & Euske, 2002). A review of a broad range of papers and studies investigating the relationship between diversity and performance found that very few of these provide a clear definition of performance (e.g. K. Y. Williams & O’Reilly, 1998). Furthermore, where it did occur, the definition was very brief, for example, ‘objective performance is the productivity of the group which can be measured by objective criteria’ (Jehn et al., 1997, p291). Therefore, it

³ The systematic literature search ended in June 2008 although papers published after that might be mentioned where necessary.

seems necessary to clarify the meaning of performance before reviewing diversity research that investigates how diversity impacts performance.

2.1.1 Variation in defining performance

There is a broad variation in the way that performance has been defined across different disciplines. In management accounting, drawing on the 3Es (effectiveness, efficiency, and economy), Otley (1999) specifies performance as results of a combination of three aspects: 1). The production of outputs; 2). The conversion of inputs into outputs; 3). The procurement of inputs. For accounting specialists including Otley, the issue about performance is how to measure and quantify it rather than how to define it.

In contrast, in organisational psychology, performance is defined as actual on-the-job **behaviours of individuals** that are relevant to the organisation's goals (Levy, 2003). According to organisational psychologists, performance is not the result of an action but the action itself (Krumm, 2001). While emphasising the importance of actions, this definition is limited in that it neglects the impacts of actions.

Differing from management accounting and organisational psychology scholars, organisational behaviour scholars define performance in a way that combines perspectives of the previous two disciplines. For example, some organisational behaviour scholars have defined performance as the accomplishment of work assignments or responsibilities and contributions to the individual/group/organisational goals, including both results (effectiveness) and behaviours (Bowers et al., 2000; Jehn & Bendersky, 2003). This definition has obvious strengths in that performance as a multi-faceted concept has been suggested as encompassing various elements that describe both the results and the actions creating the results (Lebas & Euske, 2002).

Through comparing and contrasting the three definitions of performance, there are two issues that have been found to be very important to performance conceptualisations. The first issue is related to levels of performance. The second is about its domain i.e. what

should be measured. According to the three disciplines (i.e. management accounting, organisational psychology, and organisational behaviour), levels of performance can be at organisational, group and individual levels. In particular, the management accounting specialists focus on examining performance at organisational levels, organisational behaviour scholars are more interested in both group and organisational levels, and organisational psychologists focus on individuals in the tradition of psychology. Each perspective is valuable depending on who is assessing the performance. For example, for shareholders, organisational performance may be more relevant. For managers, performance of individuals and groups is the means to achieve organisational performance.

In relation to the performance domain, there is a contrast between the three perspectives. In particular, for management accounting specialists, performance may be more about results (outputs and inputs). For organisational psychologists, behaviours of employees are their concern. Organisational behaviour scholars, however, suggest the importance of both results (i.e. the accomplishment of goals) and behaviours. While there are obvious strengths associated with perspectives of management accounting and organisational psychology, performance has a broader meaning in the organisational behaviour discipline.

2.1.2 Performance domains

Levy's (2003) intensive discussion has provided a possible resolution of the debate, at least from the perspective of non-financial performance. In his model (Expansion of the Criterion Domain, listed in Figure 2-1) Levy has successfully divided performance into two domains: task performance (TP) and contextual performance (CP). In this model, TP is the work-related activities performed by employees that contribute to the technical core of the organisation (Borman, 1997). It is what is required in the way of on-the-job behaviours (Levy, 2003). In contrast, CP is defined as the activities performed by employees that help to maintain the broader organisational, social and psychological environment in which the technical core operates (Borman, 1997). Compared to TP, CP

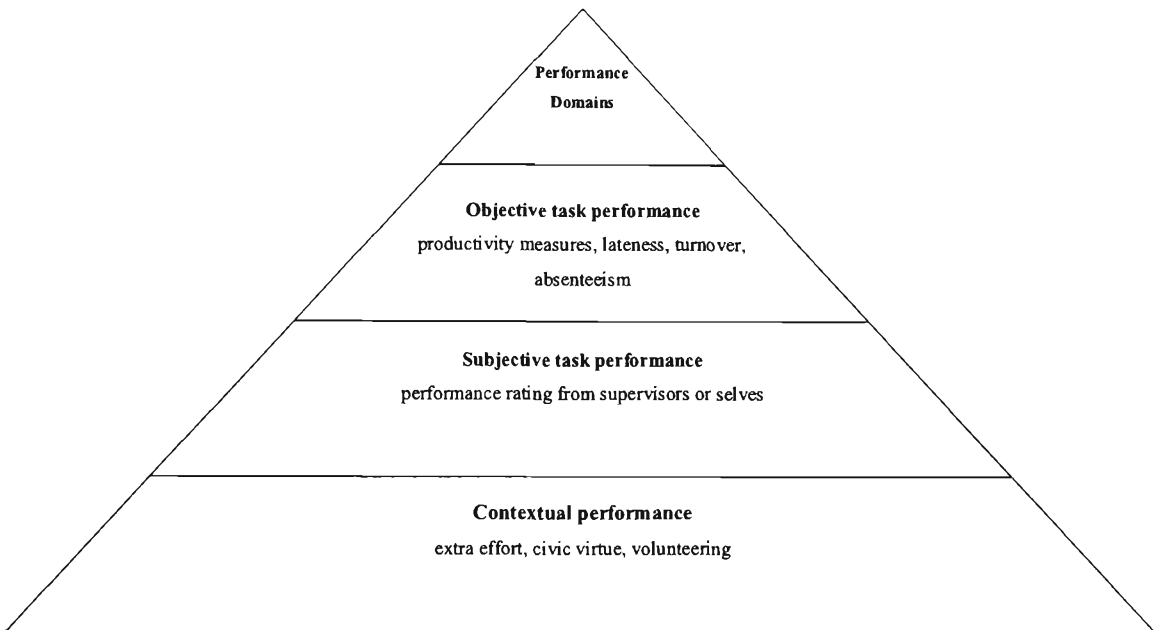
is less likely to be formally instituted by the employers as items on a job description (Levy, 2003).

Furthermore, Levy divides task performance into three sub-domains: objective task performance (OTP), subjective task performance (STP) and CP. According to Levy (2003), OTP measures are based on counting rather than subjective judgements or evaluations; STP measures are built on the judgement or evaluations of others rather than on objective measures such as counting; CP measures are determined by how employees go the extra yard rather than putting forth only what is required or expected of them.

While addressing performance's domains, Levy's model (2003) clearly distinguishes 'performance' from 'performance measures'. This differentiation is important because some performance measures have become so well known that they are almost synonymous with performance. For instance, turnover has been treated almost the same as performance but it is a performance measure rather than performance itself. Thus, when linking diversity with turnover, the research is linking diversity with performance indicated by turnover. Therefore, the quality of the research findings may be subject to the reliability and validity of turnover as a performance measure.

Despite Levy's model being a very useful framework as addressed above, his model also has potential to be further developed. For example, with respect to CP, it may be necessary to further divide CP into two sub-domains: objective contextual performance (OCP) and subjective contextual performance (SCP). This is because CP could be measured by both counting (objective measures) and judgment or evaluation (subjective measures). In his examples, extra effort and organisational loyalty are SCP measures while civic virtue, volunteering, and helping others is OCP (Borman, 1997).

Figure 2-1 Expansion of the criterion domain



Source. (Levy, 2003)

In addition, despite his model having listed some performance measures, there is a need to extend the list. For example, job satisfaction and intention to leave, two of the commonly used measures are not included in this model. Therefore, a more comprehensive list is showed in Table 2-1. As indicated in the table, performance has two domains: TP and CP. Following this classification, each domain has been divided into two sub-domains: OTP, STP, OCP and SCP. With respect to performance measures, a total of 22 identified performance measures, such as job satisfaction, intention to leave, and others, have been classified according to this typology.

Table 2-1 Performance classification of performance measures by domains

Domains	Task performance (TP)		Contextual performance (CP)	
Sub-Domains	Objective TP (OTP)	Subjective TP (OTP)	Objective CP (OTP)	Subjective CP (OTP)
Measures	Productivity measures Lateness, Turnover, Absenteeism Problem solving Goal achievement Bonuses Stock options Decision-making	Performance valuation or ratings from: supervisors, self, subordinates, peers, customers, clients Innovativeness	Civic virtue Volunteering Helping others	Extra effort Organizational loyalty Negative affective reactions Job satisfaction Work relationship quality Indicating to leave or remain Self-esteem Perceived support

Source. (Bowers et al., 2000; Levy, 2003; Otley, 1999)

Although the above discussion has addressed two important issues in performance conceptualisation and its differentiation from performance measures, it is still possible to mix up performance with group processes at the group level. In order to understand performance better, it is also necessary to differentiate performance from group processes. Group processes are defined as members' **interdependent acts** that convert inputs to outcomes through cognitive, verbal, and behavioural activities directed towards organising task work to achieve collective goals (Hinds & Mortensen, 2005). Based on this differentiation, communication, conflict, cohesion/integration (they are interdependent acts between group members), and so forth are classed as group processes. Problem solving, innovativeness, indicating to leave, commitment, and so forth, are performance measures. This distinction is important since doing so allows comparison across studies.

2.1.3 Defining performance in this research

Based on the above discussion, the following definition of performance will be adopted in this research (Bowers et al., 2000; Levy, 2003; Otley, 1999):

Performance is the accomplishment of organisational objectives, group work assignments or individuals' responsibilities and the contributions to individual/group/organisational goals. Having four sub-domains (i.e. objective task performance, subjective task performance, objective contextual performance, and subjective contextual performance), it is both results of behaviours and behaviours themselves that create the results. Performance is different from performance measures and group processes.

2.2 The Diversity Research: A Paradox

A reality in organisations is that managers must address diversity and this has served to unify explanations of a broad range of organisational behaviours, including performance (Mannix & Neale, 2005). Indeed, in exploring how diversity impacts on organisations, researchers have paid great attention to its potential effects on performance.

The presence of employees from diverse backgrounds has been traditionally viewed as an opportunity for a better pool of knowledge, skills, abilities, and other characteristics (KSAOs) and this has been considered crucial to performance (Jayne & Dipboye, 2004; Webber & Donahue, 2001). In particular, much recent research has focused on diversity within a context of groups and its impact on the groups or/and the individuals-within (S. E. Jackson et al., 2003; Mannix & Neale, 2005).

Research has increasingly shown an interest in groups⁴ because of their potential benefits to organisations. For example, depending on groups, organisations are able to garner the benefits of unique knowledge and information that group members might bring to the table (Phillips, Northcraft, & Neale, 2006). Accordingly, groups are believed to solve problems that are too complex for individuals and/or in situations where acceptance of decisions by relevant others is essential for implementation of problem-solving (Schrujjer & Vansina, 1997). Indeed, reviews of empirical research suggest that groups can accomplish tasks more effectively than individuals working alone in a range of situations (Tjosvold, Poon, & Yu, 2005). With regard to interests of diversity research in groups, it might be due to the nature of group interdependence that suggested that both collective and individual outcomes are influenced by what other individuals in the group do (Brewer, 1995).

Indeed, research has shown the important impact of diversity on performance (Milliken & Martins, 1996; K. Y. Williams & O'Reilly, 1998). However, over the past fifty years,

⁴ Groups and teams are used interchangeably in this research.

research exploring the relationship between diversity and performance has produced inconsistent results (Yeh & Chou, 2005) indicating a diversity paradox. Diversity impacts on performance both negatively and positively. In order to understand this diversity paradox better, it is important to survey the literature and empirical results. This section begins with a review of three recent papers reviewing studies spanning the 50 years until 2002. It then goes on to examine the empirical results of research published since 2002.

2.2.1 Reviews before 2002

The first review study to be discussed was done by Milliken & Martins (1996). In searching for evidence of common patterns in diversity research, they reviewed and evaluated 34 studies on the impact of different types of diversity on groups at different levels of organisational functioning between 1989 and 1994. They first distinguished between two types of diversity against various diversity dimensions: the observable, including race/ethnic, nationality, gender, age; and non-observable, including personality, value, education, functional background, occupational background, industry experience, tenure and organisational membership. They examined the empirical findings regarding effects of different types of diversity on outcomes. They found that observable diversity was associated with negative affective reactions (SCP), higher turnover and absenteeism (OTP) and that non-observable diversity seemed to have some positive cognitive outcomes in group decision-making, including, for example, numbers of alternatives considered and quality of ideas (OTP). Finally, they concluded that diversity appeared to be a double-edged sword, increasing the opportunity for creativity (OTP) as well as the likelihood that group members felt dissatisfied (SCP) and failed to identify with the group (SCP).

Two years after Milliken & Martins' review, K. Y. Williams & O'Reilly (1998) undertook a larger scale review covering 80 diversity studies spanning 40 years. Although they defined diversity in a broad sense, in the main they reviewed five types of diversity (age, sex, race/ethnicity, tenure, and background). The authors found that

gender, race/ethnicity, age and tenure have been, in general, associated with higher levels of absenteeism and turnover (OTP), lower performance evaluations (STP), and lower levels of satisfaction and commitment (SCP). They noted, however, positive effects of functional background. In particular, diversity in functional background was likely to improve creativity (OTP). In conclusion, K. Y. Williams and O'Reilly (1998) suggested that diversity is more likely to have negative than positive impacts on group performance unless steps are taken to counteract the determining effects from diversity.

S. E. Jackson, Joshi, & Erhardt (2003) conducted another review study examining 63 studies published between 1997 and 2002 to assess the effects of diversity on groups and organisations. Instead of simply focusing on the relationship between diversity and performance, they reviewed the studies to offer research directions through a SWOT analysis (strengths, weaknesses, opportunities, and threats) in order to provide a research direction. With respect to the impact of diversity, they found that for most diversity dimensions, the findings across studies were mixed. In particular, they found that gender was related to performance ratings of women (STP) but not the performance ratings of men (STP). In relation to investigations on impacts of diversity, they called for evidence to support a three-way relationship i.e. diversity-group process-performance.

In general, the three reviews outlined the diversity literature from the past 50 years, addressing the significance of research findings and directions for future study. Particularly in relation to the impact of diversity on performance, they found that results in diversity research are mixed, showing both positive and negative effects on performance outcomes depending on the types of diversity, domains of performance and contexts.

2.2.2 Reviews of diversity research since 2002

Since the previous reviews covered studies conducted before 2002, it is useful to survey research published since 2002. The research presents the results according to six dimensions of diversity: race, gender, age, tenure, education, and functional background.

The first three attributes (e.g. race, gender, age) are more social-related while the last three attributes (e.g. tenure, education, and functional background) are more information-oriented and more job-related. These six dimensions were chosen because they were the most researched attributes (Christian et al., 2006; Mannix & Neale, 2005). Accordingly, a broad picture of how diversity impacts on performance could emerge due to their representativeness. The following is a summary of findings in 21 studies after 2002. The 21 studies are considered sufficient because the purpose of the review was to identify a pattern in the literature rather than exhaustively reviewing the research findings.

2.2.2.1 Social diversity

2.2.2.1.1 Race

In general, the empirical evidence indicates a negative relationship between racial diversity and performance (Brief et al., 2005; Foley, Linnehan, Greenhaus, & Weer, 2006; Liao, Joshi, & Chuang, 2004). In particular, racial diversity was negatively related to organisational commitment (SCP), organisational deviance (SCP) (Liao et al., 2004), supportive supervision (OCP) (Foley et al., 2006), and quality work relationships (SCP). Specifically, Caucasians reported a lower quality work relationship compared to non-Caucasians (Brief et al., 2005). With respect to OTP, a significant negative relationship was found between racial diversity and team goal achievement (Kochan et al., 2003), bonuses and stock options (Jehn & Bezrukova, 2004). With regard to STP, racial diversity was found to be negatively related to performance ratings (Jehn & Bezrukova, 2004).

However, the findings are not consistent across the research. In some studies, racial diversity was unrelated to performance. For example, racial diversity had no significant effect or was not related to sales (OTP) (Kochan et al., 2003; Pitts, 2006), performance ratings (STP) (Kochan et al., 2003) and intent to remain (SCP) (Bayazit & Mannix, 2003). In some studies, there were even positive relationships between racial diversity and performance. For example, racial diversity was found to be positively related to

sales (OTP) (Leonard, Levine, & Joshi, 2004), was associated with greater decision accuracy (OTP) (Sawyer et al., 2006), and was positively related to performance measured by students' academic assessment (OTP) (Pitts, 2005). Moreover, racial diversity was found to be a significant individual predictor of rating of effectiveness (STP) (Kirkman, Tesluk, & Rosen, 2004), and was positively linked with group members' self-esteem (SCP) although the relationship was mediated by dogmatism⁵ (Chattopadhyay, 2003).

2.2.2.1.2 Gender

In general, the argument of 'value in diversity' has not been supported by research from the perspective of gender. There were no significant direct effects of gender diversity on performance ratings (STP) (Kochan et al., 2003), group effectiveness (OTP) (Chowdhury, 2005), and sales (OTP) (Kochan et al., 2003; Leonard et al., 2004). In another study, it has been suggested that gender diversity was not important for entrepreneurial team effectiveness (OTP) and did not contribute to the team-level cognitive comprehensiveness (OTP) and team commitment (SCP) (Zatzick et al., 2003). In some studies, gender diversity produced a negative impact by being positively related to intent to remain (SCP) (Bayazit & Mannix, 2003) and interpersonal deviance (SCP) (Liao et al., 2004) and being negatively related to supportive supervision (OCP) (Foley et al., 2006).

However, the findings of the effects of gender diversity are mixed. In one research project, gender diversity was positively related to performance ratings (STP) although the relationship was stronger for women than for men (Elfenbein & O'Reilly, 2005). But in other studies, gender diversity was negatively related to performance ratings (STP), although it was positively related to bonuses (OTP) (Jehn & Bezrukova, 2004); gender diversity working with other organisational variables was negatively and positively

⁵ It refers to individual differences with regard to the openness and closedness of belief systems (Chattopadhyay, 2003).

linked to productivity (OTP) and return on equity (financial performance) respectively (Dwyer, Richard, & Chadwick, 2003).

2.2.2.1.3 Age

In research concerning age diversity, the direct effects of age diversity on performance were largely negative predicting lower sales (OTP) and customer referrals (STP), but were moderated by quality of team processes (Ely, 2004). In other research, age diversity significantly predicted lower sales (OTP) (Leonard et al., 2004). Age diversity was also negatively related to performance ratings (STP), bonuses (OTP) and stock options (OTP) (Jehn & Bezrukova, 2004). It was also found that diversity in age did not contribute positively to group effectiveness (OTP) (Chowdhury, 2005). However, age diversity was found to improve decision-making (OTP) in one study and was negatively related to intent to remain (SCP) (Bayazit & Mannix, 2003). In another study, age diversity positively predicted perceived co-worker support (SCP) (Liao et al., 2004).

2.2.2.2 Information diversity

2.2.2.2.1 Tenure

Promisingly, it has been shown that group heterogeneity in tenure improved group performance (Leonard et al., 2004) and tenure diversity was positively related to performance ratings (STP), bonuses (OTP) and stock options (OTP) (Jehn & Bezrukova, 2004). However, significant negative effects of tenure diversity were also found in other research (Ely, 2004; Thatcher, Jehn, & Zanutto, 2003). In particular, tenure diversity was negatively associated with the attainment of goals set for sales productivity (OCP) and customer satisfaction (STP) (Ely, 2004).

2.2.2.2.2 Education

In the education sector, diversity of students' education background has been linked with positive effects and was found more valuable in classrooms than in other social settings

(Kirkman et al., 2004). In another research context, education diversity was found positively related to perceived performance (STP) (Watson, Stewart Jr., & BarNir, 2003). However, effects of education diversity were inconsistent. In one study, diversity in the level of education was negatively related to performance ratings (STP) (Jehn & Bezrukova, 2004). In another study, education diversity was negatively associated with organisational citizen behaviours (OCP) but only under incongruent combinations of task and goal interdependence (Van der Vegt, Van De Vliert, & Oosterhof, 2003).

2.2.2.2.3 Functional background

Diversity in functional backgrounds is similar to expertise and structural diversity. Both negative and positive effects have been found. Unexpectedly, functional diversity has been found to be negatively associated with performance. In one study, functional diversity had negative effects on group satisfaction (SCP) (Van der Vegt et al., 2003). In another study, it was shown that informational dissimilarity was negatively related to group identification (SCP) and group effectiveness (OTP) (Yeh & Chou, 2005). Similarly, another research showed that diversity in functional backgrounds did not contribute positively to group effectiveness (OTP) (Chowdhury, 2005). There was also evidence showing that background diversity was negatively associated with organisational citizen behaviours (OCP) but only under incongruent combinations of task and goal interdependence (Van der Vegt et al., 2003).

However, research conducted within the small business setting showed that functional diversity has a positive impact on innovation although this impact is reduced in larger firms (Yeh & Chou, 2005). In addition, knowledge diversity was positively related to innovation performance (OTP) (Rodan & Galunic, 2004) although diversity measured by perceived knowledge and skill difference has not been found to be directly linked with innovative behaviour (OTP) in another study (Van der Vegt & Janssen, 2003). Further evidence showed that functional background diversity was positively related to performance ratings (STP), but was negatively related to bonuses (OTP) (Jehn & Bezrukova, 2004). In another study, background diversity measured by work experience

has been found to be positively related to perceived performance (STP) (Watson et al., 2003). There is also indirect evidence showing that functional background diversity measured by the interaction with external knowledge was significantly associated with performance ratings (STP) (Cummings, 2004).

2.2.3 A diversity paradox

In light of the discussion above, the evidence of how diversity influences performance is inconclusive. The research results were extremely inconsistent, mixed and, sometimes, contradictory, indicating a diversity paradox in the literature. Specifically, diversity has been found to be positively related to performance in one study while negatively linked with performance in another.

However, there was a small common pattern existing in these results. On the one hand, dimensions of social-related diversity (e.g. race, gender, age), were likely to be negatively linked with performance, STP and SCP in particular. The results were, however, inconsistent and the significance of relationships also varied from one research to another. At times, no relationship was found between social diversity and performance. On the other hand, dimensions of job-related diversity (e.g. education, tenure, function background) were more likely to be positively related to performance, OTP and OCP in particular. The results were mixed and those dimensions might be negatively linked with performance in other research.

2.2.4 Perspectives to explain the diversity paradox

Diversity researchers have tried to dissect the nature of the diversity paradox addressed above from various perspectives. In general, these perspectives are based on diversity conceptualisations, diversity theoretical frameworks, group processes, research contexts, and methodologies. In order to understand the strengths as well as limitations in explanations from these perspectives better, it is necessary to examine these stances.

2.3 A Variety of Diversity Conceptualisations

As addressed in the previous sections, diversity research presented a paradox and researchers have tried to explain the diversity paradox from a range of perspectives. One possible explanation of the diversity paradox is related to diversity conceptualisation, which has received increased attention from researchers. For example, it has been argued that the positive or negative effects of diversity were not just a function of variables or contexts examined but were also a function of the way in which diversity was conceptualised (Bunderson & Sutcliffe, 2002). Specifically, it was suggested that different conceptualisations of diversity might lead to different results (Harrison et al., 2002).

What is diversity? It seems to be a difficult question. There is a growing consensus in the literature that diversity is about 'any attribute people use to tell themselves that another person is different' (K. Y. Williams & O'Reilly, 1998). However, people differ from one another according to various attributes, making diversity a multifaceted concept (Sauer, Felsing, Franke, & Rüttinger, 2006). Accordingly, researchers are referring diversity to attributes that are of interest to themselves (Harrison & Klein, 2007). As a result, conceptualisations of diversity vary dramatically across research, making it difficult to explain the conflicting research results.

The following section provides a comprehensive review of diversity conceptualisations, which may, in turn, clarify the meaning of diversity. Specifically, looking at key aspects of diversity conceptualisations, this section will first examine the definitions of diversity that are commonly used in literature. Then, various approaches of diversity conceptualisations will be discussed with respect to key aspects. By doing so, this section might articulate the variety in diversity conceptualisations, which, in turn, might produce some explanations of the diversity paradox.

2.3.1 Aspects in constructions of diversity

Even a cursory glance at diversity literature shows there is significant variation in the way different researchers have used the term 'diversity' (Christian et al., 2006; Mannix & Neale, 2005; Pfeffer, 1983). Pfeffer (1983, p308) described diversity as 'organisational demography' and defined it as 'the composition of basic attributes such as age, sex, educational level, length of service or residence, or race, of the social entity under study'. According to Pfeffer (1983; 1985), diversity is the composite aggregation of the characteristics of the individual members of an entity.

While authors such as Pfeffer (1983; 1985) were interested in the effects of diversity at the unit level (e.g. groups), other researchers studied diversity at both the unit and individual levels. According to Hobman & Bordia (2006), at the unit level diversity is referred to as the amount of variance in demographic characteristics or values; at the individual level, diversity is synonymous with dissimilarity and is defined as an individual's difference in the same variables compared to other group members.

In contrast to Pfeffer (1983; 1985) who has referred to diversity as certain attributes (e.g. age, gender and so forth), other researchers have defined diversity from a broad sense. For example, S. E. Jackson (2003, p802) referred to diversity (at the group level) as 'the distribution of personal attributes among interdependent members of a work unit'.

While following the broad sense of diversity, researchers turned increasing attention to the reference approach (e.g. perception) that determines which differences are to be referred to as diversity. For example, diversity was defined as 'differences between individuals on any attributes that may lead to the **perception** that another person is different from self' (van Knippenberg et al., 2004, p1008). Similarly, diversity was referred to as 'the compositional distribution of team members on any personal attributes that potentially lead to the **perception** that team members differ from one another' (Rico et al., 2007, p113).

While researchers have conceptualised the term diversity differently, they have more or less addressed the questions according to three key aspects that construct the concept of diversity:

- **the level of analysis:** which level is of interest?
- **the content of diversity:** what is diversity about?
- **the reference approach:** how attributes are referred to as diversity?

As shown in the above examination of common definitions, there are various approaches that address these key aspects and contribute to the variation in diversity definitions. Therefore, the following discussion will review the various approaches of addressing the key aspects of the construct of diversity.

2.3.2 Which level is of interest?

Researchers explore diversity at both the individual level and the unit level (Tsui, Egan, & A. O'Reilly III, 1992; Tsui, Porter, & Egan, 2002). Accordingly, different streams of research have been developed that focus on different levels of analysis. The stream that examines diversity at the individual level is sometimes called 'relational demography' dealing with the similarity of one person to another or to a group (Thatcher et al., 2003) and the stream that investigates diversity at the unit level is often termed 'organisational demography', looking at the composition of a collection of people (Pfeffer, 1983). Relational demography and organisational demography are two approaches of conceptualising diversity but not two separate concepts in this discussion. Relational demography was developed from organisational demography (Tsui & O'Reilly III, 1989). Accordingly, the following discussion firstly examines organisational demography.

2.3.2.1 Organisational demography

Organisational demography, named by Pfeffer who regarded diversity as a collective property at the unit level (e.g. a group or organisation), is analysed across organisational levels (Pfeffer, 1983). According to this stream of research, diversity is nothing more

than the distribution of a demographic attribute and diversity is based on the data gathered from individuals, but is, in fact, a collective or unit-level property (Pfeffer, 1985). It describes attributes at a level of analysis that differs from where the data were collected (Lawrence, 1997). More specifically, some organisational demography researchers even argued that diversity is a compositional construct that does not even exist at the individual level of analysis because an object or individual is diverse only in relation to other objects or individuals (Austin, 1997; Smith, Smith, Sims Jr., O'Bannon, & Scully, 1994).

Organisational demography attempts to study the effects of the composition of a certain attribute within a group or social unit (Palmer & Varner, 2007). In so doing, researchers interchange 'diversity' with 'heterogeneity/homogeneity' or dispersion that refers to the distribution of differences among the members of a unit with respect to common attributes (Harrison & Klein, 2007). In addition, organisational demography argues that the diversity level of a unit is fixed as long as a certain attribute in that unit is identified (Pfeffer, 1983).

However, while treating diversity as a property at a unit level, organisational demography research investigates the effects of diversity upon performance at both the unit (e.g. group performance) and individual levels (e.g. individual behaviours) (Bachmann, 2006; Rico et al., 2007).

2.3.2.2 Relational demography

Initially researchers in relational demography treated diversity as a social relationship between an individual and the group or another group member as in the case of dyads (Tsui & O'Reilly III, 1989). However, being extended, it also suggests that individuals compare their own attributes with the attribute composition of a social unit to determine if they are similar or dissimilar (Riordan, 2000). As relational demography is about an individual-within-the-group, it has also applications as a cross-level concept (Goldberg, 2005).

In general, relational demography attempts to study the impacts of diversity from the perspective of dissimilarity/similarity, which is the degree to which an individual-within-the-group demographic attribute is shared by other members of a social unit (Tsui & O'Reilly III, 1989). From this perspective, similarity/dissimilarity cannot be assessed without taking into account the demographic characteristics of others in the group (Riordan, 2000). Specifically, relational demography deals with an individual's distance from the other group members, rather than with the amount of diversity within the group (Hobman, Bordia, & Gallois, 2003; Tsui & O'Reilly III, 1989).

According to this approach, diversity is contingent upon both its reference basis (i.e. the composition of the group or unit) and the members' comparison processes (the perception of difference). It is not an individual's attribute, per se that affects him/her; rather, it is an individual's attribute relative to a referent other or group that explains the criteria (Goldberg, 2005). From this perspective, the individual level of analysis should be included as a key component of diversity because individual differences in various attributes reflect the content of diversity while the configuration of attributes within a unit reflects the structure of diversity (S. E. Jackson, May, & Whitney, 1995).

The preceding discussion shows that diversity has been conceptually constructed at different levels of analysis. In particular, organisational demography treats diversity as an aggregate property and relational demography suggests its multilevel nature. Not surprisingly, the various approaches will lead to different operationalisations of diversity, which, in turn, are likely to produce different research outcomes. While organisational demography and relational demography are two distinct streams of diversity research, there is a clear trend in the literature for greater focus on relational demography. This trend is shown in the argument that diversity is not only the amount of variation in a certain attribute but it is also subject to individuals' reactions to that attribute (Harrison & Klein, 2007; Pfeffer, 1985; Sorensen, 2004).

2.3.3 What is diversity about?

Diversity is concerned with differences (e.g. personal attributes) between people, which have been termed 'the content of diversity' by researchers such as Joshi & J. E. Jackson (2003). However, there are numerous attributes that differentiate people. In relation to referring to attributes as diversity, there is a trend suggesting an increasing growth in the quantum of diversity content.

In particular, from the focus on legally protected attributes such as race, gender, and age, diversity researchers have paid an increasing amount of attention to the multiplicity of diversity that includes the entire spectrum of human differences (Jayne & Dipboye, 2004). These numerous human differences range from group memberships (they are identity-based and organisational-based) such as race, gender, tenure, or functionality to more idiosyncratic characteristics such as political background, military experience, or weight (Christian et al., 2006). Recently, one researcher identified no less than 38 possible diversity attributes (Rijamampianina & Carmichael, 2005).

In principle, there is a large number of attributes that have been referred to as diversity. In categories, these attributes include primary dimensions (visible), which are age, ethnicity, gender, physical attributes/abilities, race, sexual orientation and secondary dimensions (less visible) that exert a more variable influence on personal identity and add a more subtle richness to the primary dimensions (Jayne & Dipboye, 2004). The secondary dimensions are more malleable and many of them will change over time and they include education, geographic locations, incomes, marital status, military experience, parental status, religious beliefs and work experience (Point & Singh, 2003; Rijamampianina & Carmichael, 2005).

While the trend towards the growing number of diversity attributes continues, researchers have also noted the subsequent limitations. For example, it has been argued that, while referring to diversity as numerous attributes is accurate, doing so may also require great rigor in the theoretical and empirical work (Mannix & Neale, 2005). In

practice, research has mainly focused on six attributes: race, age, gender, education, functional background and tenure (van Knippenberg et al., 2004).

2.3.4 How attributes are referred to as diversity

As shown in the previous discussion, researchers have referred to diversity as different personal attributes, such as gender, race, age and so forth indicating that diversity is a multifaceted concept (Sauer et al., 2006). Indeed, there are different terms associated with diversity, such as age diversity, cultural diversity, social diversity, and so forth. Diversity terms are constructed according to the various approaches that refer to attributes as diversity. For example, age diversity is referred to as the composition of members' ages while social diversity is referred to as including all social-related attributes. In order to understand the notion of diversity, it is necessary to discuss the various approaches that refer to attributes as diversity.

There are various approaches that refer to attributes as diversity. These approaches tend to fall into two categories: A. Mono-attribute approaches that refer to diversity as a single attribute (e.g. gender *or* race *or* age) and B. Multiple-attribute approaches that refer to diversity as multiple attributes at one time.

2.3.4.1 Mono-attribute approaches

In general, most research has taken a mono-attribute approach. This may be because EEO and AA normally focus on a single attribute such as gender or race. Research taking this approach has focused on the effects of one specific attribute at a time (although there may be more than one attribute studied in one piece of research) (Lau & Murnighan, 2005). More specifically, there are two common approaches. The first approach uses a single attribute to construct concepts such as age diversity or gender diversity accordingly. In this discussion, it is called the single attribute approach. The second approach categorises diversity attributes according to their similar or distinctive

properties and constructs concepts such as social diversity or information diversity. This is referred to as the category approach.

2.3.4.1.1 The single attribute approach

The single attribute approach is the most commonly-used method of referring to attributes as diversity although it has been discussed in slightly different ways in the literature. For example, regarding it as a diversity measure⁶, Lawrence (1997, p7) has referred to this approach as ‘Compositional Measures’ that are defined at the level of analysis higher than that of the attribute⁷ (e.g. the average tenure of an organisation). In their discussion of the meaning of diversity, Mannix & Neale (2005) referred to this as approaches that are based on proportions (e.g. diversity is a proportion or ratio of minority to majority members).

While the discussions of Lawrence (1997) and Mannix & Neale (2005) are useful, they only partially examine the single attribute approach, which goes beyond proportions and ratios. Instead, this approach refers to diversity to as proportions/ratios and compositions of a certain attribute. Thus, one can describe an organisation in terms of diversity as both: A). 45 per cent are female (i.e. gender diversity) and B). the average tenure is 15 years (i.e. tenure diversity). Therefore, the single attribute approach defines diversity based on one single attribute and constructs diversity terms in association with that attribute (i.e. gender diversity).

The biggest advantage of using this approach is that researchers can readily describe organisations or groups according to specific social attributes that are of concern to the researchers. However, while diversity may refer to any difference (i.e. attributes), defining diversity in this way does not identify the elements of similarity and distinctiveness across attributes (Jehn & Bezrukova, 2004; Milliken & Martins, 1996;

⁶ This thesis does not regard the approaches of referring attributes to diversity as measures because the process of doing so does not involve any statistical calculation. In addition, conceptualisations are not a matter of measurement.

⁷ Lawrence (1997) seemed to have mixed diversity attributes with diversity measures since she treated tenure as a diversity measure rather than an attribute.

Pelled, 1996). The limitations associated with this approach have therefore drawn increasing attention from researchers who argue for different ways to refer to an attribute as diversity.

2.3.4.1.2 The category approach

While diversity can refer to numerous personal attributes, an increasing criticism in the literature is that different types of diversity have been included under the general term 'diversity' in an attempt to understand their impact (Jehn, Northcraft, & Neale, 1999; Mannix & Neale, 2005). In the 1990s, researchers (Jehn et al., 1999; Pelled, 1996; Zenger & Lawrence, 1989) began to categorise diversity attributes according to their similar and distinct properties. Researchers following this approach suggested that certain attributes may have similar meanings, expectations, and values associated with them (Spataro, 2005), and therefore diversity in these similar attributes may have similar impacts on organizations (Mannix & Neale, 2005).

According to this approach, different attributes of diversity can be categorised into a series of diversity types, such as social diversity, information diversity and value diversity (Jehn et al., 1997; Jehn et al., 1999). While being interested in the similar or distinctive properties of the numerous diversity attributes, this approach still identifies diversity by measuring a single attribute.

With regard to the similarities and distinctions across attributes, two properties have been well addressed: visibility and job-relatedness. Visibility refers to the extent to which diversity attributes are easily observed by group members while job-relatedness is defined as the extent to which diversity attributes directly shape perspectives and skills related to tasks (Pelled, 1996; Simons & Pelled, 1999a). According to Pelled (1996), these two dimensions have the greatest tendency to trigger, respectively, selective perception of job tasks and the categorisation of individual mental processes that promote substantive and affective conflict.

Techniques to categorise diversity attributes based on similar or distinctive properties of attributes can vary across studies. Researchers tend to choose either bi-category methods or multi-category methods based on properties of diversity attributes such as visibility and job-relatedness. The commonality between the two methods is that numerous attributes or dimensions of diversity are studied at one time. The discussion will describe them followed by a brief outline of their limitations.

2.3.4.1.2.1 Bi-categories method

According to the bi-categories method, diversity attributes can be categorised into two groups that contain a certain property. The two most studied categories are surface-level diversity and deep-level diversity based on the visibility of attributes. Surface-level characteristics among team members in overt demographic characteristics (like age, race and gender) are immediately salient in groups (Phillips et al., 2006) and deep-level characteristics become known only over time through verbal and non-verbal communication defined as differences among team members' psychological characteristics (like attitudes, opinions, information and values) (Harrison et al., 2002; Mohammed & Angell, 2004).

In slightly different ways, other researchers constructed bi-categories such as the visible vs. the non-visible (Pelled, 1996), or the readily detectable vs. the less observable (Moody, Wozcynski, Beise, & Myers, 2003). However, when creating the categories, researchers have, more or less, relied on assumptions that observable differences are more likely to evoke biased or stereotyping responses than are less-observable diversity types, and that many of the problem-solving enhancement effects of diversity frequently emerge from the less-observable diversity types that represent differences of perspectives and skills (Pelled, 1996).

Researchers have also categorised diversity attributes based on the property of job-relatedness (Pelled, 1996) including categories such as highly job-related diversity (e.g. education, functional background, tenure) or less job-related diversity (e.g. race, age,

gender) (Lee & Park, 2006). Similarly, other bi-categories based on job-relatedness have also been created: task-oriented vs. relations-orientated diversity. Relations-oriented diversity refers to the distribution of attributes that are instrumental in shaping interpersonal relationships, but which typically have no apparent direct implications for task performance (Joshi & Jackson, 2003). In contrast, task-oriented diversity refers to the distribution of performance-relevant attributes (Joshi & Jackson, 2003). This category has been sometimes referred to as cognitive diversity, referring to within-team-differences in job-related attributes (Sauer et al., 2006).

2.3.4.1.2.2 Multiple-categories method

By comparison, the multiple-categories method clusters the numerous diversity attributes into multiple categories attempting to create exhaustive and mutually exclusive categories (Mannix & Neale, 2005). For example, McGrath, Berdahl, & Arrow (1995) created a list of five clusters of diversity: 1). demographic attributes such as age, gender, functional background; 2). task-related knowledge, skills, and abilities; 3). values, beliefs and attributes; 4). Personality, cogitative and behavioural styles; 5). organisational status.

As the category approach focuses on numerous attributes or dimensions of diversity at one time, it provides researchers with the capacity to explore a broader array of attributes according to their similarity and distinctiveness, which in turn may account for different impacts of diversity on organisations or groups. This approach *does not* assume that different attributes of diversity are of equal importance or have equal effects on organisations or groups (Mannix & Neale, 2005). Consequently, researchers using this method may be able to explain better the unexpected results in the diversity research compared to research assuming constancy of all diversity attributes (Cox, 1995).

However, this approach has incorrectly assumed that different types of diversity work independently producing similar or distinctive effects on organisations or groups. By comparison, other research has shown that the impact of diversity on organisations or

groups may be largely dependent on how salient that type of diversity is (Harrison, Price, & Bell, 1998). This may be partially related to the fact that people have multiple identities (e.g. a white male scientist) suggesting that people behave as a function of those multiple identities working together simultaneously (Freeman, 2003; Pratt, Rock, & Kaufmann, 2001). Thus, different types of diversity cannot be isolated from each other because groups are composed of whole individuals rather than one or two of their attributes (S. E. Jackson & Ruderman, 1995).

2.3.4.2 Multiple-attributes approaches

While the mono-attribute approach may be able to describe an organisation with respect to a single attribute, it fails to capture the full spectrum of diversity found in workplaces, particularly in relation to people's multiple attributes (S. E. Jackson et al., 2003). By comparison, multiple-attributes approaches attempt to address this limitation by referring to diversity as multiple attributes at one time. Although these approaches might still be developing, two approaches can be clearly distinguished: the group faultline approach and the perception approach.

2.3.4.2.1 The group faultline approach

Group faultlines⁸ are hypothetical lines that can potentially split a group into two or more subgroups based on the alignment of two or more characteristics (Rico et al., 2007). Introduced by Lau & Murnighan (1998), faultlines are built on two theoretical underpinnings. First, it is assumed that the impact of diversity depends on the alignment that interacts among the multiple attributes that define the diversity of a team (Thatcher et al., 2003). Second, multiple attributes (i.e. individual differences) are likely to be salient at the same time and their effects must therefore be considered simultaneously (Rico et al., 2007).

⁸ Despite being regarded as a new construct, it is treated as a measure technique in the present research.

The group faultline approach is interesting in that it is concerned with the configuration of group members' multiple attribute profiles (S. E. Jackson et al., 2003) and it services, in particular, a way to understand the interaction between subgroups within a group with respect to multiple attributes (Thatcher et al., 2003). In this way, diversity has been referred to more than one attribute at one time. For example, group faultlines may be able to describe the structure of diversity in multiple attributes (Molleman, 2005) and explicitly address the alignment of team members' attributes (Hambrick, Cho, & Chen, 1996). Focusing on the interaction of multiple attributes within a group indeed, faultline is a better explanation if more than one attribute is salient (Rico et al., 2007).

However, faultlines are limited at times. For example, this approach does not examine multiple identities of one individual simultaneously i.e. it does not deal with the combined effects of diversity across multiple dimensions of the same person (Pelled, 1996) and it only deals with the multiple attribute **profile** presented in the group. That said, faultlines deal with multiple attributes that may belong to different people.

In addition, since effects of faultlines are subject to the salience of all attributes (the theoretical basis of faultline), group members must note the existence of alignments of attributes (Hambrick et al., 1996). This is not necessarily the case as certain attributes may be more or less salient to an individual (Hobman et al., 2004). Furthermore, the measurement of faultlines also presents challenges to researchers (Li & Hambrick, 2005). Therefore, no approach is able to fully explain how a combination of attributes influences a group or an individual simultaneously (Thatcher et al., 2003).

2.3.4.2.2 The perception approach

The perception approach is built on an argument that the people have to be seen as a whole with respect to their multiple identities (Frable, 1997). In particular, this approach aims to explain how a combination of diversity attribute influences a group or an individual simultaneously (Thatcher et al., 2003). In particular, this approach assumes that individuals assign their own psychological meaning to differences in demographic

attribute characteristics (H. M. Williams, Parker, & Turner, 2007) and that individuals compare their own attributes with the demographic composition of a social unit to determine if they are similar or dissimilar (Westmaas & Silver, 2006). Specifically, rather than referring to diversity as one or two attributes, the perception approach asks respondents how similar they perceive they are to the rest of their work group with respect to diversity attributes (Riordan, 2000).

The rationale behind the perception approach asking respondents to rate the level of similarity is that, although a large number of possible attributes can be used as the basis of differentiating individuals, only those most salient in a given situation are expected to be the most important markers of diversity (i.e. attributes that people use to tell themselves that another person is different) (Chatman & O'Reilly, 2004; Hobman et al., 2004). This approach provides insights into an individual's experience of being different from other team members, and how these differences affect their individual behaviours and attitudes (Hobman & Bordia, 2006).

The perceptual approach has been proven to be helpful to explain effects of diversity as a socially operated phenomenon. In the most recent study, Riordan & Wayne (2008) found that perceived demographic similarity was more often related to, and accounted for more variance in the outcomes than did measures of actual similarity (i.e. objective diversity). However, there are also limitations that have been identified with this approach. For example, individuals may not be as consistent in their calibration of demographic attribute similarities/differences as are the more objective indices (Riordan, 2000).

2.3.5 Findings of the review

This section aims to conduct a comprehensive review of diversity conceptualisations and to find explanations for the diversity paradox. From the preceding discussion, it can be concluded that there is a variety of diversity conceptualisations in the literature demonstrated in the various approaches that address the three key aspects of the construct of diversity. Specifically, with respect to the levels of analysis, diversity has

been conceptualised at both the unit level (i.e. the compositions of attributes) and the individual level (i.e. the similarity/dissimilarity between an individual with the rest of the group). With regard to the content of diversity, diversity can be referred to as the entire spectrum of human differences. In relation to approaches that refer to attributes as diversity, diversity has been referred to as a single attribute (e.g. age diversity) and multiple attributes at one time (e.g. faultlines).

Built on this review, implications for future research including this thesis could also be drawn with respect to the three aspects of diversity conceptualisations (i.e. the level of analysis, the diversity content, and the reference approach).

2.3.5.1 The level of analysis: multilevel diversity

With respect to the level of analysis, diversity has been conceptually constructed at different levels. The multilevel nature of diversity is particularly suggested from the perspective of organisational demography describing a unit in terms of the collective composition of its members (Harrison & Klein, 2007). While it is very important to clarify how the concept constructs are defined and how they have been measured, there are few studies that have done so. Instead, it was usually briefly mentioned in research that data were aggregated to unit level after assessment of certain statistical criteria. These criteria include intraclass correlation coefficient (Mohammed & Angell, 2004; Stewart & Barrick, 2000), computation of the average deviation index, AD[mj] (Rico et al., 2007), within-unit agreement (Pelled, Cummings, & Kizilos, 2000), within-group agreement (Rwg(j)) (Schippers, Den Hartog, Koopman, & Wienk, 2007), Eta-square statistic (Kotlyar & Karakowsky, 2006), and N2 statistic measure (Trimmer, Domino, & Blanton, 2002) and so forth.

While there are various aggregation approaches [refer to the discussion of Chan's typology of composition models (Chan, 1998)], these approaches have limitations. For example, aggregation may have the drawback of ignoring the potential importance of group-level attributes in influencing individual-level outcomes (Diez-Roux, 2000).

Indeed, it has been suggested that composition effects may derive from patterns of relationships among attributes, not just from the sum or average amounts of those attributes (Mohammed & Angell, 2003). In addition, aggregation may be limited because the power of statistical testing is reduced due to the decreased number of observations and the degree of freedom for the analysis (Krull & MacKinnon, 2001).

Thus, the construct of diversity describing a unit in terms of the collective composition of its members may be theoretically sound but is not methodologically practicable. Therefore, there is a need for future research to devise and use research designs that can successfully deal with the multilevel nature of diversity. An extended discussion will be presented in section 2.7

2.3.5.2 The diversity content: diversity typology

While diversity can be referred to as the entire spectrum of human differences, as shown in the previous sections, diversity research has mainly focused on six attributes: race, age, gender, education, functional background and tenure. In addition, as different attributes of diversity may have unequal importance and, therefore, have unequal effects on organisations or groups or individuals (Mannix & Neale, 2005), researchers have started to classify different diversity attributes into types. In doing so, researchers focus on numerous attributes of diversity at one time, which, in turn, provides researchers with the capacity to explore a broader array of attributes according to their similarity and distinctiveness (Pelled, 1996; Schreiber, Morrison, & Price, 1993).

As shown in the preceding discussion, many approaches are used to categorise diversity into different types such as surface-level vs. deep-level (Harrison et al., 2002; Ilgen, Hollenbeck, Johnson, & Jundt, 2005). Specifically, the two most commonly studied properties of diversity classification are: visibility or job-relatedness (Pelled, 1996). Although these approaches may offer researchers a greater insight in explaining unexpected results (Cox, 1995), diversity continued being assigned to a single attribute according to this approach (e.g. social diversity based on race). Therefore, calls were

made for diversity conceptualisations that adopt diversity typology and that deal with multiple attributes of individuals simultaneously, rather than a single attribute that is isolated from other attributes.

2.3.5.3 The reference approach: perceived multiple attributes

With respect to the approaches of referring to diversity as attributes, increasing attention has been paid to referring to multiple attributes simultaneously, as diversity, in particular the perceived diversity. This trend was supported by the argument that diversity is the amount of variation in people's multiple attributes and the variation is also subject to individuals' reaction (i.e. whether individuals note the differences) to the multiple attributes (Harrison & Klein, 2007; Pfeffer, 1985; Sorensen, 2004).

While it has been empirically proven that effects of perceived diversity were stronger than the effects of objective diversity (Hobman et al., 2004) and that perceived diversity accounted for more variance in the outcomes than did other non-subjective measures (Riordan & Wayne, 2008), diversity has not been defined in that regard. Therefore, diversity can be defined in a way that demonstrates how diversity is a socially constructed concept.

2.3.6 Explanations of the diversity paradox

From the perspective of diversity conceptualisations, the diversity paradox occurred given the variety of conceptualisations in the literature. That said, comparisons of the results of different research outcomes ought to produce mixed results because diversity has been referred to as different things (e.g. one attribute or a class of attributes) in different research (i.e. comparing oranges with apples).

2.4 A Need for Integrated Models⁹

As addressed in the proceeding section, researchers have tried to dissect the nature of the diversity paradox from the perspective of diversity conceptualisations. While a variety of diversity conceptualisations might have contributed to the diversity paradox, there are other perspectives. Among them, the theoretical frameworks that have been used in the diversity research are one of the most commonly-addressed causes for the diversity paradox. For example, some researchers (Bunderson & Sutcliffe, 2002; Webber & Donahue, 2001) have proposed that it may be inappropriate to use a single theoretical argument to propose that all types of diversity would have a particular effect. More specifically, K. Y. Williams & O'Reilly (1998) have treated the mixed results as a consequence of the different or, sometimes, contradictory predictions of the commonly-used theoretical frameworks and they have proposed a model to integrate them. However, despite the concerns, theoretical frameworks continued being applied separately in diversity research.

Accordingly, this section will analyse the current theoretical frameworks of diversity with regard to their relevance in the diversity paradox. In doing so, this section will conduct a critical analysis of the frameworks including their basic theoretical operations, their applications in diversity research and their strengths and limitations. Then, the section will include a comparison and contrast of the applications of the three frameworks.

In exploring how diversity impacts on performance, researchers have used a number of theoretical frameworks to develop hypotheses. Similarity-attraction theory, social categorisation theory (SCT) and information/decision-making approach are the three most commonly-used methods.

⁹ Some parts of this section have been accepted for publishing (Qin, O'Meara, & McEachern, 2009). While the researcher is the first author, permissions to use the content have been obtained from all authors.

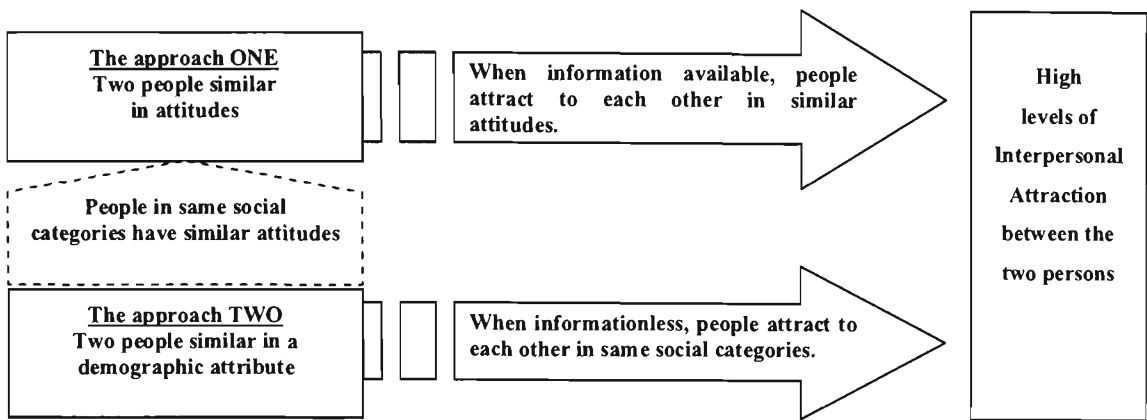
Before the review, it is necessary to differentiate a work group from a psychological group in order to understand the predictions of the theories better. In this discussion, a work group is a set of individuals “who see themselves and who are seen by others as a social entity, and who perform tasks that affect others” (Guzzo & Dickson, 1996, p309). In a work group, there is a formal or implicit social structure as well as a certain level of task interdependence (Brown, 2000). In contrast, a psychological group is one that exists psychologically for the members due to perceived similarities (i.e. that is subjectively significant for or accepted by members) (Turner, 1985).

This distinctness is important since the two concepts have been mixed up in the diversity literature. As addressed in the previous section, individuals assign their own psychological meaning to diversity based on their objective attributes or/and their subjective identities. When mentioning the group to which a group member may have assigned meaning, the following discussion will label the psychological group as follows “in-group (p)”.

2.4.1 Similarity-attraction theory

It has been argued that the conceptual foundation for most diversity research has been similarity-attraction theory (Tsui et al., 1992), which was originally developed by Byrne (1971) to explain the relationship between similarity in attitudes and interpersonal attraction. The theory suggests that individuals tend to be attracted to those who are more similar to themselves causing high levels of interpersonal attraction of a dyad having attitudinal and/or demographic similarities. A basic operation of similarity-attraction theory has been demonstrated in Figure 2-2.

Figure 2-2 A basic operation of similarity-attraction theory



2.4.1.1 Theoretical operations

Although similarity-attraction theory, in general, predicts high levels of interpersonal attraction, the prediction has been operated in two different approaches, as shown in Figure 2-2. The two approaches are basically distinguished from each other based on whether information about people's attitudes is available or not. When information about people's attitudes are available, the first approach postulates that similarity increases interpersonal attraction (Westmaas & Silver, 2006), and that individuals sharing similarity in attitudes, values, and beliefs (Sacco & Schmitt, 2005) may find the experience of interaction with each other easier, positively reinforcing, and more desirable (Riordan, 2000).

In a different way, when information about people's attitude is not available, the second approach proposes that people having demographic similarities are likely to be more attracted to one another than to people who are demographically dissimilar (Chatman & O'Reilly, 2004). Most diversity studies have taken this approach. However, the linkage between similarity and attraction is indirect in this approach. Specifically, this approach suggests that demographic similarity leads to **perceptions** of attitudinal similarity (this approach then returns to the original similarity-attraction mechanism.), which in turn, leads to reinforced interpersonal attraction (Goldberg, 2003).

Perceptions of attitudinal similarity arising between demographically similar persons are built on logic: because demographically similar people have similar life experiences and

beliefs that may affect attitudes (Foley et al., 2006), their attitudes tend to be similar, which, in turn, reinforces the interpersonal attraction (McNeilly & Russ, 2000). With respect to different demographic attributes, it was suggested that similarities in observable attributes such as, age, race and gender are more likely to affect interpersonal attraction (Goldberg, 2005).

Being used in two different ways, the similarity-attraction theory has been built on the following fundamentals. First, it assumes that when interacting with each other, an individual has a strong tendency for he or she (in a free choice situation) to select persons that are similar (Christian et al., 2006; K. Y. Williams & O'Reilly, 1998). The main reason why people are attracted to and prefer to be with similar others is that they anticipate reinforcement or upholding of their own values, attitudes, and beliefs (Riordan, 2000). This process, therefore, fosters attraction and the use of a common language that causes greater levels of interpersonal communication, greater amounts of interaction and greater social recognition (Venkatesh, Challagalla, & Kohli, 2001).

Second, with respect to the strength of attraction, similarity-attraction theory implies that the level of interpersonal attraction is dependent on perceived similarity of attitudes between two people (Young, Cady, & Foxon, 2006). Furthermore, similarity-attraction theory assumes that the similarity between people remains constant, suggesting stable interpersonal attraction between a dyad (Chatman & Flynn, 2001). Finally, similarity-attraction theory deals with a dyadic relationship (D. Byrne, 1971). In general, the theory suggests that we like those who like us.

2.4.1.2 Explaining effects of diversity

In explaining the effects of diversity, the application of similarity-attraction theory goes far beyond dyadic relationships and interpersonal attraction extending to intergroup relationships (Horwitz, 2005) as well as communication (Zenger & Lawrence, 1989) and social integration (O'Reilly, Caldwell, & Barnett, 1989). Researchers such as Bowers, Pharmer and Salas (2000) argued that homogeneous groups are more productive than

heterogeneous ones. Similarity-attraction theory supports this argument in the following sequence.

First, using social categories as proxies for attitudinal information, people perceive a higher level of similarity with those who are demographically similar compared to those who are dissimilar. Then, demographically similar people are attracted to each other due to the perceived similarities increasing the level of mutual attraction among members in homogeneous groups. In contrast, the level of mutual attraction in heterogeneous groups is low because dissimilarity is likely to reduce the attraction (Westmaas & Silver, 2006). Consequently, the process of similarity-attraction produces positive effects on homogeneous groups, and causes negative effects on heterogeneous ones.

Specifically, this theory predicts that perceived similarity across demographic attributes such as gender, race, and tenure has a positive effect on communication, integration, evaluations, attitudes, and cohesion within groups, which in turn have positive impact on group performance (Pfeffer, 1983; van Knippenberg et al., 2004). In contrast, it has been suggested that group members in heterogeneous groups will tend to have less positive attitudes toward, and will form fewer social attachments with, those whom they perceive to be less like themselves (Harrison et al., 2002).

2.4.1.3 Strength & Limitations

Similarity-attraction theory helps explain interaction between people having similar attitudes or in a same social category. It predicts people's nature of being drawn to similar others. Empirically, the similarity-attraction effect has been found across a variety of contexts (Westmaas & Silver, 2006). For example, attraction was high among individuals who shared similarity on attributes such as attitudes, values, and beliefs (Tsui & Ashford, 1991). In addition, the law of attraction has been shown to be independent of the cultural context (D. Byrne et al., 1971). However, similarity-attraction theory has some limitations. First, it cannot fully explain how people perceive others in terms of similarity, particularly in relation to their multiple social categories. For example, how

does a middle aged Asian man perceive a middle aged white man in a dyadic relationship? There is obviously more than one possibility here. In terms of age and gender, they should perceive similarity. But, on the basis of race, they may see each other totally differently.

The second limitation of similarity-attraction theory is related to an assumption that interaction is a necessary condition of the similarity-attraction paradigm (D. Byrne, 1971). Specifically, researchers have suggested that the similarity-attraction paradigm may not account for all the reported demographic effects, especially when actual interaction among the participants is unlikely (Tsui et al., 1992). Indeed, it has been found that people can express preferences for a group even without social interaction (Cox, 1995).

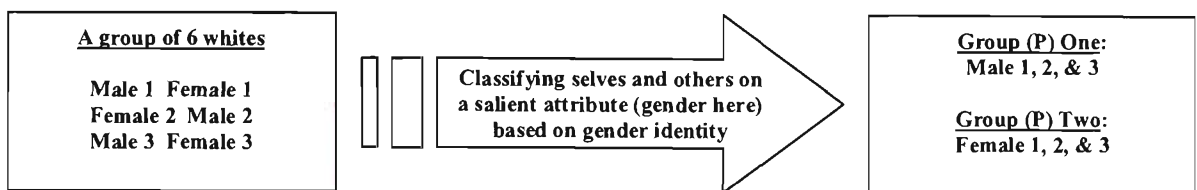
Third, this theory has incorrectly assumed that people in different social categories should all respond in the same way to being similar or different from others (Chatman & O'Reilly, 2004). For example, the similarity-attraction mechanism between two people at different ages might be different between two persons having different education backgrounds.

2.4.2 Social Categorisation Theory (SCT)

SCT is a theory that describes the process by which people sort each other into groups (P) in terms of social categories (Tajfel & Turner, 1986; van Knippenberg et al., 2004; K. Y. Williams & O'Reilly, 1998). Although SCT has close relationships with other theories such as social identity theory (SIT), which deals with aspects of an individual's self-concept based on his or her social category memberships (Foley et al., 2006) and self-categorisation theory, which explains how people define themselves in terms of membership in social categories (Mannix & Neale, 2005), only SCT is analysed in this discussion. There are reasons for doing so and they are outlined below.

Whereas SIT identifies motivations underlying people’s social categorisation: people have a need for a high-level of self-esteem and are, therefore, motivated to achieve and maintain a favourable social identity (Riordan, 2000), it cannot explain the process of how diverse people sort each other into groups (P). Similarly, self-categorisation theory only explains how people fit themselves into social categories. Therefore, they may have difficulties in explaining the effects of diversity. In contrast, built on some of the theoretical constructions of SIT and self-categorisation theory, SCT offers a dynamic interaction in diverse groups.

Figure 2-3 A basic operation of SCT



2.4.2.1 The operations of SCT

SCT starts with a basic assumption of SIT that people are motivated to view themselves as positively as they can (Tajfel & Turner, 1986). A primary means to promote a positive self-identity is to identify with a group of people who are similar to themselves (Goldberg, 2003). Whereas people can define themselves in terms of membership in social groups such as race, age, gender, and so forth (i.e. individuals create a self-identity based on social categories), only the salient social category of their multiple identities induces the social categorisation process (Rink & Ellemers, 2007). With respect to the perception of a salient social category (e.g. the attribute of gender) that triggers a corresponding categorisation, SCT suggests that, in general, people’s preference to positive social identities induces the subconscious tendency of individuals to sort each other into social categories (Brief et al., 2005; Gaertner & Dovidio, 2005).

Specifically, it was suggested that people are likely to differentiate themselves from others on the basis of demographic differences, particularly those that are more visible (e.g. gender) compared to the underlying differences (e.g. education) due to the relative difficulties in accessing the attitudinal information of others (Richard, Ford, & Ismail, 2006; Swann Jr., Polzer, Seyle, & Ko, 2004). After identifying the salient social category

that is used as the basis of categorisation, the cognitively similar categorised themselves into the in-group (P) and, in the meantime, sort others into the out-group/s (P) due to the dissimilarity (Christian et al., 2006). An example of the social categorisation process has been shown in Figure 2-3.

As Figure 2-3 shows, one obvious result of social categorisation processes is that the group of six has been further divided into two sub-groups (P) based on the salience of gender: group one (P) of three females and group two (P) of three males. According to SCT, the consequences of social categorisation processes are profound in diverse groups. Once categorisation takes place, i.e. a group separates into two or more sub-groups (P), people tend to think of others not as unique individuals but as examples of a relevant group stereotype (Tajfel & Turner, 1986; Turner & Haslam, 2001) resulting in “us-them” distinctions among people (Mannix & Neale, 2005). An example is when individuals’ perception and conducts become depersonalised (depersonalisation refers to a process through which cognition, perception, and behaviour is regulated by group standards such as group norms, stereotypes, prototypes) (Hogg, Hardie, & Reynolds, 1995).

However, SCT does not agree that people remain at the same social distance once categorisation happens (Tajfel & Turner, 1986). Instead, it argues that the salience of a certain social category is central in explaining categorisation behaviours (Tajfel & Turner, 1986). Salience is a condition where a specific social category becomes a cognitive proponent in self-perception to act as the immediate influence on perception and behaviour (Turner & Haslam, 2001). In particular, SCT suggests that different aspects of a person’s self-concept may become salient in response to the distribution of the characteristics of others who are present in a situation (Mannix & Neale, 2005).

The perception of a salient social category more or less inevitably triggers a corresponding categorisation (Swann Jr. et al., 2004). After that transition time i.e. a particular social category becomes salient, people use the values associated with that category to evaluate information and shape the contents of action. In other words, people

may identify with different social category memberships at different times as a function of changes in the social context (Levine & Thompson, 2004) resulting in another social categorisation process called re-categorisation (Harrison, Price, Gavin, & Florey, 2000; Harrison et al., 2002).

The concept of re-categorisation provides a more dynamic explanation about social categorisation suggesting that people's attention to a specific characteristic in a given situation may change over time (Chatman & Flynn, 2001). For example, demographically different team members may be hesitant to cooperate with one another because they categorise each other as out-group members. However, if the salience of surface-level demographic characteristics dissipates over time and demographically dissimilar group members begin to re-categorise themselves as fellow in-group members, they may be more inclined to cooperate with one another (Chatman & Flynn, 2001; Chatman & Spataro, 2005).

The dissipation of the social categorisation may be due to the replacement of stereotypical assumptions with views based on personal interaction. Stereotyping is a dynamic process through which people make sense of and pursue their identity-related goals within intergroup contexts via developing stereotypical assumptions of specific social categories (Stott & Drury, 2004). The assumptions, however, can change due to familiarity built from interaction (Park & Judd, 2005). In general, people's perception of a salient social category is not fixed with respect to social categorisation process according to SCT.

2.4.2.2 Explanations of effects of diversity

After categorisation, people strive for self-esteem by developing positive opinions of their own category and negative opinions of other categories (Foley et al., 2006). In doing so, people then seek to maximise intergroup (P) distinctiveness and minimise differences within the category (Tsui et al., 2002). While treating the in-group (P) members favourably, people tend to perceive out-group (P) members as less attractive

(Tajfel & Turner, 1986) resulting in cooperating with in-group (P) members and competing against out-group (P) ones (Richard et al., 2006). Consequently, people then tend to like and trust in-group (P) members more than out-group (P) ones and tend to favour in-groups over out-groups (P) (Leonard et al., 2004) developing a possible high level of social attraction in homogenous groups.

The social attraction refers to the interpersonal relationship that is based on the preferential liking for in-group over out-group members but the attraction is towards fellow in-groupers (not unique **individuals**) (Hobman & Bordia, 2006). The social attraction process produces higher commitment, group cohesion and less relational conflict in homogeneous groups, which in turn are predicted to have better performance (Gaertner & Dovidio, 2005; van Knippenberg et al., 2004). In contrast, heterogeneous groups can become a fertile breeding ground for misunderstanding and discord because of potential miscommunication associated with individual differences (Swann Jr. et al., 2004). Heterogeneous groups, in turn are predicted to have a worse performance compared to homogeneous ones.

2.4.2.3 Strength & Limitations

SCT has received substantial support from empirical results. For example, researchers have demonstrated that people differentiate themselves from others on the basis of observable differences in age, race, gender, and the like and some concealed social identities (e.g. homosexuality) (e.g. Harrison et al., 2002; Hugenberg & Bodenhausen, 2004). With respect to consequences of social categorisation, it has been shown that people who regard themselves as members of superior groups experience anxiety concerning interaction with others who are treated as inferior (Hugenberg & Bodenhausen, 2004; Tjosvold & Sun, 2001).

However, while SCT provides a useful explanation of people's behaviours in responding to differences, its explanations are not comprehensive. For instance, it has been suggested that people in a social context tend to identify with others with whom they

share characteristics that are relatively rare in that context (Mehra & Kilduff, 1998). This tendency suggests that similarity is relative to the context and that social categorisation process is more likely to happen in low diversity groups. Indeed, there is research demonstrating that the relative rarity of a social category in a particular social context is likely to promote members' use of that group as a basis for shared identity and social interaction (Mehra & Kilduff, 1998).

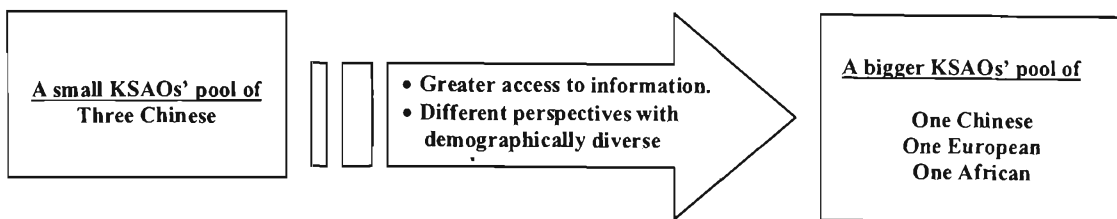
In addition, whereas SCT suggests that people use social categorisation processes to enhance self-esteem (Hornsey & Hogg, 2000) suggesting an active nature of social categorisation, there is evidence showing that people sometimes identify strongly with groups that are disadvantaged and stigmatised (Swann Jr. et al., 2004). This situation suggests that social categorisation is not only an active process but also a passive one implying that people may be unwillingly assigned to a social category (Garcia-Prieto et al., 2003).

Third, although some scholars have used SCT to explain the effects of underlying diversity (Harrison et al., 2002; Mohammed & Angell, 2004), it was developed originally to explain the effects of readily-detected diversity such as race and gender (Chatman & O'Reilly, 2004). That is, the more readily accessible the social category, the more easily that category may be used for social categorisation (Tsui et al., 1992). Empirical results from research where SCT has been used to predict the effects of underlying diversity are therefore open to discussion.

2.4.3 The information/decision-making approach

The information/decision-making approach explains how information and decision-making can be affected by group diversity (K. Y. Williams & O'Reilly, 1998). It is the theoretical basis for people arguing for the value in diversity.

Figure 2-4 A basic operation of the information/decision-making approach



2.4.3.1 Operations

The information/decision-making approach is operated according to two basic assumptions. It assumes that individuals with different demographic characteristics also have very different qualities such as knowledge, skills, abilities and other characteristics (KSAOs) (Jayne & Dipboye, 2004). That is, surface level diversity (i.e. socially-related diversity) triggers expectations that informational differences may be present, legitimising the expression of unique information (Phillips et al., 2006).

In addition, the information/decision-making approach suggests that diverse groups have greater potential to access other individuals with different backgrounds, networks, information, skills, and experiences. Based on this assumption, demographic diversity provides diverse groups with a large pool of KSAOs (Certo, Lester, Dalton, & Dalton, 2006) offering these diverse groups a variety of perspectives and approaches to the problems in hand, as well as different sources of information and expertise (van Knippenberg et al., 2004). As shown in Figure 2-4, the KSAOs' pool of three Chinese is smaller than the pool of one Chinese, one African, and one European because the African and the European may bring different perspectives and information into the group.

It has been argued that a large pool of KSAOs contributes to good quality decision-making (Jayne & Dipboye, 2004). Simultaneously, groups of members having various perspectives are more likely to avoid groupthink in decision-making (Horwitz, 2005). According to this approach, diversity causes informational diversity, which in turn influences team decisions and thus performance (Mannix & Neale, 2005). Furthermore, the information/decision-making approach assumes that the large pool of KSAOs

associated with diversity can be fully developed in diverse groups suggesting a manageable diversity (Cassell & Biswis, 2000; Rijamampianina & Carmichael, 2005).

2.4.3.2 Explanations of effects of diversity

Researchers have argued that diverse groups, especially in facing a complex and non-routine decision environment (Boone, van Olffen, van Witteloostuijn, & De Brabander, 2004), are more likely to possess a broader range of task-relevant knowledge, skills, and abilities. The potential talent gives the diverse group a larger pool of resources resulting in some beneficial effects e.g. a rational decision-making process, creativity, and innovative ideas or solutions (Bachmann, 2006). The benefits are particularly strong in highly complex and uncertain tasks for which it is necessary for groups to pull together their diverse functional expertise and resources to formulate strategies (Horwitz, 2005). In contrast, homogeneous groups are likely to have 'great difficulty because they do not contain people with the appropriate inclinations' (Schneider, 1987, p446).

2.4.3.3 Strength & Limitations

The information/decision-making approach has been supported by empirical results. There is evidence showing that the availability of multiple resources and skills causes members of diverse groups to be more innovative and creative in problem-solving than members of homogeneous groups (Rink & Ellemers, 2007). In addition, another study has revealed that in solving complex and non-routine problems, diverse groups are more effective (Simons & Pelled, 1999a). In another context, Watson et al. (2003) argued that conflicts associated with group heterogeneity may be combined with fast decision making. However, the information/decision-making approach has also been criticised for its limitations.

First, contradicting one of the assumptions of this approach, it has been argued that diversity is sometimes not manageable (Koene & Riemsdijk, 2005; Robb & Douglas, 2004). This feature of diversity suggests that problems caused by diversity may

outweigh the benefits associated with it (Reagans & Zuckerman, 2001). Second, it has been argued that demographic diversity does not necessarily produce other types of diversity (e.g. informational diversity). For example, age does not always reflect values or even work experiences (Jehn et al., 1999). Increasing diversity therefore does not necessarily improve the KSAOs (Jayne & Dipboye, 2004; Webber & Donahue, 2001). In Figure 2-4, the KSAOs' pool of one Chinese, one African and one European is not necessarily bigger than the one of three Chinese if race diversity can not bring information diversity to the group.

2.4.4 Findings of review

The previous discussion has reviewed the application of three theoretical frameworks used in diversity research. The findings have been summarised in Table 2-2 organised into the four themes emerging from the process of review.

2.4.4.1 Diversity dimensions

As shown in Table 2-2, the three frameworks have been applied to all types of diversity. However, it has been clearly demonstrated in the analysis that the frameworks have very different orientations towards the dimensions of diversity. With respect to similarity-attraction theory, it was suggested that similarities in observable attributes (i.e. social diversity) such as, age, race and gender are more likely to affect interpersonal attraction (Goldberg, 2005). With respect to SCT, it was suggested that people are likely to differentiate themselves from others on the basis of visible differences (i.e. social diversity) (Richard et al., 2006; Swann Jr. et al., 2004). With respect to the information/decision-making approach, it focuses on information diversity but assumes that social diversity causes information diversity.

Table 2-2 Findings of review of frameworks

Themes	Similarity-attraction	SCT	Information/decision-making
Dimensions of Diversity	It has been applied to all types of diversity although visible dimensions are likely to affect attraction.	It has been applied to all types of diversity although visible dimensions are more likely to be used as categorisation process.	It has been applied to all types of diversity because social diversity is assumed to increase information diversity.
Levels of concerned behaviours	It has been applied at both individual and unit levels but it was originally developed to explain dyadic relationship.	It has been applied at both individual and unit levels but it is built on social rather interpersonal attraction.	It has been applied at both individual and unit levels.
Predicted effects	It suggests positive effects on communication, integration, evaluations, attitudes, and cohesion within groups.	It argues higher commitment, group cohesion and less relational conflict in homogeneous groups.	It predicts beneficial effects e.g. a rational decision-making process, creativity, and innovative ideas or solutions.
Contextual factors	It implies that people multiple identities presented influence the strength of attraction.	It suggests contextual factors that cause a person's self-concept.	It suggests a contingent variable e.g. nature of task on the effects of diversity.
Impact on performance	It predicts negative effects of diversity, social diversity in particular.	It suggests negative effects of diversity, social diversity in particular.	It argues positive effects of diversity, information diversity in particular.

As demonstrated in Table 2-2, there is a lack of theoretical guidance to explain how different types of diversity may operate differently in its effects on performance (Bunderson & Sutcliffe, 2002) because of the great consensus in the literature that different types of diversity may have different impacts on performance (Mannix & Neale, 2005). Therefore, it is not surprising to see different or even conflicting results in research where one framework has been applied to both types of diversity.

2.4.4.2 Levels of concerns

Diversity can be analysed at the unit or individual level of analysis (Hobman & Bordia, 2006). As demonstrated in section 2.3, there are two approaches with respect to the multilevel. First, the relational demography approach treats diversity as a social relationship between an individual and the unit or another unit member as in the case of dyads. Second, the organisational demography deals with diversity as a collective property of a unit (Tsui et al., 2002). The theoretical frameworks have been applied at both levels despite their strengths at a particular level, particularly similarity-attraction theory and SCT.

As shown in Table 2-2, the similarity-attraction theory was specifically developed to understand dyadic relationships (D. Byrne, 1971); in contrast, SCT is built on social attraction and is highly dependent on prototypical features of group membership (a collective property) (Hobman & Bordia, 2006). Therefore, SCT may not be able to account fully for the effects of diversity on personal attraction in dyadic relationships while the similarity-attraction theory can not fully explain the effects of diversity interested in social attraction.

2.4.4.3 Predicted effects

As shown in Table 2-2, the similarity-attraction theory and SCT do not predict direct effects on performance. Instead, the similarity-attraction theory suggests positive effects of perceived similarity in social diversity on communication, integration, evaluations, attitudes, and cohesion within groups, which in turn have a positive impact on group performance (Pfeffer, 1983; van Knippenberg et al., 2004). Similarly, SCT predicts positive effects on commitment, group cohesion and negative effects on relational, which in turn leads to better performance (Gaertner & Dovidio, 2005; van Knippenberg et al., 2004).

Using similarity-attraction theory and SCT, diversity research has, however, directly linked diversity with performance, presenting a ‘black box’ between diversity and performance (Lawrence, 1997). The need to articulate the intervening group process may apply to the information/decision-making approach too. Whereas the information/decision-making predicts effects on innovation and creativity (Bachmann, 2006), it has been argued that the relationship between diversity and innovation is mediated by group processes such as task conflict (Passos & Caetano, 2005).

2.4.4.4 Contextual factors

As Table 2-2 shows, contextual factors are of concern to the three frameworks. Specifically, the similarity-attraction theory implies that the level of interpersonal

attraction is dependent on the perceived similarity of attitudes between two people (Young et al., 2006). That said, the attraction is influenced by the multiple identities presented. For example, the attraction is likely to be stronger between two white men compared to between one black man and one white man on the basis of gender.

Similarly, SCT suggests the temporal factor that causes re-categorisation implying that people's attention to a specific characteristic in a given situation may change over time (Chatman & Flynn, 2001). In a different way, the information/decision-making approach predicts that diverse groups, especially in facing a complex and non-routine decision environment, are more likely to benefit from diversity (Boone et al., 2004), implying that the nature of tasks moderates the effects of diversity. Therefore, without confederations of contextual factors, research results about effects of diversity are likely to vary from one situation to the next.

2.4.5 Explanations of the diversity paradox

This discussion has demonstrated that the similarity-attraction theory and SCT highlight the distinctiveness or difference of social identities, while the information/decision-making approach focuses on KSAOs associated with different individuals. With respect to the effects of diversity, the similarity-attraction theory and SCT forecasts a negative impact on performance while the information/decision-making approach predicts a positive impact on performance.

Superficially, the diversity paradox may result from a research tradition that those frameworks have been used in the research separately based on the different, or sometimes contradictory, predictions. Specifically, the explanation could be further broken down into four more specific themes in which the application of frameworks might have contributed to the diversity paradox.

First, it would be incorrect to use one of those frameworks to propose that all types of diversity would have a particular effect on group processes and performance. Instead,

different types of diversity might have different effects on performance (van Knippenberg, De Dreu, & Homan, 2004). Second, given their strength in explaining the effects of diversity at a specific level, the frameworks need to be applied at levels accordingly (e.g. the level of group or individual). Third, as the frameworks predict indirect effects on performance, it is necessary to articulate the intervening group processes that may account for the relationship between diversity and performance (Bayazit & Mannix, 2003). Finally, as the three frameworks suggest the influence of contextual factors, research results about effects of diversity are likely to vary across situations if the contextual factors have not been considered.

2.5 An Opening-Black-Box Approach

The previous sections have examined explanations for the diversity paradox from the perspectives of diversity conceptualisations and diversity theoretical frameworks. In this section, the diversity paradox will be explained from the perspective of group processes, which are also known as intervening variables (Pelled, 1996).

Intervening variables in the relationship between diversity and performance have been a concern to diversity researchers. By presenting a ‘black box’ between diversity and performance, Lawrence (1997) challenged the congruence assumption, which assumes that visible diversity characteristics are able to replace subjective concepts because the first can predict the second. This assumption underpins the two-way relationship between diversity and performance. However, Lawrence found that demographic predictors are just as limited as their social-psychological counterparts (i.e. subjective concepts) and suggested that the visible diversity characteristics cannot completely replace the subjective concepts although ‘many demographic variables [diversity characteristics] are related to subjective concepts’ (Lawrence, 1997, p19, [] added by the researcher).

In addition, Lawrence suggested that “when the intervening process is included in the relationship, the predictor [diversity] and outcome are no longer related. In other words,

the intervening process ‘accounts for’ the original relationship between the demographic predictor and the outcome” (Lawrence, 1997, p4, [] added by the researcher). The concern can even be traced back to the work of Pfeffer, who has argued that diversity is an important causal variable that affects a number of intervening variables and processes and, through them, a number of organisational outcomes (Pfeffer, 1983).

While authors such as Pfeffer (1983) and Lawrence (1997) have suggested the relevance of intervening variables in diversity impact, other researchers have directly addressed the significance of group processes in explaining the diversity paradox. In particular, Chatman and Flynn (2001) argued that

One reason for these diametrically opposed results [i.e. diversity paradox] may be that researchers have often neglected to specify the psychological mechanisms [group processes] underlying the relationship between demographic heterogeneity [diversity] and work processes and outcomes, relying instead on demographic characteristics [diversity] as proxies for such mechanisms (p960, [] added by the researcher).

Similarly, Bayazit and Mannix (Bayazit & Mannix, 2003) proposed that

The effects of different forms of demographic diversity to organizational outcomes have been unclear [mixed], mostly because previous studies have not considered a theoretical framework and have not articulated the intervening group processes through which the relationship between forms of diversity and important outcomes operate (p296, [] added by the researcher).

In 1996, Pelled developed a theoretical model called ‘An Intervening Process Theory’ to explain the mixed results of diversity research i.e. the diversity paradox. Whereas there have also been other theoretical contributions associated (for example, Pelled’s theory has firstly conceptualised a typology of various types of diversity with respect to their visibility and job-relatedness, (please see Pelled, 1996, for details)), Pelled’s theory has directed a line of enquiry that elaborates the intervening roles of group processes (conflict, in particular) in explaining effects of diversity.

In an intervening model, the relationship between diversity and performance can be addressed as follow: diversity influences performance entirely through team processes and diversity has no direct effect on performance (Smith et al., 1994). In particular, diversity either positively or negatively impacts on group processes while the latter impacts on performance either positively or negatively. According to intervening theories, diversity can have either a positive or a negative **indirect** impact on performance, depending on the role of group processes.

Intervening theories were suggested as being highly useful in explaining the diversity paradox since different group processes may have different or even opposing effects in the three-way relationship (Kulik, 2004; Reagans, Zuckerman, & McEvily, 2004; Reagans & Zuckerman, 2001). For instance, a diverse group can have advantages for certain types of task but not for others due to the different effects of group conflict (Jehn & Bezrukova, 2004).

Researchers have examined a number of group processes that work between diversity and performance including conflict (McMillan-Capehart, 2005; Michie & West, 2004; O'Reilly et al., 1989; Pelled, 1996; Pfeffer & O'Reilly, 1987), network (De Dreu & Beersma, 2005), communication (Barsness, Diekmann, & Seidel, 2005; Bhadury & Mighty, 2000; Burt, 2000; Cummings, 2004; Haslam, O'Brien, Jetten, Vormedal, & Penna, 2005; Joshi, Labianca, & Caligiuri, 2002), and social integration or cohesion (Ayoko, Hartel, & Callan, 2002; Tzafrir, Tzafrir, Harel, Baruch, & Dolan, 2004; Vodosek, 2005).

Among these group processes, cohesion (social integration), communication, and conflict are often investigated (S. E. Jackson et al., 2003; Jehn, 1999; Lawrence, 1997; Mannix & Neale, 2005; Pelled, 1996; Pfeffer, 1983). Therefore, this section only examines these three group processes that have been considered in considerable detail in the literature.

2.5.1 Diversity-Communication-Performance

2.5.1.1 Defining communication

Communication is a process that involves the sending and receiving of messages and it has been described as the heart of group behaviours and the essence of social systems (Goris, Vaught, & Pettit Jr., 2000). Two essential aspects of communication are frequency and informality. The first refers to the amount of interaction among team members while the latter concerns the extent to which group members favour less formal communication channels such as spontaneous conversations and unstructured meetings over formal channels such as highly structured meetings and written communication (Smith et al., 1994). Typical among the various types of communication is spontaneous communication, which is referred to as the informal, unplanned interactions that occur among team members and it was found to mitigate conflict in distributed teams (Hinds & Mortensen, 2005).

In the literature about the group, communication has been regarded as a key group/team process as it clarifies “how” a team member interpersonally orchestrates his/her work to get things done and perform effectively (Barrick, Bradley, Kristof-brown, & Colbert, 2007). The following sections examine how communication functions from the perspective of the three-way relationship. The first section looks at the relationship between diversity and communication and the second examines the relationship between communication and performance.

2.5.1.2 The link between diversity and communication

Communication has been one of the important aspects that needed to be dealt with in the context of diversity (Muhr, 2006). In practice, diversity in teams often causes a range of language barriers, which prevents communication. Theoretically, the linkage between diversity and communication can be explained by social categorisation theory (SCT), which has been examined in the previous section.

As outlined in the previous section, people sort each other into social categories based on perceived similarity and accordingly treat the in-group members favourably and perceive out-group members as less attractive (Brief et al., 2005; Gaertner & Dovidio, 2005). This tendency facilitates communications in homogenous groups (Gaertner & Dovidio, 2005; van Knippenberg et al., 2004) but it leads to the development of a fertile breeding ground for misunderstanding and discord in heterogeneous groups, resulting in miscommunication (Swann Jr. et al., 2004). In turn, it is predicted that heterogeneous groups will have worse communication than homogeneous ones.

The hypothetical relationship between diversity and communication has support from empirical studies. For example, Keller (2001) conducted research examining the relationship between diversity (i.e. functional diversity), communication and outcomes in 93 groups, and he found that diverse groups performed better (e.g. better technical quality) through indirect effects of external communication resulting from the members' diverse backgrounds, areas of expertise and contacts with important external networks of information. Similarly, it has been shown empirically that diversity has a positive effect on the frequency of communication within the top management teams of 79 strategic business units (K. Y. Williams & O'Reilly III, 1998).

2.5.1.3 The link between communication and performance

Communication has been an important research area in the organisational behaviour literature because communication is believed to underpin knowledge sharing in organisations (Muhr, 2006). Specifically, the effects of communication on performance were mostly examined during the 1970s to the 1980s (Ebadi & Utterback, 1984; Roberts & O'Reilly III, 1979). Communication was supposed to help with idea generation, to stimulate his/her creativity, and to improve problem solving (Ebadi & Utterback, 1984). In contrast, miscommunication and the lack of a common language make it difficult to engage in an exchange of ideas and questions, which is essential for effective teamwork (Muhr, 2006).

Unfortunately, the effects of communication on performance remain inconclusive. Data from 117 research projects showed that the frequency of communication was positively related to technological innovation (Ebadi & Utterback, 1984). However, from the perspective of conflict, Jehn (2001) noted that communication could lead to increased conflict as team members brought more of their differences to the surface.

2.5.2 Diversity-Cohesion -Performance

2.5.2.1 What is cohesion/social integration?

Researchers have frequently considered cohesion to be an important component of group processes and performance (Gully, Devine, & Whitney, 1995). In addition, cohesion and social integration are essential components of a group's integration (Smith et al., 1994). Not surprisingly, the experimental social psychology of small groups has considered them the essence of 'groupness' (Hogg et al., 1995) and strong predictors of group behaviours and social relationships in a group (Ensley, Pearson, & Amason, 2002).

Shown in their various definitions, it is difficult to distinguish the notions of cohesion and social integration (Pelled, 1996). For example, cohesion was referred to as the extent to which individual workers identify themselves with a group, are committed to group goals and are subject to the influence of other group members (Molleman, 2005). In a more simple way, cohesion is also defined as the degree to which members of a group are attracted to each other (Ensley et al., 2002). A more widely accepted definition of cohesion is the resultant of all the forces acting on members to remain in the group (Barrick, Stewart, Neubert, & Mount, 1998; Nibler & Harris, 2003).

Similarly, social integration reflects "the attraction to the group, satisfaction with other members of the group and social interaction among the group members" (Smith et al., 1994). From a more subjective perspective, social integration is also referred to as the degree to which group members are attracted to the group, feel satisfied with other members, interact socially with them, and feel psychologically linked to one another (Poizer, Milton, & Swann Jr., 2002).

Despite using the terms cohesion and social integration interchangeably, the present researcher acknowledges differences between them. For example, while the strength of cohesion and social integration depends on the attraction emerging in groups (Nibler & Harris, 2003), the attraction may come from different sources. Cohesion emerges from interpersonal attraction and is closely related to the extent to which group members are similar or dissimilar with respect to, for example, their demographic differences (Molleman, 2005).

However, social integration relies upon social attraction. Social attraction refers to a form of attraction where members are liked not as unique individuals, but as the embodiments of the group. This is distinguishable from interpersonal attraction, which is based on idiosyncratic preferences grounded in personal relationships (Goldberg, 2005). However, it is acknowledged in this discussion that cohesion and social integration are multifaceted constructs including elements of cohesiveness, satisfaction with co-workers, positive social interaction, and enjoyment of team experiences, which are the most commonly-studied outcomes in diversity research (Harrison et al., 2002).

The following two sections examine how cohesion relates to diversity and performance respectively.

2.5.2.2 The link between diversity and cohesion

As attraction is the major source of cohesion and social integration, diversity researchers have often drawn upon the similarity-attraction theory to explain the effects of diversity on cohesion and social integration (F. F. Chen & Kenrick, 2002). Specifically, it has been predicted that homogenous groups will have higher levels of attraction resulting in high levels of cohesion and social integration compared to heterogeneous ones (Carless, 2005; Pfeffer, 1983; van Knippenberg et al., 2004).

This hypothesis has empirical support. Within 147 student project teams, it has been found that diversity (perceived) had significant negative impact on social integration (i.e.

cohesiveness) although diversity (objective) had no significant regression weights (Harrison et al., 2002). There was indirect support from the study by Keller (2001), which was conducted in 93 applied research and new product development groups. In the research, Keller (2001) noted that diversity had no direct effect on cohesiveness but it affected job stress, which in turn results in low cohesiveness. Within 99 student teams, it has been found that diversity (i.e. the demographic faultlines) reduced cohesion because subgroups became more visible in diverse groups (Molleman, 2005).

2.5.2.3 The link between cohesion and performance

It has been suggested that cohesion is an important indicator of the relationship between team members, which critically influences the execution of subsequent teamwork processes and outcomes (Barrick et al., 2007). Positive effects of cohesion are suggested in the literature. For example, more highly cohesive groups were suggested as being able to coordinate group members' efforts and to integrate their perspective more effectively and efficiently (Poizer et al., 2002).

In addition, a cohesive group was predicted to have a strong impact on its members, who strive to keep the group intact and remain members of the group, conform to its norms and demands and emphasise its interest above their own (Molleman, 2005). From the perspective of interpersonal relationships, it has been suggested that cohesive groups are likely to have a stable and solid foundation of interpersonal relationships, allowing group members to interact in a flexible and efficient manner (Ensley et al., 2002). Furthermore, it was argued that cohesion has a positive effect on other group outcomes, such as knowledge transfer (Reagans & Zuckerman, 2001).

In general the empirical evidence supports the hypothesis that cohesive groups outperform non-cohesive groups. For instance, within 147 student project teams, it has been found that social integration (i.e. cohesiveness) had a significant positive impact on group task performance (Harrison et al., 2002). From the perspective of group

effectiveness, data collected from a sample of 216 students (52 teams) indicated that cohesion was a significant predictor of team effectiveness (Forrester & Tashchian, 2006).

More specifically, using 79 experimental groups of 3 to 5 students, research found that groups with high cohesion created more creative answers than groups that had low cohesion (Moore, 1997). From the perspective of conflict, within 70 top management teams (TMTs), it has been found that cohesion is negatively related to affective conflict (which was negatively related to performance) and positive related to cognitive conflict (which was positively related to performance) and new venture growth (Ensley et al., 2002).

Although the positive effects of cohesion have been empirically supported, the literature has also reported a lack of consensus (Barrick et al., 1998). Investigations have generated a considerable amount of theoretical controversy suggesting that cohesiveness does not necessarily ensure good performance. Specifically, it has been proposed that cohesiveness is not beneficial to groups given that consensus in decision making may suppress performance (Watson et al., 2003). In addition, it has been shown that cohesion was not a significant predictor of team effort or team work satisfaction (Forrester & Tashchian, 2006).

Research has also cast doubt on the cause-and-effect direction of the relationship between cohesion and performance. Conducting a meta-analysis of 66 tests of cohesiveness-performance effect for more than 30 years, Mullen and Copper (1994) found that the most direct effect might be from performance to cohesiveness rather than from cohesiveness to performance. A more contradictory argument located in the groupthink literature indicates that social integration may be negatively related to performance because groups with high levels of cohesion may experience more conformity and therefore are less creative (Bernthal & Insko, 1993). However, high levels of group cohesion do not always lead to groupthink. In particular, there is research showing that high task-oriented cohesion resulted in the lowest perception of groupthink symptoms (Bernthal & Insko, 1993).

2.5.3 Diversity-Conflict-Performance

2.5.3.1 Defining conflict

The conceptualisation of conflict in the literature has taken on many forms, depending on the perspectives that are of interest to the researchers. In summary, there are three main themes to the definitions of conflict within the literature. The first approach, which emphasises the dissimilarity between people, views conflict as a process that begins when an individual or group perceives differences and opposition between him or herself and another individual or group about interests, beliefs, or values that matter to him or her (De Dreu & Weingart, 2003; De Dreu & Beersma, 2005).

Stressing the socially-constructed meaning of conflict (the second approach), some researchers (G. Q. Chen, Liu, & Tjosvold, 2005; S. Sawyer, 2001) treated conflict as differences in how people interpret information. This approach indicates neither a positive nor negative nature of conflict. In describing the symptoms and causes of conflict (the third approach), researchers (De Dreu & Beersma, 2005) regarded the overt hostility between two or more parties as conflict, and argued that conflict exists when there is a manifest purpose in the struggle for resources so that to some degree, the more one party gets, the less others have.

In this discussion, conflict is defined as perceived incompatibilities or perceptions by the parties involved that they hold discrepant views or have interpersonal incompatibilities (Amason, Thompson, Hochwarter, & Harrison, 1995; Jehn, 1995). The definition has obvious strengths in that it allows this researcher to use the three themes discussed above to examine the phenomenon of conflict. First, this definition emphasises the dissimilarity between people by defining conflict as the perceived incompatibilities between people, particularly those having discrepant views and interpersonal incompatibilities. According to this definition, conflict is endemic when members of different groups interact and work together (Mohammed & Angell, 2004; Sawyer, 2001). Second, this definition implies the socially constructed meaning of conflict by referring to conflict as 'perceptions' of people. Conflict is awareness of incompatibilities but the awareness

may be incorrect (Tajfel & Turner, 1986). Third, this definition also indicates the possible causes of conflict i.e. discrepant views or interpersonal incompatibilities.

2.5.3.2 Causes of conflict

Causes of group conflict vary. Traditionally, conflict has been tied to resource-based factors (Chatman et al., 1998). However, it has been argued recently that causes of conflict may be more or less related to groups' interdependent nature, which implies that group members have to interact and work together (Mohammed & Angell, 2004; Sawyer, 2001). For instance, apart from the resource-based factors (Chatman et al., 1998), people in conflict believe that they cannot be mutually satisfied or that they cannot be reconciled or integrated (Paul, Seetharaman, Samarah, & Mykytyn, 2004).

In addition, people may exhibit in-group favouritism even if there is no objective goal incompatibility or competition for scarce resources (there is no economic basis for conflict). In extreme, social categorisation and identification processes may even create the illusion of conflict where there is none (Tajfel & Turner, 1986). In turn, conflict pervades virtually all organisational functioning including group processes (Lee, 2002). Thus, conflict has even been regarded as one of the inescapable features of the interactions of any work groups (Pearson, Ensley, & Amason, 2002) and it has even been treated as an important indicator of the quality of interaction, which determines group effectiveness to accomplish tasks (Mannix & Neale, 2005).

2.5.3.3 Typology of conflict

In exploring the effects of conflict, researchers have tried to distinguish types of conflict. For instance, it has been argued that conflict has four dimensions i.e. cognitive task conflict, emotional conflict, emotional person conflict, and cognitive person conflict emphasising the detrimental effects of emotional conflict on performance (Greer, Jehn, & Mannix, 2008; Jehn & Bendersky, 2003). The distinction between affective/relationship-related and cognitive/task-related aspects of conflict is critical to

understanding the circumstances in which conflict can be beneficial or detrimental to performance (Passos & Caetano, 2005). Based on this distinction, Jehn's two-dimensional conflict model (i.e. relationship conflict vs. task conflict) has been considered as the well-accepted and established conflict typology by researchers (Guerra et al., 2005; Medina et al., 2005).

2.5.3.3.1 Relationship conflict

Jehn (1994; 1995) defined relationship conflict as a perception of interpersonal incompatibility and typical tension, irritation and hostility among group members. It is a form of conflict with a strong personal and emotional component, characterised by feelings of anger, frustration, distrust, and personality differences among team members (Hinds & Mortensen, 2005; Passos & Caetano, 2005). As it involves perceived tension and frustration about personal differences such as interpersonal style attitudes and preferences (Trimmer et al., 2002; Yang & Mossholder, 2004), relationship conflict is relationship-oriented.

2.5.3.3.2 Task conflict

Jehn (1994; 1995) defined task conflict as a perception of disagreement among group members about the content of their decisions and involves differences of opinions, ideas, and viewpoints. It exists when group members differ in views and opinions regarding the tasks being performed and interpretation of job-related information (Yang & Mossholder, 2004) characterised by discord over different opinions and viewpoints (Hinds & Mortensen, 2005). Essentially, task conflict is task-oriented.

Despite two-dimensional conflict having been well-accepted in the research, it may be helpful to note a unique form of task conflict, labelled as process conflict by some researchers (e.g. Jehn & Bendersky, 2003). Process conflict is disagreement about how the work gets done, centring on disagreements about task strategy and delegation of duties and resources (Jehn & Shah, 1997; Jehn et al., 1999; Jehn & Chatman, 2000).

However, unlike the distinction between task conflict and relationship conflict, which was based on a theoretical reflection, the distinction between task conflict and process came out of the empirical data analysis (Passos & Caetano, 2005).

Jehn & her colleagues (2003) argued that it is necessary to separate process conflict from task conflict because process conflict centres on the means to accomplish the specific task, not about the content or substance of the task, itself. Specifically, process conflict is about strategies for approaching the task including disagreements about the composition of a team and who should do what, debates about resources, and fights about how to schedule tasks efficiently (Jehn & Bendersky, 2003). Given its great similarity to task conflict, process conflict will be regarded as a form of task conflict in this discussion.

Following a short introduction about conflict, the following sections will discuss how conflict functions in relationship diversity and performance. More specifically, the relationships will be examined with respect to two types of conflict.

2.5.3.4 The link between diversity and conflict

Similarity-attraction theory and SCT have been the theoretical basis for predicting the relationship between diversity and relationship conflict (Mannix & Neale, 2005). In section 2.4.2, it was outlined that people categorise each other based on similarity and, accordingly, tend to like and trust in-group members more than out-group ones and tend to favour in-groups over out-groups. Consequently, diverse groups can become a fertile breeding ground for misunderstanding and discord because of potential miscommunication associated with individual differences. Diverse groups, in turn are predicted to have a higher level of relationship conflict compared to homogeneous ones.

To explain the relationship between diversity and task conflict, the information/decision-making approach has been used. This theory explains how information and decision-making can be affected by group diversity (K. Y. Williams & O'Reilly, 1998). According to the information/decision approach, demographic diversity provides diverse groups

with a large pool of KSAOs and therefore offers diverse groups a variety of perspectives and approaches to the problems at hand, as well as different sources of information and expertise available.

Due to the respective belief structures in diverse groups, group members with different demographic backgrounds may have divergent preferences and may interpret tasks differently and these divergences are likely to manifest themselves as intragroup task conflict (Henley & Price, 2004; Pelled et al., 1999; Simons & Peterson, 2000). Accordingly, diverse groups are predicted to have a higher level of task conflict compared to homogeneous one.

The hypothetical predictions mentioned above have empirical support. In research involving 190 workers conducted in a Mexican context, Pelled, Xin, and Weiss (1997) found that age dissimilarity was positively related to relationship conflict while diversity in tenure was positively associated with task conflict. In 2002, using 88 teams, Trimmer et al (2002) found an association between conflict (both types) and personality diversity.

Similarly, within 79 groups, it has been found that diverse groups measured by low faultline scores experienced high levels of conflict (Thatcher et al., 2003). Two years later, Vodosek (2005) found that the effects of diversity (i.e. cultural diversity) are positive and similar across different types of conflict across 76 university groups. In 2006, research conducted within 27 student project teams found that value dissimilarity had a positive association with both types of conflict (Hobman & Bordia, 2006).

The relationship between diversity and conflict is, however, far from being conclusive. Empirical evidence does not support the hypothetical relationship in some cases. For example, while Pelled, Xin, and Weiss (1997) found the hypothetical relationship between diversity (age and tenure diversity) and performance, they did not find significant effects between gender and tenure diversity and relationship conflict. In 2005, Yeh & Chou (2005) examined the relationship between diversity (i.e. functional and positional diversity), conflict and performance (N=88) within enterprise resource

planning (ERP) teams and they found that diversity (i.e. functional) was not the main source of the task or relationship conflicts. More recently, within 45 student project groups, Mohammed and Angell (2004) noted a lack of a significant main effect of diversity on conflict, in particular relationship conflict.

2.5.3.5 The Link between Conflict and Performance

Historically, conflict has been viewed as a determinable variable between situational and individual antecedents and performance (Jehn & Bendersky, 2003; Pearson, Ensley, & Amason, 2002; Sportsman, 2005; Tidd & Friedman, 2002). However, recently it has been suggested that conflict might be a doubled-edged sword, with both beneficial impacts (e.g. improving decision quality) and detrimental effects (e.g. difficulties in achieving commitment) (Amason & Mooney, 1999; G. Q. Chen et al., 2005; De Dreu & Beersma, 2005; Guerra et al., 2005) depending on the type of conflict generated.

It has been argued that relationship conflict fuels prejudice, intergroup competition and negative out-group attitudes on the part of the majority of group members causing poor interpersonal relationships at work (Brief et al., 2005). As a result, communication becomes difficult among diverse members breaking personal and professional relationships (Medina et al., 2005). As the level of relationship conflict increases, cognitive systems shut down and information processing is impeded (De Dreu & Weingart, 2003).

The negative effects of relationship conflict on performance have been empirically proven (Choi & Cho, 2005; De Dreu & Weingart, 2003; De Dreu & Beersma, 2005; Rau, 2005). It has been found that relationship conflict decreased performance by depressing job satisfaction, inducing dysfunction in group processes, and reducing group effectiveness (Buchholtz, Amason, & Rutherford, 2005; Guerra et al., 2005; Medina et al., 2005).

With respect to the positive effects of task conflict on performance, the link has been supported in the last decade (Jehn & Bendersky, 2003). Growing evidence indicates that people are forced to abandon complacency and seek new ways of dealing with old problems only when people are in situations where there is disagreement about the old ways (task conflict) causing innovation (Bacal, 2004) and inducing creativity (Medina et al., 2005). In addition, research has found that constructive debates associated with task conflict increases the quality of decision-making (De Dreu & Weingart, 2003; Vodosek, 2005) and communication between group members (Richter, Scully, & West, 2005).

However, the duality of conflict effects is still being debated. In 2005, Yeh and Chou did not find task negative effects of relationship conflict on projects' effectiveness (N=88) within Enterprise resource planning (ERP) teams. In addition, it has been shown that the effects of task conflict are not strictly linear (Jehn, 1995). Specifically, as task-related arguments increased, group members found that they were better able to critically assess information related to their job. High levels of conflict, however, interfered with group performance (Jehn, 1997). Members became overwhelmed with the amount of conflicting information and continuously became sidetracked and lost sight of the main or original goal of the discussion. In the opinion of Jehn and her colleagues, low and high levels of task conflict are detrimental, but medium levels of task conflict are beneficial (Jehn & Mannix, 2001).

2.5.4 Findings of Review

This section has examined intervening theories that explain the diversity paradox from the perspective of group processes. To do so, the section examined the intervening theories literature that addressed group processes, communication, cohesion/social integration and conflict in particular. Hypothetical effects of diversity predicted by the intervening theories have been summarised in Figure 2-5.

Figure 2-5 Hypothetical diversity effects

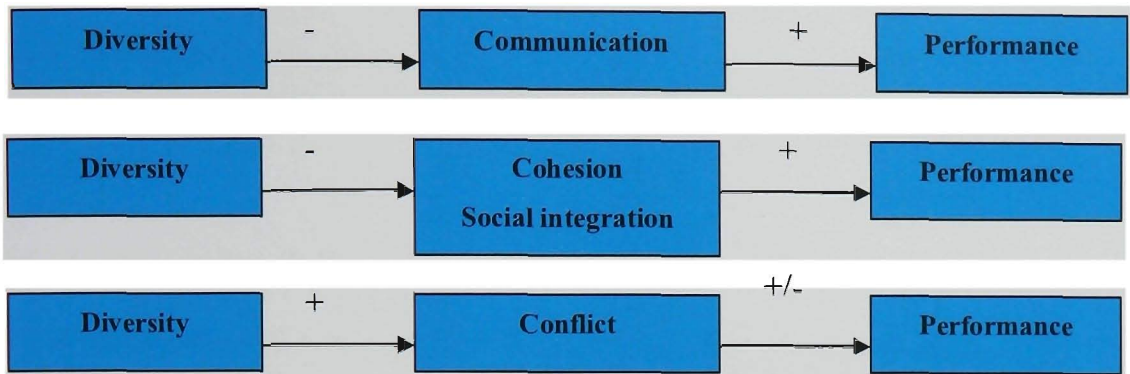


Figure 2-5 illustrates that intervening theories predict both positive and negative effects of diversity depending on the roles played by a particular group process in the three-way relationships. For instance, diversity decreases the frequency of communication, which is, in turn, positively related to performance. The diversity-communication-performance relationship therefore suggests negative effects of diversity. Similarly, according to the diversity-cohesion/social integration-performance, diversity is negatively related to cohesion/social integration, which is predicted to impact on performance positively. This three-way relationship also suggests negative effects of diversity.

In contrast to communication and social integration, conflict has both negative and positive roles in the intervening theories. Diversity is predicted to impact on conflict positively. However, it has been suggested that conflict has both negative and positive effects on performance depending on sub-types of conflict i.e. relationship and task conflict. In particular, relationship conflict has been found to be negatively related to performance, resulting in negative effects of the three-way relationship; task conflict is suggested to have a positive impact on performance causing positive effects of diversity. As a result, diversity has both a negative and a positive impact on performance via conflict.

As shown in the previous discussion, the hypothetical effects of diversity have been empirically supported suggesting the theoretical strength of intervening theories. However, intervening theories are at their early stage of theorisation due to the

inconclusive and sometimes contradictory research results. While research to advance intervening theories further remains a promising explanation of the diversity paradox, different theoretical perspectives are needed. Research might be particularly helpful in the theorisation of intervening theories when considering the following perspectives.

2.5.4.1 Various types of diversity

New intervening theories should also consider how to classify a wide range of diversity attributes. While diversity can be referred to as numerous personal attributes, an increasing criticism in the literature is that different types of diversity have been included under the general term 'diversity' in an attempt to understand their impact (Jehn et al., 1999; Mannix & Neale, 2005). Researchers taking this approach suggest that certain attributes may have similar meanings, expectations, and values associated with them (Spataro, 2005), and therefore diversity in these similar attributes may have similar impacts on organisations (Mannix & Neale, 2005). Although numerous studies have shown that diversity leads to a decrease in in-group cohesion and member commitment (Austin, 1997), it has been argued that the effects of diversity on cohesion may differ due to the type of diversity (Webber & Donahue, 2001).

Therefore, future research could categorise different attributes of diversity into a series of diversity types, such as social diversity, information diversity and value diversity (Jehn et al., 1997; Jehn et al., 1999). It would be helpful to categorise diversity with regard to two properties that have been well addressed: visibility and job-relatedness.

2.5.4.2 Research contexts

Since it has been found that the same types of diversity produced different effects in different contexts, there seem to be processes that affect the impact of diversity (Randel, 2002). New intervening theories should also take research contexts into account. It has been demonstrated that moderators such as contextual factors, "social worlds" that an individual belongs to (Riordan, 2000), may affect whether diversity differences are

noticed and how people react to them (Mannix & Neale, 2005; Milliken & Martins, 1996; Spataro, 2005). Yet, the same demographic characteristics might yield different work-related attitudes/behaviours in different research contexts. Following this stream of theoretical argument, it seems necessary to examine further how research contexts function in intervening theories.

Research contexts such as research locations may be particularly meaningful. For example, since most intervening theories were developed and tested in the USA and European countries, future research to be conducted in different countries/locations such as Australia will contribute significantly to the theorisation of intervening theories.

2.5.4.3 A particular intervening theory: the diversity-conflict-performance paradigm

While there is a need for new intervening theories to explain other group processes, such as group networks in the relationship between diversity and performance (Reagans & Zuckerman, 2001; Reagans, Zuckerman, & McEvily, 2004), theorisation may make a significant contribution when attempting to conclude the existing intervening theories. Future theorisation could pay attention to a specific group process: conflict. For some researchers, the diversity-conflict-performance relationship is also termed the diversity-conflict-performance paradigm (Kulik, 2004).

It has been suggested that conflict is a particularly powerful group process in intervening theories compared to communication and cohesion/social integration (Jehn, 1999; Pelled, 1996; Pelled et al., 1999). There are a number of reasons for this. First, communication and cohesion/social integration may have less power in explaining the diversity paradox compared to conflict. As shown in Figure 2-5, communication and cohesion/social integration can only account for the negative effects of diversity but they cannot account for the favourable effects of diversity on performance (McMillan-Capehart, 2005). This nature of conflict may be useful in explaining the diversity paradox.

The second reason is that conflict can serve as a proxy for communication and cohesion/social integration. In proposing an intervening process theory, Pelled (1996) noted that communication and cohesion/social integration might be strongly related to conflict, although they are not identical and that problems with communication and cohesion/social integration are always found where conflict is present, but not vice versa.

The third reason is that diversity has great potential to promote conflict. According to both similarity-attraction theory and SCT, people strive for self-esteem by developing positive opinions towards similar others (in-group) and negative opinions towards the dissimilar (out-group) (Jehn & Mannix, 2001; Pelled, 1996; Schippers et al., 2003), creating great conflict tension between dissimilar people in diversified contexts.

While the diversity-conflict-performance relationship might be a particularly useful explanation for the diversity paradox, to the author's knowledge there are only two studies (Jehn et al., 1997; Pelled et al., 1999) that have directly explored the diversity-conflict-performance relationship. In addition, the findings of the two studies were not consistent.

Specifically, Jehn et al. (1997) showed first, that visible (social) diversity increased relationship conflict, which was negatively related to performance, resulting in a negative impact of diversity on performance and second, that information diversity increased task conflict, which, however, was negatively associated with performance, causing a negative impact of diversity on performance as well. Explaining the difference in the effects of task conflict compared to previous results (Jehn, 1994; Jehn, 1995), Jehn et al. (1997) suspected that types of task might influence the impact of task conflict.

Two years later, Pelled and her colleagues (1999) found that functional diversity had a positive relationship with task conflict, which was positively related to performance, resulting in a positive impact of diversity on performance. It has also been found that age diversity was negatively related to relationship conflicts, which was not found to impair

performance, leaving the relationship between diversity and performance unclear. Unexpectedly, Pelled and her colleagues (1999) found that tenure was not significantly related to task conflict and that gender diversity was not related to relationship conflict in either direction (positive or negative). They explained that those unexpected findings were due to variations between individuals in length of tenure causing heated interaction among members, and that the findings were due to a lack of gender diversity in their study (Pelled, Xin et al., 1999).

Although the diversity-conflict-performance paradigm seems to be able to produce a deeper insight into the diversity paradox, research that attempts to explore the paradigm has produced mixed results, which highlights the need to further advance the paradigm as well as to employ other theoretical lenses, such as the moderation effect of contextual factors.

2.5.5 Explanations of the diversity paradox

According to the intervening theories, the diversity paradox is understandable due to the different roles played by different group processes. For instance, the diversity-communication-performance relationship and the diversity-cohesion/social integration-performance relationship explain negative effects of diversity, while the diversity-conflict-performance relationship predicts both negative and positive effects of diversity. In addition, because the diversity-conflict-performance relationship predicts both negative and positive effects of diversity, it could be particularly helpful in explaining the diversity paradox.

2.6 The Moderating Variables¹⁰

Research contextual factors have been a concern in the organisational behaviour literature (Gelfand, Erez, & Aycan, 2007). However, it was argued that most diversity

¹⁰ Some parts of this section have been published in conference proceedings (Qin, 2007).

research has examined the direct impact of diversity on team processes and team outcomes, neglecting the role of the research contexts (Schippers et al., 2007).

In this discussion, the term “context” refers to surroundings associated with a particular phenomenon, and involves units of analysis expressly above those being examined (Kidwell Jr, Mossholder, & Bennett, 1997). According to Jehn & Bezrukova (2004), the contextual factors include culture, business strategies, HRM practices, and so forth. In explaining the diversity paradox, contextual factors have been examined as moderators by considering how organisational culture moderates how diverse people approach and solve problems (Chatman, Polzer, Barsade, & Neale, 1998).

By definition, moderating variables are third variables that affect the direction and/or strength of the relationship between an independent or predictor variable and a dependent or criterion variable (Baron & Kenny, 1986). According to their functions on the relationship of concern, there are two types of moderators including amplifiers that strengthen the relationship between variables, and suppressors that weaken the relationship between variables (Jehn & Bendersky, 2003; Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001).

Although some researchers have used the terms ‘moderator’ and ‘mediator’ interchangeably, moderators will be distinguished from mediators in this discussion. This is because mediators are third variables that account for the relationship between independent variables and dependent variables (Baron & Kenny, 1986). Moderator variables are important, because specific research factors (e.g. context information) are often assumed to reduce or enhance the influence that specific independent variables have on specific responses in question (the dependent variable) (Baron & Kenny, 1986).

In diversity research, contextual factors have been suggested as being a moderator of the effects of diversity (Triandis, 1995; K. Y. Williams & O'Reilly, 1998). However, being moderators, contextual factors are a critical but understudied variable (Mannix & Neale, 2005; Milliken & Martins, 1996). Recently, there has been a growing research interest in

moderators such as contextual factors within groups, “social worlds” that an individual belongs to (Riordan, 2000). As research contextual factors may affect whether diversity differences are noticed and how they are reacted to, the same demographic characteristics might yield different work-related attitudes/behaviours in different research contexts.

Therefore, this section will examine the diversity paradox from the perspective of contextual factors with respect to their moderation effects on the mechanism of diversity impact.

2.6.1 A particular example of diversity mechanism: Diversity-conflict-performance paradigm

As addressed in the previous chapters, the effects of diversity have been examined not only from a two-way relationship (diversity-performance) but also a three-way relationship (diversity-group processes-performance). In addition, a number of group processes have been included in the three-way relationship (Kulik, 2004; Reagans, Zuckerman, & McEvily, 2004; Reagans & Zuckerman, 2001). However, this section will see if the contextual factors could offer some explanation for the diversity paradox; one particular example, diversity-conflict-performance paradigm (hereafter, it is called the paradigm), was chosen for the purpose of this discussion.

The paradigm was chosen for three reasons. First, as the purpose of the discussion is to demonstrate the existence of possible moderation effects of contextual factors, it is unnecessary to exhaust all existing intervening theories. Second, as addressed in section 2.5, the paradigm may be particularly meaningful in explaining the diversity paradox because conflict has been found to be both negatively and positively related to performance, depending on the sub-types of conflict.

Third, whereas the paradigm may provide a promising explanation of the diversity, the research results examining this paradigm have been once again mixed (Jehn et al., 1997; Pelled et al., 1999). According to current theoretical arguments and empirical findings,

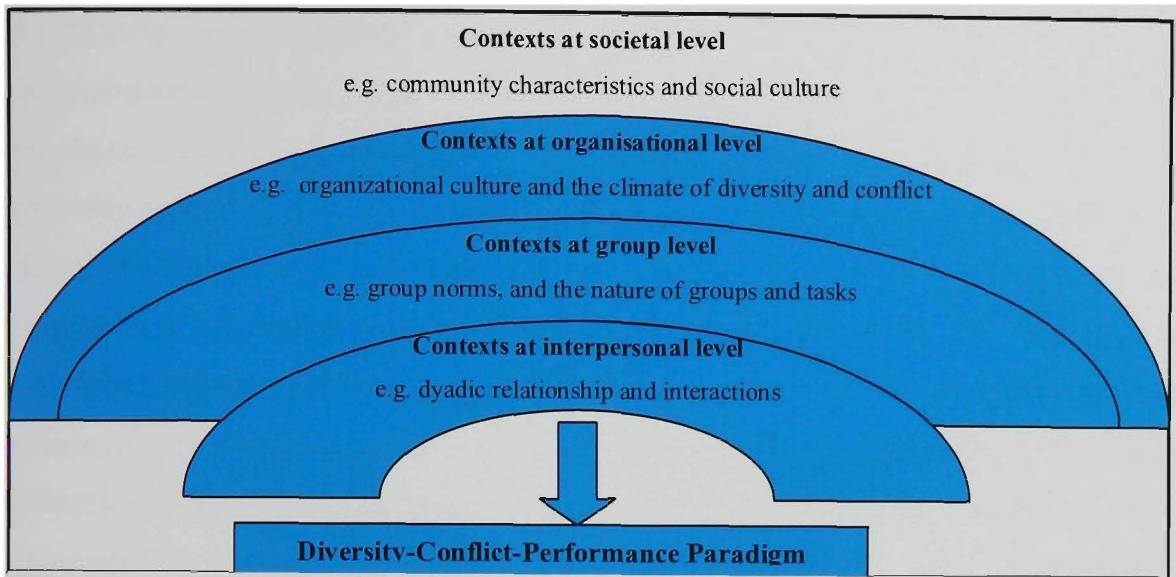
the specific effects of diversity are still difficult to predict (S. E. Jackson & Joshi, 2004). However, given the fact that the same dimension of diversity produced different effects, it seems that there may be processes that affect the impact of group diversity (Randel, 2002) calling for careful consideration by the moderators when trying to disentangle the diversity paradox presented by the extremely inconsistent research results.

2.6.2 A multilevel model of research contextual moderation

In examining the moderation effects of contextual factors on the paradigm, this discussion will be developed along a multilevel framework due to a complexity of research contextual factors. In the diversity research, contexts is a catch-all term and has been used to refer to any contingency that might shape the contours of the phenomena under investigation including culture, task characteristics, strategic context, temporal context and so forth (S. E. Jackson et al., 2003).

Given the fact that context is a multilevel construct that encompasses innumerable specific elements (S. E. Jackson & Joshi, 2004), the current discussion may benefit from a heuristic guide that identifies the complexity of the research context as a conceptual construct. Inspired by a multi-level framework (S. E. Jackson et al., 1995; S. E. Jackson et al., 2003), this discussion will rely on a model of moderations of multilevel contextual factors. As shown in Figure 2-6, the mechanism of the paradigm is moderated by research contextual factors at multi-levels including interpersonal, group, organisational, and societal levels. The discussion will begin with the societal level and end with the interpersonal level. Specifically, the moderation role of the research context may also be examined with respect to the relationship between diversity and conflict (D-C) and the relationship between conflict and performance (C-P).

Figure 2-6 Moderations of multilevel contextual factors



Source: (S. E. Jackson & Joshi, 2004)

2.6.3 Research contexts at societal level

Although societal contexts might have a less significant impact on groups compared to organisations as a whole, they have been investigated as moderators on the effects of diversity. For instance, the degree of diversity present in sales districts was hypothetically able to moderate the effects of diversity (S. E. Jackson & Joshi, 2004). In addition, demographic differences seem to matter differently in different cultures, for example, the cultures of the Japanese (Milliken & Martins, 1996) and the Chinese (Nibler & Harris, 2003). Furthermore, it has been suggested that diversity experiences of whites in their communities will moderate the negative reactions of whites to racial and ethnic diversity in organisations (Brief et al., 2005). However, discussion of societal contexts is generally beyond the scope of the group diversity literature (S. E. Jackson & Ruderman, 1995; S. E. Jackson et al., 2003; S. E. Jackson & Joshi, 2004).

2.6.4 Research contexts at organisational level

2.6.4.1 Organisational culture

As the social context of groups, organisational culture has been traditionally examined as the moderating variable of group dynamics. Despite the fact that organisational culture may have been conceptually constructed differently by different researchers, it has been generally treated as a construct that represents the essence of organisational differences (Kokt, 2003) in terms of core values, behavioural norms, and behavioural patterns. It not only governs how people in an organisation interact with each other and invest energy in their jobs and the organisation at large (Guerra et al., 2005) but it also reflects the central values of the organisation and dictates the appropriateness of attitudes and behaviours (Chatman & Spataro, 2005; Spataro, 2005). In general, it serves as a foundation for the organisation's management system, as well as the set of management practices and behaviour that both exemplify and reinforce those principles (Chatman & Spataro, 2005; Spataro, 2005).

Particularly in group research, it has been suggested that organisational culture may render members of a group to be more or less tolerant towards discussions and different opinions that may arise within the group (Guerra et al., 2005). It is therefore reasonable to treat organisational culture as a potential moderator of effects of diversity since it has direct implications for the extent to which an organisation's members emphasise or de-emphasise differences between diverse individuals (Spataro, 2005).

2.6.4.2 Aspects of organisational culture

Whereas organisational culture refers to the broader pattern and nature of beliefs and values (Hobman et al., 2004), it is a construct that encompasses many elements depending on their significance of concern to the researcher. Cultural orientations (i.e. individualism versus collectivism) and organisational climate are two common aspects of organisational culture (Oyserman, Coon, & Kimmelmeier, 2002). Despite rarely being defined, individualism is normally referred to as the norms that stress human independence and the importance of the individual self-reliance and liberty while

collectivism relates to norms that focus on human interdependence and the importance of collective rather than the importance of separate individuals (Singelis, Triandis, Bhawuk, & Gelfand, 1995; Triandis, Bontempo, Villareal, Asai, & Lucca, 1988).

2.6.4.2.1 Individualism versus collectivism

Individualism and collectivism have been reported as being two of the most heavily researched areas of organisational culture (McMillan-Capehart, 2005). According to some researchers (Chatman et al., 1998; McMillan-Capehart, 2005), organisational culture that emphasises individualism encourages employees to pursue individual goals and objectives while offering rewards based on individual achievement; conversely, collectivistic cultures focus on shared objectives and cooperation. Employees in collectivist organisations are more likely to adjust their own behaviour when differences in co-workers' behaviour are noted (Chatman et al., 1998).

With respect to the impact on the paradigm, it was suggested that collectivistic culture promoting the salience of organisational membership positively moderated the effects of diversity on group processes and that individualistic culture has negative impacts (Chatman et al., 1998; McMillan-Capehart, 2005). In other words, the relationship between diversity and group processes will be stronger in individualistic culture than in collectivistic one. However, this argument was just partially supported indicating that subjects who were similar to others sent more memos (an indicator of group communication) in the individualistic condition than in the collectivistic condition but subjects who were dissimilar to others sent more memos in the collectivistic condition than in the individualistic condition (Chatman et al., 1998).

However, with respect to conflict, it has also been suggested that individualistic culture may positively moderate the relationship between diversity and conflict while collectivistic culture may negatively moderate the relationship between diversity and conflict (Spataro, 2005). This proposition seems quite reasonable since people in collectivistic cultures are more likely to adjust their behaviours when dealing with

dissimilar others. However, to date there is no empirical research examining the argument.

2.6.4.2.2 Organisational climate

Organisational climate is one aspect of organisational culture. However, it is slightly different from culture in that it is a construct that may be located at both organisational and group levels. For the purpose of this discussion, all levels of climate will be discussed in this section. By definition, climate is conceived as the influence of work contexts on employee behaviours or/and attitudes and organisations can have a number of climates (Kossek & Zonia, 1993).

With respect to diversity, climate refers to an individual's perceptions of the organisation's attention to diversity issues, as reflected through human resource (HR) policies and procedures and general attitudes towards the value of a diverse workforce for organisational effectiveness (Hobman et al., 2004; Kossek & Zonia, 1993). In a positive climate of diversity it is suggested that group members value and respect the views of the dissimilar others, seek out and enjoy interacting with a wide variety of individuals, and work productively in those relationships (Hobman et al., 2004).

Although focusing on different organisational levels, climate is similar to two other concepts: group openness and diversity perspective. Group openness is defined as the propensity of a group to tolerate, encourage, and engage in open, frank expression of views indicating the propensity of groups to share information (Amason, Thompson, Hochwarter, & Harrison, 1995). Only relevant to diversity, the diversity perspective is group members' normative beliefs and expectations about diversity and its role in their work group (Ely & Thomas, 2001). As addressed in their definitions, climate is at various organisational levels, while group openness and diversity perspectives are properties only at the group level. However, openness and diversity perspectives are about individuals' attitudes and they should be also constructs at the individual level.

Yet, although there are similarities between organisational climate, group openness and diversity perspective, they are applied differently in this discussion. In particular, organisational climate is a multi-aspect construct including areas such as diversity climate and conflict climate. In addition, openness is treated as a measure of climate. This is because climate describes the quality of a construct while openness quantifies climate in nature. More specifically, openness has two dimensions with respect to diversity and conflict: openness to diversity and openness to conflict.

2.6.4.2.2.1 Openness to diversity

It was suggested that the diversity climate affects how people express themselves and manage tensions related to diversity (e.g. cultural identity) and whether minorities feel respected and valued in organisations (Muhr, 2006). Therefore, openness to diversity is used to facilitate open communication and achieve a higher level of integration within groups. In contrast, groups with low openness to diversity may fail to regard and effectively utilise the diversity available and express negative biases associated with social categorisation (Hobman et al., 2004). Therefore, the greater the group openness to diversity, the less relationship conflict group members experience; in contrast, the greater the group openness to diversity, the more task conflict group members experience.

2.6.4.2.2.2 Openness to conflict

Openness to conflict is similar to another term, 'group acceptability norms' referring to members' acceptability of conflict (Jehn & Bendersky, 2003). Openness to conflict has been seen as an amplifying moderator on the relationship between conflict and performance because acceptability norms may encourage both task and relationship conflict (Jehn & Bendersky, 2003). In particular, the greater the group openness to conflict, the more conflict the group members experience. However, it has been found that group openness amplifies the positive effects of task conflict but the amplifying impact on negative effects of relationship conflict was not found (Jehn, 1995).

2.6.5 Research contexts at group level

2.6.5.1 Group norms

The first contextual factor at the group level is group norms. Group norms are standards that regulate behaviours among group members (Jehn, 1995). They are a natural product of group development. In particular, once a group develops a clearly defined goal, group norms encouraging goal-facilitative actions and discouraging inhibitory behaviours will automatically emerge (Brown, 2000). Although providing similar regulations, group norms function slightly differently across organisational levels (Brown, 2000). According to Brown (2000), at the individual level, norms act as frames of reference through which the world is interpreted and they are especially useful in novel or ambiguous situations, where they can act as pointers on how to behave. For the group, norms help to regulate social existence and hence help to coordinate group members' activities.

Apart from openness to conflict and diversity, which have been treated by some scholars as group norms, there is another construct, group mutuality, which may serve to moderate the paradigm. Group mutuality can be defined as the extent to which group members believe that they are mutually accountable and responsible and will share in the consequences of their decisions and it captures the extent to which diverse members of a group feel joint responsibility and share goals (Amason et al., 1995). It would be expected that group mutuality amplifies the positive relationship between task conflict and performance. The greater the group mutuality, the more task conflict the group members experience. In contrast, group mutuality suppresses the negative relationship between relationship conflict and performance. The greater the group mutuality, the less relationship conflict the group members experience.

2.6.5.2 The properties of groups

Group sizes, group types, group longevity, and group interdependence are four commonly addressed group properties. However, given its close relation to tasks, interdependence will be used in this section only to refer to goal interdependence, i.e.

independence of success (Brown, 2000). Task independence will be analysed in the task related discussion.

2.6.5.2.1 Group Sizes

The size of a group represents its structural and compositional context implying the resources available in the group (Amason et al., 1995). The size of the group can be defined as the number of members (Smith et al., 1994). In the group dynamics literature, it has been suggested that the larger the group, the greater information availability a group will have at its disposal (Yap, Chai, & Lemaire, 2005) suggesting that group sizes will strengthen the positive effects of diversity on performance such as innovation. However, it has also been argued that group processes and performance may also suffer problems of communication related to control and coordination, damaging performance (S. E. Jackson et al., 1991; Smith et al., 1994) when group sizes get bigger.

In addition, as group sizes increase, members are less likely to help others as the number of other people present increases. This is because such presence provides an individual with more opportunities to diffuse responsibility (Pelled et al., 2000). Accordingly, additional members, in particular diverse members, can complicate the amount of possible, simple interactions resulting in communication problems in larger groups and suggesting a great potential of conflict (Horwitz, 2005). Therefore, it is likely that the larger the group, the more conflict group members will experience.

2.6.5.2.2 Group types

In terms of their members, tasks, and tools, groups have been classified into different types such as work/production teams, project teams, parallel teams, action/involvement teams, management teams, and Top Management Teams (TMT) (Webber & Donahue, 2001). However, suspecting there are overlaps among those conceptualisations of group types (e.g. management teams and TMT), the present researcher categorises groups into

three types in this discussion (Horwitz, 2005): work teams, projects teams, and management teams.

Accordingly to Horwitz (2005), work teams perform day-to-day functions of organisations and these teams are generally on-going with stable and well-defined memberships and roles. Project teams generally perform single-event tasks within a specified time frame, such as developing a new product/service or implementing a new technology. Tasks performed by project teams involve substantial application of knowledge and judgment, hence, they employ individuals from diverse functional units to capitalise on their specialised expertise. Management teams coordinate and give directions to sub-units under their responsibility and consist mainly of upper-level managers from various functional units and who are responsible for the overall performance of their respective business units. One particular management team, TMT directs a firm's strategic movements and shares the responsibilities for the success of organisations (Horwitz, 2005).

There is a fundamental assumption in the diversity literature that members of management teams, in particular TMT and project teams, are more likely to be informational heterogeneous (i.e. diversity in highly job-related attributes such as functional and educational background), but less likely to be socially heterogeneous (i.e. diversity in less job-related attributes such as age, race, and gender). In contrast, the production teams are more likely to exhibit heterogeneity on lower job-related attributes and less likely to demonstrate heterogeneity on higher job-related attributes (Horwitz, 2005; 2001). Thus, it has been suggested that the relationship between social diversity and cohesion may be stronger for production teams because heterogeneity on these attributes is likely to be greater in this type of team (Webber & Donahue, 2001). Stronger relationships between diversity and task conflict will present in groups that are at higher organisational levels. However, there is no empirical evidence supporting either argument.

2.6.5.2.3 Group Longevity

For some researchers, group longevity refers to the time a team has existed and differs from team tenure, which refers to the length of time an individual has been with the team (Schippers et al., 2007). In this discussion, group longevity is referred to as the length of time group members have spent working together (Pelled, 1996; Pelled et al., 1999). The group longevity was the average length of time the members of a team had belonged to that team and the higher average time a team has existed, the longer will be their history of working together (Pelled et al., 1999). It has particular implications on the diversity-conflict-performance paradigm.

Empirically, effects of diversity on outcomes including group processes such as conflict have been found to converge over time. After a period of time, group members may become familiar with the different perspectives in diverse groups and therefore begin to share each other's perspectives (Harrison et al., 2002). In this way, group longevity may diminish the positive relationship between information diversity and task conflict. Similarly, socially diverse teams (e.g., diversity in race, age, or gender) work closer and negative effects of social diversity decrease as time passes by (Knouse & Dansby, 1999; Pelled et al., 1999).

Therefore, group longevity may weaken the relationship between social diversity and relationship conflict. This dynamic can be explained in the following ways. According to similarity-attraction theory, identity theory, and categorisation theory, team members' categorisation of one another in initial interactions is based on surface-level features (Harrison et al., 2002) implying that people have less of a tendency to categorise and stereotype based on attributes such as age or race when group members have worked together for a longer time (Pelled, 1996). This change over time may also be due to familiarity that makes social categorisations less likely (Pelled, 1996).

A second way of explaining the impact of longevity is related to the notion of interpersonal congruence, the degree of fit between people's self-views and the appraisals of their partners (Poizer et al., 2002). It has been suggested that the effects of

diversity on group processes are likely to depend on the level of interpersonal congruence in the group.

When interpersonal congruence is low, the negative effects of increased diversity on group functioning may go unchecked; when interpersonal congruence is high, however, the mutual understanding and appreciation for one another's perspectives it fosters may buffer the group from the potentially disruptive effects of diversity (Poizer et al., 2002). In other words, the effects of diversity on disruptive group processes such as relationship conflict may decrease as interpersonal congruence among group members increases. It is important to explore this phenomenon further in that groups may not have fully capitalised on the potential benefits of diversity (Carroll & Hannan, 2000).

Group longevity has also been found to moderate the effects of conflict on performance. A number of researches have examined the moderating role of longevity from different perspectives. From the perspective of crossover development between two sub-types of conflict over time, Pelled et al. (1999) argued that task and relationship conflict may influence each other. In particular, relationship conflict may induce task-related attacks while too much task conflict intension is more likely to cause relationship conflict. Accordingly, the effects of conflict on performance will change.

From the process of social categorisation, Chatman & Flynn (2001) provided a more dynamic explanation of the moderation role of time in which people's reaction to specific characteristics in a given situation may change over time. At the initial interaction, demographically different team members may be hesitant to cooperate with one another because they categorise each other as out-group members. However, when the salience of demographic characteristics dissipates over time, demographically-dissimilar group members begin to re-categorise themselves as fellow in-group members. Group members may be more inclined to cooperate with one another because the increased familiarity tends to result in beneficial information sharing, improved conflict resolution, and better task performance and because collaborating or getting

together frequently to perform tasks can reduce the impact of demographic differences (Chatman & Flynn, 2001; Harrison et al., 2002; Jehn & Mannix, 2001).

In recent research, the above discussions have been partially supported indicating that early relationship conflict was more likely to bleed over into later task conflict than the reverse (Henley & Price, 2004). In general, over time, groups in conflict would perform better as relationship conflict is more likely to turn into task conflict, which is positively associated with performance.

2.6.5.2.4 Goal interdependence

Similar to ‘outcomes interdependence’ (Schippers et al., 2007), goal interdependence is defined as the extent to which a team member believes that other team members’ goal attainment facilitates movement towards his or her own goals (Van der Vegt & Janssen, 2001). It is similar to the interdependence of fate (Brown, 2000). Goal interdependence is an important construct in that how people behave in group settings (competitively or cooperatively) toward each other may depend on whether they perceive their interests prevailing over collective interests (Van der Vegt et al., 2003).

With respect to the effect of diversity, it has been suggested that when group members share common goals and values, cultural diversity leads to more beneficial outcomes (Ely & Thomas, 2001). Similarly, it has been suggested that whether conflict benefits or injures decision making is subject to whether group members perceive positive or negative goal interdependence (Janssen, Van De Vliert, & Veenstra, 1999). In particular, under low goal interdependence, it is difficult for individuals to predict whether fellow team members will cooperate or not (Van der Vegt et al., 2003) suggesting that group members pursue their personal interests with low potential for conflict.

2.6.5.3 Task characteristics

The emerging theoretical frameworks suggest that the nature of the task will strongly affect the relationship between group diversity and group outcomes (Howard & Brakefield, 2001). Variation in task nature has been suggested as one of the primary reasons for the inconsistent research findings (i.e. the diversity paradox) (Mohammed & Angell, 2003). Although a task rarely presents only one type of characteristic, previous research has generally considered the moderating effects of one task characteristic on diversity (Stewart & Barrick, 2000).

As the nature of task has been seen to affect individuals' experiences of the work (Howard & Brakefield, 2001) and group outcomes, including both processes and performance (Bhadury & Mighty, 2000; Martin, 2006), the moderating role of task characteristics is quite well established in the diversity literature (Jehn et al., 1999; Pelled et al., 1999). In general, task characteristics can be referred to as the nature of the job including both component and structural properties.

A number of widely known job characteristics are mentioned in the literature including skill variety, autonomy, task identity, feedback, dealing with others, friendship opportunities, task significance, task interdependence, and task routineness (Carless, 2005; Keller, 2001; Molleman, Nauta, & Jehn, 2004). In this section, a detailed discussion will focus on task interdependence and task routineness given their popularity in the research.

Task interdependence is defined as the extent to which group members rely on one another to perform and complete their individual jobs indicating the intensity of interaction among group members (Horwitz, 2005; Jehn, 1995). Task routineness refers to the extent to which a task has information processing requirements, set procedures, and stability (Pelled et al., 1999).

However, in terms of conceptualisation, task routineness is similar to skill variety while task interdependence has a great overlap with all the other characteristics. This may be

the reason why most diversity studies have focused on task interdependence and task routineness (Jehn et al., 1999; Kankanhalli, Tan, & Wei, 2007; Pelled, 1996; Pelled et al., 1999).

2.6.5.3.1 Task interdependence

Although it may be conceptually similar to group interdependence (Van der Vegt & Janssen, 2003), task interdependence will be used in this discussion.

Whereas the degree of interdependence in work groups may stem from several sources including role differentiation, the distribution of skills and resources, and the manner in which goals are defined and pursued (Van der Vegt & Janssen, 2003), task interdependence has been found to increase interpersonal communication, cooperation and information sharing among members in socially diverse groups (Peltokorpi, 2006). Although it is sometimes argued that it has direct effects on group-related outcomes, task interdependence is generally seen as a contingency variable, exacerbating or attenuating the effects of other factors on outcomes (Duffy, Shaw, & Stark, 2000)

With respect to the relationship between diversity and conflict, task interdependence has been suggested as an amplifying moderator. It increases the amount and intensity of interaction among group members allowing more opportunities for conflict to occur and to affect the group and its members (Jehn, 1995). In the meantime, it has been suggested that task interdependence diminishes stereotyping and creates a collective identity (Van der Vegt et al., 2003). In particular, group members performing a highly interdependent task must frequently communicate and interact with other group members, enabling the person to utilise the diverse opinions and ideas resulting from diversity (Van der Vegt & Janssen, 2001). As a result, task interdependence strengthens the relationship between diversity and task conflict.

However, when tasks are interdependent, the demand for smooth interaction among group members (e.g. communication, cooperation, and coordination effort) is heightened

(Jehn et al., 1999) strengthening the relationship between diversity and relationship conflict. In contrast, in low interdependent tasks, group members tend to operate as individuals with less intense interaction and coordination, thereby reducing negatively affective outcomes and potential for conflict arising from member heterogeneity. Therefore, the relationship between diversity and conflict would be weaker in low interdependent tasks than in higher interdependent ones. Empirically, it has been found that the effects of information diversity were stronger in task-interdependent groups than in task-independent groups (Jehn et al., 1999).

In relation to the relationship between conflict and performance, task interdependence has been seen as an amplifying moderator. That said, the relationship between conflict and performance becomes stronger when task interdependence is greater (Kankanhalli et al., 2007). In particular, it has been suggested that task interdependence strengthens the relationship between conflict (including both task and relationship ones) and performance because task interdependence increases the amount and intensity of interaction between group members, thus increasing the salience of conflicts that occur within a group to its members (Jehn & Bendersky, 2003). This argument has empirical support: the effect of relationship conflict was generally greater in highly interdependent groups but the effect of task conflict was relatively smaller (Jehn, 1995). This may be explained by the argument that 'dislike' and 'friction' may be more detrimental to group performance when group members are required to depend more on each other (Kankanhalli et al., 2007).

2.6.5.3.2 Task routineness

According to the dimensions of task routineness, tasks can be categorised into routine tasks and non-routine tasks. In general, routine tasks have a low level of task variability and are done the same way each time, with predictable results (Pelled et al., 1999). In contrast, non-routine tasks require problem-solving, have few set procedures, and have a high degree of uncertainty (Schruijer & Vansina, 1997). In assessing the feasibility of seeking information for dealing with uncertainty in problem-solving, it was suggested

that the amount of disagreement and the variety in a group, needs to match the level of varieties in the task for the group to be effective (J. E. Sawyer et al., 2006).

Specifically, if the level of task variety and amount of information required to complete the task exceeds the level of variety and number of differing viewpoints among group members, the costs associated with searching for information and evaluating solutions may become unreasonable (Jehn, 1995). From this perspective in assessing task routineness, a number of propositions about the moderating role of routineness can be developed.

With respect to the relationship between diversity and conflict, it has been suggested that routineness is likely to be a suppressing moderator (Schruijer & Vansina, 1997). In particular, if the task is routine, group members can use standard operating procedures, while discussions of work methods are not necessary (Horwitz, 2005), suggesting that routine tasks create less frustration with dissimilar others than complex tasks. Thus, the lower routineness a task presents, the less conflict members in diverse groups will experience.

Empirically, it has been found that job routineness reduced the positive association between diversity and relationship conflict; however, routineness was found to enhance the positive association between diversity and task conflict because group members performing routine tasks seek task debates with dissimilar others to make their work more interesting (Pelled et al., 1999). In contrast, it is necessary for groups to pull together their diverse functional expertise and resources to formulate strategies to deal with highly complex and uncertain tasks (Horwitz, 2005), increasing the potential of conflict among group members, particularly dissimilar ones. Therefore, it would be expected that the lower routineness a task presents, the more conflict group members will have. However it was found that the effects of information diversity are stronger in complex tasks than in routine ones (Jehn et al., 1999)

With respect to the relationship between conflict and performance, it has been predicted that task routineness is both a suppressing and amplifying moderator (Jehn, 1995; Jehn & Bendersky, 2003). In particular, task routineness may inhibit the relationship between relationship conflict and group performance because conflicts are a welcome relief to the boredom of the routine tasks. Jehn & Bendersky (2003) explained that members having relieved their relationship problems could go back to their tasks with renewed energy focusing after the petty fighting.

With respect to task conflict, it was argued that the relationship between task conflict and performance would be stronger in non-routine tasks than in routine ones because non-routine tasks require problem solving and have a high degree of uncertainty inducing a greater potential of conflict among dissimilar group members (Jehn & Bendersky, 2003). There is empirical evidence supporting this argument. For example, task conflicts were found to have the most positive effects in complex tasks (De Dreu & Weingart, 2003). In addition, the effects of task conflict have been found to depend on task routineness: task conflict can be positively related to performance in non-routine tasks but negatively in routine tasks (Jehn, 1995).

2.6.5.4 Other contexts at the group level

There are also other research contextual factors that have been examined with respect to their impact on diversity effects. For the purpose of this discussion, they have been categorised into two groups: management practices and group processes.

2.6.5.4.1 Management practices

It has been argued repeatedly in the literature that diversity may dampen group performance if management is unable to bridge the chasms formed by diverse characteristics (Mannix & Neale, 2005). For instance, management could provide diversity training to increase the social integration of the groups and their organisations as a whole (Mannix & Neale, 2005). Doing so could promote group identification and

diminish stereotyping and categorisation processes (Hobman & Bordia, 2006) encouraging group members to appreciate the values, abilities and behaviours expected of those participating as members (McMillan-Capehart, 2005).

With respect to conflict, training of group members who were in conflict has been found to be beneficial. In particular, the relationship between task conflict and performance was positive when conflict was actively managed and negative when it was passively managed (DeChurch & Marks, 2001). Thus, it would be expected that management practices would have an amplifying moderation role on the beneficial function in the paradigm and have a suppressing moderation role on the dysfunctional relationship in the paradigm.

According to Jehn & Bezrukova (2004), the contextual settings include culture, business strategies, HRM practices, and so forth. For example, some researchers attempt to explain the paradox by considering how organisational culture moderates how diverse people approach and solve problems (Chatman et al., 1998). From the perspective of diversity management (HRM practices), Giovannini argued that the impact of diversity on group dynamics and productivity varies significantly depending on how well such diversity is managed (Giovannini, 2004).

2.6.5.4.2 Team processes

Considering group processes as moderators can enhance the understanding of the dynamics of diverse groups (Mohammed & Angell, 2004). For instance, it was found that diversity was positively related to innovation if teams have good team processes (Fay, Borrill, Amir, Haward, & West, 2006). In addition, it has been found that the effects of diversity were more marked in groups with low levels of social cohesion (Sargent & Sue-Chan, 2001). Furthermore, organisational learning has been studied as a moderator on the relationship between conflict and performance although moderation effects were not significant (Yeh & Chou, 2005).

In the context of TMT, it was found that in the absence of debate, a TMT may not be able to draw on the diverse experiences of its members to make decisions that optimise performance (Simons & Pelled, 1999b). In relation to the effects of conflict, it has been suggested that relationship conflict can moderate the relationship between task conflict and performance. In particular, Pelled (1996) argued that when relationship conflict increases, the positive relationship between task conflict and performance becomes weaker. However, there is no empirical evidence supporting her proposition and she did not discuss the possibility of the moderating role of task conflict on the relationship between relationship conflict and performance.

Thus, in relation to the moderating role of group processes, it can be hypothesised below: any dysfunctional group process (e.g. relationship conflict) would suppress the negative effects of the paradigm, while beneficial group processes (e.g. task conflict) would amplify the positive effects of the paradigm.

2.6.6 Research contexts at the interpersonal level

Contextual factors at this level are related to either dyadic or interpersonal relationships. A number of constructs have been proposed to moderate relationships in the paradigm. From the relationship between the group leader and group members, it was suggested that the effects of diversity might be more favourable if group leaders and members are able to use team members' creativity and information and to deal with communication problems (Kochan et al., 2003). It has also been found that supervisors' facilitation (defined as supervisors' functioning meetings with their subordinates) can diminish the effects of diversity on relationship conflict while enhancing the effects of diversity on task conflict (Pelled, Xin, & Weiss, 2001).

Another construct relates to the perception between group members (called interpersonal congruence) referring to the degree to which group members see others in the group as others see themselves (Poizer et al., 2002). When interpersonal congruence is high, the relationship including both professional and personal is likely to be smooth. Thus, it

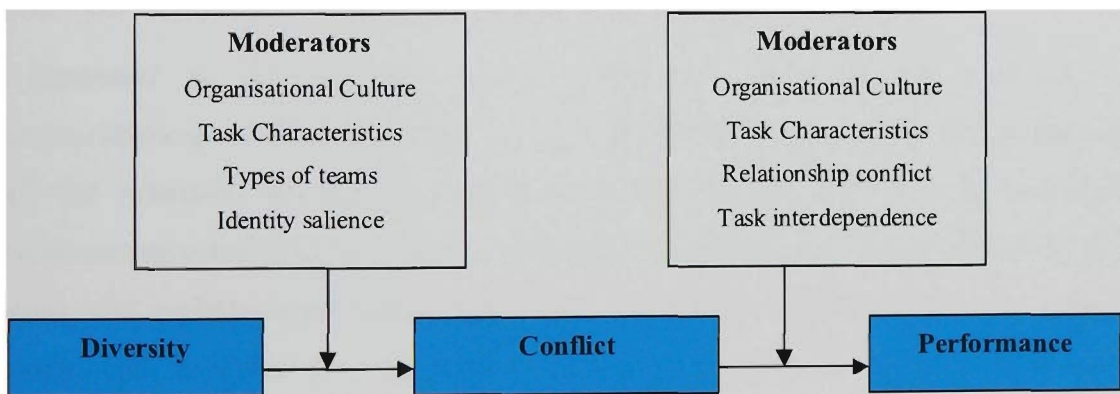
could hypothetically moderate the effects of diversity on conflict although empirical findings did not support this (Poizer et al., 2002).

2.6.7 Findings of review

The conclusion from this review seems to be unavoidable: the research contexts moderate the paradigm although the significance of moderation might vary across different contextual factors.

The moderators of the relationships between diversity, conflict and performance can be re-addressed in Figure 2-7. In particular, organisational culture, temporal contexts, task characteristics, socialisation tactics, types of team and identity salience will moderate the relationship between diversity and conflict while organisational culture, task characteristics, relationship conflict and task interdependence will moderate the relationship between conflict and performance.

Figure 2-7 Moderators on the diversity-conflict-performance paradigm



2.6.8 Explanations of the diversity paradox

The diversity paradox could be explained from the perspective of research contextual factors. Specifically, because research contextual factors (i.e. the social world) may affect whether diversity differences are noticed and how they are reacted to, the same demographic characteristics might yield different work-related attitudes/behaviours in different research contexts.

2.7 Perspectives from Methodologies

In the preceding sections, the diversity paradox has been explained from four perspectives (i.e. diversity conceptualisations, diversity theoretical frameworks, intervening theories, and research contextual factors). In this section, the diversity paradox will be explained from the perspective of methodologies, in particular three methodological issues: the diversity measurement, the performance measurement and the statistical analysis techniques. The following section will examine them respectively.

2.7.1 Diversity measurement

The current diversity measurement is limited in that it cannot fully catch the meaning of diversity with respect to the multiple identities of group members in particular. The following section will articulate this limitation, associated with currently-used diversity measurement techniques.

2.7.1.1 Diversity measurement in dealing with multiple identities

As discussed in the previous section, there are two general approaches in conceptualisations of diversity (Tsui et al., 1992; Tsui et al., 2002). At the individual level, the relational demography approach treats diversity as a social relationship between an individual and the group or another group member as in the case of dyads. In contrast, the organisational demography approach deals with diversity as a collective property and analyses the impacts of diversity at various organisational levels. Correspondingly, different measures have been developed under each approach.

2.7.1.1.1 The relational demography approach

Given the fact that relationship demography is developed from organisational demography, it may be useful to compare and contrast the measures accordingly. In general, measures in the relational demography approach are similar to ones in the organisational demography approach in that they measure differences against the same

characteristics. However they are different in that they measure an individual's distance from the other group members, rather than the amount of diversity within the group (Hobman et al., 2003; O'Reilly et al., 1989). The major measuring technique in relational demography is called the relational demography score or Euclidean Distance (ED). It is the square root of the summed squared differences between an individual's value on a specific demographic variable and the value on the same variable for every other individuals in the sample for the work unit, divided by the total number of respondents in the unit (Tsui et al., 1992).

2.7.1.1.2 The organisational demography approach

Measures in the organisational demography approach describe attributes at a level of analysis that differs from that at which the data were collected (Lawrence, 1997). Given that people have multiple identities, measurement techniques in this approach can be further divided into two groups. Measures in the first group assess diversity according to a single identity. In contrast, measures in the other group deal with multiple identities at one time.

Actually, the single identity method is the one adopted in most diversity research. This is because research in organisational psychology has traditionally focused on the personal meanings of social categories (e.g. gender, race, ethnicity, and so on) one at a time (Frable, 1997). The measuring techniques include a regeneration index (the amount of time that elapses before the ratio of new members to old reaches 1 to 1), and index of heterogeneity (the extent to which there are a number of significant groups or categories in a distribution and the dispersion of the organisational population over these categories) (Pfeffer, 1983). One of the most popular methods is the coefficient of variation (it is defined as the standard deviation of a variable divided by its mean) (Pelled, 1996). This, the most commonly used method is used because it is not sensitive to the scale on which the variables are measured (Sorenson, 2002).

The method of dealing with multiple identities at one time assumes that group processes and their outcomes are influenced by the complex confluence of diversity dimensions, not isolated dimensions of diversity (Lau & Murnighan, 1998; Lau & Murnighan, 2005). There is currently one technique called group ‘faultlines’, which is dependent on the alignment of individual member characteristics (multiple). Although the group faultlines technique has been treated as a new concept in research (Li & Hambrick, 2005; Rico et al., 2007), it has been regarded as a diversity measurement technique in the present research.

2.7.1.1.3 The measurement limitations

There are both strengths and limitations with current measures available at the moment. With respect to the strengths, measures in each approach have different advantages due to their particular focuses. For instance, measures in the relational demography approach focus on dissimilarity/similarity between individuals, which is crucial to similarity-attraction paradigm and social categorisation processes. In contrast, measures in the organisational demography approach are useful because distributional properties of diversity of the organisation are critical in understanding the impacts of diversity on performance (Pfeffer, 1983). Furthermore, ‘faultlines’ are particularly interesting in that there is growing concern with the configuration of group members’ multiple diversity profiles (S. E. Jackson et al., 2003).

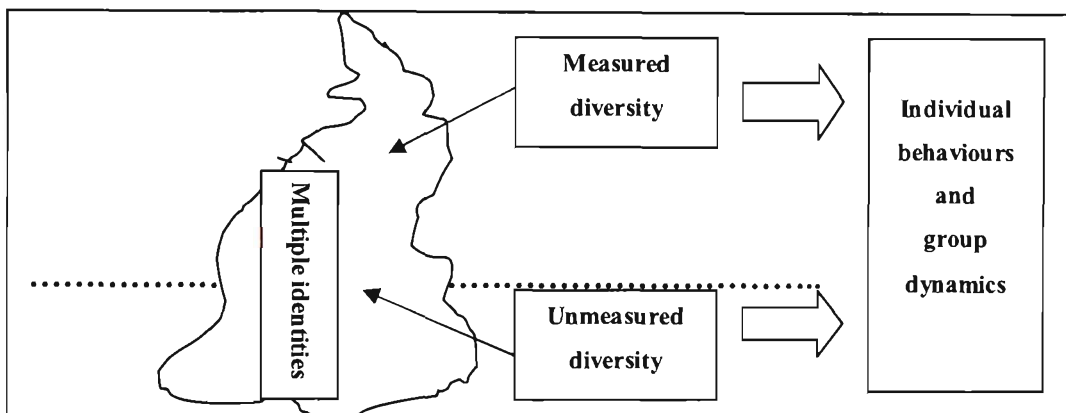
However, there are at least two critical limitations with the two approaches, particularly in relation to multiple identities. The first limitation is that none of the techniques including ‘faultlines’¹¹ measure multiple identities of **one** individual simultaneously i.e. they do not deal with the combined effects of diversity across multiple dimensions of **one** individual (Pelled, 1996). This is problematic for at least two reasons. First, according to complexity theory, outcomes are not determined by single causes but by

¹¹ ‘Faultlines’ are useful for considering distributions of a group’s multiple identities that may influence dynamics of diversity. According to Lau and Mumighan (1998), groups that encompass an identical array of demographic attributes collectively can still have markedly different dynamics if those characteristics are distributed differently among the individuals in a group (p. 327).

multiple ones (Byrne, 1998). In the diversity-conflict-performance paradigm, people's behaviours may not be caused just by the measured identity, but also determined by other factors e.g. unmeasured multiple identities as illustrated in Figure 2-8.

The second reason is that group diversity dynamics are highly related to the multi-dimensional nature of identity. This is because group members may be similar in some dimensions of diversity and different in other dimensions (Freeman, 2003). Specifically, all identities interact with each other (Pratt et al., 2001) causing complicated diversity mechanisms. Consequently, one needs to see people as a whole with respect to their multiple identities (Frable, 1997).

Figure 2-8 An iceberg of measured identity



Another limitation of current diversity measurement is that most approaches measure **objective** diversity rather than **perceived** diversity. This may relate to a basic assumption that group members' identity differences are equally and fully recognised by group members (Garcia-Prieto et al., 2003; Kulik, 2004) suggesting a fixed diversity in a given group of individuals with respect to all dimensions. However, objective diversity may not be able to fully reflect the impact of diversity for at least two reasons.

First, it has been argued that 'identity' is neither stable nor fixed (Nkomo, 1995). That said, people may behave differently across contexts in relation to their multiple identities despite the fact that those identities are objectively stable (i.e. a person might only have a certain number of identities). For instance, a young woman may behave like a **young**

woman at one time while she is just a woman at another occasion depending completely on the situation (i.e. the salient identity of a person's multiple identities changes across contexts).

Second, people respond to diverse surroundings differently. For example, the context may affect whether diversity differences are noticed and how they are reacted to (Milliken & Martins, 1996). Empirically, with respect to racial diversity, it has been shown that, in the same research, white Americans tend to view their environment as a multiracial one but African Americans seldom see the same reality in the same way (Friedman & Davidson, 2001).

2.7.2 Performance measurement

Performance measurement is a concern in any research where performance is measured. As shown in section 2.2, when examining the effects of diversity, researchers have used a variety of measures to assess performance. Because of the variety, it is very difficult to compare research results across studies, particularly if the measures assessed totally different domains of performance.

In the diversity literature, non-financial performance measures were the ones mainly adopted. This might be due to an argument that financial measures of performance are not comparable across industries (Davila & Venkatachalam, 2004). Whereas a large number of non-financial performance measures are employed in the diversity research, only five measures were commonly used. On the basis of the classification of performance domains, the following section will examine these measures. With respect to the sub-domains of performance, the five performance measures assess OTP, STP, and SCP.

2.7.2.1 Objective task performance

The commonly-used measures in assessing OTP are turnover. According to Levy (2003), OTP measures should be based on quantitative counting rather than subjective judgements or evaluations and they should address work-related activities performed by employees (Borman, 1997).

2.7.2.1.1 Turnover

Turnover is defined as the number of workers who have left in a given period of time (Pfeffer, 1983; Pfeffer, 1985) and it is easy to measure. While the causes of turnover vary from individual to individual, there are two primary forms: the involuntary turnover initiated by organisations among people who would otherwise prefer to stay, and the voluntary turnover initiated by employees whom organisations would prefer to stay (De Cieri & Kramar, 2005).

Based on the distinguishing characteristics of two forms of turnover, turnover is not necessarily a bad thing depending on who initiates it. This nature of turnover is, however, not recognised in diversity research. When referring to the negative effects of diversity, researchers linked it with high turnover without addressing if the turnover was voluntary or not in some studies (Haveman, 1995; Leonard & Levine, 2006). In other research, voluntary turnover was clearly identified (Zatzick et al., 2003). Comparisons between the findings are likely to produce mixed results.

Worthy of noting is a possible confusion between actual turnover and employees indicating their intention to leave, that is, the intention of employees to resign. Although indicating an intention to leave has been found to be a strong predictor of actually quitting (Krumm, 2001), indicating to leave does not mean actual resignation. Caution must be taken when comparing research results using the two performance measures.

As an objective measurement tool, turnover is normally based on counting. Its most common measurement instrument is group turnover rate (the ratio between the number of members left and the original number of group members) (S. E. Jackson et al., 1991).

2.7.2.2 Subjective task performance (STP)

Assessing STP, two commonly-used measures in diversity research are performance rating (including all dimensions i.e. supervisors, self, subordinates, peers, customers, or clients¹²) and innovativeness. According to Levy (2003), STP measures are built on the judgement or evaluations of others rather than on objective measures such as counting.

2.7.2.2.1 Performance rating

Performance rating is a STP measure and it is defined as listing all the employees being evaluated in a certain order (Krumm, 2001). The assessment information can be taken from sources such as supervisors, self, subordinates, peers, customers or clients. There are both advantages and disadvantages in using any of the assessment sources above. Errors of performance rating occur when raters compare individuals with themselves or each other rather than against objective standards. The most common rating errors include those such as “similar to me” and “contrast” (De Cieri & Kramar, 2005). While diversity research continues using performance rating from one source (Joshi, Hui, & Jackson, 2006), it has been argued that using multiple raters minimises possible bias.

2.7.2.2.2 Innovativeness

The second subjective task performance measure is innovativeness. In this discussion, innovativeness refers to behaviours that are intentional generation, promotion and realisation of new ideas within a work context (Van der Vegt & Janssen, 2003). There are two essential sequential stages in a process of innovativeness: the idea generation (i.e. creativity) and idea realisation (i.e. innovation).

¹² The author classes all dimensions in one category as they are applying a similar mechanism.

Innovativeness begins with creativity. Creativity can be defined as seeing the same things as others see but in a different way (Clark, 1994) and it is indicated by the emergence of unique ideas demonstrated by new combinations or the innovative reorganisation and synthesis of different aspects of a particular situation (Moore, 1997). Creativity is suggested as being the result of a social process or group interaction, and not based on the individual characteristics of a particular group member, i.e. a gifted individual (Moore, 1997). In particular, creativity is normally assumed to relate to brainstorming (Guzzo & Dickson, 1996). This is divergent from a common value: creativity is sometimes considered to be a result of innate genius, particularly in western societies where individual achievement is emphasised.

Creativity alone cannot, however, be regarded as being innovativeness. Innovativeness requires a further process of innovation. Creativity is a necessary, yet not sufficient condition that leads to innovativeness (Matsuo, 2006). In particular, innovativeness arises only when the following two attributes are present: the knowledge available for an innovative activity, and the ability of individuals and teams to apply the available knowledge (Taylor & Greve, 2006). The knowledge pool is highly related to creativity but the ability to apply the available knowledge indicates the level of innovation (Bassett-Jones, 2005). The relationship between creativity and innovativeness is that the more diverse the information and knowledge that are applied, the more novel will be the output (Moore, 1997).

Creativity is a necessary precondition for innovation. Innovation can be defined as the application of novelty to the generation of a new product or service (Taylor & Greve, 2006). Researchers have long recognised innovation as a vital ingredient for survival and profitability (Gong, 2006) and the link between innovations and competitive advantage has long been understood (Bassett-Jones, 2005).

The discussion suggests that innovativeness is a result of a social process or group interaction, and not based on individual characteristics of a particular group member, i.e. a gifted individual (Moore, 1997). Innovativeness has been assessed according to a

number of approaches. Most common measures use questionnaire scales such as the scale of innovation climate (Matsuo, 2006) and the Remote Associates Task (RAT) (Fong, 2006).

In diversity research, innovation and creativity have, however, been used interchangeably (Bassett-Jones, 2005; Haner, 2005). Given the conceptual differences between the two measures, research employing innovation or/and creativity is likely to present mixed results.

2.7.2.3 Subjective contextual performance (SCP)

In assessing SCP, the most commonly-used measure is job satisfaction. Levy (2003) suggested that SCP can be measured by how employees go the extra yard rather than putting forth only what is required or expected of them and that SCP is less likely to be formally instituted by the employers as items on a job description.

Job satisfaction is one of the most common SCP measures. Job satisfaction is normally defined as a pleasurable, positive emotional state resulting from the appraisal of one's job or experience or represents a person's overall evaluation of his or her present work role (Pincus, 1986). It is generally considered to be a way to assess workers' affective responses to important facets of jobs across time and place (De Dreu & Beersma, 2005; Wharton, Rotolo, & Bird, 2000). As jobs have multiple facets, job satisfaction is a multi-dimensional term measured by different aspects of a job (Pincus, 1986). For example, job satisfaction has also been referred to as the extent to which individuals express a positive affective orientation towards the work environment (Schippers et al., 2007).

Job satisfaction is an important indication of employees' performance. A satisfied worker is generally considered to be a productive worker (Hugenberg & Bodenhausen, 2004). In addition, job satisfaction has been linked with other well established beneficial performance indicators such as job involvement. It is suggested that low levels of job satisfaction lead to low job involvement, whereas, for people in a situation of low job

involvement, performing well or poorly on the job does not really affect their self-image, which makes them harder to motivate (De Cieri & Kramar, 2005).

As it has been suggested that job satisfaction is largely influenced by individuals' perception of their experiences (De Dreu & Beersma, 2005), its measures are usually based on questionnaires. In the 1970s, job satisfaction was mostly assessed by the Job Description Index (JDI) (Pincus, 1986), but, recently, it has been assessed by other techniques such as face scale (Levy, 2003), particularly in diversity research (Jehn et al., 1997).

As a subjective performance measure, job satisfaction is subject to bias. Specifically, it is suggested that job satisfaction is affected by variables at the same level, such as employee personality traits, or variables at the group level (Chan, 2006). For example, numerous studies have suggested that women are more satisfied than men, older workers more satisfied than younger workers and whites more satisfied than non-whites (Wharton et al., 2000). Moreover, despite being regarded as a positive outcome, a happy or satisfied worker is not necessarily a productive one (Kramar, 2005).

2.7.3 Analytic tool in dealing with multilevel data

As shown in the discussion above, diversity is inherently a multilevel construct (Harrison & Klein, 2007) and the data in diversity research are multilevel in nature. That said, data are collected from individuals clustered in larger units, which may themselves be located in even higher-order variables (Kline, 2005). In addition, research has to rely on aggregated data from the lower level (individuals) to represent the group diversity. However, it is problematic to aggregate the nested data from a low level (individual) to a higher level (unit) because participants from the same units may behave similarly compared with those from different units (Krull & MacKinnon, 2001).

The characteristics of multilevel structures in the data set have presented two major challenges to the process of data analysis.

1. the aggregation issue. Although the data were collected from individuals, analyses were carried at the group level via aggregation. However, the issue of data aggregation has to be considered carefully.
2. the non-independence. As most traditional statistical methods assume independence of samples (Kline, 2005), researchers have to choose a statistical technique that considers the important effects from the higher-level properties (e.g. departments and organisations) when analysing the data at the individual level.

2.7.3.1 The aggregation issue and Structural Equation Modelling (SEM)

There are normally two options when analysing data corresponding to individuals nested within groups and organisations. The first is to assign the higher level measure to each unit at the lower level (e.g. assign group scores to individuals) with the researcher then undertaking analyses at the lower levels (Kidwell Jr et al., 1997). This approach ignores group membership and focuses exclusively on individual variations and on individual-level attributes (Diez-Roux, 2000). The second is to aggregate measures taken at the lower level of analysis (e.g. aggregating individual-level measures to form group-level composites), the researcher then conducts analysis at the higher level (e.g. group level) (Kidwell Jr et al., 1997). This approach is similar to Chan's (1998) elemental composition where data from a lower-level are used to establish the higher-level construct. As data in this research were collected only at the individual level, concerns were only given to elemental composition.

In Chan's typology of composition models (Chan, 1998, p236), there are five different approaches to using data from a lower-level to establish a higher-level construct and those approaches are summarised below:

- Additive model. The meaning of the higher-level construct is a summation of the level units regardless of the variance among these units. Under these circumstances, the variance of the lower level units is of no theoretical or operational concern.

- Direct consensus model. The meaning of the higher-level construct is in the consensus among lower level units justified by the within-group agreement index.
- Referent-shift consensus model. Lower level units being composed by consensus are conceptually distinct though derived from original individual-levels units.
- Dispersion model. Meaning that the higher level construct is in the dispersion or variance among lower-level units.
- Process model. Process parameters at the higher level are analogues of process parameters at lower levels.

While Chan's typology successfully specifies individual composition approaches, diversity research is normally conducted with a configuration approach that not only uses the mean to aggregate data, but also includes the variance to examine diversity effects (Mohammed & Angell, 2003). In addition, prior to aggregating individual-level scores to the group-level, a number of statistical criteria have to be met including, for example, an intraclass correlation coefficient (Mohammed & Angell, 2004; Stewart & Barrick, 2000) and computation of the average deviation index, AD[mj] (Rico et al., 2007). Criteria also include within-unit agreement (Pelled et al., 2000), within-group agreement (Rwg(j)) (Schippers et al., 2007), the Eta-square statistic (Kotlyar & Karakowsky, 2006), and the N2 statistical measure (Trimmer et al., 2002). While different terms have been used, researchers primarily rely on statistical criteria to determine whether between-group differences were stronger than within-group differences.

While aggregation approaches have been suggested as being statistically sound, they are also limited. For example, aggregation may have the drawback of ignoring the potential importance of group-level attributes in influencing individual-level outcomes (Diez-Roux, 2000). Indeed, it has been suggested that composition effects may derive from patterns of relations among attributes, not just from the sum or average amounts of those attributes (Mohammed & Angell, 2003).

In addition, aggregation may be limited because the power of statistical tests is reduced due to the decreased number of observations and the degrees of freedom in the analysis (Krull & MacKinnon, 2001). For example, one common mistake in group research is to ignore the individual level when conceptualising or when analysing data from nested designs (Zaccaro, Cracraft, & Marks, 2006).

Therefore, as demonstrated in the discussion, aggregation might not be an optimal approach for proper analysis of structures of data in diversity research (Kaplan, 2000). Techniques such as structural equation modelling (SEM) may provide a solution to the issue because it does not rely on aggregation.

SEM is a powerful generalisation of earlier statistical approaches with the key virtue of having less restrictive assumptions of measurement error (Goerzen & Beamish, 2005). In particular, SEM grows out of and serves purposes similar to multiple regression but in more powerful ways. It takes into account the modelling of interactions, non-linearities, correlated independents, measurement error, correlated error terms, multiple latent independents each measured by multiple indicators, and one or more latent dependents with multiple indicators (Curran, 2003; Livert, Rindskopf, Leonard, & Stirratt, 2001). Accordingly, SEM has become one of the most popular statistical methodologies available to quantitative social scientists and it has become a language for talking about the relationship between variables (Kaplan, 2000).

In general, SEM models consist of two parts: the measurement part that links observed variables to latent variables via a confirmatory factor model and the structural part that links latent variables to each other via analysis of simultaneous equations using path analysis (Kaplan, 2000). Statistically, SEM tests the hypothetical model in a simultaneous analysis of the entire system of variables to determine the goodness of fit, which indicates the discrepancy between observed values and the values expected under the model in examination (Goerzen & Beamish, 2005). If the goodness of fit is adequate, the hypothetical model argues for the plausibility of postulated relations among

variables. If it is inadequate, the tenability of such relations is rejected (B. M. Byrne, 1998).

One of the primary strengths of SEM is related to aggregation. For example, SEM does not require aggregation data that were collected at the lower-level unit. Instead, SEM seeks to describe the variances and covariance of a set of variables in terms of a smaller number of structural parameters even when the data are non-normal (Kaplan, 2000).

However, SEM is also limited. For example, it requires a large sample size, particularly in complex models (Bauer, 2003). That is, complex models require the estimation of more statistical effects, and a larger sample becomes necessary in order for the results to be reasonably stable (Kline, 2005). It has also been suggested that the likelihood of encountering a technical problem in the analysis is more likely in SEM if the sample size is small (Wendorf, 2002). In SEM literature, sample sizes that exceed 200 cases could be considered large (Landis, Beal, & Tesluk, 2000). In addition, SEM also assumes the independence of residuals, the violation of which results in biased standard errors and test statistics (Curran, 2003).

2.7.3.2 The non-independence

As mentioned earlier, data in diversity research are clustered at different levels. Accordingly, responses of individuals from the same group or organisation may be correlated. Such correlations may be due to shared group experiences, reciprocal influences resulting from group interaction, or non-randomly distributed background variables (Krull & MacKinnon, 2001). For example, responses for job satisfaction may be affected by organisational financial performance.

Due to the particular nature of the non-independence of data in diversity research, a complementary multilevel approach that considers experiences and reactions of individuals within units has been called for (Harrison & Klein, 2007). Multilevel Linear Modelling (MLM) has been suggested as a means of providing a solution to the problem.

MLM refers to a family of regression estimation techniques applied to data organised into hierarchically structured clusters and it combines the effects of variables at different levels into a single model with accounting for the interdependence among observations within higher-level units (McMahon, Pouget, & Tortu, 2006). For example, in a two-level MLM, separate linear regressions are performed on observations with each lower-level cluster and these first-order regression estimates (intercepts and slopes) are then used as outcomes in regression models involving higher-level units (Curran, 2003).

MLM is powerful in dealing with non-independent data in a number of ways. For example, it preserves the original data structure (i.e. individual level variables need not to be aggregated to group means) while explicitly modelling the within-group homogeneity of errors by allowing the estimation of error terms for both the individual and the group (Krull & MacKinnon, 2001).

In addition, MLM is estimated using iterative Empirical Bayes or maximum likelihood (EB/ML) techniques, rather than the ordinary least squares (OLS) method (OLS assumes interdependence of data) to estimate the parameters of single-level models and it was extended from a regression model to dependent data structures (Curran, 2003). Furthermore, because MLM considers effects from more than one level, it allows researchers to deal with the micro-level of individuals and the macro-level of groups or contexts simultaneously.

However, MLM has limitations too. For example, it is difficult to incorporate a measurement model (e.g. a latent variable measured by multiple indicators) in MLM and it cannot model complex relationships such as mediation pathways (Bauer, 2003).

Although MLM and SEM are analytically and empirically dissimilar, they could be complementary to each other with respect to their strengths and limitations. Indeed, it has been proposed that SEM be used to fit MLM pursuing a rigorous development and application of multilevel SEM to test complex factorial measurement in nested data structures (Curran, 2003). Accordingly, a multilevel SEM may have the ability to

simultaneously examine the effects of variables at both the individual and group levels, as well as possible cross-level interaction effects (Krull & MacKinnon, 2001).

2.7.4 Explanations of the diversity paradox

From the perspective of methodologies, the diversity paradox could be explained. With regards to diversity measurement, research results are likely to be mixed because current diversity measurement only catches some aspects of diversity, in particular, the multiple identities of group members. In relation to performance measures, a variety of measures have been used to assess different domains of performance. This is likely to cause difficulties in result comparisons. With respect to the statistical analysis tool, inconsistent results are likely to emerge due to the limitations associated with the current techniques, dealing with the nested data in particular.

2.8 A Summary of this Chapter

In this chapter, the definition of performance was given in the first section. The second section presented a “diversity paradox” indicating the inconsistent research findings in diversity research. From sections three to seven, discussions to examine possible causes of the diversity paradox from perspectives of diversity conceptualisations, diversity theoretical frameworks, group processes, research contextual factors, and methodologies were presented. While addressing the limitations of the literature, a number of research opportunities have also been identified. Built on this basis, the next chapter will introduce the research focuses, frame the research question, and develop the hypotheses.

Chapter 3. The Present Research & Hypothesis Development

The previous chapter showed that the results of diversity research were extremely mixed, and sometimes contradictory, indicating a diversity paradox in the literature. It was also demonstrated that the diversity paradox can be explained from a number of perspectives including how diversity is conceptualised, the limitations associated with diversity theoretical frameworks, the 'black box' between diversity and its outcomes, research contextual factors, and methodological issues.

While explanations from these perspectives are promising, the preceding discussion showed no consistent findings in studies where one or two perspectives mentioned above have been applied (e.g. Jehn et al., 1999; Pelled et al., 1999). Thus, no consensus has yet been reached in the literature with respect to the effects of diversity in the workplace and the diversity paradox in particular.

This chapter extends the preceding discussion to the current research. In particular, the sections that follow will introduce the focuses of the research and frame the research questions. Following that, hypotheses will be developed.

3.1 Focuses of the Research

Given the limitations in the literature, the present research will attempt to explain the diversity paradox applying the five perspectives simultaneously: diversity conceptualisations, diversity theoretical frameworks, group processes, research contextual factors, and methodological issues.

3.1.1 Diversity conceptualisation

As demonstrated in the previous chapter, the meaning of diversity can vary across different approaches of conceptualisations. Subsequently, apparently contradictory findings in diversity research are understandable because many inconsistent findings

simply could be the result of a confusion of terminology (i.e. comparing apples and oranges) (Chan, 2006). The specific definition of diversity will be articulated below with respect to its typology, its subjective meaning, and its multilevel-conceptual approach.

3.1.1.1 A two-dimension Construct

It was shown in the previous chapter that diversity research has mainly focused on six attributes: race, age, gender, education, functional background and tenure. As different attributes of diversity may have unequal effects on organisations or groups, or individuals, researchers have started to classify different diversity attributes into types (Mannix & Neale, 2005). Specifically, there are two properties that are commonly studied to differentiate types of diversity: visibility or job-relatedness. Visibility reflects social aspects of diversity while job-relatedness indicates the information dimension of diversity (Pelled, 1996) .

However, although classifying diversity based on visibility and job-relatedness may offer researchers a greater insight into explaining the unexpected results (De Abreu Dos Reis, C.R., Sastre Castillo, & Roig Dobón, 2007), diversity continued being assigned to a single attribute (e.g. social diversity based on race). Therefore, suggestions are made for diversity conceptualisations that adopt diversity typology and that deal with multiple attributes simultaneously, rather than a single attribute that is isolated from others (Allen et al., 2008).

Correspondingly, as a two-dimensional construct, diversity is classified into two types in the present research: social diversity and information diversity. In particular, the former is related to race, age and gender, which reflect social dissimilarity among people in relation to visibility; the latter relevant to tenure, education and functional background, which indicate information dissimilarity among people with regards to job-relatedness.

3.1.1.2 A socially constructed term: perceived diversity

The discussion in the previous chapter illustrated that diversity is a subjective term depending on how people interpret diversity attributes (Westmaas & Silver, 2006; H. M. Williams et al., 2007). Moreover, it was argued that diversity is the amount of variation in people's multiple attributes and the variation is also subject to individuals' reaction (i.e. whether individuals note the differences) to the multiple attributes (Harrison & Klein, 2007; Sorensen, 2004). There is emerging empirical evidence suggesting that effects of perceived diversity are stronger than the effects of objective diversity (Hobman et al., 2004) and that perceived diversity accounted for more variance in the outcomes than did other non-subjective measures (Riordan & Wayne, 2008).

Therefore, diversity research should ideally focus on the role of individuals' subjective interpretations of dissimilarity in a social unit (Van der Vegt & Van De Vliert, 2005). However, diversity has not been defined in this way.

In the present research, diversity is conceptualised on the basis of participants' *perception of multiple attributes simultaneously*. Adopting a dual-typology of diversity, perceived social diversity refers to the perception of social dissimilarity based on race, age, and gender, while perceived information diversity refers to the perception of information dissimilarity on tenure, education, and functional background. It should be noted that, according to this conceptualisation, perception is based on three attributes simultaneously. Perceived social diversity is different from perceived race diversity, perceived age diversity or perceived gender diversity individually. Instead, perceived social diversity is based on individuals' interpretation of variation in **all** three attributes.

3.1.1.3 A framework for multilevel-construct conceptualisations

With respect to the level of analysis, the fact that diversity has been conceptually constructed at different levels of analysis suggests a multilevel nature of diversity (Harrison & Klein, 2007). With regards to the multilevel nature of conceptualisations, there is currently no analytical technique that can improve an inadequately designed

study, where the construct fails to capture the true relationships and effects underlying the phenomenon of interest (Chan, 2006). Therefore, to clarify diversity conceptualisations, the present research needs an appropriate conceptualisation model. This model should drive the potential statistical application making it clear how the construct is conceptualised and will be measured at different levels of analysis (Chan, 2006).

Built on Meade & Eby’s recent work (2007) on multilevel construct validation, a framework is proposed in the present research for conceptualising subjective constructs such as diversity. However, before explaining the framework, it is necessary to introduce two terms. The first is ‘construct referent’, which refers to properties where respondents’ beliefs/perceptions are held (Meade & Eby, 2007). Construct referent can be at both the individual and unit¹³ levels. That said, a person’s belief might focus on both individuals, including the person him/herself, and the unit as a whole where the person belongs.

The second term is construct aggregation, which refers to the approaches of how individuals’ perceptions are converted into a collective property. This term is similar to Chan’s composition model (Chan, 1998). However, as the present research is focused on subjective constructs (i.e. respondents’ perceptions), Chan’s typology of composition models has not been used here, for simplicity’s sake. Specifically, there will be two approaches in construct aggregation: the aggregation approach that is based on absolute levels of the construct and the dispersion approach that uses the extent of consensus (i.e. agreement or variability) among the unit members (Meade & Eby, 2007).

Table 3-1 A framework for conceptualising subjective constructs

	Construct Referent	Properties at individual level	Properties at unit level
Construct aggregation			
Absolute		CO One	CO Two
Dispersion		CO Three	CO Four

Conceptualisation option (CO)

Sources: (Meade & Eby, 2007)

¹³ The unit level in organisations includes levels at groups, departments, organisations, and so forth.

As shown in Table 3-1, four cells are created by construct referent and aggregation approaches. In each cell, there is one conceptualisation option (CO). Accordingly, there are four different COs based on different combinations of construct referent and aggregation approaches. Specifically, with respect to CO one and three, researchers could conceptualise subjective constructs according to respondents' perceptions on properties at the individual level (measures, for example, can be 'how do you or every one in your unit feel about their jobs?'). Using CO two and CO four, researchers could also conceptualise subjective constructs according to respondents' perceptions on properties at the unit level (measures, for example, can be 'people in your unit are happy or my unit is a successful unit?').

Both CO one and two use the absolute level of respondents' perceptions to convert individual perceptions into a collective construct. Definitions using these options may look like, "construct A refers to the total amount of frustration of all unit members...". In contrast, using CO three and four, researchers could convert respondents' perceptions based on dispersion among respondents. An example of a definition could be, "construct B is the consensus level among the unit members in relation to...".

To conclude, the preceding discussion established a need for new diversity conceptualisations from three aspects. Correspondingly, using CO one (i.e. the construct of diversity is based on perception of properties at the individual level), diversity has been conceptualised as a subjective two-dimensional construct in the present research. Specifically, the definition of perceived diversity is as below:

Perceived diversity is classified into two types and it is a construct at both individual and unit levels. At the individual level, perceived social diversity is individuals' **perceptions of social dissimilarity** towards others within a social unit based on **a group of social-related** attributes such as race, sex, and age. Perceived information diversity is individuals' perception of members' **perception of informational dissimilarity** towards others within a social unit based on **a group of job-related** attributes such as tenure, education, and functional background (Allen et al., 2008; G. B. Cunningham, 2007; Hobman et al., 2004; Pelled, 1996; Riordan, 2000).

At the unit level, perceived social diversity is the **total amounts** of members' perception of social dissimilarity towards others within a unit based on a group of social-related attributes such as race, sex, and age. Perceived information diversity is the **total amounts** of members' perception of informational dissimilarity towards others within a social unit based on a group of job-related attributes such as tenure, education, and functional background (Allen et al., 2008; G. B. Cunningham, 2007; Hobman et al., 2004; Pelled, 1996; Riordan, 2000).

While the researcher is interested in perceived diversity, objective diversity will also be measured and analysed in comparison with perceived diversity. Objective diversity is defined as below:

Objective diversity is classified into two types and it is a construct at both individual and unit levels. At the individual level, objective social diversity is **individuals' dissimilarity** in relation to others within a social unit based on a **group** of **social-related** attributes such as race, sex, and age. Objective information diversity is **individuals' dissimilarity** in relation to others within a social unit based on a **group** of **job-related** attributes such as tenure, education, and functional background (G. B. Cunningham, 2007; Pelled et al., 1999; Riordan, 2000).

At the unit level, objective social diversity is the **average** of individuals' dissimilarity in relation to others within a social unit based on a group of social-related attributes such as race, sex, and age. Objective information diversity is the **average** of individuals' dissimilarity in relation to others within a social unit based on a group of job-related attributes such as tenure, education, and functional background (G. B. Cunningham, 2007; Pelled et al., 1999; Riordan, 2000).

Whereas the wording for the definition of diversity at the individual and the unit levels is slightly different, diversity is obviously a multilevel construct in the present research. As demonstrated in earlier discussions, the stream that examines diversity at the individual level is sometimes called 'relational demography' dealing with the similarity of one person to another or to a group (Thatcher et al., 2003). The stream that investigates diversity at the aggregate level is sometimes termed 'organisational demography', looking at the composition of a collection of people (Pfeffer, 1983). While adopting the unique conceptualisation of diversity above, the present research will, however, continue this tradition when referring to the literature in discussions.

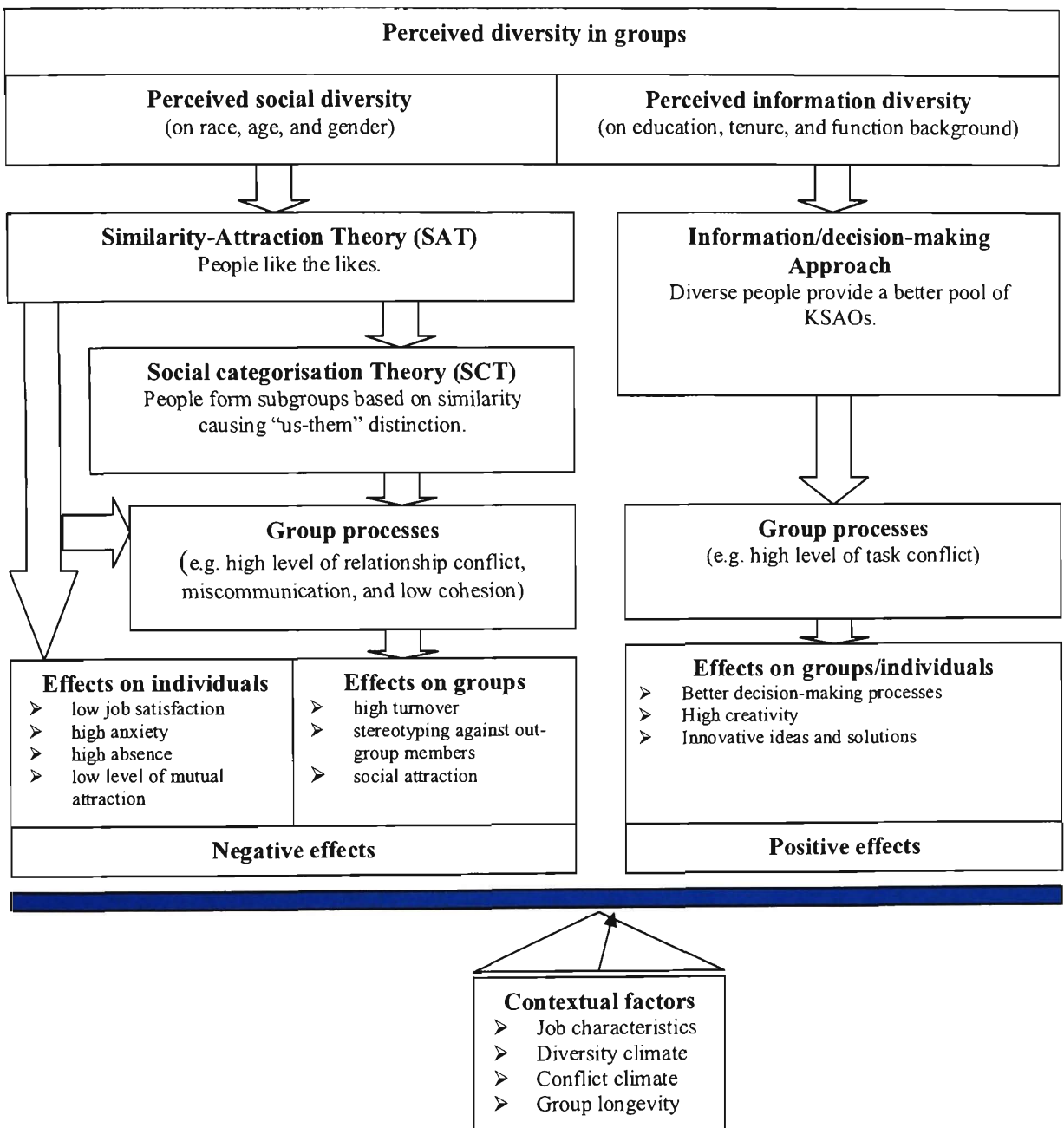
3.1.2 The theoretical framework: an integrated model

The discussion in the previous chapters demonstrated that the current diversity frameworks (i.e. similarity-attraction theory, SCT, the information/decision-making approach) are competing with each other, predicting both negative and positive effects of diversity on performance. It has also been argued that the diversity paradox resulted from a research tradition that those frameworks have been adopted in the research separately based on the different or sometimes contradictory predictions.

Correspondingly, it is argued in the present research that understanding the dynamic of the diversity impact is almost impossible without integrating all three theoretical frameworks. Accordingly, this research proposes an integrated theoretical model of diversity explaining how diversity is likely to influence performance. The model is shown in Figure 3-1.

The model posits that diversity influences performance both negatively and positively simultaneously and that the impact of diversity is contingent upon the contextual factors (e.g. diversity climate) balancing the negative effects suggested by similarity-attraction theory and SCT, and the positive effects predicted by the information/decision-making approach. To articulate the operation of the integrated model, its theoretical propositions will be specified below with respect to typology of diversity, levels of impact, effects predicted, and contextual factors, which will be articulated specifically in the coming sections.

Figure 3-1 An integrated framework



3.1.2.1 Typology of diversity: two dimensions of diversity

It was clearly demonstrated in the previous chapter that there is a lack of theoretical guidance to explain how different types of diversity may operate differently to impact on performance (Bunderson & Sutcliffe, 2002). The integrated model therefore proposes two dimensions of diversity: social diversity and information diversity. In addition, the

model also explains how the current three frameworks may work differently with different types of diversity.

As shown in the previous chapter, the currently used three frameworks have been applied to all types of diversity, but the frameworks, indeed, have very different orientations towards the dimensions of diversity. In particular, similarity-attraction theory and SCT may have particular strengths in social diversity (i.e. observable attributes) because age, race and gender are more likely to affect interpersonal attraction (Goldberg, 2005) and social categorisation processes (Richard et al., 2006; Swann Jr. et al., 2004).

In contrast, the information/decision-making approach may be better in explaining the impact of information diversity (i.e. job-related attributes) because social diversity (i.e. demographic) does not necessarily produce other types of diversity e.g. information (cognitive) diversity (Jehn et al., 1999). Therefore, the integrated model postulates that under the theoretical underpinnings of the information/decision-making approach increasing, information diversity (i.e. tenure, education and function background) is likely to improve the KSAOs (Jayne & Dipboye, 2004; Webber & Donahue, 2001).

3.1.2.2 Levels of impact

The impact of diversity has been analysed at both the group and individual levels under the theoretical prediction of current theories (Hobman & Bordia, 2006). Although having been applied at both levels, similarity-attraction theory and SCT may have strengths at a particular level. Specifically, SCT may not be able to fully account for the effects of diversity concerned with personal attraction in dyadic relationships while the similarity-attraction theory cannot fully explain the effects of diversity arising from social categorisations.

Therefore, the integrated model argues that the impact of diversity on individuals is better explained by the similarity-attraction theory because it was developed to

understand dyadic relationships (D. Byrne, 1971). In addition, the integrated model suggests that SCT is good at explaining the social attraction that is based on the preferential liking for in-group over out-group members (Hobman & Bordia, 2006).

3.1.2.3 Effects predicted

The current three frameworks cannot adequately explain the diversity paradox individually, calling for theoretical frameworks that could formulate both negative and positive effects of diversity. The integrated model predicts that diversity will influence performance both negatively and positively simultaneously.

However, as demonstrated in Lawrence's argument of a 'black box' between diversity and performance (Lawrence, 1997), diversity theories need to articulate the intervening group processes that may account for the diversity impact (Passos & Caetano, 2005). The integrated model specifies the intervening processes between diversity and performance. In particular, similarity-attraction theory and SCT predict that social diversity causes high levels of relationship conflict, miscommunication and low cohesion while the information/decision-making approach suggests that information diversity stimulates high levels of task conflict.

In order to understand the predictions of the integrated model better, it is necessary to describe the effects of diversity on outcomes including both group processes and performance. Specifically, the similarity-attraction theory suggests negative effects of diversity on individuals (low job satisfaction, high absence, high level of relationship conflict, and so forth) (Pfeffer, 1983; van Knippenberg et al., 2004). Similarly, SCT predicts negative effects of diversity on groups (miscommunication, low cohesion, high turnover, and so forth) (Gaertner & Dovidio, 2005; van Knippenberg et al., 2004). In contrast, the information/decision-making approach asserts positive effects of diversity on both individuals and groups (better decision-making processes, high creativity, high level of task conflict, and so forth) (Bachmann, 2006).

3.1.2.4 Contextual factors

It has been demonstrated that contextual factors are relevant to the three frameworks and that results in diversity research are likely to vary across situations unless there are considerations of contextual factors. Correspondingly, the proposed integrated model incorporates contextual factors into its propositions.

Specifically, the integrated model proposes that the impact of diversity on performance is contingent upon contextual factors, which balance the negative and positive effects of diversity. As the task characteristics determine the need and level of contact among members in diverse groups (Tolbert, Andrews, & Simons, 1995; Turner, 1985), individuals' propensity to hold negative stereotypes and prejudices against other group members is likely to be influenced by task characteristics. In addition, organisational culture, such as diversity and conflict climate, is likely to influence individuals' attitudes towards, and interpretation of, diversity (Muhr, 2006).

3.1.3 A particular intervening theory: the diversity-conflict-performance paradigm

According to the intervening theories, the diversity paradox is understandable given the different roles played by different group processes such as communication, cohesion and conflict. In addition, conflict has been suggested as a particularly powerful group process in intervening theories compared to communication and cohesion/social integration due to its predictions of both negative and positive effects of diversity (Jehn, 1999; Pelled, 1996; Pelled et al., 1999). This particular relationship has been termed the diversity-conflict-performance paradigm (Kulik, 2004).

While the paradigm might be a particularly useful explanation of the diversity paradox, to the present researcher's knowledge, only two studies have examined the paradigm directly and the two studies produced mixed results (Jehn et al., 1997; Pelled et al., 1999) highlighting the need to advance research on the paradigm further. Even though there is a need to research other group processes (such as group networks in the

relationship between diversity and performance) (Reagans & Zuckerman, 2001; Reagans et al., 2004), the focus of the present research is on the paradigm.

3.1.4 Moderation effects: contextual factors

The diversity paradox has been explained from the perspective of research contextual factors in the previous chapter. Specifically, the same demographic characteristics might yield different work-related attitudes/behaviours due to the moderation effects of different contextual factors. Although it has been suggested that a number of contextual factors moderate the effects of diversity, the present research focuses on two aspects of organisational climate (i.e. openness to diversity and openness to conflict), one aspect of group properties (i.e. group longevity), and two types of task characteristics (i.e. job interdependence and task routineness).

There are several reasons why these contextual factors have been chosen as moderators in the present research. First, due to the limited funding and timeline, the present research is limited and cannot investigate those contextual factors requiring a larger research design (e.g. temporal factors). Second, while a number of contextual factors might moderate the effects of diversity, the factors chosen in the present research have been mostly addressed (Jehn et al., 1999; Kankanhalli et al., 2007; Pelled, 1996; Pelled et al., 1999). Further examination of these factors in a new research design would provide valuable insights in comparison to previous findings, particularly with respect to the diversity-conflict-performance paradigm. Third, there are few difficulties of data accessibility because of the availability of measures for all chosen contextual factors in the literature. This availability will significantly reduce the complexity of the research design with respect to measurement development.

To sum up, it seems reasonable to re-examine these contextual factors in the present research, where a new theoretical framework as well as a new research design have been deployed.

3.1.5 Methodological issues

In Chapter Two, the diversity paradox was explained from the perspective of methodology. In particular three methodological issues were addressed: the diversity measurement, the performance measurement and statistical analysis techniques. The following sections explain approaches that will be adopted in the present research.

3.1.5.1 Diversity measurement

As demonstrated earlier, there are at least two critical limitations with current diversity measurement. First, there is no technique that measures multiple characteristics for **one** individual simultaneously. Second, most approaches measure **objective** diversity rather than **perceived** diversity.

In order to overcome the limitations, the present research measures participants' **perceptions** towards social or information dissimilarity with respect to **two groups of identities simultaneously**. The two groups of identities are social dissimilarity based on race, age, and gender, and informational dissimilarity according to tenure, education and function background.

3.1.5.2 Performance measures

Recent evidence indicates that organisations are increasingly using non-financial performance measures (Davila & Venkatachalam, 2004). Following this trend, performance measures used in the present research are job satisfaction and innovativeness. There are reasons why the two outcomes are of interest to the present research. With respect to innovativeness, it is broadly assumed that diversity is fundamental for innovativeness (Muhr, 2006) and that diversity may have the potential to facilitate innovativeness in diverse groups (Levine & Moreland, 2004).

Industrial/organisational psychologists have shown great interest in job satisfaction (Judge, Thoresen, Bono, & Patton, 2001) and it has been considered an important

predictor of job performance (Jones, 2006). A satisfied worker is generally considered a productive worker (Hugenberg & Bodenhausen, 2004) and job satisfaction has been linked with other well-established beneficial performance indicators such as job involvement (De Cieri & Kramar, 2005).

In line with other performance measures, job satisfaction has been adopted in different research (Jawahar, 2006; Pincus, 1986). In addition, diversity theories indicate that working in demographically heterogeneous settings is less desirable than working in settings that are more demographically homogeneous (Wharton et al., 2000). Therefore, research on affective outcomes of diversity would provide opportunities to test the theories.

3.1.5.3 Data analysis tools: Multilevel SEM

In the previous chapter, SEM was suggested as a potential analytical technique for latent variables. Given the multilevel nature of diversity data, it has also demonstrated that MLM might offer a good alternative for analysing data that are clustered together. However, due to limitations associated with both SEM (Kline, 2005) and MLM (Bauer, 2003), it has been necessary to use SEM to fit MLM pursuing a rigorous development and application of multilevel SEM to test complex factorial measurements in nested data structures (Curran, 2003) simultaneously examining the effects of variables at both individual and group levels (Krull & MacKinnon, 2001).

One recent development within the SEM domain is the capacity to model nested data, and the newly-developed technique is called multilevel SEM (Tomarken & Waller, 2005). According to Tomarken & Waller, multilevel SEM analyses provide aggregated estimates of parameters within-group (the individual level) and between-group (the group level), but not separate estimates of the parameters for each group. Multilevel SEM can prevent the significant distortion in results that occur when analyses fail to account for between-group heterogeneity (i.e. non-independence across groups) (Tomarken & Waller, 2005).

The specific outline of how multilevel SEM is used in the present research will be given in chapter Four (i.e. research methodology) and chapter Seven (i.e. data analysis) accordingly.

3.2 The Research Questions

The preceding sections have introduced the present research's focuses, which might offer possible explanations for the diversity paradox. The present research applies a cross-level and integrated model to investigate the impact of perceived diversity. In doing so, this research will provide deep insight into the diversity paradox.

Given the focus of the present research, the following research question has been identified as the basis for this study:

How does the process of conflict influence the relationship between diversity and performance?

In addressing the question above, a number of subsequent second-order questions have emerged. However, it is not feasible to examine them all in the present research. To assist in the examination of the primary question and to offer a better understanding of the diversity-conflict-performance paradigm, two questions will also be examined:

Does group conflict mediate the relationship between diversity and performance?

Is the diversity-conflict-performance paradigm moderated by research contextual factors?

3.3 The Hypotheses

To address the research questions, the present research proposes a number of hypotheses to describe the relationships among the constructs. There are two things worthy of noting in the hypothesis development. First, most hypotheses will apply to both group and individual levels although the analysis procedures will be different. This is except for

hypotheses on moderation effects, and the reason for doing so will be pointed out in the moderation effect testing. Second, although the present research is interested in the perceived diversity, hypotheses will be developed with both objective diversity and perceived diversity. Doing so should offer a good comparison with the two streams of diversity research.

3.3.1 The diversity-conflict-performance paradigm

3.3.1.1 The social diversity-relationship conflict-job satisfaction sub-paradigm

According to the integrated model in Figure 3-1, group members in socially diverse groups are likely to perceive a high level of relationship conflict. Specifically, similarity-attraction theory and SCT support the prediction. From the perspective of similarity-attraction theory, it is suggested that similarities in observable attributes (i.e. social diversity) are more likely to affect interpersonal attraction (Goldberg, 2005), developing a possible low level of social attraction in socially diverse groups. This can become a fertile breeding ground for misunderstanding and discord because of potential miscommunication associated with individual differences (Swann Jr. et al., 2004). Socially diverse groups, in turn, are predicted to have a higher level of relationship conflict.

From the perspective of social categorisation processes (Richard et al., 2006; Swann Jr. et al., 2004), group members in socially diverse groups strive for self-esteem by developing positive opinions of their own category and negative opinions of other categories (Foley et al., 2006). Accordingly, people tend to treat the in-group members favourably and perceive out-group members as less attractive (Tajfel & Turner, 1986) resulting in cooperation with in-group members and competition with out-group ones (Richard et al., 2006). The process is likely to increase the relationship conflict in socially diverse groups.

In the conflict literature it has been suggested that relationship conflict fuels prejudice, intergroup competition and negative out-group attitudes on the part of the majority of group members, causing poor interpersonal relationships at work (Brief et al., 2005). As

a result, communication between diverse members becomes difficult, breaking personal and professional relationships (Medina et al., 2005).

There are both theoretical arguments and empirical evidence supporting the negative effects of relationship conflict on performance (Choi & Cho, 2005; De Dreu & Weingart, 2003; De Dreu & Beersma, 2005; Rau, 2005). Therefore, it would be reasonable to argue that relationship conflicts depress job satisfaction inducing dysfunction in group processes, and reducing group effectiveness (Buchholtz et al., 2005; Guerra et al., 2005; Medina et al., 2005).

On the basis of the theoretical propositions above, two hypotheses are proposed in the present research:

H. 1. Perceived social diversity has a positive influence on relationship conflict, which, in turn, has a negative impact on job satisfaction.

H. 2. Objective social diversity has a positive influence on relationship conflict, which, in turn, has a negative impact on job satisfaction.

3.3.1.2 The information diversity-task conflict-innovativeness sub-paradigm

The integrated model asserts a positive relationship between information diversity and task conflict. The information/decision-making approach particularly explains this assertion. According to the integrated model, information diversity is likely to improve the KSAOs (Jayne & Dipboye, 2004; Webber & Donahue, 2001) offering diverse groups a variety of perspectives and approaches to problems in hand, as well as different sources of information and expertise (van Knippenberg et al., 2004).

Due to respective belief structures in diverse groups, group members with different informational backgrounds have divergent preferences and interpretations of tasks and these divergences are likely to manifest themselves as intragroup task conflict (Henley & Price, 2004; Pelled et al., 1999; Simons & Peterson, 2000).

In addition, the conflict literature indicated that as task-related arguments increased, group members found that they were better able to critically assess information related to their jobs. Specifically, constructive debates associated with task conflict are likely to increase the quality of decisions (De Dreu & Weingart, 2003; Vodosek, 2005) and communication between group members (Richter et al., 2005).

Furthermore, there is emerging evidence proposing that people are forced to abandon complacency and seek new ways of dealing with old problems only when people are in situations where there is disagreement about the old ways (task conflict) (Song, Dyer, & Thieme, 2006). Abandonment of complacency in seeking new ways of dealing with old problems is likely to induce innovativeness including both innovation (Bacal, 2004) and creativity (Medina et al., 2005).

Correspondingly, as predicted in the integrated model as well as existing theoretical arguments, the present research proposes that:

H. 3. Perceived information diversity has a positive influence on task conflict, which, in turn, has a positive impact on innovativeness.

H. 4. Objective information diversity has a positive influence on task conflict, which, in turn, has a positive impact on innovativeness.

3.3.2 Mediation effects of conflicts

In the literature, group processes have been suggested as intervening variables in the relationship between diversity and performance (Lawrence, 1997). Group processes mediate the relationship between diversity and performance. In addition, conflict has been proposed as the most representative group process in explaining the effects of diversity (Pelled, 1996). Accordingly, it would be reasonable to argue that:

H. 5. Task conflict mediates the relationship between perceived information diversity and innovativeness.

H. 6. Task conflict mediates the relationship between objective information diversity and innovativeness.

H. 7. Relationship conflict mediates the relationship between perceived social diversity and job satisfaction.

H. 8. Relationship conflict mediates the relationship between objective social diversity and job satisfaction.

3.3.3 Moderation effects of contextual factors

One thing to be clarified before the discussion is that four sub-paradigms are to be considered in the moderation testing. The four sub-paradigms are: the relationship between perceived social diversity, relationship conflict and job satisfaction (the PSD-RC-JS sub-paradigm); the relationship between objective social diversity, relationship conflict and job satisfaction (the OSD-RC-JS sub-paradigm); the relationship between perceived information diversity, task conflict and innovativeness (the PInD -TC-Inn sub-paradigm); the relationship between objective information diversity, task conflict and innovativeness (the OInD -TC-Inn sub-paradigm).

In terms of methodologies, there are currently two general approaches to test moderation effects: the intervening approach and the interacting approach. The first examines whether moderators moderate the relationships between independent variables and dependent variables or not; the second is interested in how moderators interact with independent variables causing effects on outcome variables (Frazier, Tix, & Barron, 2004; Holmbeck, 1997). The present research is interested in whether moderators moderate the paradigm and the intervening approach is therefore adopted.

Another reason why the intervening approach is used related to the assumption, upon which applications of the interacting approach are built: moderators have causal relationships with dependent variables (Holmbeck, 1997; Kim, Kaye, & Wright, 2001). This assumption was difficult to meet in the present research. For an example, it is hard to argue that people who have higher levels of openness to diversity will report higher levels of job satisfaction.

3.3.3.1 Moderation effects of task Interdependence on the diversity-conflict-performance paradigm

Task interdependence has been suggested as an amplifying moderator of the relationship between diversity and conflict because task interdependence increases the amount and intensity of interaction among group members allowing more opportunity for conflict to occur and affect the group and its members (Jehn, 1995).

Interdependence is also suggested as an amplifying moderator of the relationship between conflict and performance because the need for active interaction among group members performing highly interdependent tasks is likely to increase the salience of conflicts (Jehn & Bendersky, 2003). The salience results in a greater impact of conflict on performance.

Correspondingly, the present research predicts that:

H. 9. Task interdependence moderates the PSD-RC-JS sub-paradigm.

H. 10. Task interdependence moderates the OSD-RC-JS sub-paradigm.

H. 11. Task interdependence moderates the PInD-TC-Inn sub-paradigm.

H. 12. Task interdependence moderates the OInD-TC-Inn sub-paradigm.

3.3.3.2 Moderation effects of task Routineness on the diversity-conflict-performance paradigm

Task routineness acts as a suppressor of the relationship between diversity and conflict. In routine tasks, where group members can use standard operating procedures and discussion of work methods is not necessary, diversity is likely to create less frustration to dissimilar others (Horwitz, 2005). Thus, the higher routineness a task presents, the less conflict members in diverse groups will experience.

Task routineness is a suppressing moderator on the interaction between relationship conflict and performance. It was suggested that conflicts are a welcome relief to the boredom of routine tasks and members, having relieved their relationship problems, can go back to their tasks with renewed energy, after the petty fighting is finished (Jehn, 1995; Jehn & Bendersky, 2003).

With respect to the relationship between task conflict and performance, task routineness was also suggested as a suppressing moderator. In particular, it was argued that the relationship between task conflict and performance would be stronger in nonroutine tasks than in routine ones because non-routine tasks require problem solving and have a high degree of uncertainty, inducing a greater potential for conflict among dissimilar group members (Jehn & Bendersky, 2003).

Hypotheses could be proposed in the present research:

H. 13. Task routineness moderates the PSD-RC-JS sub-paradigm.

H. 14. Task routineness moderates the OSD-RC-JS sub-paradigm.

H. 15. Task routineness moderates the PInD-TC-Inn sub-paradigm.

H. 16. Task routineness moderates the OInD-TC-Inn sub-paradigm.

3.3.3.3 Moderation effects of openness to diversity on the diversity-conflict-performance paradigm

It is argued that openness to diversity moderates the relationship between diversity and conflict. In particular, openness to diversity is suggested to facilitate open communication and a higher level of integration within groups (Hobman et al., 2004). Therefore, the greater the group openness to diversity, the less relationship conflict group members experience. In contrast, the greater the group openness to diversity, the more task conflict group members experience. The following hypotheses are developed:

H. 17. Openness to diversity moderates the PSD-RC-JS sub-paradigm.

H. 18. Openness to diversity moderates the OSD-RC-JS sub-paradigm.

H. 19. Openness to diversity moderates the PInD-TC-Inn sub-paradigm.

H. 20. Openness to diversity moderates the OInD-TC-Inn sub-paradigm.

3.3.3.4 Moderation effects of openness to Conflict on the diversity-conflict-performance paradigm

Openness to conflict has been suggested as an amplifying moderator on the relationship between conflict and performance because acceptability norms may encourage both task and relationship conflict (Jehn & Bendersky, 2003). In particular, the greater the group openness to conflict, the more conflict the group members experience. Therefore, the following hypotheses can be drawn:

H. 21. Openness to conflict moderates the PSD-RC-JS sub-paradigm.

H. 22. Openness to conflict moderates the OSD-RC-JS sub-paradigm.

H. 23. Openness to conflict moderates the PInD-TC-Inn sub-paradigm.

H. 24. Openness to conflict moderates the OInD-TC-Inn sub-paradigm.

3.3.3.5 Moderation effects of group longevity on the diversity-conflict-performance paradigm

Group longevity is predicted to suppress the relationship between diversity and conflict. After a period of time, group members may become familiar with the different perspectives in diverse groups and therefore begin to share each other's perspectives (Harrison et al., 2002). In this way, group longevity may diminish the relationship between diversity and conflict. The present research proposes that:

H. 25. Group longevity moderates the PSD-RC-JS sub-paradigm.

H. 26. Group longevity moderates the OSD-RC-JS sub-paradigm.

H. 27. Group longevity moderates the PInD-TC-Inn sub-paradigm.

H. 28. Group longevity moderates the OInD-TC-Inn sub-paradigm.

3.4 A Summary of this Chapter

In this chapter, focuses of the present research have been stated with respect to addressing the limitations of the existing literature. Specifically, the research will explain the diversity paradox from a combination of five perspectives. Moreover, the research questions were also framed. Based on the integrated framework, 28 hypotheses were developed to address the research questions. In particular, hypotheses were arranged in three parts: the diversity-conflict-performance paradigm, mediation effects of task, and moderation effects of five research contextual factors. The next chapter will identify an appropriate research strategy as well as a research method to answer the research questions.

Chapter 4. The Research Design & Ethics

In the previous chapters, related literature was examined. Accordingly, a primary research question has been identified: does the process of group conflict influence the relationship between diversity and performance? In this chapter, an appropriate research strategy as well as a research method will be identified in order to answer the research question. Specifically, there will be detailed discussion with respect to the epistemological stance of this research and the rationale of choosing a quantitative strategy. Following that is a detailed research design that includes measurement development, the research context, sampling, sampling size, data collection, and data analysis. Finally, considerations will be given to ethical issues.

4.1 Rationalisation of the Research Strategy and Methodology

4.1.1 The epistemological stance: a positivist's perspective

Choosing a research strategy is a matter related to what the researcher needs to know and how to find out. That is, in order to produce knowledge, the researcher needs to know if his/her belief is true or not, and must identify the particular procedure to verify his/her belief. In order to verify the truth (i.e. if his/her belief is true or not), the researcher's first effort will be to imagine what the truth could be (Frankfort-Nachmias & Nachmias, 1992). In doing so, the researcher may need to make assumptions about what the nature of the knowledge he/she hopes to produce is (e.g. the fundamental nature of reality) (Neuman, 2000). Thus, choosing a research strategy is also a matter of clarifying one's epistemological stance.

Clarifying the epistemological stance has significant consequences for the conduct of social inquiry and for its outcomes because it influences whether the researchers are objective, unbiased, and valid (Blaikie, 1993; Blaikie, 2000; Thietart, 2001). Specifically, according to philosophers such as Crotty (1998), epistemology provides answers to the question 'how is it possible for us to gain knowledge of the world' and it is concerned with evaluating claims about the way (i.e. the methodology) in which the

world can be known to us. This is a perspective from epistemology to methodology to interpret the significance of epistemology. An alternative way is to move from methodology to epistemology. That said, any theorising about the social world relies upon some implicit philosophical assumptions about the nature of reality, of the subject-object relationship and of the social world we envisage (Baert, 1998; Thietart, 2001).

In general, positivism will be the particular epistemological stance for the present research, an epistemological approach that advocates essentially the application of the methods of the natural sciences to the study of social reality and beyond (Bryman, 2001). It has formed the foundation of the development of social science since 1822, when the French philosopher Auguste Comte coined the term (Babbie, 1992). Among the different positions of epistemology, positivism is regarded as the traditional scientific approach and it confines genuine knowledge within the bounds of science and observation (Blaikie, 1993; Halfpenny, 1982; Norton, 1998).

4.1.1.1 What are positivists' assertions?

There are various philosophical claims made by positivists. Although Halfpenny (1982) identified twelve claims of positivism and Blaikie (1993) also suggested six key ideals associated with positivistic approaches in their books, there are some essential assertions that are shared by the positivists. For the purpose of this discussion, these essential assertions have been summarised in the following table with respect to the truth about reality, the nature of knowledge, and the methodology of inquiry.

As indicated in Table 4-1, positivism is an epistemological approach that claims independent reality, believes in objective knowledge, and argues the same "logic of enquiry" in both social and physical worlds. The information suggested in this table is significant since it demonstrates the basic nature of positivism that the knowledge produced by positivists is objective and a-contextual. However, some positivists argue that it is difficult to achieve objectivity in social research (Blaikie, 1993).

Table 4-1 Assertions of positivists

The Content	Assertions
Reality	<p>There is a reality independent of human minds.</p> <p>Reality is what is available to the senses via observations and measurement.</p> <p>Objectivity was a characteristic that resided in the individual scientist. Scientists are responsible for putting aside their biases and beliefs and seeing the world as it 'really' is.</p>
Knowledge	<p>Positivists argue objective knowledge.</p> <p>Sense experiences and perceptions are the only admissible base of human knowledge and precise thought.</p> <p>The most perfect form of knowledge is simple description of the phenomena that we experience and perceive.</p> <p>Knowledge of anything beyond sense experience and perceptions is impossible.</p>
Methodology	<p>Empirical validation or falsification is the basis of "real" enquiry.</p> <p>Positivists argue application of deductive reasoning to postulate theories that can be tested.</p> <p>Observation and measurement is the core in the process.</p> <p>The social world can be accessed by the same 'logic of enquiry' as the physical world.</p> <p>Positivists seek understanding of cause and effect.</p> <p>Positivists have "objective" explanation as their goal.</p>

Sources (Babbie, 1992; Blaikie, 2000; Bryman, 2001; Crotty, 1998; Halfpenny, 1982)

4.1.1.2 Challenges to positivists

In relation to addressing the research question, positivism seems to be a suitable epistemological stance given its obvious strengths, in particular, its assertions about reality. In order to answer the question, this research is based on an assumption that the relationship between diversity and performance (the reality) must be there working in a certain way that we can observe or measure. In addition, conflict is assumed to influence the relationship between diversity and performance (the reality) although we have not yet fully approached and measured the impact. Positivism supports this assumption because it claims that the existence of external reality is out of human minds and that human minds could not act at all if reality did not exist (Crotty, 1998).

However, while being informed by positivism, it is acknowledged that positivism has been challenged in recent decades by other approaches such as post-positivism. While

remaining the broad tradition of positivism and retaining a number of its features, post-positivism has concerns with positivism's assertions,

Without necessarily jettisoning the objectivism inherent in positivism, these insiders [positivists] have challenged its claims to objectivity, precision and certitude, leading to an understanding of scientific knowledge whose claims are more modest. This is a less arrogant form of positivism. It is one that talks of probability rather than certainty, claims a certain level of objectivity rather than absolute objectivity, and seeks to approximate the truth rather than aspiring to grasp its totality or essence (Crotty, 1998, p29, [] added by the researcher).

Specifically, with respect to reality, it has been argued that reality can never be fully appreciated, but only be approximated. This is because observation and measurement are always subject to falsification as a result of 'fitting' with pre-existing knowledge: editors, referees and professional peers (Halfpenny, 1982; Outhwaite, 1987).

With respect to the nature of knowledge, there is radical critique arguing that knowledge is not based on unchallengeable, rock-solid foundations and knowledge is conjectural because of the inescapable subjectivity of human awareness/perception (Blaikie, 2000). According to this point of view, knowledge is situated or/and partial (D. S. Byrne, 1998).

In relation to the methodology of producing knowledge, it was suggested that methods of accessing the social world could be different from the methods for investigating the physical world (Delanty & Strydom, 2003) although the logic of enquiries is the same. This point of view is associated with subjectivity as well. As participants and researchers are not 'empty vessels'; they have feelings and values which may influence their judgment of observation and measurement as well as perceptions of the concepts being measured. Accordingly, to some extent, they hear and see different realities of the same things (Babbie, 1992). According to this point of view, in order to produce sound knowledge, researchers should consider methods that could offer a deeper access of subjectivity in the social world. For example, compared to the experimental setting, research may be conducted in more natural settings (Delanty & Strydom, 2003).

4.1.2 The chosen research strategy: quantitative strategy

Following the clarification of epistemological stance a research strategy was adopted in this research. Deciding what type of approach to collect and to analyse the data is the starting point for the methodology of research. In general, there are two types of approach: qualitative and quantitative strategy (Creswell, 2003). Inspired by positivists' preference (Bryman, 2001), a quantitative strategy has been adopted in this research. In particular, a quantitative strategy was chosen because of its characteristics, compared to a qualitative strategy in relation to answering the research question.

Although procedures vary from one piece of research to another, there are identifiable features that distinguish qualitative and quantitative approaches. The characteristics have been summarised in the table below.

Table 4-2 Quantitative versus qualitative strategy

Quantitative style	Qualitative style
Deductive orientation	Inductive orientation
Testing of theory	Generation of theory
Point of view of researcher	Points of view of participants
Macro perspective	Micro perspective
Measure objective facts (behaviour)	Construct social reality, cultural meaning
Focus on variables (numbers)	Focus on interactive processes, events (words)
Structured	Unstructured
Reliability is key	Authenticity is key
Value free	Values are present and explicit
Independent of context	Situational constrained
(Artificial settings)	(Natural settings)
Many cases/subjects	Few cases/participants
Statistical analysis	Thematic analysis
Researcher is detached	Researcher is involved
Sources (Bryman, 2001; Frankfort-Nachmias & Nachmias, 1992; Neuman, 2000)	

As shown in Table 4-2, by using deductive reasoning, quantitative approaches test hypotheses measuring concepts and analyse relationships between variables, not processes. Because a large number of cases are involved, the common methods used in a quantitative research are structured interviews, self-completion questionnaires,

structured observations and so forth (Bryman, 2001). In contrast, based on inductive reasoning, qualitative research seeks answers for questions that stress how social experiences are created and given meaning. Using a small number of cases, ethnography/participant observation and interviews are commonly used in qualitative research (Babbie, 1992).

At first glance, a qualitative approach seemed to be a suitable methodology for answering the current research question where subjectivity needs to be addressed. However, given that the intent of this research was to identify the relationship between diversity, conflict and performance (generalisation requires a large number of cases) and that this research attempted to test a theory (i.e. the integrated model of diversity), a quantitative strategy is considered more suitable because of its unique characteristics, as demonstrated in Table 4-2.

However, as addressed in the preceding discussion, quantitative approaches may suffer from certain limitations associated with the main epistemological stance: positivism. For example, unavoidable subjectivity in concept measurement may determine the quality of data, a critical issue in diversity research that has been identified in the previous sections. In order to overcome the limitation, this research uses a survey approach, a method that has been suggested as being able to provide answers to questions about 'what meanings' people give to things (Bryman, 2001). In addition to this advantage, a survey method may be particularly useful since it provides data from a large number of cases rather than from a few participants. The rationale for choosing a survey method is the focus of next section.

4.1.3 Why a survey?

Surveys have been regarded as one of the most widely used techniques for collecting data in social science research (Aaker et al., 2007). They can be designed to capture a wide variety of information on many diverse topics and subjects. In general, there are three circumstances when a survey research method can be used. First, it should be used

when the goals of the research call for quantitative data, when the information sought is reasonably specific and familiar to the respondent, and when the researcher himself/herself has considerable prior knowledge of particular problems and the range of responses likely to emerge (Bryman, 1988).

Second, surveys are likely to be preferred when there is a concern about establishing relationships (either correlation or cause-and-effect) (Bryman, 2001). The third circumstance is where there is need to collect information about unobservable phenomena (Frankfort-Nachmias & Nachmias, 1992). For example, in this research, non-demographic concepts (e.g. perception toward diversity) can't really be observed or measured directly because they were inferred by participants from their experiences.

In consideration of the circumstances above, a quantitative strategy using a survey method seemed to be the most appropriate methodology and data collection method in this research. This approach is able to provide data drawn from a large number of cases (for the purpose of establishing relationships between variables) and is able to address subjective meanings of concepts (e.g. perceived diversity is unobservable). By choosing a survey method, this research has benefited significantly from the methodological advantages associated with surveys. For example, the survey was carried out in natural settings. Doing so allowed the researcher to make statistical inferences about broader populations and permitted him to generalise the findings from real-life situations, thereby increasing the external validity of the research (Bryman, 2001).

4.2 The Research Design

The preceding section clarified the epistemological stance (i.e. a positivist's perspective) and articulated the rationale for choosing the research strategy (i.e. a quantitative study) and research method (i.e. a survey approach). While decisions for factors above were important, a research plan was also needed to specifically conduct the survey, which was the objective of the research design.

In general, a research design provides research with a framework through which the various components of a research project are brought together: the research question, the data, the analysis and the results. It usually comes after defining the research question and before beginning data collection (Bryman, 2001; Thietart, 2001). The research design in this research consisted of defining the means necessary to answer the research question (this has been done in the section 4.1 on rationalisation of the research strategy and methodology), measurement development, determining the data research context and sources (including the sampling process and size), and selecting data collection techniques and analysis methods. While the following sections present the plan for conducting the survey, more details about the specific procedures are to be articulated in coming chapters.

4.2.1 Measurement development and piloting testing

In quantitative research, the process of measurement development is a process of assigning numbers to concepts that are presented by indicator/s. In this research all concepts were measured by established indicators that have been tested in other research. Therefore, there were fewer concerns with the development of indicators and their assessment. However, the procedures were different for the demographic information including age, gender, race, education, functional background and tenure.

For the demographic information, it was necessary to revise indicators that were sensitive (e.g. race/ethnicity background) to participants to increase response rates. Specific changes were carried out based on outcomes of the pilot testing. For the more abstract concepts, there were fewer changes in the indicators since these indicators had already been tested in other research and they were established and acceptable to this research. Despite preserving the wording of the original scales when using established scales, minor modifications were made to some measuring scales in this research to suit the contexts. All changes will be specified in the coming chapters.

The research methodology was tested using a pilot study before administering the self-completion questionnaires to participants ensuring that survey questions operated well and that the research instrument functioned well as a whole (Bryman, 2001). In doing so, questionnaires were distributed to a number of students who were doing small projects in a local university. By doing so, the feasibility of the study (e.g. any question generating similar answers or the adequacy of instructions to participants) was examined. Accordingly, necessary refinement or modification was carried out.

4.2.2 The research context, sampling and sample size

The population was identified as working groups in workplaces in Victoria, Australia, particularly in Melbourne and Ballarat. As the researcher was interested in both social and information diversity, there was no particular requirement for the demographic characteristics of the organisations. That said, there was no need to control demographic characteristics prior to choosing samples because variation in these variables was expected. However, given the nature of small companies (fewer than 20 employees), where companies' key person/s (e.g. the owner) are normally participating in the work groups, which significantly influences the working relationships, the sizes of chosen companies had to be medium or large.

In addition, because geographically distributed groups have been found to have different working relationships from collocated groups (Hinds & Mortensen, 2005), this research focused on collocated groups where diverse group members interact with each other more intensively. Therefore, any medium or large organisations having collocated working groups in the Victorian workplace were included in the population.

As the number of working groups in Victorian workplaces was relatively large for an unfunded PhD project, it was not feasible to send questionnaires to all. The researcher had to use samples. (If census is not possible, sampling is the only alternative).

The function of a sample is to 'stand in' for a much larger but generally inaccessible population of cases, which forms the real focus of interest to researchers (Bryman, 2001). Because samples are a segment of the population that are selected for investigation, the process of sampling (i.e. selecting cases from the population) influences the inference about a population on the basis of samples. Given the complex relationship between samples and a population, many errors in social research are related to sampling (Burton, 2000). For example, if the sampling procedure has produced samples which are wildly different from the population, most of the effort will have been wasted (Dyer, 1995). So, great attention was paid to sampling in this research.

Although probability sampling (i.e. random selection) remains the primary method of sampling (Babbie, 2001), the sampling process in this research was non-probability sampling. This was because there was no list of the population available (i.e. all organisations having working groups in Melbourne and Ballarat), nor was the research likely to create one. In particular, convenient samples were used in the research relying on available samples. While the researcher approached any organisations that were functioning with groups/teams, organisations that showed an interest in participating were sampled for this research. In addition, there was no preference for particular industries. To be specific, at the individual level, samples were employees who have completed the survey; at the group level, samples in the present research were working groups that have participated in the survey.

With respect to the sample size, it was restricted by the thesis time span although the researcher understands that bigger is generally better. However, in principle, this research followed, two general rules guiding a project. First, about 30 cases (cases mean groups if the analysis is carried out at the group level) are required in order to provide a pool large enough for any analysis; second, there should be at least five cases that fall in any single cell of the analytical table (Bouma & Ling, 2004).

4.2.3 Data collection

Currently, there are four approaches of administering a survey: personal interviewing, telephone interviewing, mail survey (the face-to-face handout approach such as in classrooms is categorised in this class because researchers have to wait for completed questionnaires to be returned when using either approach), and online survey (Aaker et al., 2007). In this research, the data collection techniques were the handout approach and the web-based online method depending on the particular circumstances of participating organisations. The rationale for choosing these approaches was based on the strengths and weaknesses of each approach in association with characteristics of the organisations in question. A specific rationale and the precise procedures for doing so will be further described in Chapter Six, in which the specific processes of data collection are to be articulated.

4.2.4 Data analysis

The data were mainly analysed using SEM, multilevel SEM in particular. The reason why SEM was chosen as the analysis tool was associated with its particular strengths in analysing data of latent variables (e.g. the perceived diversity) in comparison with other statistical techniques such as multiple regressions. In addition, its capacity for analysing multilevel data also contributed to the decision. How the analysis was conducted will be described in Chapter Seven.

Primarily, the task of SEM was to determine the goodness of fit between the hypothesised model formulated on the hypothetical relationships in Chapter Three and the sample data (B. M. Byrne, 1998). However, given the complexity of the data structure, the data analysis was carried out in three parts. The first part was related to testing the diversity-conflict-performance paradigm. The second part was to test the mediation effects. Moderation effect testing was the objective of the third part.

4.3 Ethical Issues in the Research

To avoid the abuse of participants' rights during the data collection, the researcher considered ethical issues. The basic ethical principle of this research was that no harm would come to the participants as a result of their participation (Aaker et al., 2007; Oppenheim, 1992). Practically, this research took one of the broad approaches to making ethical decisions: to follow a set of rules (de Vaus, 2002). The University of Ballarat was the body that established the rules based on stringent regulations.

According to the University of Ballarat's policy, research projects and practices must be approved by the appropriate ethics committee represented by community representatives. In particular, projects involving human subjects such as this PhD research are required to be approved by Human Research Ethics Committee (HREC). Furthermore, as piloting and the field study were to be conducted in different organisations, it was a requirement that approvals be obtained for each stage. Specifically, the application processes were staged into ethical risk assessment and lodgement of applications. The lodgement of application included responses to questions made by HREC.

4.3.1 Ethical approval for piloting testing

4.3.1.1 Ethical risk assessment

To determine the ethical application to be handled by appropriate committee, a process of ethical risk assessment was carried out. The purpose of assessment was to evaluate the level of risk that the project would present to its participants. According to the assessment, this project might present more than minimal ethical risk because the information about gender and race or ethical identity had been sought. Therefore, the ethical application had to be approved by HREC Executive Officer for review at a full meeting of the HREC.

However, a special case argument was made to HREC Executive for consideration of a special case by the HREC Chair. This was due to the particular nature of the project.

Although the student identity numbers were to be asked for in the questionnaires, identity-related information was to be deleted after the group membership was clarified. This means that the survey was completely anonymous and information collected via the survey was unlikely to cause any harm to the participants (e.g. breaches of confidentiality).

Fortunately, the special case approval was granted by the Chair of HREC after consideration of the particular circumstances of this project. The ethical application was submitted for approval via the expedited review process.

4.3.1.2 Application for HREC approval

A standard form of application for HREC approval was completed and this was a 17-page document giving HREC detailed information about the researcher and the project. In addition, a copy of the questionnaire and a plain language information statement had also been attached to the application. The plain language statement was very important because it provided both reassurance and guidelines to the participants. The statement gave a brief introduction to the project, its length, and how to complete the survey. In addition, the anonymity of the participants was assured.

Furthermore, the plain language statement informed participants of the completely voluntary participation in the process and there would be no risk during the study. The statement also indicated that participants were free to withdraw or to discontinue participation in the study at any time if they were uncomfortable with participating (e.g. responding to any particular questions). Finally, the statement informed participants of where the data were to be stored and when and how to access the research findings.

The application was approved by HREC with minor changes that required minor rewording of some parts of the document.

4.3.2 Ethical approval for field study

The application process was similar to ethical approval for pilot testing. However, ethical approval was granted conditionally upon consent letters being obtained from the participating organisations. The consent letter could not be presented to the ethical committee because the participating organisations normally required the ethical approval prior to considering to participate (there was a slight conflict between the two systems). The conditional ethics approval was clearly indicated in the letter of survey participation invitation, which is discussed in the chapter on data collection.

Required by the HREC, the researcher prepared a final report to be approved by the committee. Please see Appendix A for more details.

4.4 A Summary of this Chapter

At the beginning of this chapter, the researcher clarified the epistemological stance used to explore problems in the present research and described the chosen research strategy for answering the research questions. Following that was a summary of the detailed research design including measurement development, the research context, sampling, sampling size, data collection, and data analysis. Finally, how ethical issues were considered was explained at the end of this chapter. In the next chapter, a questionnaire will be developed and pilot-tested to measure the relevant constructs in the research.

Chapter 5. Measurement Construction

In the previous chapter, the research strategy used to address the research question was outlined and a brief summary of the research procedures was presented. On this foundation, this chapter will describe how measurement was developed. In particular, this chapter will focus on how the questionnaire was designed, the structure of the questionnaire, and how the questionnaire was pretested and, as a consequence, was revised.

5.1 The Design of Measurement

Measurement is a ruler of concepts (it is similar to measuring, for instance, a distance). In quantitative research such as the present study, to develop/find a measurement is to assign numerals or numbers to objects of interest, events, or variables according to some pre-specified rules (Frankfort-Nachmias & Nachmias, 1992). In the present research, the main concern in the process of measurement was to ensure that the created numerical system (i.e. the data set) was similar in structure to the concepts being measured (i.e. a valid measure). Specifically, considerations were given to whether the differences between the data of the two (or more) variables described the difference among real cases. This was critical because doing so determined the quality of measurement (Thietart, 2001).

There are two general approaches in measurement development. In some cases, researchers take a measure that is already developed and reported in the professional literature (i.e. an approach to find a ruler); in other cases, the researcher has to develop measures that will convert empirical observations into the form required by the research problem and the research design (i.e. an approach to develop a ruler) (Blaikie, 2000; Bryman, 2001). In the present research, the first approach was adopted: all concepts were measured by established measures. However, the processes of adoption were slightly different across different types of concepts.

In general, there were two types of information measured in the research: the demographic information including age, gender, race, education, functional background, tenure and the more abstract concepts: perceived diversity, conflict, subjective performance. The demographic information is qualitative and its measurers (they are to be called ‘qualitative measurers’ hereafter) are well established although recode processes are still necessary. Reasons for recoding will be explained when necessary.

There was a need to assess the measurement functionality of quantitative measures prior to the data analysis (at the both piloting and final stages) despite these scales (they are to be called ‘quantitative measures’ hereafter) having already been tested and were relatively established in diversity research. There were two reasons why functionalities of the established scales needed assessment. First, as the scales were adopted from other research, their configuration was open to discussion. Second, since most of the scales were tested in locations such the USA, UK, and in certain European countries, the functionalities of these scales were still a concern although Australia could have a similar research context to these other locations.

In order to maintain the high level of functionalities of these established scales reported in other research, efforts were made to preserve the wording of the original scales, particularly for quantitative measures. However, minor modifications were made to some scales to suit the particular research contexts. Changes are specified below.

5.2 The Questionnaire Structure¹⁴

In the original version of the questionnaire prior to pilot testing, contained 45 questions and these were allocated to five sections. While section Five was concerned with collecting demographic information about participants, sections One to Four were about participants’ attitudes towards diversity, conflict and performance.

¹⁴ A sample questionnaire is presented in Appendix B.

The numbers of indicators for each concept varied. However, there was normally one item for demographic information except for information about race. Because of the possible ambiguity in the meaning of 'Australian' (which some define as people with Australia citizenship, while others regard Australian as "white people with blue eyes and brown hair"), two questions were designed to capture information about participants' race and background and they will be discussed in detail in the section.

By contrast, all quantitative measures in this research had multiple-item scales ranging from two to five. There are many reasons why it is desirable to measure these concepts in the research by using multiple indicators rather than one. For example, given the complexity of concepts in this research multiple indicators could be particularly helpful. The concepts measured by quantitative measures in this research all have multi-facets (i.e. dimensions) and it was unrealistic to attempt to capture one concept with a single question (Aaker et al., 2007). In addition, multiple indicators can help to develop valid measures, help to increase reliability, and so forth (de Vaus, 2002).

The sequence of questions was determined by three factors. First, the sequence of questions needed to be both interesting and logical to the participants. The questionnaire, as a whole, should flow smoothly from one area to the next. Second, questions about performance were deliberately arranged at the beginning of the questionnaire in order to decrease the percept-to-percept impact, one limitation associated with subjective measures. These were discussed in the previous chapter. Third, demographic questions were placed at the end of the questionnaire (section Five). Doing so was built on an assumption that the participants are likely to develop some degree of trust and confidence by the end of the survey where the most sensitive questions (e.g. the question for gender, age, race and so forth) are placed. Based on these factors, the sequence of the questionnaire was arranged in the following way.

5.2.1 Section One: Group performance

As stressed earlier, participants' perception about their performance was placed at the beginning of the questionnaire to reduce the percept-to-percept effects. This is one of procedural remedies recommended in the literature to control percept-to-percept biases (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Specifically, questions were mainly about participants' experiences and their perception of their and other group members', experiences in the work teams. These items were to measure two different types of subjective performance: job satisfaction and group innovativeness.

5.2.1.1 Job satisfaction

Job satisfaction was measured using five items that were adopted from Levy (2003, p299). This scale was originally designed to tap the extent to which employees were satisfied and happy with their jobs. The five items were ranked on a seven-point Likert scale (from 1=strongly disagree to 7=strongly agree). Participants were asked for their perception on the following five statements "Generally speaking, you were very satisfied with your project team (question 1); You frequently thought of swapping to another project team (question 2); You were generally satisfied with your roles in your project team (question 3); You believe that most people in your team were very satisfied with their roles (question 4); People involved in your project often thought of swapping to other team/s (question 5)."

The major content is identical to the original version although there are minimal changes to suit the research context. Among the items, question 2 and question 5 were reverse-coded.

5.2.1.2 Innovativeness

The scale for innovativeness was adopted from Matsuo's recent work (2006). Matsuo developed this scale out from Scott and Bruce's work (1994).

In this scale, there were five items, “The main function of members was to follow others’ instructions in your team (question 6); A person could get in a lot of trouble by being different in your team (question 7); People in your team were expected to deal with problems in the same way (question 8); A person could not do things that were too different in your team (question 9); The team leader or people taking the role of team leader usually got credit for other’s ideas (question 10).” The five items were ranked on a 7-point Likert scale (from 1=strongly disagree to 7=strongly agree). Different from job satisfaction, all items for innovativeness were reverse-coded.

5.2.2 Section Two: Characteristics of teams and tasks

The second section of the questionnaire was designed to seek information about participants’ teams and job/task characteristics. Task interdependence and job routineness were sought.

5.2.2.1 Task interdependence

Task interdependence was measured through three items adopted from Van der Vegt et al. (2003). The major content is identical to the original version although there are minimal changes to the items with respect to the tense. In particular, the 7-point scale (from 1=strongly disagree to 7=strongly agree) asked participants’ opinions with regard to three statements that describe the extent to which an individual needed to work closely with his/her team-mates.

The three statements were, “You had a one-person job, you rarely had to check or work with other team members (question 11); You had to work closely with your team members to do you work properly (question 12); in order to complete your work, your teammates and you had to exchange information and advice (question 13)”. This scale was adopted because it was used in a range of successful studies with high levels of functionality (e.g. Jehn et al., 1999).

5.2.2.2 Job routineness

The scale for job routineness was adopted from Jehn, Northcraft, and Neale's work (1999). Similarly to task interdependence, the 7-point Likert scale (from 1=strongly disagree to 7=strongly agree) sought participants' opinions with regard to three statements that describe high routine jobs.

The three statements were, "The methods you followed in your work were about the same for dealing with all types of tasks, regardless of the activity (question 14); Your job was very routine (question 15); You felt like you were doing the same thing over and over again (question 16)." The content was identical to the original scale.

5.2.3 Section Three: Perceived diversity and openness to diversity

In section three, two concepts were measured: perceived diversity and openness to diversity. Based on a seven-point Likert scale (from 1=strongly disagree to 7=strongly agree), participants were asked for their perception of their similarity to their team members as well as their attitudes towards diversity.

5.2.3.1 Perceived social and informational diversity

Four items were adopted from Hobman et al. (2004) to measure perceived diversity including both social and informational diversity. The content of four items remained identical to the original version and the questions asked participant's perception of how they feel different from the other members of their teams in terms of various characteristics. In particular, there were two items to measure each type of perceived diversity.

The two items for perceived social diversity were: "You felt you were visibly dissimilar to other team members (question 17); In terms of visible characteristics (e.g. age, gender, ethnicity/race), you thought you were different from other team members (question 18)". Similarly, perceived informational diversity was measured by two

questions: “You felt you were professionally and/or educationally dissimilar to other team members (question 21); In terms of functional background (e.g. professional background and/or work experiences), you thought you were different from other team members (question 22)”.

5.2.3.2 Openness to diversity

With regard to perceived diversity, items for openness to diversity were also adopted from Hobman et al. (2004) including openness to both social and informational diversity. No change was made to the original version. Specifically, the questions asked for participants’ perception of the members’ attitudes towards diversity and strategies to deal with diversity issues. In particular, there were two items to measure the perception towards each type of diversity.

For perceived social diversity, the two items were: “In your team, members enjoy doing jobs with people of different race/ethnicity, gender and/or age (question 19); In your team, members make an extra effort to listen to people of different racial/ethnic background, gender and or age (question 20)”. For perceived informational diversity, the two questions were, “In your team, members enjoy doing jobs with people from different professional backgrounds and/or work experiences (question 23); In your team, members make an extra effort to listen to people who are from different professional backgrounds and/or work experiences (question 24)”.

Although the four items measured the same construct i.e. openness to diversity, they were placed respectively after items for perceived diversity. This was because it offered participants a clear structure to follow.

5.2.4 Section Four: Conflict and conflict climate

The section four was divided into two parts: part A dealt with conflict while part B was about openness to conflict.

5.2.4.1 Part A: Conflict

There were four items for task conflict and relationship conflict respectively. Both scales used eight items that were adopted from the work of Jehn (1994; Jehn, 1995). The scales have been successfully used in numerous studies for measuring intra-group conflict and they have been well accepted for demonstrating high reliability and validity. Therefore, no change was made from the original version.

The four items for task conflict were, “How much conflict of ideas was there in your team (question 25); How different were your views on the content of your project (question 26); How much did you talk through disagreements about your team projects? (question 27); How much disagreement was there about task procedure in your team (question 28)?” Three of the questions (questions 25, 27, and 28) used the seven-point Likert scale ranked from ‘None=1’ to ‘a lot=7’. Question 26 used the seven-point Likert scale ranked from ‘Identical=1’ to ‘totally different=7’.

There were four items for relationship conflict as well, “How often did people get upset while working in your team (question 29)? How much were personality conflicts evident in your team (question 30)? How much emotional tension was there in your team (question 31)? How much interpersonal friction was there in your team (question 32)?” Question 29 used a seven-point Likert scale ranked from ‘Never=1’ to ‘Quite Often=7’. The other three items (i.e. question 30, 31, and 32) used the seven-point Likert scale ranked by from ‘None=1’ to ‘a lot=7’.

5.2.4.2 Part B: Openness to conflict

Openness to conflict was measured by four items adopted from Amason and Sapienza (1997). These four items asked participants to respond to four statements with a seven-point Likert scale (from 1=strongly disagree to 7=strongly agree). However, there were some changes made to the original version, in order to emphasise the context of team/group, teams/groups as backgrounds were added to each statement.

The four items for openness to conflict were “In your team, your team members thoroughly and sincerely evaluated different alternatives (question 33); The job quality improved when all the team members participated (question 34); In your team, dissenting opinions were encouraged (question 35); The team members enjoyed debating different ideas (question 36)”. Although two types of conflict were measured in the research, items for openness to conflict have not been linked to any particular types of conflict. Similar to the construct of openness to diversity, openness to conflict has a clear collective nature of property indicated in the statements.

5.2.5 Section Five: Demographic information

In this section, seven different kinds of demographic information were sought from participants including gender, race/ethnicity, age, education level, tenure, functional background, occupation, and group longevity. The information forms the basis of objective diversity.

5.2.5.1 Gender

One item was used to measure gender and the item was, “Your gender (question 37).”

5.2.5.2 Race/ethnicity

The measurement for race was most difficult to develop due to its sensitivity. A dichotomous question of ‘white or non-white’ was not used because it seemed to be an oversimplification, forcing the participants to answer. It was also likely to cause measurement errors and decrease the response rate. In order to increase the response rate, four items were used for this information. By doing so it was believed that participants were offered alternatives if they did not feel comfortable with the answer to any one of the items.

The four items were, “What is the ancestry of your family (question 38); What country were you born in (question 39); What language do you speak at home (question 40);

How would you describe your visual appearance (question 41).” All the information was believed to be helpful in identifying the participants’ dichotomous race classifications such as ‘white vs. non-white’ and ‘Asian vs. non-Asian’.

5.2.5.3 Age

There was only one item for age and it was, “Your age (question 42)”. Participants were provided five age categories ‘under 30’, ‘30-39’, ‘40-49’, ‘50-59’, and ‘60 and above’. This classification was taken because it best-suited the context of the Victorian workplace. For example, unlike the category used in other research (Hobman & Bordia, 2006), only a small proportion of the workplace are ‘under 20’. In addition, the behavioural differences between age 31-35 and age 36-40 might not be significant enough to be put in two groups.

5.2.5.4 Educational level

The classification of education level was adopted from the Australian Bureau of Statistics (Australian Bureau of Statistics). The question was “What is the highest level of education that you have completed (question 43)”. Participants were offered seven choices, “Up to year 12; certificate level 4; advanced diploma and diploma level; bachelor degree level; graduate diploma and graduate certificate; postgraduate degree level; other”.

5.2.5.5 Tenure

An item was developed to measure tenure, “How long have you worked for the current organisation in years (question 44)”. Participants were offered ten choices from 1 year to 10 years or more.

5.2.5.6 Group longevity

An item was developed to measure group longevity. Participants were asked, “How long have you worked for your current team in months (question 45)”. Participants were offered 60 choices from one month to 60 months or more.

5.2.5.7 Functional background

Functional background was assessed with one item, “What is your job title within the organisation (e.g. manager) (question 46)”. This is an open ended item. Participants were offered a short blank text space in which to record their answers.

5.3 The Survey Pilot Test

In this research, a pilot study was conducted to pre-test the questionnaires before the final administration including both its measures and its appearance and structure. To ensure participation go smoothly, the pilot was undeclared. That said, the participants were not told that the questionnaire was still under development. This method was chosen because all indicators in the questionnaire were well accepted and it was not the main objective of the pilot to improve the content of questions. Instead, the main objective of the pilot was to examine how the well-established scales could be combined together and how these scales would function in the Australian context.

5.3.1 The process

The survey was tested on students doing a Master’s of Business Administration (MBA) in a Victorian regional university, Australia. In teams, these students were doing student projects for their subjects. These teams normally have four to five members. The duration of projects spanned eight to ten weeks. The survey was administered at the end of the projects. More importantly, the participants were mature students who were normally working in Victorian workplaces or had such experiences.

About 100 copies of the questionnaire had been prepared for the students in four different subjects. With respect to the content of the questionnaire (i.e. the items), not all items were put in the pilot survey. In particular, some items for moderators were left out of the pilot survey because those constructs such as job interdependence and job routineness did not apply to teams of short duration. In addition, in the demographic information, tenure and group longevity were taken out because these did not apply as well to the student teams. However, in order to identify participants' membership of student project teams, their names and student numbers were requested.

Either the researcher or the course instructors administered the survey. This approach of survey administration offered the advantage of getting direct feedback from participants. Apart from the plain language statement, the students were both orally and literately informed of their right of not undertaking or continuing the survey at any time in either situation.

There were a total of 47 questionnaires returned. However, there were seven cases where missing values were more than 25 per cent. These cases were deleted. The sample size became 40, which was acceptable because it was greater than the suggested number (i.e. 25) for any complex survey (Aaker et al., 2007).

It was slightly different from the normal piloting procedure with respect to examining the participants' demographic information. Although it has been argued that the demographic characteristics of piloting participants such as age, gender, education should match the final sample (de Vaus, 2002; Oppenheim, 1992), the close match was not sought in this research because this research explored effects of variation in those dimensions. Accordingly, a report of demographic characteristics of the participants was less useful in this research. However, the respondents were considered to be reasonably representative of the final population. This was due to two reasons: A). the MBA students are mature students with a broad range of ages ranging from category one (i.e. under 30) to four (i.e. 50-59); B). the participants were studying part-time and they all had work experience in Victoria.

While the pilot sample size was relatively small, some evaluating assessment was still carried out, using SPSS as the analysis software. Apart from evaluating the general presentation of questions, the assessment also included response variations and reliability and validity tests. However, the validity test was done only from the perspective of face validity i.e. whether indicators were able to reflect or represent some parts (i.e. dimensions) of the concepts. The results have been attached in Appendix C.

5.3.2 The Presentation of the questionnaire

The presentation of a questionnaire is of significance to participants, especially in self-completion questionnaires such as the survey used in this research. In particular, aspects of presentation of the questionnaire examined in the pilot study included the length of questionnaire, the layout of the questionnaire and the wording of questions. The criteria for checking the aspects were related to, for instance, non-responses.

The length of the questionnaire was the first concern of the pilot testing because a long questionnaire is likely to increase the missing data due to participants' refusals to answer caused by their fatigue. It was suggested as a good practice that the participants know the expected length in advance (Aaker et al., 2007). The participants were informed that it would take them five to eight minutes to complete the survey and the number of questions in the content. With respect to the length, it was noted that all respondents finished the questionnaire within a reasonable time span.

Because wording of particular questions and the layout of the questionnaire could have an influence on how a respondent interprets them, which in turn influences the responses pattern (Neuman, 2000), the wording of questions and the layout of questionnaire were the focus of the pilot test. Doing so was particularly important in this piloting work because one of the main objectives was to examine how well the established scales combined together. In doing so, careful consideration was given to the following points. First, how well the questions followed one another? This was examined by noting any

confusion raised by the participants in the process of survey completion. Fortunately, there was no such concern raised during the process.

The issue of non-response for a particular question was another focus of the piloting. Indeed, it was found that the majority of participants refused to give their names and their student numbers. Although the cover letter clearly stated that “this information will be deleted after the groups have been identified, and no further identification of your responses will be possible”, it was clearly indicated that anonymity to the participants was a concern and the approach of asking personal information to determine the group membership was not feasible. Since group memberships were the critical information for the data analysis, there was a need for this research to develop an alternative question/technique to obtain the information. This was done and more details are presented in the section “Revision of the Questionnaire”.

5.3.3 Variation of responses

The variation of responses in the piloting was assessed. This was done through a basic frequency analysis with both frequency tables and skewness testing. It was found that all quantitative items had generated variation in responses. The variation was indicated in widely spread histograms. Although the pilot data were quite skewed for a couple of items, it was likely that a greater variation and a better skewness would be found in a larger sample. Further results can be found in Appendix C.

5.3.4 Validity testing

The validity testing was mainly about face validity. Repeated examinations of each scale were carried out to explore if indicators in the same scales were measuring the same things. No conflicting item was found with respect to face validity. Due to the small size of the sample of participants, confirmative factory analysis (CFA) was not conducted.

5.3.5 Reliability testing

Reliability testing was done via SPSS. As shown in Table 5-1, scales showed a high level of reliability and these scores were normally bigger than 0.7 (Cronbach's Alpha) except for two scales. The scale of innovativeness had a score of 0.619 (Cronbach's Alpha) within five indicators. A further analysis, 'Cronbach's Alpha if item deleted', showed that the score could reach 0.711 if indicator FIVE was deleted. The scale of task conflict also had a score below 0.7 but it could reach 0.802 if item THREE was deleted. However, there was no item that has been deleted at this stage. As the Cronbach scores were reasonably high (all close to 0.7), the functionalities of these scales were not be of concern.

Table 5-1 Reliability test results

Scales	Cronbach's Alpha	N of Items	Increased Cronbach if item deleted
Job satisfaction	0.879	5	0.900 if item 5 deleted
Innovativeness	0.619	5	0.711 if item 5 deleted
Perceived social diversity	0.704	2	N/A
Perceived information diversity	0.888	2	N/A
Perceived diversity	0.859	4	N/A
Task conflict	0.675	4	0.802 if item 3 deleted
Relationship conflict	0.934	4	N/A

5.3.6 Revision of the Questionnaire

A number of issues were raised during the piloting process and the revision was carried out accordingly. First, a few minor wording mistakes were changed. Second, given the high rate of missing values in the item to identify participants' group memberships, a different item was created for the final study. Specifically, all participating organisations were asked to provide group lists and every member in lists was aware of his/her membership. Accordingly, the researcher developed a question, "which team are you from". The participants were then provided with choices of group lists created by each organisation. Thus, the group membership could be clarified without asking for identification-related information.

A third major revision was related to items on race. Given the existence of missing values in the item on race, the measures for race have been extended to multiple items with four indicators.

Apart from the above, the pilot study gave the researcher valuable experience in the design of relevant administrative procedures. It was found that a paper-and-pen based survey with intensive work on data entering might not be feasible for the present research. The research was then mainly conducted using an online approach (the detailed rationale is to be discussed in the next chapter), which indeed saved a lot of time in data entry.

5.4 A Summary of Chapter

This chapter described how measurements were developed and pilot tested. The description focussed on how the questionnaire was designed, followed by an introduction of the structure of questionnaire. In addition, details were given about how the questionnaire was pilot tested and revised accordingly. The next chapter will describe how the data were collected by using the questionnaire.

Chapter 6. Data Collection

The preceding chapter described how the questionnaire was constructed and pilot-tested. This chapter focuses on the process of data collection. The chapter first discusses the research context, followed by issues related to samples such as characteristics of participating organisations and the teams/groups included. Then, the discussion covers issues such as methods of questionnaire administration and questionnaire return rates; finally, the chapter concludes with a summary of the characteristics of respondents and their responses with respect to different organisations.

6.1 A Victorian Research Context

This research was carried out in Victoria, the most intensively populated state in Australia. There were reasons why this diversity research was conducted in Victoria. This was because doing so was of significance to the literature and was feasible for this PhD thesis. Specifically, few diversity studies have been conducted in Victoria.

Second, the current research might be particularly meaningful in the Victorian context due to the Victorian demographic structure of the population. According to census statistics (2006) from the ABS, Victoria is a highly diverse state, particularly in terms of its demographic dimensions, and these were of interest to the researcher. The specific percentages of each dimension are outlined below.

In terms of Country of Birth (CoB), among people who reside in Victoria in 2006, 23.8 per cent were born overseas and 0.7 per cent were overseas visitors making up a total of 24.5 per cent (the largest responses were: England 3.3 per cent, Italy 1.7 per cent, New Zealand 1.3 per cent, VietNam 1.2 per cent and China 1.1 per cent.); with respect to languages spoken at home for people who usually reside in Victoria, several languages other than English (74.4 per cent) were spoken at home: Italian 2.7 per cent , Greek 2.4 per cent , Vietnamese 1.5 per cent , Cantonese 1.4 per cent and Mandarin 1.3 per cent ; with respect to religion, there was a diverse structure of belief: among the responses,

Catholic 27.5 per cent , No Religion 20.4 per cent , Anglican 13.6 per cent , Uniting Church 5.6 per cent and Eastern Orthodox 4.5 per cent (Australian Bureau of Statistics).

In addition to the current diverse demographic structure in Victoria, there was a trend towards diversification in the Victorian population. For example, from 2005 to December 31, 2006, Victoria's annual population growth was largely driven by net overseas migration (NOM), which accounted for approximately 55 per cent of the state's growth. As a result of the NOM, it could be said that Victoria is becoming even more diverse.

Apart from the reasons that were associated with Victorian demographic characteristics, the third reason to conduct the research in Victoria was finance-related. As the PhD thesis was un-funded, it was practical to avoid long distance travel to meet participating organisations. This strategy has been proven particularly feasible because the data were collected from a number of organisations located in various parts of Victoria and the process of data collection took more than one year.

6.2 Issues Related to Samples

6.2.1 Sampling strategy and process

Although probability sampling (i.e. random selection) remains the primary method of sampling (Babbie, 1992), the sampling processes in this research were non-probability sampling. In probability sampling, researchers use the probability theory to determine sample frames and to calculate sample sizes based on the specified population (Aaker et al., 2007). In this project, no list of the population was available (i.e. all organisations having work groups in Victoria), nor was the research likely to create one. Therefore, this research relied on available participants, an approach that is called convenience sampling (Neuman, 2000). This approach is considered a quick and inexpensive method (Aaker et al., 2007) and this feature was appropriate for an unfunded PhD research.

As this research was focused on diversity from a broad perspective including both social and informational diversity attributes, there was no requirement for the organisations approached to have any particular set of demographic characteristics. Instead, the researcher approached any organisation that was functioning via groups/teams. However, given the nature of small companies, companies would need to be of medium or large size. In addition, because geographically distributed groups have been found to have different working relationships from collocated groups (Hinds & Mortensen, 2005), this research focused on collocated groups where diverse group members interact with each other more intensely. Therefore, any medium or large organisations having collocated working groups in the Victorian workplace were included in the population.

6.2.2 Characteristics of participating organisations

Fortunately, six organisations had shown their interest in diversity research and participated in this survey. Given the various natures of the industries the participating organisations belonged to, it might be helpful to describe them individually. In addition, due to the issue of confidentiality, none of the participating organisations are named. Instead, they will be referred to by codes. Accordingly, no information from their websites is referred to either. A summary of the participants has been presented in Table 6-2. The following section describes each organisation respectively.

6.2.2.1 Participating organisation one: a call centre (PR)

PR is a call centre and it provides services in areas such as contact centre management, customer relationship management, direct marketing, and so forth. One of the significant characteristics of PR is that its TMT takes the issue of diversity seriously. In the first meeting with four members of its TMT led by the CEO, the participation plan was created with full support from all senior members who were in charge of different departments (e.g. HR).

With respect to the nature of its business, jobs in call centres are termed ‘dead-end’ jobs that are often characterised by ‘low status, poor pay and few career prospects’ and often labelled as ‘electronic sweatshops’ (Malhotra, Budhwar, & Prowse, 2007). Given the nature of business, the background of the workforce in call centres is becoming increasingly diverse. Despite the growing popularity of call centres, researchers report that employees as well as customers are less satisfied with call centre service operations as compared to more traditional (in-person) services (Malhotra et al., 2007).

PR has more than 400 employees but it was decided to administer this survey only to employees at the head office, where there were approximately 180 employees working in functional departments (e.g. HR) as well as the call centres. These employees were allocated to a total of 23 work teams. Among them, 18 were call centre teams providing service for a range of clients. The others were functional teams such as administration, learning services, and so forth.

6.2.2.2 Participating organisation two: a corporation group in the decorative surface business (LX)

Although there were only 5 participants from LX (in one group from the HR department in its Victoria office), it is still necessary to describe LX, a leading marketer, distributor and manufacturer of premium decorative surfaces in Australia and New Zealand. As a group, LX has a portfolio of market-leading brands. It has an extensive national distribution network in Australia, with dedicated distribution centres that specialise in customer service and design selection, and over 8,000 marketing and information display centres in independent outlets. The Company has distribution arrangements in New Zealand with independent distributors that provide access to customers in all regions. The business approach may explain why its HR people were interested in a diversity-related survey.

6.2.2.3 Participating organisation three: a construction material provider (BL)

BL is one of Australia's largest building and construction materials suppliers and it has operations worldwide. It produces and distributes a broad range of construction materials to customers in the building and construction industries with operations concentrated in three key geographical markets - Australia, the USA and Asia. BL has leading market positions in all three geographic markets.

BL has a particular characteristic that is worthy of mention: it has a clear diversity policy stating that BL is committed to operating in a manner that exhibits respect for differences among employees, customers and communities. In particular, it requires a workplace free of discrimination or hostility with respect to a range of attributes such as gender, race, religion, ethnicity, national origin, age, disability, marital status, family responsibilities, pregnancy, sexual orientation, political conviction or trade union activity. In addition, it requires its employees to act in a manner that helps create and maintain a workplace environment that supports diversity and a workplace that is free from discrimination and harassment. It would be very useful to find out if this characteristic makes a difference to the effects of diversity.

While BL has more than 16,200 employees worldwide, the survey was only done in its Victorian office. Thirty-four employees in seven teams from a range of areas were allocated to participate in the survey. The teams were based on different work locations.

6.2.2.4 Participating organisation four: an energy provider (CP)

CP is an electricity distributor in Victoria and it operates one of the most reliable electricity networks in Australia. CP is known to its employees as a strong, leading and yet stable employer. In consultation with its employees, CP has developed a set of core values and behaviours that reflect its expectations both in the performance of individual work and the way CP's people do business as a whole. For example, CP aims to offer a wide array of challenges and opportunities within a technical and complex environment. CP believes that people who work together can achieve the best outcome for customers.

One important characteristic of CP is that it is a foreign-owned company (Asian company).

A total of 150 employees were nominated to participate in the survey. As suggested by the management, the team structure was based on the locations they worked in: Melbourne, Geelong, and other.

6.2.2.5 Participating organisation five: a manufacturer (AA)

AA is the world's leading manufacturer and supplier of locking solutions, meeting tough end-user demands for safety, security and user friendliness and it has more than 30,000 employees world wide and annual sales of about AUD\$5 billion. Its Asia pacific division comprises companies in Australia, New Zealand, China and elsewhere in Asia. More than 60 employees were chosen to participate in the survey. They mainly worked in the head office (Victoria) of its Australian branch. Although the head office is located in its major manufacturing site where there are a large number of workers, AA decided not to survey the workers due to the low accessibility of computers.

There were a total of four teams in AA and the teams were based on participants' functional backgrounds. The four teams were the customer service (team one), the customer service (team two), the finance team, and the information technology team.

6.2.2.6 Participating organisation six: an aged care provider (BS)

BS was established in 1948 by a small group of volunteers with religious backgrounds, who saw a real and urgent need within the community to provide care and support to vulnerable elderly people such as those who were poor, widowed or lonely. With its genuine concern for older people in disadvantaged circumstances, BS grew from its small beginnings to become one of Victoria's foremost not-for-profit providers of specialist aged care services. It currently employs more than 1,000 employees, who are

supported by 600 volunteers, to care for more than 2,000 clients across Melbourne, the Mornington Peninsula and regional Victoria.

One characteristic of BS is its interest in cultural diversity with its elderly clients. According to the Australian Institute of Health and Welfare report, *Projections of Older Immigrants (2001)*, by the year 2011 Victoria will have the country's most culturally diverse older population. It is expected that immigrants from culturally and linguistically diverse backgrounds (CALD) will make up about one-third of the state's older population. Recognising this diversity of client backgrounds, BS aims to provide culturally appropriate care to meet the individual needs of its clients.

A total of 113 employees were nominated to participate in the survey. These employees were allocated to 11 teams. Among these teams, seven were created for the purpose of this survey: teams of team leaders from certain regions (e.g. eastern Melbourne).

6.3 The Survey Administration

Two issues of the survey administration were the approaches of administration and the questionnaire response rates (QRRs). This section describes the rationale for choosing the survey administration approaches and how the specific administration approaches were carried out, followed by cautious planning to maximise QRRs,

6.3.1 Methods of questionnaire administration

While approaches of administering the survey are of significance to data quality, choosing the way to conduct a survey is not easy. As mentioned in Chapter Four, there are four ways to conduct a survey: personal interviewing, telephone interviewing, mail survey, and online. While each technique may have its obvious strength/s, no approach is consistently superior to the others. The strengths and weaknesses of each approach have been summarised in the table below.

Table 6-1 Evaluations of four survey techniques

Criterion	Personal interview	Telephone interview	Mail (handouts)	Online (web-based)
Cost	High	Moderate	Low	Extremely low
Response rate	High	High	Low (high for handouts)	Moderate
Control of situation	High	Moderate	Low	Low
Applicability to geographically dispersed population	Moderate	Moderate	High	High
Applicability to heterogeneous populations	Low	Low	High	High
Collecting detailed information	High	Moderate	Moderate	Moderate
Speed	Low	Moderate	Low (high for handouts)	High

Source: (Aaker et al., 2007; Bryman, 2001; de Vaus, 2002; Oppenheim, 1992; Wright, 2005)

As shown in Table 6-1, each of the techniques has different strengths and weaknesses. In terms of strengths, personal and telephone interviews have traditionally been seen as the most effective in response rates; personal interviews may be particularly strong in terms of controlling the operation. However, both approaches are expensive, particularly when accessing a geographically located and heterogeneous population (Aaker et al., 2007). One of the major strengths of mailing a survey is its low cost and high flexibility to access a population (Bryman, 2001). Unfortunately, a mailing survey is also the least flexible methods in terms of speed (de Vaus, 2002). By comparison, online surveys have become increasingly popular due to their obvious strengths such as extremely low costs and high response speed (Wright, 2005).

The main method chosen for this research was the online approach. However, because there were just 5 nominated participants in LX, the handout approach was used in this organisation. The rationale for choosing these approaches is articulated in the following sections.

6.3.1.1 The online approach (web-based)

There are debates about conducting survey research online (Wright, 2005) and research has been used to assess the differences between traditional approaches and online-based

surveys (Healey, 2007). The debates are associated with both advantages and disadvantages of conducting survey research online.

Due to a tremendous increase in Internet use and computer-mediated communication online surveys have become increasingly popular (Wright, 2005). It was estimated that 20 per cent of research in Australia in 2004 was from online methodologies; in the United States, the estimation is even higher at 30 per cent (Aaker et al., 2007). The following discussion will demonstrate the advantages from the cost perspective, the speed of response, and so forth.

With respect to costs, once start-up costs are absorbed, online surveys can save money by reducing the paper, ink, mailing, and the environmental costs associated with the paper-and-pen counterparts (Thompson, Surface, Martin, & Sanders, 2003). For example, costs are decreased for photocopying surveys, mailing packets, typing, scanning, cleaning, and coding data (Automatic data entry increases accuracy because coding errors are less likely).

With respect to the speed of response, responses are received more quickly because the online surveys are delivered to participants faster and the data analysis/feedback steps are automatic or accelerated, leading to more timely use of participant input (Andrews, Nonnecke, & Preece, 2007).

Apart from the advantages mentioned above, it has even been suggested that online surveys eliminate the possibility of a respondent being identified based on his or her handwriting style, increasing respondents' feelings of lack of anonymity (Thompson et al., 2003). This was a concern raised in the pilot with respect to identifying group memberships.

However, it has also been pointed out that the online-survey approach might be limited at times. For example, there is uncertainty over the validity of the data and sampling

issues as well as concerns surrounding the design, implementation, and evaluation of an online survey (Wright, 2005).

The online survey was provided by a commercial web server, which is powered by the Apache (open source software that provides communication between web servers and visiting computers), PHP 5 (a powerful computer language that has particular strengths in communication between web servers and databases) and MySQL (a very powerful and reliable relational database management system). The specific application software is LimeSurvey, an open source software package that has a very user-friendly interface.

Although the researcher has a solid knowledge of Apache, PHP and MySQL (there is a similar platform running in his computer), it was decided to carry out the survey via a commercial web server based on considerations of reliability and security. Operated by a group of professionals, the web server provided a reliable and secure means of conducting online surveys. This strategy was proven successful in the later stages of the research with regard to reliability.

6.3.1.2 The paper-and-pen survey administration

Although online surveys have become more and more popular, paper-and-pen surveys persist in research contexts where participants have limited computer literacy and/or accessibility (Thompson et al., 2003). However, the reason for using paper-and-pen surveys was more practical. Because only five people were nominated in LX, it seemed unsuitable to setting up an online survey for such a number. In addition, there was little pressure on tasks including survey administration as well as data entry for five cases.

Apart from the consideration on strengths of online and paper-and-pen surveys, there were also other practical reasons for taking the particular approaches to conduct in the survey. First, as the research was an unfunded PhD thesis, finance was of concern. The chosen approaches were ideal because associated costs were the lowest. This was particularly the case for the online approaches. In addition, due to the strict time frame of

a PhD, the process of data collection had to be done within a strict timeline. Both the handout-approach and web-based technique had obvious advantages of faster distribution and return of questionnaires. Furthermore, as all participants were nominated by their organisations, there was no issue around the validity of data and sampling.

6.3.2 Survey administration

There were differences in distraction processes between online and paper-and-pen survey. It is necessary to describe them separately.

6.3.2.1 The online survey administration

The process and length of survey administration varied between organisations. While it took only a couple of months for some organisations, it took more than one year for the others such as AA and BS. However, there were certain procedures common to all organisations. The commonality included the following stages: confirming participation, preparing participation, survey administration, and the post stage of survey administration.

Stage One: Confirming participation. Establishing the participation confirmation was the objective of this stage. As requested by participating organisations, meetings or other correspondence between the researcher and organisations were carried out. HR managers were normally the contact for organisations (except for PR, where the CEO was the organiser for the participation, which certainly facilitated the survey administration. The survey at PR was completed within three months.). During the initial contact process, participating organisations normally asked questions in relation to how to participate in the survey and issues such as how organisations could benefit from their participation.

At the end of this stage, organisations had confirmed their participation. As a condition of the conditional ethical approval mentioned in the methodology, written

correspondence was requested from all organisations. Written consent letters from all six participating organisations were obtained and the consent letters were passed on to the University ethics committee for a final approval.

Stage Two: Preparing participation. Prior to the survey administration, further correspondence (either face to face meetings, or other methods) took place allowing the researcher to introduce the project in more detail. (In one case, several meetings were made with the survey administration team). The introduction included explanations of both theoretical objectives and potential practical implications. The correspondence was important because doing so would maximise the potential benefits for organisations and minimise the negative impact on participants in the survey.

Following the introduction there was a need to identify team structures in each organisation. As mentioned earlier, the creation of team lists was to assure the anonymity of participants. During the process, the researcher clarified a number of issues for participating organisations. For example, it was acceptable that one participant could belong to two or even more teams simultaneously. There were two different situations where the team structures were divulged to their members: A. team lists gave all team members' names; B. team lists gave team names, which made sense to their members (e.g. HR team).

According to the team structures, the researcher developed specific versions of the surveys for each organisation. In total, five different versions of the online survey were created. However, the only differences among the versions were related to the questions of team structures "which team are you from". The main content (i.e. questions) was identical.

Stage Three: Survey administration. Stage THREE could be further divided into three sub-stages: sub-stage 1. Starting the survey; sub-stage 2. Follow-up contact and extending the participation; sub-stage 3. Concluding the survey.

- Sub-stage 1. Starting the survey. Individual participants were normally contacted by participating organisations (except for BL, where the researcher got the email addresses of all 34 participants and directed the participants throughout the process). However, on behalf of organisations, a sample letter was prepared by the researcher in order to give participants the necessary information regarding the project and to offer participants opportunities to ask questions as they might wish to know more about the research or if they were confused about certain questions. The sample letter introduced the project as well as the potential benefits from the participation. (Please see Appendix D for more details). Organisations normally combined this letter with their introductory message. In addition, participants were informed of the timeline to complete the survey, which was normally two weeks. A deadline gave the participants a sense of seriousness.
- Sub-stage 2. Follow-up contact and extending the participation. At the end of the second week, reminder messages were sent out including deadlines and links to the survey (in case participants had accidentally deleted the initial messages). At the end of each week, the researcher sent out the updated information about the number of people who had completed the survey. The information was made available for organisations to decide if they wanted to extend or conclude the survey. No organisation completed their survey within two weeks. All organisations extended the survey for one more week (some organisations had even extended it twice) in order to obtain better response rates or to ensure everyone had a chance to read their message (e.g. participants might be on leave).
- Sub-stage 3. Concluding the survey. Surveys were normally concluded within three weeks. Organisations sent messages from the management and from the researcher showing their appreciation. Most importantly, the concluding messages gave the participants information about where they could access the results of this project.

Whereas the online procedures were similar across participating organisations, PR had a slightly different procedure. Specifically, PR conducted the survey on its intranet (rather than internet) and communication with participants was carried out by PR staff, a computer specialist. Accordingly, PR did not use the web server made available. Instead, the computer specialist developed his own version of the online survey through database software named Access, which is available in most PCs using Microsoft Office. However, the person did send the Access-version survey to the researcher for comment prior to distributing to PR's participants.

6.3.2.2 The paper-and-pen survey administration

The paper-and-pen survey administration used the same processes, as did the online survey. However, copies of the survey were packed and delivered to the administration staff in LX, who then administered them to the participants. The administration staff also collected the survey and posted it back to the researcher. The administration staff was also informed of their participation anonymity and were reminded to seal the survey during the process.

6.3.3 Questionnaire return rates

As questionnaire return rates (QRRs) determine the quality of survey research, the concern of QRRs has been the foundation of questionnaire administration. Actually, this researcher used cautious procedures to maximise QRRs. For example, with respect to survey administration, efforts have been made to seek the possibility of completing questionnaires during working hours, which meant participants would get paid for what they did. This issue was assumed to be particularly salient because this was assumed to be a work-related matter. Fortunately, all participating organisations agreed to ask their participants to complete the surveys within company time.

6.3.4 Participation summary

The exact numbers of participants from each organisation is summarised in the Table 6-2. In six columns there is information about organisation codes, numbers of teams from each organisation, the numbers of nominated participants, numbers of responses, useable responses from each organisation, and responses rates accordingly.

As shown in Table 6-2, there were 49¹⁵ teams from the six organisations. Among them, PR had 23 teams. Within the 49 teams were 532 nominated participants (i.e. team members). Among those nominated participants, 355 had completed the questionnaires (whether in full or part). Among 355 cases, 280 cases were determined to be useable. However, the response rates were calculated by numbers of responses divided by nominated participants. Relatively, LX, BL, BS, and PR had higher response rates more than 0.75. AA and CP had rates at 0.18 and 0.51 respectively.

Table 6-2 A Summary of participation

Organisations	Numbers of Teams	Nominated participants	Numbers of Responses	Useable Responses	Response Rates
PR	23	170	133	66	0.78
LX	1	5	5	5	1.00
BL	7	34	32	32	0.94
CP	3	150	77	70	0.51
AA	4	60	11	10	0.18
BS	11	113	97	97	0.86
Total 6	49	532	355	280	0.67

6.4 A Summary of the Chapter

This chapter described the process of data collection, which included the characteristics of the research context, characteristics of participating organisation, and methods of questionnaire administration. This chapter concluded with a summary table of responses. Following this chapter is the data analysis chapter describing how the data were processed ready for analysis and how the hypothesis tests were carried out.

¹⁵ This number is different from the final number of teams because four teams have been discarded due to missing data. The final number of teams is 45.

Chapter 7. Data Analysis

The preceding chapter described the characteristics of participating organisations in the research context (i.e. the Victorian workplace) and how the data were gathered from the participants. This chapter deals with the data treatment and data analysis in this thesis. The fundamental steps in the data treatment included data processing, preliminary analysis, and so forth. While the aims of each stage are slightly different, this chapter has been structured as follows. The first stage of data processing was to get data ready for analysis. Then, undertaking a preliminary analysis allowed the researcher to become familiar with and to understand the data. Further preliminary analysis was also conducted to examine the functionalities of quantitative measures. The final analyses have been carried out to test the hypotheses followed by a summary of test results. The chapter concludes with a summary.

7.1 Data Processing: Getting Data Ready for Analysis

Data processing is the first stage of analysis and it prepares data by putting them in a form suitable for analysis. Another objective was to understand the data better. Data processing at this stage was mainly conducted using SPSS 16. Specifically, the processes mainly included coding, cleaning, combining data sets, handling blank responses, re-coding, and dealing with missing values. Doing so was to ensure that data were accurate and free of errors. This stage of data processing is very important because many mistakes may result from data that are poorly prepared, particularly with respect to missing values.

7.1.1 Coding

Coding refers to categorising and numbering the responses (Aaker et al., 2007). Technically, there are two types of coding, so-called precoding and postcoding. Precoding is the allocation of codes to answers before people fill in the questionnaire

since answers have been determined beforehand, whereas postcoding is to be conducted afterwards of survey completion (de Vaus, 2002).

In this research, precoding has been applied to non-demographic information (i.e. quantitative data) because codes appeared on the questionnaire (this has been discussed in Chapter Five). However, the code for missing data was created for all measures after data were collected. In particular, codes for missing values were different from codes for normal values. To avoid confusion to both the researcher and computer software packages, “99” was allocated to all missing values in the present research including demographic information. Doing so ensured that missing values were not mixed up with valid values.

Measures for demographic information (i.e. qualitative data) were conducted via postcoding, including gender, age, race, tenure, group longevity, education, and function background. Specifically, coding for gender and age were straightforward. With respect to gender, females were coded 1 and males were coded 2. The five choices for age were coded 1 (under 30) to 5 (60 and above) respectively.

The coding for race was the most complicated. As introduced in Chapter Five, four items were used to obtain racial information. The four items were accordingly transformed into three measures with codes: white (coded 1) vs. non-white (coded 2), Europeans (coded 1) vs. non-Europeans (coded 2), and ABS racial categories coded from 1 to 18.

Tenure was coded from 1 (one year) to 10 (10 years and above) according to the number of years of services with the organisations. Similarly, group longevity was coded from 3 (up to three months) to 60 (60 months and above) according to the numbers of months of participation those in the groups.

Education was coded in the following way according to the categories of choice: up to year 12 (coded 1), certificate level 4 (coded 2), advanced diploma and diploma level

(coded 3), bachelor degree level (coded 4), graduate diploma and graduate certificate (coded 5), and postgraduate degree level (coded 6).

Codes for functional background were based on the following: finance and accounting (coded 1), production (coded 2), sales and marketing (coded 3), IT (coded 4), HR (coded 5), R&D (coded 6), and general management (coded 7).

7.1.2 Cleaning

During data cleaning, data were checked to ensure that they had been entered correctly. A quick review of the analysis results for frequency showed that there were some uncoded values in the tables. For example, values of '0' appeared in the frequency tables and it was found that '0' was coded as 'missing values' in default settings by the web server on which the questionnaire was stored. In addition, a check on the distribution of responses was conducted to make sure that they were in correct ranges. Furthermore, a manual check was carried out to make sure that all demographic information had been coded correctly. For example, all women were coded as '1' and all men '2'. Moreover, manual checks on text responses were conducted to make sure the extra information had been included in the dataset.

7.1.3 Re-coding

Both quantitative and qualitative data required recoding. With respect to quantitative data, eight questions were reverse-coded. 1 to 7 was given to the original codes of 7 to 1 respectively. These questions were items 2 and 5 for job satisfaction, all five innovativeness items and the task interdependence item (item 1).

Four qualitative measures were also recoded. Race was recoded as whites vs. non-whites because the number of participants in the non-white subcategories was too small for meaningful analysis (Linnehan, Chrobot-Mason, & Konrad, 2006). Tenure was re-coded because the span of 10 years might not make such sense for some categories (people

working in a company 9 or 10 years). Therefore, recoding took place (1 for working under 3 years and 2 for working above 3 years). Similarly, there was a need to reduce the number of codes (there were total 60 codes) for group longevity. Recodes were based on the following criteria: 1 for less than 12 months of participation, 2 for 12 to 24 months, and 3 for 24 months and above.

7.1.4 Dealing with missing values

Ideally, a dataset should have “all-completed” items for the entire sample. Despite the best efforts made by researchers, there are usually missing values in data sets including the present one. Dealing with missing values is important because nearly all standard statistical methods presume that every case has information on all the variables to be included in the analysis (Allison, 2002). In order to deal with missing values effectively and correctly, it is necessary to identify the causes of missing values.

7.1.4.1 Causes of missing values

Whereas numerous factors could have caused missing values in the present data set, two factors were most salient: technical failure and participation refusal. As mentioned in chapter Six, participating organisation PR conducted the survey within its intranet rather than through the commercial web server provided. The online survey was developed in Access. This appeared an unwise decision: there were a large number of cases having missing values.

A visual check showed that the missing values in PR’s data were caused by some technical problems with the online administration. As mentioned earlier, all quantitative measures (question 1 to question 36) were compulsory, whereas qualitative measures about demographic information (question 37- question 45) were voluntary. All questions were arranged in numerical order. In the PR data, there were, however, more than 40 cases that had responses skipping through compulsory questions. For example, data showed that participants had answered question 1 to question 36, but with missing

values for question 5, question 6, question 14 and question 17. In addition, there were also cases where respondents answered the qualitative questions but not the quantitative questions.

The missing data pattern seemed unreasonable with regard to the default setting of the online survey. Unlike paper-based surveys, participants in an online survey cannot skip any compulsory questions because they cannot go to the next section if they have left any compulsory question/s unanswered. With respect to these missing values, it was unlikely that it was caused by the participant's intention to refuse to answer the questions. Instead, it seems more likely that missing values were caused by technical problems.

Missing values in the present data set might also be caused by participation refusal. Some samples were reluctant to participate in the survey. This could be identified also by a visual check. For example, there were cases, where all responses were missing except for the question on group membership at the beginning. In addition, there were also cases where no responses in any demographic information question. The pattern of uncompleted questions suggests that some respondents might be reluctant to participate or answer certain questions.

7.1.4.2 Missing values across organisations

After a visual check on the causes of missing values, a more comprehensive analysis was carried out to check the number of cases with missing values with regard to each indicator. In particular, the analysis calculated the number of cases according to each indicator. Further analysis identified the number and percentage of cases with no responses to certain indicators across organisations. The results are presented in Table 7-1.

Table 7-1 Missing values across organisations

	NoR	PR		LX		BL		CP		AA		BS		Missing	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
JS1	325	30	22.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	30	8.5
JS2	318	37	27.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	37	10.4
JS3	317	38	28.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	38	10.7
JS4	316	39	29.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	39	11.0
JS5	315	40	30.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	40	11.3
Inn1	309	46	34.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	46	13.0
Inn2	308	47	35.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	47	13.2
Inn3	307	48	36.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	48	13.5
Inn4	304	51	38.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	51	14.4
Inn5	306	49	36.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	49	13.8
Tin1	300	51	38.3	0	0.0	0	0.0	4	5.2	0	0.0	0	0.0	55	15.5
Tin2	300	51	38.3	0	0.0	0	0.0	4	5.2	0	0.0	0	0.0	55	15.5
Tin3	298	53	39.8	0	0.0	0	0.0	4	5.2	0	0.0	0	0.0	57	16.1
TRo1	298	53	39.8	0	0.0	0	0.0	4	5.2	0	0.0	0	0.0	57	16.1
TRo2	298	53	39.8	0	0.0	0	0.0	4	5.2	0	0.0	0	0.0	57	16.1
TRo3	297	54	40.6	0	0.0	0	0.0	4	5.2	0	0.0	0	0.0	58	16.3
SoD1	295	54	40.6	0	0.0	0	0.0	5	6.5	1	9.1	0	0.0	60	16.9
SoD2	296	53	39.8	0	0.0	0	0.0	5	6.5	1	9.1	0	0.0	59	16.6
OSD1	294	55	41.4	0	0.0	0	0.0	5	6.5	1	9.1	0	0.0	61	17.2
OSD2	294	55	41.4	0	0.0	0	0.0	5	6.5	1	9.1	0	0.0	61	17.2
InfD1	294	55	41.4	0	0.0	0	0.0	5	6.5	1	9.1	0	0.0	61	17.2
InfD2	293	56	42.1	0	0.0	0	0.0	5	6.5	1	9.1	0	0.0	62	17.5
OID1	289	60	45.1	0	0.0	0	0.0	5	6.5	1	9.1	0	0.0	66	18.6
OID2	289	60	45.1	0	0.0	0	0.0	5	6.5	1	9.1	0	0.0	66	18.6
TC1	288	59	44.4	0	0.0	0	0.0	7	9.1	1	9.1	0	0.0	67	18.9
TC2	288	59	44.4	0	0.0	0	0.0	7	9.1	1	9.1	0	0.0	67	18.9
TC3	289	59	44.4	0	0.0	0	0.0	7	9.1	0	0.0	0	0.0	66	18.6
TC4	287	60	45.1	0	0.0	0	0.0	7	9.1	1	9.1	0	0.0	68	19.2
RC1	287	60	45.1	0	0.0	0	0.0	7	9.1	1	9.1	0	0.0	68	19.2
RC2	286	61	45.9	0	0.0	0	0.0	7	9.1	1	9.1	0	0.0	69	19.4
RC3	286	61	45.9	0	0.0	0	0.0	7	9.1	1	9.1	0	0.0	69	19.4
RC4	286	61	45.9	0	0.0	0	0.0	7	9.1	1	9.1	0	0.0	69	19.4
OC1	283	62	46.6	0	0.0	0	0.0	8	10.4	2	18.2	0	0.0	72	20.3
OC2	283	62	46.6	0	0.0	0	0.0	8	10.4	2	18.2	0	0.0	72	20.3
OC3	283	62	46.6	0	0.0	0	0.0	8	10.4	2	18.2	0	0.0	72	20.3
OC4	281	64	48.1	0	0.0	0	0.0	8	10.4	2	18.2	0	0.0	74	20.8
Gen	280	62	46.6	0	0.0	0	0.0	13	16.9	0	0.0	0	0.0	75	21.1
Age	274	62	46.6	0	0.0	1	3.1	18	23.4	0	0.0	0	0.0	81	22.8
CoB	205	205	*	*	*	*	*	*	12	15.6	0	0	0	0	12
Race	269	64	48.1	0	0.0	0	0.0	12	15.6	5	45.5	5	5.2	86	24.2
Lan	280	63	47.4	0	0.0	0	0.0	12	15.6	0	0.0	0	0.0	75	21.1
Fun	251	63	47.4	0	0.0	1	3.1	18	23.4	5	45.5	17	17.5	104	29.3
Ten	219	29	43.9	0	0	0	0	14	20	3	30	15	15.5	61	21.8
GL	252	5	7.6	0	0	3	9.4	7	10	6	60	7	7.2	28	10
Edu	272	63	47.4	1	20.0	1	3.1	18	23.4	0	0.0	0	0.0	83	23.4
		2295	0.42	0	0	3	0.0	255	0.07	33	0.07	22	0.01	2609	0.18

Number of responses (NoR); * there is no CoB question in the survey; Group longevity (GL)
 Job satisfaction (JS); Innovativeness (Inn); Social diversity (SoD); Information diversity (InfD); Task conflict (TC); Education (Edu)
 Relationship conflict (RC) ; Task interdependence (Tin); Task routineness (TRo); Openness to social diversity (OSD);
 Openness to information diversity (OID); Country of Birth (CoB); Language spoken at home (lan); Function background (Fun);

The results show that the percentages of missing data gradually increased from the start (with the lowest score of 8.5 per cent) to the finish (with the highest percentage of 29 per cent). It seems understandable that people felt tired when approaching to the end of survey. In addition, it seems that missing values vary significantly across organisations.

The first impression about the variation of missing values across organisation is that LX, BL and BS have relatively small numbers of missing values while PR, CP, and AA have larger percentages. In particular, LX and BL have almost no missing values. This may be due to the small number of participants in the two organisations. Sample sizes cannot, however, fully explain the phenomena. Whereas there were 97 cases in BL, the percentage of missing values (the number of missing values against the total of responses) is 1 per cent ($=22 \text{ missing values} / (97 \text{ cases} * 43)$). In contrast, the percentage of missing values for PR is 42 per cent, which suggests that almost half of the cells in the dataset are occupied by missing values.

The variation of missing values across organisations suggests that the missing values were not systematic. Therefore, there was no need to delete any particular questions or items.

7.1.4.3 Missing values deletion and imputation

There are a number of techniques available in relation to dealing with missing values. More or less, these techniques are built on two mechanisms of ‘missing’: missing completely at random (MCAR) and missing at random (MAR).

MCAR refers to data where the ‘missing mechanism’ does not depend on the variable of interest, or any other variable, which is observed in the dataset (Scheffer, 2002). According to some researchers, MCAR is required in order for case deletion to be valid although missing data are very rarely MCAR (Garson, 2008). In a less stringent sense, MAR is a condition which exists when missing values are not randomly distributed

across all observations but are randomly distributed within one or more sub-samples and it is much more common than MCAR (Garson, 2008).

7.1.4.3.1 Techniques of case deletion and imputation

Various approaches have been developed to deal with missing values including both data deletion and imputation. Specifically, two of the more common data deletion techniques are Listwise and Pairwise deletion. Common imputation techniques include Regression Imputation and Expectation –Maximisation (EM) algorithm.

Particularly, Listwise deletion omits an entire case from the analysis cases because it is in some way(s) incomplete (Oppenheim, 1992). In a slightly different way, Pairwise deletion omits cases that do not have data on a variable used in the on-going calculation only (Garson, 2008). Because Listwise deletion excludes any case lacking any item (Allison, 2002), it is preferred over Pairwise deletion when sample size is large in relation to the number of cases which have missing data.

The basis of both techniques is that the deleted cases are a relatively small proportion of the entire dataset and are representative of it (i.e. missing values are missing completely at random) (Dolan, van der Sluis, & Grasman, 2005). Therefore, deletion of cases will not distort data representation. In most research settings, however, missing data are indicative of some pattern and cannot safely be assumed to reflect randomness (Garson, 2008).

Moreover, case deletion, particularly Listwise deletion, is very likely to reduce the sample size (N) significantly, which in turn damages the representativeness of the sample (Allison, 2002). The loss in sample size can also appreciably diminish the statistical power of the analysis (Garson, 2008). Therefore, many researchers are much more stringent on the conditions of case deletion: both Listwise and Pairwise methods assume missing values are MCAR (Garson, 2008; Scheffer, 2002).

If data are not MCAR, missing values should be imputed (Garson, 2008). The most traditional imputation technique is mean substitution. However, it is no longer preferred because substitution of the simple (grand) mean will reduce the variance of the variable (Scheffer, 2002). Reduced variance can create a spiked distribution at the mean in frequency distributions and can bias correlation downward (attenuation) (Garson, 2008).

Fortunately, in the last decade, other techniques of imputation have become available. They include Regression Imputation, and imputation of values using the EM (Expectation -Maximisation) algorithm, both of which will perform single imputation (Scheffer, 2002).

Regression Imputation simply uses non-missing data to predict the values of missing data (Liu, Wei, & Zhang, 2006). This technique assumes that missing values are MAR (as opposed to MCAR) and that the same model explains the data for the non-missing cases as for the missing cases, which, of course, is not necessarily true (Garson, 2008). One of the problems with the regression method is that all cases with the same values on the independent variables will be imputed with the same value on the missing variable, causing some of the same problems as mean substitution (Allison, 2002) .

Using Maximum Likelihood Estimation (MLE), the EM algorithm imputes missing data values without recourse to the simulation involved in the Regression Imputation methods discussed above. In particular, this technique uses the EM algorithm to predict missing values (Liu et al., 2006). Because MLE makes fewer demands of the data in terms of statistical assumptions, the EM algorithm is now the most common method of imputation (Liu et al., 2006; Scheffer, 2002).

7.1.4.3.2 Data deletion and imputation in the present research

The deletion or imputation of missing values was not straightforward in the research. Whereas the discussion above provides some rationale for dealing with missing values,

processes of missing value treatment are peculiar in the present research. The peculiarity is associated with causes of missing values.

As identified in the previous section about the causes of missing values, technical faults and reluctance to participate may have contributed to the incomplete cases. As shown in Table 7-2, 17 per cent of the cases that have missing values are in at least 18 indicators (50 per cent). Among them, there were even nine cases with no values in 35 indicators and 14 cases with no values in all 36 quantitative measures.

On the one hand, it seems irrational to simply delete all cases with any missing values because doing so would lead to an unnecessary loss of cases, but on the other hand, imputing all missing values appears invalid in that imputed values cannot fully reflect the real data, particularly for cases with no values in all indicators.

The technique used in this thesis to deal with missing values is a combination of case deletion and imputation. To do so, a number of procedures were carried out including case deletion, MCAR analyses, and imputation. All processes were conducted in SPSS. MCAR was tested by missing values analysis (MVA), which operates based on Little's MCAR test for MCAR (Garson, 2008).

Case deletion was based on the analysis of numbers of indicators with missing values. In particular, cases that had more than 25 per cent of indicators missing values were deleted (E. Cunningham, 2007). By doing so, 75 cases were deleted leaving 280 usable ones. However, there were still six missing values in the 280 cases, which required the next stage of missing value treatment.

A further MVA found that some indicators did not have any missing values and these indicators were not included in the MCAR test. Finally, there were 17 indicators selected for MCAR test within 280 cases. The Little's MCAR test results are presented in Table 7-3 (Chi-Square = 95.142, degrees of freedom = 78, probability = .091). Because the p

value is not significant, the data were assumed to be MCAR (Garson, 2008). According to Cunningham (2007), it seems appropriate to impute the missing values.

Table 7-2 Numbers and percentages of missing indicators (quantitative measures)

Numbers of indicators		Per cent	Frequency	Per cent	Valid Per cent	Cumulative Per cent
Numbers and percentages of missing indicators in each cases	0	0.00	274	77.2	77.2	77.2
	1	0.03	1	0.3	0.3	77.5
	2	0.06	1	0.3	0.3	77.7
	4	0.11	2	0.6	0.6	78.3
	8	0.22	1	0.3	0.3	78.6
	9	0.25	1	0.3	0.3	78.9
	12	0.33	3	0.8	0.8	79.7
	14	0.39	8	2.3	2.3	82.0
	15	0.42	2	0.6	0.6	82.5
	18	0.50	1	0.3	0.3	82.8
	19	0.53	1	0.3	0.3	83.1
	20	0.56	1	0.3	0.3	83.4
	21	0.58	1	0.3	0.3	83.7
	22	0.61	7	2.0	2.0	85.6
	23	0.64	1	0.3	0.3	85.9
	24	0.67	1	0.3	0.3	86.2
	26	0.72	8	2.3	2.3	88.5
	29	0.81	2	0.6	0.6	89.0
	30	0.83	4	1.1	1.1	90.1
	31	0.86	5	1.4	1.4	91.5
33	0.92	4	1.1	1.1	92.7	
34	0.94	3	0.8	0.8	93.5	
35	0.97	9	2.5	2.5	96.1	
36	1.00	14	3.9	3.9	100.0	
Total	Total	355	100.0	100.0		

Table 7-3 Little's MCAR test results

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1	TIn1	2.79																
2	TIn2	-1.21	2.94															
3	TIn3	-0.53	1.46	2.22														
4	OID1	0.01	0.15	0.20	1.19													
5	OID2	-0.23	0.21	0.17	0.85	1.52												
6	TC1	-0.15	0.24	0.16	-0.20	-0.31	1.85											
7	TC2	-0.14	0.08	0.10	-0.15	-0.18	0.97	1.61										
8	TC3	-0.30	0.58	0.58	0.30	0.33	0.42	0.27	2.60									
9	TC4	0.02	-0.02	-0.05	-0.17	-0.21	1.35	0.92	0.29	2.18								
10	RC1	0.05	-0.04	-0.16	-0.31	-0.45	1.18	0.87	0.11	1.46	2.13							
11	RC2	-0.13	0.02	-0.06	-0.39	-0.47	1.34	0.96	-0.02	1.23	1.54	2.40						
12	RC3	0.04	0.04	-0.15	-0.44	-0.50	1.24	0.83	-0.12	1.32	1.66	1.94	2.40					
13	RC4	-0.10	0.09	-0.10	-0.44	-0.55	1.32	0.97	-0.05	1.44	1.68	2.01	2.12	2.45				
14	OC1	-0.27	0.33	0.52	0.47	0.58	-0.38	-0.26	0.63	-0.49	-0.62	-0.60	-0.69	-0.73	1.56			
15	OC2	-0.20	0.36	0.29	0.23	0.25	0.06	0.06	0.58	0.02	-0.06	-0.08	-0.12	-0.13	0.44	0.96		
16	OC3	-0.28	0.37	0.43	0.42	0.46	-0.20	-0.06	0.49	-0.34	-0.54	-0.46	-0.58	-0.55	0.70	0.42	1.85	
17	OC4	-0.41	0.40	0.49	0.48	0.60	-0.14	-0.03	0.76	-0.29	-0.35	-0.43	-0.59	-0.55	0.75	0.36	0.93	1.63

Little's MCAR test: Chi-Square = 95.142, DF = 78, Sig. = .091

7.2 Objective Diversity Measures

Objective diversity was calculated with Euclidean Distance (ED). ED is one of widely used distance measures and it measures how different an individual is in relation to all other individual within a given team (Harrison & Sin, 2005). It is the square root of the summed squared differences between an individual's value on a specific demographic variable and the value on the same variable for every other individual in the same team, divided by the total number of respondents in the team (Tsui et al., 1992). The ED calculation was carried out in SPSS.

One limitation of ED is that it is sensitive to the team sizes and its scores are not comparable across teams of different sizes (Harrison & Sin, 2005). Therefore, ED scores were rescaled to the 0-1 range.

Instead of a single attribute, three attributes were used to calculate the ED for each case in the research. In particular, age, gender and race were used to calculate social ED while tenure, function background, and education were used to calculate information ED. However, it is worth noting that ED measures the distance of one person to all of his/her teammate/s in a given team, and it does not describe the team. Means of all members' ED scores were computed and used for the objective diversity measures at the team level.

7.3 To Understand the Data

To understand the data, the researcher carried out a preliminary analysis that helped to build a picture of what the data look like (de Vaus, 2002). Before the statistical analysis of the data, a series of data processing checks on distribution were performed to eliminate any potential errors that could occur. Distributions of the data show the key features of variables and they provide useful information about how the sample is spread in the various indicators of each variable. In the present research, features of data assessed were frequency distributions, normality of measures (i.e. skewness), measures

of central tendency (i.e. mean, median, and mode), and measures of dispersion (i.e. standard deviation). The information about all indicators and scales has been presented in the following sections providing the full picture of the data.

7.3.1 Frequency distributions across different demographic categories

Table 7-4 presents useful information about participants with regard to their demographic information. There are 173 women (68 per cent) and 83 men (32 per cent) in the present data. The characteristics of the sample may be associated with the industries with the particular businesses that three organisations operate in. While PR deals with a call centre business, the employees allocated by CP are also from its call centre, dealing with customer services. In addition, BS is an aged-care provider. Both aged-care and call centres have traditionally been staffed by females.

In comparison, participants are evenly distributed across age categories although there are only 18 people in the category of 60 years and above. This is because women (the majority of the participants) are likely to retire by the age of 60. Not surprisingly, the overwhelming majority of participants are white Anglo Saxon (WAS), a reflection of the general demographic structure of Australian.

With respect to function background, there are a total of 109 participants (45 per cent) from production. This is a relatively large number compared with other functional backgrounds such as IT (2 per cent) and HR (3 per cent). Participants are, in general, evenly distributed across different categories of education with one exception. There are a larger number of participants (62) with education at the level of up to year 12.

As shown in Table 7-4, there was relatively a large proportion of Anglo-Saxon participants and it would be ideal to see bigger variation in this dimension. This was probably due to the process of random sampling, which gave the researcher a little control over the sample characteristics. However, as this researcher was interested in a

total of 6 diversity attributes and the proportions were relatively balanced across other categories (e.g. gender, age, tenure, functional background, education).

7.3.1.1 Normality of measures

The focus of univariate analysis in the present research was on the normality test, examining whether the underlying distributions of responses were normally distributed. Normality is important because it is a common assumption of most statistical analysis techniques. Normality testing in the present research was based on Skewness scores, which indicate how much a distribution of a variable in the current dataset varies from a normal distribution.

Table 7-4 A summary of demographic information of samples across organisations

		Organisations						No.	Per.
		PR	LX	BL	CP	AA	BS		
Gender	Female	42	1	10	39	4	77	173	0.68
	Male	21	4	21	25	4	8	83	0.32
Age	Under 30	19	0	6	21	3	12	61	0.26
	30-39	17	3	7	6	2	26	61	0.26
	40-49	12	2	5	16	1	16	52	0.22
	50-59	10	0	8	12	0	17	47	0.20
	60 and above	2	0	3	4	1	8	18	0.08
WAS vs. Non-WAS	WAS	49	5	24	59	4	67	208	0.80
	Non-WAS	12	0	8	6	2	25	53	0.20
Europeans vs. Non-Europeans	Europeans	56	5	28	63	4	80	236	0.90
	Non-Europeans	5	0	4	2	2	12	25	0.10
Tenure	up to 3 years of service	15	2	8	15	6	71	117	0.53
	above 3 years of service	22	3	24	41	1	11	102	0.47
Functional Background	F&A	1	0	4	0	3	7	15	0.06
	Production	40	0	9	33	0	27	109	0.45
	S&M	11	0	4	20	2	0	37	0.15
	IT	1	0	2	0	0	2	5	0.02
	HR	1	5	0	0	0	1	7	0.03
	General Management	8	0	12	6	1	43	70	0.29
Education	Certificate Level 4	17	0	6	5	0	3	31	0.14
	Advanced Diploma and Diploma Level	7	0	3	12	0	14	36	0.16
	Bachelor Degree Level	8	1	6	5	3	16	39	0.17
	Graduate Diploma and Certificate	0	2	2	5	0	18	27	0.12
	Postgraduate Degree Level	2	1	3	1	0	21	28	0.13
	Up to Year 12	3	0	10	30	5	14	62	0.28

White Anglo Saxon (WAS); Finance & Accounting (F&A); Sales & Marketing (S&M); Information Technology (IT); Human Resource (HR)

Results of Skewness are presented in Table 7-7 and the results suggest that distributions of most of the measures are close to normal distributions because the absolute values of

most Skewness scores are smaller than 1. A large number of negatively skewed distribution suggested that there were more cases (cases that have values bigger than the means) in the left hand side of the normal curve.

7.3.1.2 Means, standard deviation and correlations of indicators

Means, standard deviations (SD), and bivariate correlations are presented in Table 7-5 (measures for diversity, conflict and performance variables) and Table 7-6 (measures for all moderating variables)¹⁶. Means for indicators of job satisfaction were all high (≥ 4.91), therefore illustrating overall subjective contextual performance, while means for innovativeness were all below 4 (≤ 3.58), suggesting, in general, low subjective task performance. However, the larger standard deviations suggest that there are bigger differences among participants with regards to perceived innovativeness.

Mean scores of most conflict indicators were less than 3 (except for task conflict items 2 and 3), suggesting that conflict levels in these teams are, in general, low. Moreover, bigger SD of relationship conflict implies bigger differences among participants' perception of relationship conflict. Furthermore, participants reported a lower level of relationship conflict than task conflict.

The large means of indicators for task interdependence and job routineness indicate that tasks performed by the participants have low task interdependence and are quite routine. The big standard deviations for all job routineness indicators show that participants responded towards this construct in a significantly different manner from each other. A further survey on the indicators for openness to diversity and openness to conflict showed that participants reported a positive diversity and conflict climate in their workplace, indicated by the large means.

Examination of the correlations among the indicators shows that in general, the relationships are in the predicted directions. However, there were inconsistencies within

¹⁶ The table of mean, standard deviation and correlation is only presented at the item level as SEM does not require aggregation of scales that have multiple items.

Table 7-5 Means, standard deviations, and correlations for indicators of diversity, conflict and performance

Indicators	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1 JS1	5.70	1.36	1	0.50	0.50	0.47	0.32	-0.26	-0.43	-0.29	-0.46	-0.44	-0.13	-0.12	-0.18	-0.14	-0.24	-0.24	0.19	-0.37	-0.40	-0.32	-0.38	-0.36
2 JS2	5.51	1.58	0.50	1	0.35	0.33	0.55	-0.28	-0.46	-0.37	-0.45	-0.43	-0.12	-0.11	-0.16	-0.13	-0.27	-0.22	0.10	-0.34	-0.35	-0.28	-0.33	-0.34
3 JS3	5.58	1.23	0.50	0.35	1	0.41	0.24	-0.12	-0.31	-0.13	-0.26	-0.35	-0.14	-0.17	-0.24	-0.19	-0.18	-0.26	0.23	-0.27	-0.23	-0.24	-0.29	-0.27
4 JS4	5.15	1.30	0.47	0.33	0.41	1	0.43	-0.15	-0.31	-0.23	-0.26	-0.36	-0.08	-0.13	-0.09	-0.18	-0.24	-0.16	0.20	-0.35	-0.37	-0.33	-0.37	-0.35
5 JSS	4.91	1.48	0.32	0.55	0.24	0.43	1	-0.31	-0.42	-0.32	-0.41	-0.38	-0.09	-0.10	-0.16	-0.10	-0.34	-0.25	0.16	-0.40	-0.38	-0.34	-0.38	-0.41
6 Inn1	3.49	1.62	-0.26	-0.28	-0.12	-0.15	-0.31	1	0.40	0.42	0.38	0.36	-0.01	0.04	0.11	0.08	0.09	0.05	-0.12	0.17	0.16	0.09	0.11	0.14
7 Inn2	2.69	1.59	-0.43	-0.46	0.31	-0.31	-0.42	0.40	1	0.49	0.69	0.58	0.25	0.25	0.19	0.19	0.23	0.20	-0.24	0.32	0.31	0.25	0.33	0.35
8 Inn3	3.58	1.78	-0.29	-0.37	-0.13	-0.23	-0.32	0.42	0.49	1	0.61	0.36	0.10	0.07	0.19	0.21	0.13	0.08	-0.13	0.23	0.18	0.11	0.20	0.21
9 Inn4	3.21	1.72	-0.46	-0.45	-0.26	-0.26	-0.41	0.38	0.69	0.61	1	0.46	0.20	0.23	0.16	0.22	0.23	0.21	-0.17	0.30	0.33	0.26	0.33	0.32
10 Inn5	2.79	1.61	-0.44	-0.43	-0.35	-0.36	-0.38	0.36	0.58	0.36	0.46	1	0.16	0.13	0.21	0.14	0.27	0.19	-0.22	0.39	0.33	0.22	0.31	0.35
11 SoD1	3.34	1.53	-0.13	-0.12	-0.14	-0.08	-0.09	-0.01	0.25	0.10	0.20	0.16	1	0.52	0.44	0.43	0.14	0.13	-0.11	0.17	0.21	0.15	0.20	0.23
12 SoD2	3.43	1.75	-0.12	-0.11	-0.17	-0.13	-0.10	0.04	0.25	0.07	0.23	0.13	0.52	1	0.32	0.46	0.10	0.20	-0.08	0.16	0.15	0.11	0.12	0.13
13 InfD1	3.59	1.63	-0.18	-0.16	-0.24	-0.09	-0.16	0.11	0.19	0.19	0.16	0.21	0.44	0.32	1	0.59	0.19	0.19	-0.08	0.17	0.15	0.17	0.19	0.24
14 InfD2	4.03	1.74	-0.14	-0.13	-0.19	-0.18	-0.10	0.08	0.19	0.21	0.22	0.14	0.43	0.46	0.59	1	0.17	0.22	-0.09	0.13	0.13	0.13	0.15	0.16
15 TC1	2.94	1.36	-0.24	-0.27	-0.18	-0.24	-0.34	0.09	0.23	0.13	0.23	0.27	0.14	0.10	0.19	0.17	1	0.56	0.19	0.67	0.59	0.63	0.59	0.62
16 TC2	3.09	1.27	-0.24	-0.22	-0.26	-0.16	-0.25	0.05	0.20	0.08	0.21	0.19	0.13	0.20	0.19	0.22	0.56	1	0.13	0.49	0.47	0.49	0.42	0.49
17 TC3	4.05	1.61	0.19	0.10	0.23	0.20	0.16	-0.12	-0.24	-0.13	-0.17	-0.22	-0.11	-0.08	-0.08	-0.09	0.19	0.13	1	0.12	0.05	-0.01	-0.05	-0.02
18 TC4	2.93	1.48	-0.37	-0.34	-0.27	-0.35	-0.40	0.17	0.32	0.23	0.30	0.39	0.17	0.16	0.17	0.13	0.67	0.49	0.12	1	0.67	0.54	0.58	0.62
19 RC1	2.85	1.46	-0.40	-0.35	-0.23	-0.37	-0.38	0.16	0.31	0.18	0.33	0.33	0.21	0.15	0.15	0.13	0.59	0.47	0.05	0.67	1	0.68	0.73	0.74
20 RC2	2.72	1.55	-0.32	-0.28	-0.24	-0.33	-0.34	0.09	0.25	0.11	0.26	0.22	0.15	0.11	0.17	0.13	0.63	0.49	-0.01	0.54	0.68	1	0.81	0.83
21 RC3	2.68	1.55	-0.38	-0.33	-0.29	-0.37	-0.38	0.11	0.33	0.20	0.33	0.31	0.20	0.12	0.19	0.15	0.59	0.42	-0.05	0.58	0.73	0.81	1	0.87
22 RC4	2.58	1.56	-0.36	-0.34	-0.27	-0.35	-0.41	0.14	0.35	0.21	0.32	0.35	0.23	0.13	0.24	0.16	0.62	0.49	-0.02	0.62	0.74	0.83	0.87	1

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Job satisfaction (JS); Innovativeness (Inn); Social diversity (SoD); Information diversity (InfD); Task conflict (TC); Relationship conflict (RC)

Indicators	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	5.20	1.67	1	0.42	0.21	0.11	0.15	0.22	0.03	0.08	-0.01	0.11	0.13	0.13	0.11	0.19
2	4.81	1.71	0.42	1	0.57	-0.05	0.13	0.13	0.09	0.07	0.08	0.10	0.15	0.22	0.16	0.19
3	5.36	1.49	0.21	0.57	1	-0.02	0.19	0.18	0.14	0.05	0.12	0.09	0.28	0.19	0.22	0.25
4	4.21	1.74	0.11	-0.05	-0.02	1	0.39	0.31	0.07	0.02	0.10	-0.01	0.01	-0.08	-0.05	0.06
5	4.45	1.93	0.15	0.13	0.19	0.39	1	0.84	0.21	0.19	0.22	0.27	0.33	0.13	0.15	0.24
6	4.35	1.91	0.22	0.13	0.18	0.31	0.84	1	0.24	0.21	0.22	0.30	0.34	0.12	0.18	0.26
7	5.62	1.17	0.03	0.09	0.14	0.07	0.21	0.24	1	0.56	0.67	0.46	0.43	0.33	0.33	0.40
8	5.19	1.34	0.08	0.07	0.05	0.02	0.19	0.21	0.56	1	0.51	0.67	0.38	0.22	0.22	0.31
9	5.46	1.09	-0.01	0.08	0.12	0.10	0.22	0.22	0.67	0.51	1	0.63	0.34	0.22	0.28	0.35
10	5.24	1.23	0.11	0.10	0.09	-0.01	0.27	0.30	0.46	0.67	0.63	1	0.38	0.21	0.28	0.39
11	4.97	1.24	0.13	0.15	0.28	0.01	0.33	0.34	0.43	0.38	0.34	0.38	1	0.36	0.41	0.47
12	5.88	0.97	0.13	0.22	0.19	-0.08	0.13	0.12	0.33	0.22	0.22	0.21	0.36	1	0.32	0.29
13	4.56	1.35	0.11	0.16	0.22	-0.05	0.15	0.18	0.33	0.22	0.28	0.28	0.41	0.32	1	0.54
14	5.03	1.26	0.19	0.19	0.25	0.06	0.24	0.26	0.40	0.31	0.35	0.39	0.47	0.29	0.54	1

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).
Task interdependence (Tin); Task routineness (TRo); Openness to social diversity (TRo3); SoD1; SoD2; OSD1; OSD2; ImD1; ImD2; OID1; OID2; TCI; TC2; TC3; TC4; RCI; RC1; RC2; RC3; RC4; OCI; OC1; OC2; OC3; OC4

Table 7-7 Normality test results

	JS1	JS2	JS3	JS4	JS5	Inn1	Inn2	Inn3	Inn4	Inn5	Tin1	Tin2	Tin3	TRo1	TRo2	TRo3	SoD1	SoD2	OSD1	OSD2	ImD1	ImD2	OID1	OID2	TC1	TC2	TC3	TC4	RC1	RC2	RC3	RC4	OCI	OC2	OC3	OC4	
N	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	
Valid	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Missing	-1.64	-0.96	-1.60	-1.16	-0.48	0.22	0.98	0.30	0.60	0.92	-0.89	-0.53	-1.13	-0.03	-0.20	-0.18	0.37	0.41	-1.19	-0.65	0.17	-0.12	-0.93	-0.86	0.69	0.80	0.03	0.80	1.02	1.00	1.04	1.13	-0.67	-1.20	-0.41	-0.78	
Std. Error of Skewness	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

certain scales. For example, as shown in Table 7-5, social diversity items were both negatively and positively related to task conflict items. The consistencies will be further examined in the reliability tests.

7.4 Examining Functionalities of Quantitative Measures

Although all quantitative measures used were established scales adopted from other research, functionalities of the scales were examined including both their validity and reliability. Doing so ensured that the scales were functioning well in the present research context.

7.4.1 Reliability

The reliability of a scale determines its measurement consistency. A reliable measure suggests that it could produce the same results across other contexts. The reliability testing was conducted via SPSS and the internal consistency measure is Cronbach alpha, which is considered to be the best reliability test for multi-item measures (Bryman, 2001).

As shown in Table 7-8, most of the scales show a high level of reliability and the Cronbach's α scores were bigger than 0.7 in all but three out of thirteen scales. The scale of task interdependence had a score of 0.670 (Cronbach's α). A further analysis, 'Cronbach's α if item deleted', showed, however, that the score could reach 0.725 if the item one was deleted. The score for perceived social diversity was 0.684, it was close to 0.7. Similarly to the pilot study, the scale of task conflict once again had a score of 0.675 although the score could reach 0.802 if item three was deleted. This information suggested that, if necessary, item 3 for task conflict could be deleted from the scale at the late stage of analysis. However, there was no item that has been deleted at this stage given the fact that the Cronbach scores were all reasonably high (all close to 0.7).

7.4.2 Validity

Validity is an important facet of a scale and it reflects the accuracy of measurement (Creswell, 2003). A valid scale is one that measures what it is designed to measure. Two common validity testing techniques are exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), both focusing solely on how and to what extent the indicators are linked to their underlying variables (Kaplan, 2000). However, there are differences with respect to the theoretical underpinnings in their applications. EFA is designed for the situation where links between indicators and variables are unknown or uncertain whereas, CFA is used to statistically test *a priori* hypothesised relations between indicators and underlying variables (B. M. Byrne, 1998).

Table 7-8 Reliability test results

Scales	Cronbach's α	N of Items	Increased Cronbach if item deleted
Job satisfaction	0.774	5	N/A
Innovativeness	0.819	5	N/A
Task interdependence	0.670	3	0.725 if Tin1 deleted
Task routineness	0.767	3	N/A
Perceived social diversity	0.684	2	N/A
Perceived information diversity	0.744	2	N/A
Perceived diversity	0.773	4	N/A
Openness to social diversity	0.716	2	N/A
Openness to information diversity	0.772	2	N/A
Openness to diversity	0.847	4	N/A
Task conflict	0.675	4	0.802 if TC3 deleted
Relationship conflict	0.934	4	N/A
Openness to conflict	0.728	4	N/A

With respect to applications, EFA could be considered when the researcher has no prior knowledge of the intended unobserved variables. In contrast, CFA is appropriately used when the researcher has some knowledge of the structure of the underlying variables and the procedure of CFA focuses solely on the link between indicators and measured variables (B. M. Byrne, 1998).

As demonstrated in the previous discussion, there is substantial evidence in the literature supporting the structures of constructs to be tested. Further information needed included how well the indicators linked with the underlying construct (i.e. the factor). CFA fitted the purpose well. In particular, using AMOS (version 16), both two-factor and one-factor CFA have been conducted to test the validity of variables

that were measured by multiple questions. Specifically, two-factor CFA were tested with variables of task interdependence versus routineness, perceived diversity, and openness to diversity, while variables of job satisfaction, innovativeness, task conflict, relationship conflict, and openness to conflict were tested in one-factor CFA. The 'fit' statistics are presented in Table 7-9.

Table 7-9 CFA results (N=280)¹⁷

Scales (number of items)	P	df	χ^2	χ^2/df	SRMR	AGFI	RMSEA
	>0.05**	N/A	N/A	1 < a < 2**	<0.06**	>0.95**	<0.05**
Job satisfaction (4)	0.286	3	3.781	1.260	0.023	0.978	0.031
Innovativeness (4)	0.118	2	4.274	2.137 ¹⁸	0.022	0.963	0.064
Task interdependence & routineness *	0.285	2	2.508	1.254	0.026	0.978	0.030
Social diversity & Openness to Social diversity*	0.155	3	5.237	1.746	0.036	0.970	0.052
Information diversity and Openness to information diversity*	0.354	3	3.254	1.085	0.032	0.981	0.017
Openness to diversity*	0.768	2	0.528	0.264	0.006	0.995	0.000
Task Conflict (4)	0.591	2	1.051	0.526	0.011	0.991	0.000
Relationship conflict (4)	0.796	2	0.457	0.229	0.003	0.996	0.000
Conflict*	0.284	4	5.034	1.256	0.013	0.974	0.030
Openness to conflict (3)	0.686	1	0.163	0.163	0.006	0.998	0.000

P (significance values) ; * two-factors CFA; ** acceptable level (Holmes-Smith, 2008)

In SEM the chi-square statistic is a test of the null hypothesis that the matrix of implied variance and covariance (from the hypothetical model) is not significantly different from the matrix of sample variances and covariance. In the present research, a high level of measurement validity is not to reject the null hypotheses. If the chi-square is large and the p value is very small (say, <0.05), it would be suggested that there is a less than 5 per cent likelihood that the differences between the two matrixes (i.e. the matrix of implied and sample) is due to chance alone. That said, the hypothetical model is not a good representation of the data.

In the research, P values for accepted levels of model fits were greater than 0.05. Apart from chi-square statistics, other multiple criteria were used to assess the goodness-of-fit considering a consensus in the SEM literature that chi-squared test statistic should not be the sole basis for determining model fit (Raykov & Marcoulides, 2006). For example, normed Chi-square (χ^2/df) scores were also produced, which should be greater than 1.0 but smaller than 2.0 to indicate a good fit.

¹⁷ The reporting style in the present research followed recommendations from Nicol, & Pexman ((1999) and Schumacker & Lomax (2004).

¹⁸ A less strict rule of thumb could be applied. For example, normed chi-square scores were accepted when they were bigger than 0.5 and less than 3.0, Bredahl, 2001 & 2004, Chou, Boldy, & Lee, 2001).

As Chi-square is very sensitive to sample sizes, normed Chi-square scores are less dependent on sample sizes.

Other model fit indexes used in the research included standardised Root Mean-square Residual (SRMR), Adjusted Goodness-Fit Index (AGFI) (only AGFI is reported in the present research because Goodness-of-fit, GFI, is very similar to AGFI) and Root Mean-square Error of Approximation (RMSEA). With respect to the “rules of thumb”, SRMR should be less than 0.06, AGFI should be greater than 0.95, and RMSEA should be less than or equal to 0.05 to indicate a close fit (it indicates a reasonable fit if RMSEA is greater than 0.05 but less than 0.08) (Holmes-Smith, 2008).

The CFA results suggested that most measurement models including both one-factor and two-factor fit well with the data although there were slight concerns raised on normed Chi-square (χ^2/df) scores. However, given that Chi-square statistics are very sensitive to sample sizes as well as complexity of models, all measurement models in the present research were, in general, confirmed given the relatively smaller sample size.

Furthermore, the fact that all measurement models were less complicated (this was indicated by the small number of degrees of freedom) may also explain the reason why all Chi-squares were relatively small, ranging from 0.163 to 5.237. In general, all indicators in the measurement models were correctly measuring the underlying construct according to hypothetical structures.

7.4.3 Techniques of dealing with multiple indicator scales

All quantitative measures in the present research have multiple indicators ranging from two to five items. In this research, to convert multiple indicators into scales was not done just by simply adding together the scores from sets of questions. Instead, caution was paid in choosing strategies to deal with these multiple-indicator measures in order to achieve confidence that all indicators were measuring the same underlying construct.

As the data were to be analysed by SEM, which has particular strengths in dealing with latent variables measured by multiple indicators, there was no need to convert scores for scales of perceived diversity, conflict, job satisfaction or innovativeness. SEM dealt with multiple indicators simultaneously. However, for the purpose of classifying participants, scales for moderators (i.e. interdependence, task routineness, openness to diversity, openness to conflict) have been converted into single scores.

The research did not convert multiple indicators into scales by using means, due to the disadvantages of doing so (Foley et al., 2006; Rico et al., 2007). For example, even if two people have the same scale scores (means), it does not mean that they have provided identical responses to the multiple questions. In contrast, the same scale scores can be presented through quite different sets of answers.

Instead, indicators of these scales were combined into single measures by using Pearson product-moment correlations as weights and then weighted means of all indicators were computed. Following this procedure was believed to be more accurate (Pelled et al., 1999) because consideration had been given to unequal contributions of each indicator towards the measured construct (Rowe, 2006). That said, the method takes into account of unequal variance contributed from each items. By doing so, the reliability of the scales has been maximised. Further information about the process will be presented in the section on moderation testing.

7.5 Understanding the Data's Multilevel Nature: A Two-level Structure

It was likely that the participants from a particular group or organisation in the research were more similar to each other than randomly selected individuals with respect to their responses. The dynamics of clustering data are suggested in the multilevel literature. Such similarity in responses may be due to shared group experiences, reciprocal influences resulting from group interaction, or non-randomly distributed background variables (Krull & MacKinnon, 2001). However, traditional analyses such as multiple regressions (Curran, 2003) are not designed to accommodate clustered data. This status requires a more in-depth and comprehensive multilevel analysis of data in diversity research (Harrison & Klein, 2007).

In chapters Two and Three, multilevel SEM was identified as an ideal means for dealing with the multilevel data based on its particular strengths. However, before proceeding to the multilevel SEM, a particular analysis was conducted to explore the multilevel structure of the data determining whether an across-level effect was presented in the data. That said, an individual's membership in a particular group was a source of influence on that person's responses. This allowed a better understanding of how the data were clustered, particularly with respect to a three-level structure and it is considered an absolutely necessary means to assess the presence of group effects before proceeding to other statistical analysis (Zaccaro et al., 2006).

The analysis technique used was variance components analysis (VCA). In particular, VCA was carried out to test intraclass correlation coefficients (ICC), a measure to assess the relative homogeneity of the scores within the classes in relation to the total variation (please see a review, Cook, 2000). By definition, ICC for a particular level is the ratio between the observed variation of the dependent variable attributable to that level and the total variance to all levels in the dataset (Mohammed & Angell, 2004; Stewart & Barrick, 2000).

The structure of data was assumed to be three-level: individual, group, and organisational levels. In particular, three ICC scores were produced for all responsible variables to describe how much variance came from individual, group and organisational levels respectively. Four responsible variables were tested with respect to ICC. The VCAs were conducted in Linear Structural Relations (LISREL 8.8) and the results are presented in Table 7-10.

Table 7-10 ICC Results

Levels	Job Satisfaction		Innovativeness		Task Conflict		Relationship Conflict		N
	variance	% explained	variance	% explained	variance	% explained	variance	% explained	
Org.	0.04870	3.64%	0.10414	5.07%	0.03734	2.77%	6.16573	4.74%	6
Group	0.13993	10.45%	0.12914	6.29%	0.19821	14.73%	45.37923	34.88%	45
Individual	1.15011	85.91%	1.81984	88.64%	1.11020	82.50%	78.55456	60.38%	280
	1.33874	100.00%	2.05312	100.00%	1.34575	100.00%	130.09952	100.00%	

As shown in the table, a three-level structure has not been supported by the data. Instead, a twofold structure was found. Specifically, the ICCs showed that variance

attributable to the organisational level was far below the rule of thumb scores¹⁹ and the scores for group level were, in general (except for innovativeness), above 10 per cent. However, the large ICC numbers at the individual level suggested that an extensive amount of variation occurs at the individual level. Therefore, the analysis was conducted at individual and group levels.

7.6 The Procedure of Analysis

The analyses were carried out in three parts. The first part tested the diversity-conflict-performance paradigm. The second part was about testing the mediation effects. The third was the moderation effect test. All tests were conducted in SEM. To offer a better understanding of the results, this section will articulate the specific procedures. Before outlining the testing processes, one noteworthy step was the procedure of partitioning the covariance matrices.

Covariance matrices needed to be partitioned because of the two-level structure of the data. The two-level structure was addressed in section 7.5. Based on the two-level structure, the covariance matrix of the data was partitioned into two parts: the group level and the individual level. The analysis of partitioning the covariance matrix was conducted using LISREL 8.8 (although AMOS is user-friendly, it is not able to partition covariance matrix). First, a two-level VCA was conducted with all quantitative measures in LISREL but the focus of the analysis was different from that in section 7.5 where the purpose was to understand the multilevel structure. The focus here was on the creation of covariance matrices.

As requested, LISREL produced two matrices based on the percentage of variation at the individual and group level rather than a single matrix of total covariance of the data. The two matrices were further treated in Excel 2003 (AMOS cannot read data from Excel 2007) adding information about sample sizes (N) and indicators' names. In LISREL, the matrix at the individual level is also called the covariance matrix-within while the matrix at group level is named the covariance matrix-between.

¹⁹ The bench score was 10 per cent (Holmes-Smith, 2008).

Moreover, two tables were created for the covariance matrixes at the individual and group level respectively. The only difference between the two tables at the same level is whether the tables include either the perceived or the objective diversity variables. The reason for doing so was because of the different sample sizes between perceived diversity variables and objective diversity variables. Specifically, at the individual level, N was 280, for the table that included perceived diversity variables, whereas N was 259 for the table that included objective diversity variables. At the group level, N was 45 for the table that included perceived diversity variables, whereas N was 38 for the table that included objective diversity variables. Therefore, there were a total of four covariance tables (further details can be referred to Appendix E).

Before the multilevel SEM tests, the covariance matrixes were attached to SEM models. By doing so, the analysis processes were to partition total covariance into different levels according to VCA percentages (Kaplan, 2000). Therefore, the analyses were carried out to assess the right proportion of effects attributable to different levels.

7.6.1 Tests on the diversity-conflict-performance paradigm

This part of the analysis was to test four hypotheses: Hypothesis 1, Hypothesis 2, Hypothesis 3 and Hypothesis 4. As the most important premise of the present research, the four hypotheses propose that different types of diversity induce different forms of conflict, which in turn influence performance. Specifically, Hypothesis 1 and Hypothesis 2 described the relationships between social diversity, relationship conflict and job satisfaction (the SD-RC-JS sub-paradigm). Hypothesis 3 and Hypothesis 4 predicted the relationships between information diversity, task conflict and innovativeness (the InD -TC-Inn sub-paradigm).

To test the hypotheses, multilevel SEM was conducted. The procedure of analysis followed the general guide recommended in the SEM literature (Holmes-Smith, 2008; Schumacker & Lomax, 2004). In general, the analysis procedure took place in three steps. First, models were specified based on the hypothetical relationships between variables. The parameters were then estimated. After that, goodness of model fit was assessed and the models were modified if the models failed to fit the data (these two

steps also apply to mediation and moderation effect testing). The third step was to determine if hypotheses were supported.

7.6.1.1 Model specification and parameter estimation

Model specification was a process to present the hypothetical relationships amongst diversity, conflict and performance which were stated in Chapter Three. Those hypothetical relationships were structural parts of the SEM models. Because all constructs including objective diversity (as indicated by the dissimilarity of multiple diversity attributes) were latent variables, the SEM models also included the measurement model that reflects how the constructs were measured.

However, there was not only a single model considered when representing the hypothetical relationship between variables, but also alternative models. Doing so was considered appropriate because of the decreased probabilities of accepting a model as a true model when, in fact, an alternative may provide an even better representation of the data. Because SEM tests whether the hypothetical model fits the sample or not, it does not mean that the hypothetical model is the only representation of the data when fit indices indicate good fit. A confirmed model only means that the null hypothesis (the hypothetical model fits the data) can't be rejected (Schumacker & Lomax, 2004).

Maximum likelihood (ML) was used as the iterative estimation method in all SEM model testing. ML parameter estimation is used to determine the parameters that maximise the probability (likelihood) of the sample data, given the chosen probability distribution model (D. L. Jackson, 2001). ML was chosen because it is generally favoured above other methods in small to medium samples such as the size of the present research (Holmes-Smith, 2008). In addition, a normal distribution of the data in the present research meets ML's presumption of multivariate normality distribution.

7.6.1.2 Assessing model fit and model modification

Model fit was assessed by chi-square statistics that test whether the matrix of implied variance and covariance is significantly different from the matrix of sample variance

and covariance. In particular, a large chi-square with a small p value suggested a poor model fit. In the present research, p values for accepted levels of model fits were greater than 0.05. This criterion suggests that the departure of the data from the models is not statistically significant at the 0.05 probability level.

Apart from chi-square statistics, other multiple criteria were also used to assess the goodness of fit. These indices included normed Chi-square (χ^2/df), standardised Root Mean-square Residual (SRMR), Adjusted Goodness-Fit Index (AGFI) and Root Mean-square Error of Approximation (RMSEA). With respect to the “rules of thumb”, acceptable levels for particular indices will be specified.

While sources of mis-specification of models vary, a number of issues were considered before the decision to delete and/or include parameters from/in a model. In particular, Critical ratio (CR) was carefully examined. CR is the ratio of parameter estimate to its estimated standard error (Kline, 2005). CR should be in the expected direction (i.e. positive or negative influence) and statistically different from zero (CR should be larger than ± 1.96 at the 0.05 significance level).

In addition, standardised residuals were also assessed. If the absolute value of standardised residuals was larger than 1.96, it suggested a poor fit between the sample covariance matrix and the matrix predicted by the hypothetical model (Tomarken & Waller, 2005). Another useful statistical score, the modification indices, was used. The indices suggest how much the chi-square would be significantly reduced if the corresponding parameter was eliminated and it has been described as the most useful way to re-specify the hypothetical model and (Kaplan, 2000). In the present research, modifications always started with parameters that have the largest modification indices.

The present research also took the common model validation procedure and the model validation was done by comparing the alternative models with the hypothetical models.

7.6.1.3 Hypothesis assessment

In the test of the paradigm, hypotheses were supported if two conditions were met:

- Condition One. The hypothetical models build on the hypothetical relationships were confirmed and they were better representations of the data compared to alternative models; and
- Condition Two. All predicted bivariate relationships were found including both statistical significance and directions.

Both conditions are necessary but not sufficient for the hypothesis support. This is because hypotheses in this part of the analysis predict not only the relationships between diversity, conflict, and performance, but also the directions of relationships (i.e. being positive or negative). Goodness of fit in SEM only indicates the model's representativeness on the data. A model is a good representation of data even if the predicted relationship is not found in the testing (e.g. the relationship is not statistically significant or in an opposite direction). The support of hypothesis criteria is outlined in Table 7-11.

Table 7-11 Outline of hypothesis support

Hypotheses To be tested	Conditions to be met			Hypotheses status
	Condition One		Condition Two	
Hypothesis A	The hypothetical model built on the hypothetical relationship is confirmed.	The hypothetical model is a better representation of the data than the alternative model.	The predicted bivariate relationships are found.	Hypothesis A is supported if the two conditions are met.

As seen in Table 7-11, Condition One includes two components: the goodness of fit of the hypothetical model and the comparison between hypothetical model and alternative model. In the research, the assessment of model fit was relatively straightforward and the model fit was assessed in criteria stated in section 7.6.1.2.

However, comparisons between the hypothetical model and the alternative model took more steps and they were done via either Chi-square difference testing or comparing Akaike Information Criterion (AIC) indices depending on the types of alternative models. Two types of alternative model were assessed and they are named Type A and Type B in this discussion.

- Type A. The alternative model suggests a direct relationship between diversity and satisfaction, building up a triangle relationship between diversity, conflict and performance (an example can be seen in Figure 7-2). To compare the hypothetical model and the alternative model, chi-square difference tests were conducted. Chi-square difference testing measures the significance of the differences between the two models for the same data and it assumes that one model is a nested subset of the other (Kline, 2005). In this research, Type A models were built from the hypothetical models by adding a path meeting the assumption of chi-square difference tests.

The interpretation of chi-square difference tests is briefly described here. If chi-square difference tests showed significant difference between the hypothetical model and Type A model, the model with the better fit indices was regarded as a better model in representing the data. If chi-square difference tests showed no significant difference between the hypothetical model and the alternative model, the hypothetical models were accepted as the better representation of the data for the reason of parsimony. In SEM, parsimony requires models as simple as possible unless there are theoretical reasons to suspect effects or correlations of the erased path/s (Kaplan, 2000; Kline, 2005).

- Type B. The alternative model predicts the relationships between the constructs under examination and other relevant construct/s in the literature. These relevant constructs are not proposed in the hypothetical models but according to the literature, their relationships with variables under examination may exist (Schumacker & Lomax, 2004). As different constructs were introduced for each sub-paradigm, Type B models will be articulated in the analyses respectively. When Type B models were confirmed, model comparisons were carried out to explore whether the alternative models were better representations of the data.

The hypothetical model and Type B model were not nested in each other because there were different variables in the models. Accordingly, Chi-square difference testing was not used to compare the alternative model and the hypothetical model. Comparisons were based on AIC indexes. AIC reflects the discrepancy between

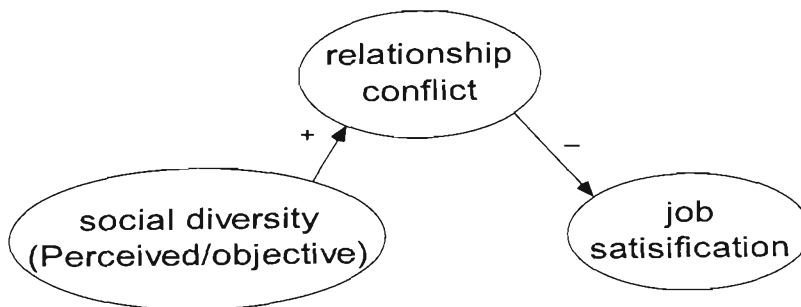
models under assessment and data covariance matrices and it is normally used to compare models rather than being interpreted for a single model (B. M. Byrne, 1998). The method was to compare AIC scores: the lower AIC reflected the better-fitting model (Kline, 2005).

If Condition One was met, Condition Two was then assessed. Condition Two was met if the predicted relationships were found. That said, the relationships were statistically significant in the predicted direction. When both Condition One and Two were met, it was proved that a hypothesis was supported in the analysis. The following section articulates the specific assessment with respect to the two sub-paradigms.

7.6.1.4 The social diversity-relationship conflict-job satisfaction sub-paradigm

Two hypotheses (Hypothesis 1 & Hypothesis 2) were formulated to predict the relationship between social diversity, relationship conflict and job satisfaction. Based on the two hypotheses, the hypothetical models were specified. As seen in Figure 7-1, the models predict that social diversity including both perceived and objective diversity positively influences the relationship conflict, which, in turn, is negatively associated with job satisfaction. As a result, the models propose a negative relationship between social diversity and job satisfaction. According to these models, there is no direct relationship between social diversity and job satisfaction. The two hypothetical models will be called hereafter, the PSD-RC-JS model and the OSD-RC-JS model.

Figure 7-1 The SD -RC-JS sub-paradigm (the hypothetical models)

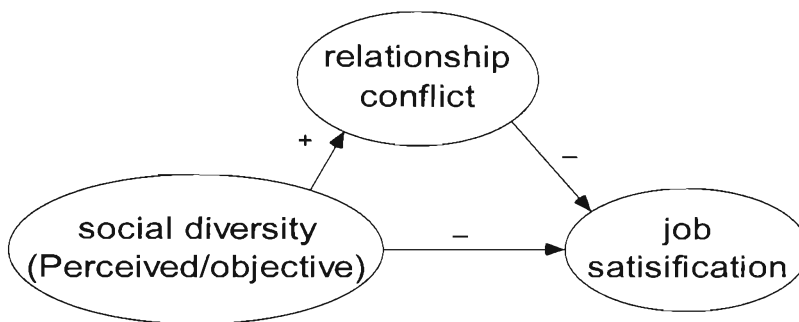


The two models were tested at both the individual and group levels. Furthermore, perceived and objective diversity were separately examined. The goodness of fit was

assessed in the criteria stated in section 7.6.1.2 and the results are summarised in section 7.7.

If the hypothetical models were confirmed, the alternative models (Type A) were also tested to determine if there is a better model to represent the data. The alternative models suggest a direct and negative relationship between social diversity and job satisfaction and are presented in Figure 7-2. The two alternative SEM models will be called hereafter the alternative PSD-RC-JS model and the alternative OSD-RC-JS model. When the alternative models were confirmed, model comparisons were carried out to explore whether the alternative models were better representations of the data.

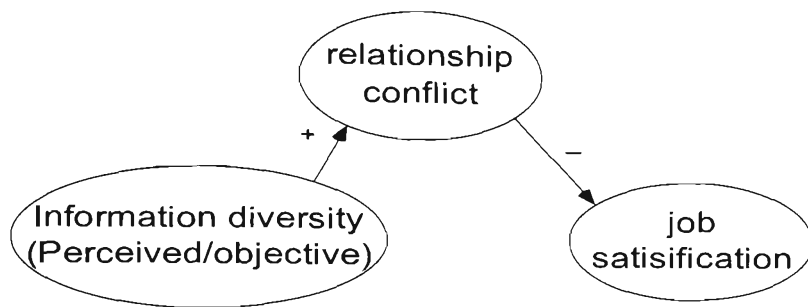
Figure 7-2 The SD -RC-JS sub-paradigm (the alternative models: Type A)



As described in section 7.6.1.3, chi-square difference tests were conducted to compare the hypothetical model and the alternative model (Type A).

Type B models were also tested. The alternative models, as shown in Figure 7-3, predict that perceived/objective information diversity is positively related to relationship conflict, which, in turn, is negatively linked with job satisfaction. When the alternative models were confirmed, model comparisons were carried out according to AIC scores. The models will be called, hereafter, the alternative PInD-RC-JS model and the alternative OInD-RC-JS model.

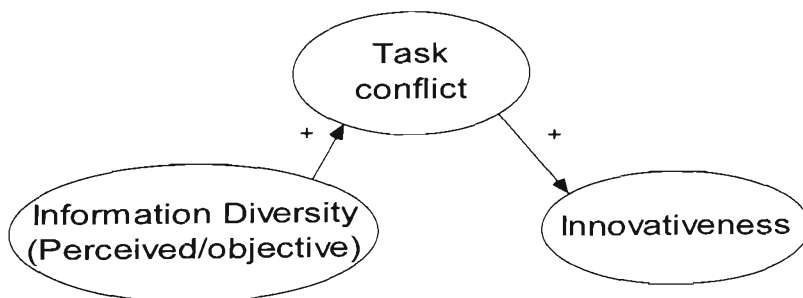
Figure 7-3 The relationship between information diversity, relationship conflict and job satisfaction (the alternative model: Type B)



7.6.1.5 The information diversity-task conflict-innovativeness sub-paradigm

Two hypotheses (Hypothesis 3 & Hypothesis 4) were tested in this step. Hypothetical models were specified to describe the relationship between information diversity, task conflict, innovativeness and they are presented in Figure 7-4. The hypothetical models suggest that information diversity including both perceived and objective diversity positively influences task conflict and that task conflict, in turn, positively influences innovativeness. As a result, the models predict a positive relationship between information diversity and innovativeness. According to the models, however, there is no direct relationship between information diversity and innovativeness. The two hypothetical models will hereafter be called the PInD-TC-Inn model and the OInD-TC-Inn model.

Figure 7-4 The InD-TC-Inn sub-paradigm (the hypothetical models)

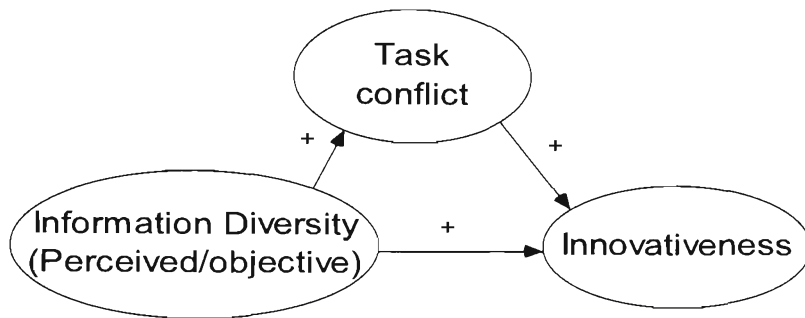


For the social diversity-relationship conflict-job satisfaction sub-paradigm, tests were also analysed at both individual and group levels. Perceived and objective diversity were also separately examined. The goodness of fit was assessed in criteria stated in section 7.6.1.2 and the results are summarised in section 7.7.

Two types of alternative models were also assessed to examine if there is a better model to represent the data. Type A models suggest a direct and positive relationship

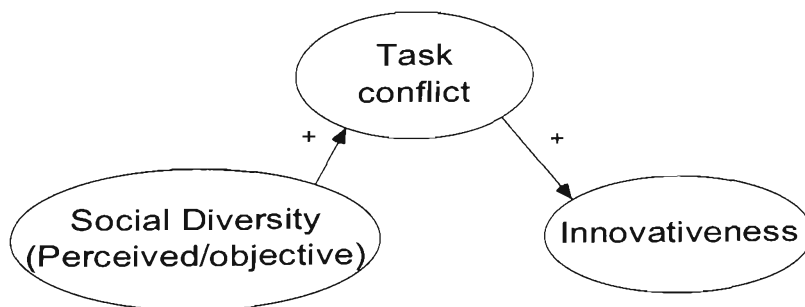
between information diversity and innovativeness. The alternative models are presented in Figure 7-5. They will hereafter be called the alternative PInD-TC-Inn model and the alternative OInD-TC-Inn model. As the two models are nested in each other, Chi-square difference testing was used to compare the hypothetical models with the alternative models.

Figure 7-5 The InD-TC-Inn sub-paradigm (the alternative model: Type A)



Type B models were also used to examine whether the constructs examined were associated with other construct/s which were not proposed in the models. As seen in Figure 7-6, the alternative models predict that perceived/objective social diversity is positively related to task conflict, which, in turn, is positively linked with innovativeness. Similarly, when the alternative models were confirmed, model comparisons were carried out to explore whether the alternative models were better representations of the data. Hereafter the models are called the PSD-TC-Inn model and the OSD-TC-Inn model. Model comparisons were conducted by comparing AIC indexes.

Figure 7-6 The InD-TC-Inn sub-paradigm (the alternative model: Type B)



7.6.2 Mediation effects of conflict

The theoretical underpinnings of the paradigm tested in section 7.6.1 are that conflict mediates the relationship between diversity and performance. Four hypotheses (Hypothesis 5, Hypothesis 6, Hypothesis 7, and Hypothesis 8) were proposed accordingly. While other techniques such as multiple regressions might be used to assess mediation effects, analyses were done in SEM in this research because it could analyse relationships between dependent variables simultaneously. That explains why there were only three steps in the present analyses compared to Baron and Kenny's method (1986), which normally takes four steps to carry out a mediation test.

Step One. The relationship between diversity and performance was modelled and analysed. This step was to establish if there was an effect to be mediated (the necessary condition).

Step Two. Conflict was introduced as mediator. Accordingly, diversity, conflict and performance built up a triangular relationship.

Step Three. Assessment was conducted to describe the differences between regression weights of the relationships between diversity and performance obtained from steps one and two.

The interpretation of the results is based on the following guidelines (Baron & Kenny, 1986; Whitener, 2001). Conflict **fully mediated** the relationship between diversity and performance if:

1. the relationship was significant (different from zero) at Step One (there was an effect to be mediated), and
2. the relationship between diversity and performance disappeared (not significantly different from zero) at Step Two.

Conflict **partially mediated** the relationship between diversity and performance if:

1. the relationship was significant at Stage One (there was an effect to be mediated), and

2. the relationship between diversity and performance became smaller at Step Two (but significantly different from zero).

Under either full or partial mediation, the relationship between diversity and conflict (Precondition One) and the relationship between conflict and performance (Precondition Two) must be significant (different from zero).

The approach used in the current research is one of the most commonly-used approaches. According to a review of 200 articles (MacKinnon, Lockwood, Hoffman, West, & Sheeis, 2002), the majority of studies took this approach when testing for mediation. As the present research was to see whether the relationship between diversity and performance was mediated by conflict, the approach seemed straightforward to examine the question as addressed above.

Specifically, the mediation effects were tested with both task conflict and relationship conflict. The specific procedures are discussed separately in the following section.

7.6.2.1 Mediation effects of task conflict

Task conflict was predicted to mediate the relationship between perceived/objective information diversity and innovativeness (Hypothesis 5 and Hypothesis 6). To illustrate the processes of mediation tests better, Figure 7-7 and Figure 7-8 are presented below.

Figure 7-7 Step One: Tests of relationship between diversity and performance

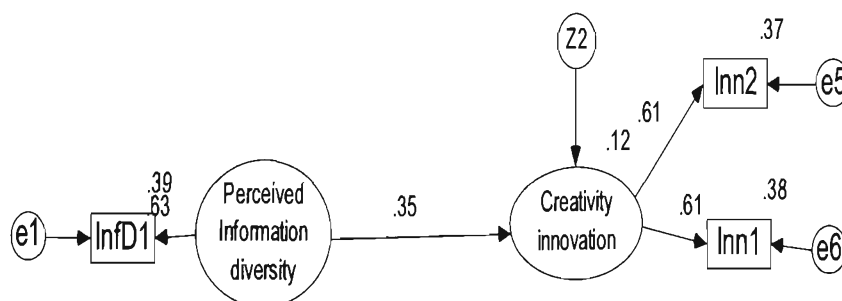
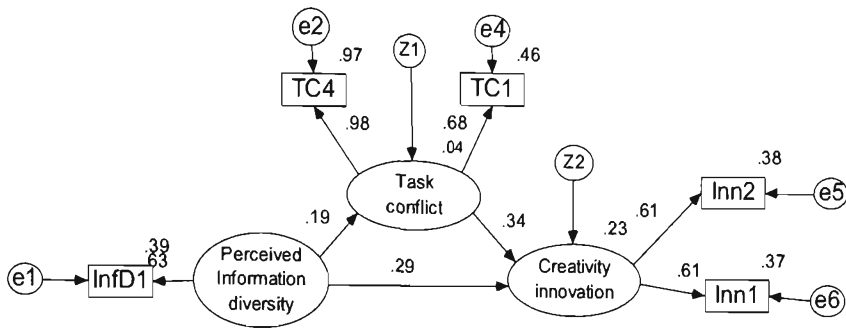


Figure 7-8 Step Two: Tests of relationships amongst diversity, conflict, and performance



As seen in Figure 7-7, in Step One, the relationship between perceived information diversity and innovativeness was analysed to establish that there was an effect to be mediated. Then task conflict was introduced as the mediator. As shown in Figure 7-8, perceived information diversity, task conflict and innovativeness built up a triangular relationship. Step Three was to describe the differences between the regression weights of the relationships between perceived information diversity and innovativeness obtained from Step One and Two respectively. The test results can be found in section 7.7.

7.6.2.2 Mediation effects of relationship conflict

Relationship conflict was suggested to mediate the relationship between perceived/objective social diversity and job satisfaction (H7 and H8). The tests of mediation effects are identical to the mediation testing on task conflict as illustrated in Figure 7-7 and Figure 7-8. The test results will be summarised in section 7.7.

7.6.3 Moderation effects of contextual factors on the diversity-conflict-performance paradigm

Five contextual factors were examined in this research: task interdependence, task routineness, openness to diversity, openness to conflict and group longevity. These factors were predicted to have moderation effects on the diversity-conflict-performance paradigm. More specifically, every contextual factor was hypothesised to moderate four sub-paradigms: PSD-RC-JS, OSD-RC-JS, PInD-TC-Inn, and OInD-TC-Inn. That said, 20 hypotheses were tested in the analysis, numbered from Hypothesis 9 to Hypothesis 28.

In comparison to mediation effect tests, the moderation effect testing was slightly more complicated. Because there were a number of moderators to be examined in the present research, the moderation tests were carried out one factor by one factor. It is noteworthy that the moderation testing in the present research aimed to discover whether the contextual factors under examination were moderating the paradigm, but was **not** aiming to discover the specific strengths of the moderation.

The moderation testing technique used was multiple-group SEM. To do so, separating the sample into two groups according to the scores of the contextual factors, the multiple-group SEM were carried out to examine if the models under examination apply across two sub-groups of the sample. To do so, the analysis procedures were carried out in five steps.

Step One. Because all moderating factors except for group longevity are latent variables measured by multiple indicators, aggregating scores of moderators were calculated according to factor weights. Instead of simply averaging the scores, using factor weights acknowledges the uneven importance of multiple indicators. The aggregating scores were treated as ‘continuous variables’ and ‘means’ of these scores were also produced. This was done in SPSS.

Step Two. In SPSS, the dataset was then divided into two sub-datasets: the below group and the above group. In the ‘**below group**’, participants’ scores of a specific moderating variable were smaller or equal to the mean. In the ‘**above group**’, participants’ scores of a specific moderating variable were bigger than the means. In total, there were five (five moderating variables) pairs of such sub-groups.

Step Three. This step was to obtain the fit statistics (i.e. chi-square statistics) for the **unconstrained** multiple-group SEM model. Three sub-steps were carried out.

1. First, a specific model (i.e. PSD-RC-JS, OSD-RC-JS, PInD-TC-Inn, or OInD-TC-Inn) was drawn in AMOS.
2. Second, in Amos’s function of “manage groups”, two groups were created for the specific model named “the below group” and “the above group”. No constraint was placed on the model (i.e. all parameters were free to estimate

across two groups) and the model was therefore called “the unconstrained model”.

- Third, data sets obtained in Step Two were attached to the models accordingly: the data of the below group to the model of the below group whereas the data of the above group to the model of the above group. The chi-square statistics were obtained and they were called “the chi-square statistics for the unconstrained model”.

Step Four. This step was similar to Step Three except for **constraints** made to parameters in the models of “the below group” and “the above group”. In order to demonstrate the procedure of constraining parameters, an example was presented below.

- First, as seen in Figure 7-9 and Figure 7-10, parameters have been named differently across the two models.
- Following that, specifications were made to the two groups. All corresponding parameters were set to be equal: $a1_1=a1_2$; $a2_1=a2_2$; $a4_1=a4_2$; $b1_1=b1_2$; $b2_1=b2_2$; $b3_1=b3_2$; $z1_1=z1_2$; $z2_1=z2_2$; $v1_1=v1_2$; $v2_1=v2_2$; $v3_1=v3_2$; $v4_1=v4_2$; $v5_1=v5_2$; $v7_1=v7_2$.
- Then, data sets obtained in step two were attached to the models accordingly. This step produced the chi-square statistics and they were called “the chi-square statistics for the constrained model”.

Figure 7-9 Model for the group lower than the mean on moderator

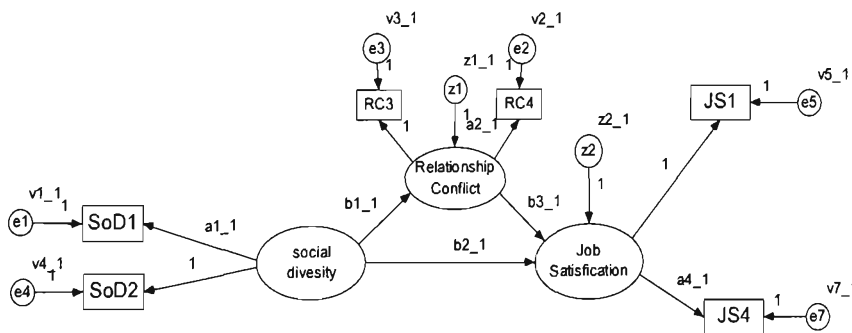
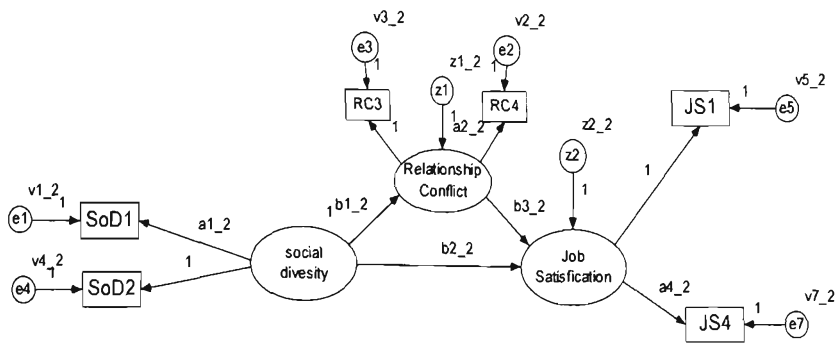


Figure 7-10 Model for the group higher than the mean on moderator



Step Five. In this step, Chi-square difference tests were carried out to reveal differences between the chi-square statistics of the unconstrained and the chi-square statistics of the constrained models. The interpretation of the chi-square difference tests complied with the following guideline. If chi-square difference statistics did **not** reveal a significant difference between the **two sets of chi-square statistics**, models were assumed to apply across groups. Accordingly, moderation effects of the specific contextual variable were not proved. By contrast, if chi-square difference statistic indicated significant differences between the two set of chi-square statistics, models were not assumed to apply across groups and, as a result, moderation effects of the specific contextual variable were established.

In addition to tests of the 20 hypotheses, moderation tests were also carried to explore any possible moderation effect of contextual factors on any bivariate relationship in the diversity-conflict-performance paradigm.

Moderation tests were only conducted at the individual level because the group membership had been broken down when samples were separated at step two. That said, members in one group may be separated into the above group and the below group respectively due to their different scores on a specific contextual variable.

7.7 Testing Results

This section presents the test results. As indicated in the preceding section, the analysis procedures were quite different across hypotheses. Therefore, the results will accordingly be presented in three parts. To do so, the discussion will demonstrate how the hypotheses were (not) supported by the results based on the hypothesis support criteria described in the preceding section. Concluding each part of the discussion, a summary of hypothesis status of support will be outlined.

7.7.1 Results of testing the diversity-conflict-performance paradigm

This part presents the results of testing the diversity-conflict-performance paradigm. Four hypotheses were tested (Hypothesis 1, Hypothesis 2, Hypothesis 3, and Hypothesis 4). Specifically, the sub-paradigms (i.e. social diversity-relationship conflict-job satisfaction and information diversity-task conflict-innovativeness) were separately examined.

7.7.1.1 The social diversity-relationship conflict-job satisfaction sub-paradigm

Two hypotheses (Hypothesis 1 and Hypothesis 2) were tested in the analyses, and they described the relationship of social diversity-relationship conflict-job satisfaction. To gain support for the hypotheses, the two conditions summarised in section 7.6.1.3 have to be satisfied.

Condition One was that the hypothetical models have to be confirmed, and they should be a better representation of the data than the alternative models. To examine this condition, six models were tested: two hypothetical SEM models and four alternative models. As models were tested at both individual and group levels, the results are summarised separately in Table 7-12 and Table 7-12. Fit indexes are **bold and underlined** in the tables when models fit the sample data. Further standardised parameter estimates are presented in Appendix F.

Table 7-12 Fit results for the SD-RC-JS sub-paradigm (at the individual level)

	Models	P	df	χ^2	χ^2/df	SRMR	AGFI	RMSEA	AIC
	(at the Individual level)	>0.05*	N/A	N/A	1<a<2*	<0.06*	>0.95*	<0.05*	N/A
H1	PSD-RC-JS (n=280)	<u>0.204</u>	8	10.956	<u>1.370</u>	<u>0.028</u>	<u>0.967</u>	<u>0.036</u>	36.956
	ibid. (Alt. model)	<u>0.185</u>	7	10.055	<u>1.436</u>	<u>0.022</u>	<u>0.965</u>	<u>0.040</u>	38.055
	PIInD-RC-JS (alt. model)	<u>0.058</u>	7	13.626	<u>1.947</u>	<u>0.039</u>	<u>0.953</u>	<u>0.058</u>	41.626
H2	OSD-RC-JS (n=259)	<u>0.116</u>	6	10.214	<u>1.702</u>	<u>0.026</u>	<u>0.963</u>	<u>0.052</u>	28.214
	ibid. (Alter. model)	<u>0.093</u>	5	9.445	<u>1.889</u>	<u>0.020</u>	<u>0.958</u>	<u>0.059</u>	29.445
	OInD-RC-JS (Alt.model)	0.004	5	17.364	3.473	0.049	0.927	0.094	37.364

P (significance values); * acceptable level A reasonable fit is indicated if RMSEA greater than 0.05 but less than 0.08. (Holmes-Smith, 2008). Perceived Social diversity (PSD); Relationship conflict (RC); Job satisfaction (JS); Objective Social Diversity (OSD); Perceived Information Diversity (PIInD); Objective Information Diversity (OInD); Hypothesis 1 (H1); Hypothesis 2 (H2)

At the individual level, the two hypothetical models PSD-RC-JS and OSD-RC-JS perfectly fit the sample data. As shown in Table 7-12, all fit indexes meet the “rules of thumb”. To examine whether the hypothetical models were a better representation of the data, model comparisons have been carried out. For Type A alternative models, chi-square difference tests were conducted. The results are presented in

Table 7-13.

Table 7-13 Chi-square difference test results

Models	Chi-square	df	P
H1. PSD-RC-JS (n=280)	10.956	8	0.204
ibid. (Alternative model)	10.055	7	0.185
chi-square difference test	0.901	1	0.343
H2. OSD-RC-JS (n=259)	10.214	6	0.116
ibid. (Alternative model)	9.445	5	0.093
chi-square difference test	0.769	1	0.381

Perceived Social diversity (PSD); Objective social diversity (OSD); Relationship conflict (RC); Job satisfaction (JS);
Hypothesis 1 (H1); Hypothesis 2 (H2)

As indicated in

Table 7-13, chi-square difference statistics show **no** significant difference between the chi-square statistics of the hypothetical models and their nested alternative models. The p values were 0.343 and 0.381 respectively. On this basis, the hypothetical

models were regarded as better representations of the data than their nested models on the ground of parsimony.

With respect to Type B models, comparisons of AIC scores were carried out. As the lower AIC reflected the better-fitting model, the PSD-RC-JS model was a better model (AIC=36.956) than the PInD-RC-JS model (AIC=41.626). In relation to the OInD-RC-JS model, it was not confirmed in the data and it was not representing the data. Thus, the hypothetical models were a better representation of the data than the alternative models. At the group level, the hypothetical models were, however, not confirmed by the data. As shown in Table 7-14, the PSD-RC-JS and OSD-RC-JS models did not fit the sample data and all fit indexes failed to meet the “rules of thumb”. Consequently, any model comparison with alternative models was not necessary.

Table 7-14 Model fit results for the SD-RC-JS sub-paradigm (at the group level)

Models		P	df	χ^2	χ^2/df	SRMR	AGFI	RMSEA	AIC
(at the group level)		>0.05*	N/A	N/A	1<a<2*	<0.06*	>0.95*	<0.05*	N/A
H1	PSD-RC-JS (n=45)	0.000	7	59.895	8.556	0.099	0.280	0.414	87.895
	ibid. (Alt. model)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PInD-RC-JS (alt. model)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
H2	OSD-RC-JS (n=38)	0.026	5	12.762	2.552	0.095	0.670	0.205	32.762
	ibid. (Alter. model)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	OInD-RC-JS (Alt.model)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

P (significance values); * acceptable level A reasonable fit is indicated if RMSEA greater than 0.05 but less than 0.08. (Holmes-Smith, 2008). Perceived Social diversity (PSD); Relationship conflict (RC); Job satisfaction (JS); Objective Social Diversity (OSD); Perceived Information Diversity (PInD); Objective Information Diversity (OInD); Not applicable (N/A); Hypothesis 1 (H1); Hypothesis 2 (H2)

Thus, Condition One was met for Hypothesis 1 and Hypothesis 2 at the individual level but not at the group level. Accordingly, further assessment on bivariate relationships was to examine whether Condition Two has been satisfied at the individual level. Tests were conducted to estimate standardised regression weights for bivariate relationships in the models and they have been presented in Table 7-15. Relationships that are statistically significant are **bolded and underlined** in the table.

Table 7-15 Bivariate relationships in the SD-RC-JS sub-paradigm

Hypotheses	Bivariate relationships	β (p) (i)	β (p) (ii)
H1	PSD-RC	<u>0.285 (p<0.001)</u>	N/A
	RC-JS	<u>-0.506 (p<0.001)</u>	N/A
H2	OSD-RC	<u>-0.131 (p=0.041)</u>	N/A

Hypothesis 1 and Hypothesis 2 proposed that perceived/objective social diversity will positively influence relationship conflict, which is, in turn, negatively related to job satisfaction. All bivariate relationships were statistically significant but not all predicted bivariate relationships were found in the tests. Specifically, the predicted positive relationship between perceived social diversity and relationship conflict was found ($\beta = 0.285$; $p < 0.001$). Moreover, a negative relationship between relationship conflict and job satisfaction were supported in the test ($\beta = -0.506$; $p < 0.001$). In contrast to the positive relationship presumed, the relationship between objective social diversity and relationship conflict was, however, negative. Thus, Condition Two was met for Hypothesis 1 but not for Hypothesis 2.

In summary, after testing the social diversity-relationship conflict-job satisfaction sub-paradigm, Hypothesis 1 was supported at the individual level but not at the group level. Hypothesis 2 was not supported at either the individual or group levels. The results are presented in Table 7-16.

Table 7-16 Hypotheses testing results (the SD-RC-JS sub-paradigm)

Hypotheses		Status	
the paradigm test		Individual level	Group level
H. 1	PSD → RC → JS	Supported	Not supported
H. 2	OSD → RC → JS	Not supported	Not supported

Perceived Social diversity (PSD); Objective social diversity (OSD); Relationship conflict (RC); Job satisfaction (JS);
Hypothesis 1 (H1); Hypothesis 2 (H2)

Hypothesis 1 was supported at the individual level because the PSD-RC-JS model was confirmed and because it was a better representation of the data than the alternative models. Moreover, all predicted bivariate relationships were found. In contrast, Hypothesis 2 was not proved in the analysis although the OSD-RC-JS model

was confirmed and provided a better representation of the data than alternative models. Specifically, Hypothesis 2 failed to be supported with respect to the predicted bivariate relationships.

7.7.1.2 The information diversity-task conflict-innovativeness sub-paradigm

Tests were carried out on two hypotheses (Hypothesis 3 and Hypothesis 4) describing the hypothetical relationships between information diversity, task conflict, and innovativeness. Similar to the relationship between social diversity, relationship conflict and job satisfaction, two conditions have to be met for the hypotheses to be supported.

To see if the hypothetical model met Condition One, six models were also tested: two hypothetical models and four alternative models. The models were analysed at individual and group levels and the results are summarised in Table 7-17 and Table 7-19 respectively. Fit indexes are **bold and underlined** in the tables when models fit the sample data. Further standardised parameter estimates are presented in Appendix F.

Table 7-17 Fit results for the InD-TC-Inn sub-paradigm (at the individual level)

Models		P	df	χ^2	χ^2/df	SRMR	AGFI	RMSEA	AIC
(at the Individual level)		>0.05*	N/A	N/A	1<a<2*	<0.06*	>0.95*	<0.05*	N/A
H3	PInD-TC-Inn (n=280)	<u>0.061</u>	5	10.548	2.110	<u>0.040</u>	<u>0.958</u>	<u>0.063</u>	30.548
	ibid. (Alt. model)	0.033	5	12.168	2.434	0.044	0.949	0.072	32.168
	PSD-TC-Inn (alt. model)	0.000	10	40.368	4.037	0.085	0.907	0.104	62.368
H4	OInD-TC-Inn (n=259)	<u>0.321</u>	4	4.683	<u>1.171</u>	<u>0.028</u>	<u>0.973</u>	<u>0.026</u>	26.683
	ibid. (Alter. model)	<u>0.282</u>	3	3.816	<u>1.272</u>	<u>0.024</u>	<u>0.971</u>	<u>0.032</u>	27.816
	OSD-TC-Inn (Alt.model)	<u>0.297</u>	4	4.908	<u>1.227</u>	<u>0.046</u>	<u>0.972</u>	<u>0.030</u>	26.908

P (significance values); * acceptable level A reasonable fit is indicated if RMSEA greater than 0.05 but less than 0.08. (Holmes-Smith, 2008). Perceived Information diversity (PInD); Objective Information diversity (OInD); Task conflict (TC); Innovativeness (Inn.); Perceived Social diversity (PSD); Objective Social diversity (OSD); Not Applicable (N/A); Hypothesis 3 (H3); Hypothesis 4 (H4)

The two hypothetical models of Hypothesis 3 and Hypothesis 4 were confirmed at the individual level. As seen in

Table 7-17, fit indexes meet the “rules of thumb” except for the normed chi-square score of PInD-TC-Inn, which is, however, close to 2. Tests were then carried out to examine if the hypothetical models were better representations of the data than alternative models. As the two alternative models of the model of PInD-TC-Inn were not confirmed by the data, this hypothetical model was accordingly regarded as a good representation of the data without conducting model comparisons.

Model comparisons were, however, carried out on the OInD-TC-Inn model. For Type A model, model comparison was conducted by chi-square difference tests. The results are presented in Table 7-18.

Table 7-18 Chi-square difference test results (the InD-TC-Inn sub-paradigm)

Models	Chi-square	df	P
H3. PInD-TC-Inn (n=280)	N/A	N/A	N/A
ibid. (Alternative model)	N/A	N/A	N/A
chi-square difference test	N/A	N/A	N/A
H4. OInD-TC-Inn (n=259)	0.321	5	0.321
ibid. (Alternative model)	0.283	4	0.282
chi-square difference test	0.038	1	0.845

Perceived Information diversity (PInD); Objective Information diversity (OInD); Task conflict (TC); Innovativeness (Inn.); Not Applicable (N/A); Hypothesis 3 (H3); Hypothesis 4 (H4)

As seen in the table, the chi-square difference statistics show that there is **no** significant difference ($p=0.845$) between the chi-square statistics of the hypothetical model and the alternative model. The hypothetical models were, therefore, regarded as a better representation of the data than their nested models on the grounds of parsimony. Model comparisons were also carried out between the hypothetical model and Type B model based on a comparison of AIC scores. As the lower AIC reflected the better fitting model, the hypothetical model was a better model (AIC=26.683) than the alternative model (AIC=26.908) although the difference between the two was minor.

At the group level, neither of the hypothetical models was confirmed. As seen in Table 7-19, none of the model-fit indexes support the models. Accordingly, no model comparison was conducted because both hypotheses failed to meet Condition One.

Table 7-19 Model fit results for the InD-TC-Inn sub-paradigm (at the group level)

Models		P	df	χ^2	χ^2/df	SRMR	AGFI	RMSEA	AIC
(at the group level)		>0.05*	N/A	N/A	1<a<2*	<0.06*	>0.95*	<0.05*	N/A
H3	PInD-TC-Inn (n=45)	0.000	6	84.696	14.116	0.078	0.328	0.546	36.956
	Ibid. (Alt. model)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PSD-TC-Inn (alt. model)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
H4	OInD-TC-Inn (n=38)	0.000	5	30.559	6.112	0.119	0.446	0.372	50.558
	ibid. (Alter. model)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	OSD-TC-Inn (Alt.model)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

P (significance values): * acceptable level A reasonable fit is indicated if RMSEA greater than 0.05 but less than 0.08. (Holmes-Smith, 2008). Perceived Information diversity (PInD); Objective Information diversity (OInD); Task conflict (TC); Innovativeness (Inn.); Perceived Social diversity (PSD); Objective Social diversity (OSD); Not Applicable (N/A) ; Hypothesis 3 (H3); Hypothesis 4 (H4)

On the basis of the analyses proceeded as far, both Hypothesis 3 and Hypothesis 4 met Condition One at the individual level but not at the group level. Correspondingly, the analyses were progressed to examine if the two hypotheses met Condition Two in relation to the predicted bivariate relationships. The estimation of standardised regression weights for the predicted bivariate relationships was only carried out at the individual level. The results are presented in Table 7-20 and relationships that are statistically significant are **bolded and underlined** in the table.

Table 7-20 Bivariate relationships in the InD-TC-Inn sub-paradigm

Hypotheses	Bivariate relationships in models	β (p) (i)	β (p) (ii)
H3	PInD-TC	<u>0.247 (p=0.022)</u>	N/A
	TC-Inn	<u>0.323 (p<0.001)</u>	N/A
H4	OInD-TC	0.003 (p=0.768)	N/A
	TC-Inn	<u>0.323 (p<0.001)</u>	N/A

β (i) at the individual level; β (ii) at the group level ; Perceived Information diversity (PInD); Objective Information diversity (OInD); Task conflict (TC); Innovativeness (Inn); Not Applicable (N/A) ; Hypothesis 3 (H3); Hypothesis 4 (H4); p values (p);

Hypothesis 3 and Hypothesis 4 predicted that perceived/objective information diversity would positively influence task conflict, which is, in turn, positively related to innovativeness. As seen in Table 7-20, not all bivariate relationships were statistically significant. Specifically, the predicted positive relationship between perceived information diversity and task conflict was found in the tests ($\beta= 0.247$;

$p=0.022$). Moreover, the predicted positive relationship between task conflict and innovativeness was also proved ($\beta= 0.323$; $p<0.001$). The predicted positive relationship between objective information diversity and task conflict was, however, not statistically significant ($\beta= 0.003$; $p=0.768$). Thus, Condition Two was supported for Hypothesis 3, but was not met for Hypothesis 4.

To summarise the analyses on the sub-paradigm, Table 7-21 is presented below showing the status of the hypothesis tests. As showed in the table, Hypothesis 3 was supported at the individual level but not at the group level. Hypothesis 4 was not supported at either the individual or group level.

Table 7-21 Hypotheses testing results (the InD-TC-Inn sub-paradigm)

Hypotheses		Status	
the paradigm test		Individual level	Group level
H. 3	PInD → TC → Inn	Supported	Not supported
H. 4	OInD → TC → Inn	Not supported	Not supported
Perceived Information diversity (PInD); Objective Information diversity (OInD); Task conflict (TC); Innovativeness (Inn.); Hypothesis 3 (H3); Hypothesis 4 (H4)			

Hypothesis 3 was supported at the individual level because the PInD-TC-Inn model was confirmed and its alternative models were not supported by the data. Moreover all predicted positive bivariate relationships were found. In contrast, Hypothesis 4 failed to be supported although the OInD-TC-Inn model met Condition One. Specifically, the predicted positive bivariate relationship between objective information diversity and task conflict was not found in the tests.

While the two sub-paradigms were separately hypothesized, additional analyses were also carried out to explore how the two-sub-paradigms fit into one model. The tests were only conducted for perceived diversity at the individual level. The model was confirmed ($\chi^2 = 50.998$; $df = 34$; $p = 0.031$). Please see Appendix F for the standardised parameter estimates. The analyses revealed the independent relationship between the two sub-paradigms.

7.7.2 Mediation effects of conflict

Results of mediation testing will be presented in this section. Four hypotheses (Hypothesis 5, Hypothesis 6, Hypothesis 7, and Hypothesis 8) were tested. Specifically, the mediation effects of task conflict and relationship conflict were separately examined. Hypotheses support criteria were described in section 7.6.2.

7.7.2.1 Mediation effects of task conflict

Two hypotheses (Hypothesis 5 and Hypothesis 6) were tested in the analyses, and the hypotheses predict that task conflict mediates the relationships between perceived/objective information diversity and innovativeness. Moreover, the mediation tests were conducted at both individual and group level. Table 7-22 summarises the results of the tests. As shown in the table, when the bivariate relationships were statistically significant, the numbers are **bolded and underlined**.

Table 7-22 Test results for mediation effects of task conflict

Procedure	Mediation effects of task conflict on Relationships between	β (i)	β (ii)
Step One	PInD/Inn.	<u>0.285 (p=0.028)</u>	<u>0.329 (p<0.001)</u>
	OInD/Inn.	-0.005 (p=0.632)	<u>0.113 (p=0.002)</u>
Bivariate Relationships to be significant	PInD/TC	<u>0.247 (p=0.022)</u>	<u>0.396 (p<0.001)</u>
	TC/Inn	<u>0.323 (p<0.001)</u>	<u>0.735 (p<0.001)</u>
	OInD/TC	-0.003 (p=0.768)	0.043 (p=0.186)
	TC/Inn	<u>0.324 (p<0.001)</u>	<u>0.621 (p<0.001)</u>
Step Two	PInD/Inn. (incorporating mediator)	<u>0.219 (p=0.036)</u>	-0.032 (p=0.379)
	OInD/Inn. (incorporating mediator)	-0.006 (p=0.439)	<u>-0.073 (p<0.001)</u>
Step Three	H5. Δ of β s at Step One & Two	Δ > 0 (PM)	(FM)
	H6. Δ of β s at Step One & Two	N/A	N/A

β (i) at the individual level; β (ii) at the group level ; p values (p) | Δ | difference between β s ; Not applicable (N/A); Perceived Information diversity (PInD); Objective Information diversity (OInD); Task conflict (TC); Innovativeness (Inn) ; Hypothesis 5 (H5); Hypothesis 6 (H6)

As demonstrated previously, there should be effects to be mediated at Step One and this was regarded as the necessary condition to be met for mediation effects. As seen in the table, only the relationship between objective information diversity and innovativeness was not significant at the individual level ($\beta = -0.005$; $p < 0.632$). Thus, the necessary condition for mediation was not supported for this relationship because there is no effect to be mediated.

Further assessment on preconditions indicated that the relationship between objective information diversity and task conflict was not statistically significant at either the individual level ($\beta=-0.003$; $p=0.768$) or the group level ($\beta=0.043$; $p=0.186$), so Precondition Two was not met. As a result, the mediation assessment was only conducted for the relationship between perceived information diversity and innovativeness at Step Three. If there was no mediation assessment at Step Three, cells would be marked as ‘N/A’, that is, ‘not applicable’.

Step Three showed that task conflict partially mediated the relationship between perceived information diversity and innovativeness at the individual level. This was because the relationship between perceived information diversity and innovativeness was still statistically significant ($\beta=0.219$; $p=0.036$) but the strength **decreased** after incorporating the mediator of task conflict. At the group level, the full mediation effects of task conflict on the relationship between perceived information diversity and innovativeness were proved because the relationship between perceived information diversity and innovativeness disappeared ($\beta=-0.032$; $p=0.379$) after the mediator was incorporated.

In summary, Hypothesis 5, which predicted that task conflict mediates the relationship between perceived information diversity and innovativeness, was supported at both the individual and group levels. As seen in Table 7-23, full mediation effects were found at the individual level, but partial mediation effects were proved at the group level. In contrast, Hypothesis 6 failed to be supported at either level.

Table 7-23 Hypotheses testing results (mediation effects of task conflict)

Hypotheses		Status	
		Individual level	Group level
H. 5	PInD/Inn	Supported (PM found)	Supported (FM found)

7.7.2.2 Mediation effects of relationship conflict

Two hypotheses (Hypothesis 7 and Hypothesis 8) were tested in the analyses, and the hypotheses predict that relationship conflict mediates the relationships between perceived/objective social diversity and job satisfaction. Similar to task conflict, the mediation effects of relationship conflict were tested at both the individual and group level and the results are presented in Table 7-24. As shown in the table, when the bivariate relationships were statistically significant, the cell is **bolded and underlined**. If there was no assessment at Step Three, cells will be marked as not applicable (N/A).

Table 7-24 Test results for mediation effects of relationship conflict

Procedure	Mediation effects of relationship conflict on relationships between		β (i)	β (ii)
	Step One	PSD/JS		<u>-0.219 (p=0.017)</u>
OSD/JS			-0.003 (P=0.974)	-0.123 (P=0.556)
Bivariate Relationships to be significant	PSD/RC		<u>0.285 (p<0.001)</u>	<u>0.096 (p=0.153)</u>
	RC/JS		<u>-0.506 (p<0.001)</u>	<u>-0.973 (p<0.001)</u>
	OSD/RC		<u>-0.131 (p=0.041)</u>	-0.060 (p=0.686)
	RC/JS		<u>-0.506 (p<0.001)</u>	<u>-0.952 (p<0.001)</u>
Step Two	PSD/JS (incorporating mediator)		-0.087 (p=0.334)	<u>0.358 (p<0.001)</u>
	OSD/JS (incorporating mediator)		-0.065 (P=0.379)	0.093 (P=0.567)
Step Three	H7. Δ of β s at Step One & Two		FM	N/A
	H8. Δ of β s at Step One & Two		N/A	N/A

β (i) at the individual level; β (ii) at the group level; Perceived Social Diversity (PSD); Relationship conflict (RC); Objective Social Diversity (OSD); Job satisfaction (JS); Partial Mediation (PM); Full Mediation (FM); Hypothesis 7 (H7); Hypothesis 8 (H8)

The results showed that the relationship between perceived social diversity and job satisfaction was statistically significant at the individual level ($\beta = -0.219$; $p = 0.017$) satisfying the necessary condition. The relationship between perceived social diversity and job satisfaction at the group level and the relationship between objective social diversity and job satisfaction at both levels were, however, not statistically significant suggesting that there was no effect to be mediated. Consequently, the mediation test

was proceeded only to the relationship between perceived social diversity and job satisfaction at the individual level.

Assessment on the two preconditions showed the statistical significance of the relationship between perceived social diversity and relationship conflict ($\beta=0.285$; $p<0.001$) and the relationship between relationship conflict and job satisfaction ($\beta=-0.506$; $p<0.001$) at the individual level. Therefore, either of the two preconditions was satisfied for relationship conflict on the relationship between perceived diversity and job satisfaction at the individual level.

Step Three demonstrated that relationship conflict fully mediated the relationship between perceived social diversity and job satisfaction at the individual level. The mediation was proved full because the relationship between perceived social diversity and job satisfaction disappeared ($\beta=-0.087$; $p=0.334$) after the mediator of relationship conflict was incorporated.

To summarise the mediation test on relationship conflict, Hypothesis 7, predicting that relationship conflict mediates the relationship between perceived social diversity and job satisfaction, was supported at the individual but not at the group levels. As seen in Table 7-25, full mediation effects were found at the individual level. In contrast, Hypothesis 8 failed to be supported at either level.

Table 7-25 Hypotheses testing results (mediation effects of relationship conflict)

Hypotheses		Status	
mediation effects of RC		Individual level	Group level
H. 7	PSD/JS	Supported (FM found)	Not supported
H. 8	OSD/JS	Not supported	Not supported

Perceived Social Diversity (PSD); Relationship conflict (RC); Objective Social Diversity (OSD);
Job satisfaction (JS); Partial Mediation (PM); Full Mediation (FM); Hypothesis 7 (H7); Hypothesis 8 (H8)

7.7.3 Tests of moderation effects of contextual factors on the diversity-conflict-performance paradigm

The discussion here describes moderation effect testing. Five contextual factors were examined in the moderation test and each contextual factor was predicted to

moderate four sub-paradigms: POS-RC-JS, OSD-RC-JS, PInD-TC-Inn, and OInD-TC-Inn. Accordingly, 20 hypotheses were tested (Hypothesis 9 to Hypothesis 28).

Chi-square statistics of the unconstrained and constrained models are presented in Table 7-26. Accordingly, chi-square difference tests were carried out to examine if the differences between the two sets of chi-square statistics were statistically significant. Apart from the four models, tests were also conducted in order to explore the potential moderation effects on all bivariate relationships included in the models. However, only results for hypothesis tests are presented in the table. Moderation effects on all bivariate relationships are provided in Appendix H.

To distinguish results, the hypothesis tests that are statistically significant are **bold** in the table. In addition, the p values of chi-square difference tests are underlined if the differences between the two sets of chi-square statistics are statistically significant. The interpretation of results is straightforward for the moderation tests: if the chi-square difference test showed no statistically difference between the goodness of fit between the two models, no moderation effect was found; if there were significant differences, moderation effects were proved. The status of the hypothesis tests have been summarised in Table 7-27.

As seen in the table, task interdependence was found to moderate the SD-RC-JS sub-paradigm, but not the InD-TC-Inn sub-paradigm. Hypothesis 9 and Hypothesis 10 were, therefore, supported, and Hypothesis 11 and Hypothesis 12 failed to be supported.

With regard to task routineness, all related hypotheses (Hypothesis 13, Hypothesis 14, Hypothesis 15, and Hypothesis 16) were supported. The diversity-conflict-performance paradigm was moderated by task routineness.

Openness to diversity was found to moderate the SD-RC-JS sub-paradigm. Moderation effects were found, however, to the PInD-TC-Inn sub-paradigm, but not to the OInD-TC-Inn paradigm. Therefore, Hypothesis 17, Hypothesis 18, and Hypothesis 19 were supported, but Hypothesis 20 was not proven.

The analyses indicated that openness to conflict was moderating the SD-RC-JS sub-paradigm, but not the InD-TC-Inn sub-paradigm. Hypothesis 21 and Hypothesis 22 were supported whereas Hypothesis 23 and Hypothesis 24 were not.

Similar to the situation with openness to conflict, group longevity was found to moderate the SD-RC-JS sub-paradigm supporting Hypothesis 25 and Hypothesis 26. The PInD-TC-Inn sub-paradigm was not moderated by group longevity. Hypothesis 27 and Hypothesis 28 were therefore not supported.

In summary, the SD-RC-JS sub-paradigm was moderated by all five contextual factors examined. The PInD-TC-Inn sub-paradigm was, however, moderated by task routineness and openness to diversity. Moreover, task routineness also moderated the OInD-TC-Inn sub-paradigm.

Additional tests have shown moderation effects on some bivariate relationships. Specifically, task interdependence was found to moderate three bivariate relationships: the relationship between perceived social diversity and job satisfaction, the relationship between objective social diversity and job satisfaction, and the relationship between relationship conflict and job satisfaction. Task routineness was found to moderate all the bivariate relationship under examination.

Table 7-26 Chi-square difference test results in moderation tests

Models	Task Interdependence (H9 to H12)			Task Routineness (H13 to H16)			Openness to Diversity (H17 to H20)			Openness to Conflict (H21 to H24)			Group Longevity (H25 to H28)		
	χ^2	df	P	χ^2	df	p	χ^2	df	p	χ^2	df	p	χ^2	df	p
	N/A	N/A	<0.05	N/A	N/A	<0.05	N/A	N/A	<0.05	N/A	N/A	<0.05	N/A	N/A	<0.05
	H9			H13			H17			H21			H25		
PSD-RC-JS*	12.452	16	0.712	10.735	16	0.826	16.251	16	0.436	24.172	16	0.086	35.445	16	0.003

ibid.**	36.578	28	0.128	64.769	28	0.000	66.330	28	0.000	97.539	28	0.000	58.032	28	0.001
χ² test	24.126	12	<u>0.020</u>	54.034	12	<u>0.000</u>	50.079	12	<u>0.000</u>	73.367	12	<u>0.000</u>	22.587	12	<u>0.031</u>
OSD-RC-JS*	H10			H14			H18			H22			H26		
	9.166	10	0.516	5.564	10	0.850	15.123	10	0.128	14.822	10	0.139	5.318	10	0.869
	30.370	18	0.034	62.909	18	0.000	55.001	18	0.000	75.459	18	0.000	24.362	18	0.144
ibid.**	21.204	8	<u>0.007</u>	57.345	8	<u>0.000</u>	39.878	8	<u>0.000</u>	60.637	8	<u>0.000</u>	19.044	8	<u>0.015</u>
χ² test	21.204	8	<u>0.007</u>	57.345	8	<u>0.000</u>	39.878	8	<u>0.000</u>	60.637	8	<u>0.000</u>	19.044	8	<u>0.015</u>
PInD-TC-Inn*	H11			H15			H19			H23			H27		
	17.443	10	0.065	15.055	10	0.130	19.387	10	0.036	16.088	10	0.097	18.688	10	0.044
	21.687	18	0.246	39.996	18	0.002	35.826	18	0.007	27.814	18	0.065	28.011	18	0.062
ibid.**	4.244	8	0.834	24.941	8	<u>0.002</u>	16.439	8	<u>0.037</u>	11.726	8	0.164	9.323	8	0.316
χ² test	4.244	8	0.834	24.941	8	<u>0.002</u>	16.439	8	<u>0.037</u>	11.726	8	0.164	9.323	8	0.316
OInD-TC-Inn*	H12			H16			H20			H24			H28		
	6.927	8	0.545	8.509	8	0.385	8.370	8	0.398	7.838	8	0.449	1.486	8	0.993
	16.166	19	0.646	43.586	19	0.001	22.597	19	0.256	25.072	19	0.158	19.932	19	0.399
ibid.**	9.239	11	0.600	35.077	11	<u>0.000</u>	14.227	11	0.221	17.234	11	0.101	18.446	11	0.072
χ² test	9.239	11	0.600	35.077	11	<u>0.000</u>	14.227	11	0.221	17.234	11	0.101	18.446	11	0.072
Perceived Social Diversity (PSD); Objective Social Diversity (OSD); Relationship Conflict (RC); Job Satisfaction (JS); Perceived Information Diversity (PInD); Objective information Diversity (OInD); Task conflict (TC); Innovativeness (Inn); P (significance values); * No constraints; ** Constraints; Chi-square difference test (χ ² test); ; hypothesis 9 -28 (H 9 -28)															

The moderating effects of openness to diversity were proved on the relationship between social diversity and relationship conflict, on the relationship between social diversity and job satisfaction, on the relationship between relationship conflict and job satisfaction, on the relationship between perceived information diversity and task conflict, and on the relationship between perceived information diversity and innovativeness. Openness to conflict was proved to moderate all bivariate relationships between social diversity, relationship conflict and job satisfaction, but not between perceived information diversity, task conflict, innovativeness. Group longevity moderated the relationship between relationship conflict and job satisfaction, and the relationship between perceived information diversity and task conflict.

Table 7-27 Testing results (Moderation tests)

Hypotheses		Status
the moderation test		Single level
H. 9	TI's moderation on PSD → RC → JS	Supported

H. 10	TI's moderation on OSD → RC → JS	Supported
H. 11	TI's moderation on PInD → TC → Inn	Not supported
H. 12	TI's moderation on OInD → TC → Inn	Not supported
H. 13	TR's moderation on PSD → RC → JS	Supported
H. 14	TR's moderation on OSD → RC → JS	Supported
H. 15	TR's moderation on PInD → TC → Inn	Supported
H. 16	TR's moderation on OInD → TC → Inn	Supported
H. 17	OD's moderation on PSD → RC → JS	Supported
H. 18	OD's moderation on OSD → RC → JS	Supported
H. 19	OD's moderation on PInD → TC → Inn	Supported
H. 20	OD's moderation on OInD → TC → Inn	Not supported
H. 21	OC's moderation on PSD → RC → JS	Supported
H. 22	OC's moderation on OSD → RC → JS	Supported
H. 23	OC's moderation on PInD → TC → Inn	Not supported
H. 24	OC moderation on OInD → TC → Inn	Not supported
H. 25	GL's moderation on PSD → RC → JS	Supported
H. 26	GL's moderation on OSD → RC → JS	Supported
H. 27	GL's moderation on PInD → TC → Inn	Not supported
H. 28	GL's moderation on OInD → TC → Inn	Not supported

Perceived Social Diversity (PSD); Objective Social Diversity (OSD); Relationship Conflict (RC) Job Satisfaction (JS);
Perceived Information Diversity (PInD); Objective Information Diversity (OInD); Task Conflict (TC); Innovativeness (Inn.);
Task Interdependence (TI); Task Routineness (TR); Openness to Diversity (OD); Openness to Conflict (OC);
Group Longevity (GL)

7.8 A Summary of the Chapter

This chapter describes the process of data treatment and data analysis. The data processing stage was to get data ready for analysis. Moreover, the preliminary analysis procedure allowed the researcher to become familiar with the data. Further preliminary analysis examined the functionalities of quantitative measures. In the section on the analysis procedure, the criteria and specific steps were articulated. The results were presented in the results testing section. These results will be discussed in the next chapter with respect to the consistencies and inconsistencies in the existing knowledge.

Chapter 8. Discussion

In the previous chapter, data were processed and analysed. As described in the result summary, some hypotheses were supported while others were not. In particular, guided by a table that explicitly summarised what has supported and what has not, the discussion will focus on consistencies and inconsistencies with how the results fit with existing knowledge. Given the different purposes and procedures of the three-part analysis, the discussion will also be presented in three parts.

Because of the large amount of information included in the previous chapter, the test results will be re-presented in this chapter with a summative

Table 8-1. In total, 28 hypotheses were tested. The following discussion will focus on results outlined in

Table 8-1, but it may go beyond the scope of hypothesis testing where additional tests were conducted.

8.1 Tests on the Diversity-Conflict-Performance Paradigm

To explore the paradigm, four hypotheses were developed (Hypothesis 1 to Hypothesis 4) and tested. The hypotheses were developed based on an integrated framework that predicts both negative and positive effects of diversity. Specifically, Hypothesis 1 and Hypothesis 2 predict that perceived/objective social diversity has a positive influence on relationship conflict, which, in turn, has a negative impact on job satisfaction (the SD-RC-JS sub-paradigm). By contrast, Hypothesis 3 and Hypothesis 4 argue that perceived/objective information diversity has a positive influence on task conflict, which, in turn, has a positive impact on innovativeness (the InD-TC-Inn model sub-paradigm).

Hypotheses were tested using multilevel SEM. The analyses were confirmatory and the purpose of the analysis was to test the goodness of fit between the hypothetical models implied in the hypotheses and data collected from the present samples. The status of each hypothesis is presented in

Table 8-1.

Table 8-1 The status of hypotheses

Hypotheses		Status	
Part One: the paradigm test		Individual level	Group level
Hypothesis. 1	PSD → RC → JS	Supported	Not supported
Hypothesis. 2	OSD → RC → JS	Not supported*	Not supported
Hypothesis. 3	PInD → TC → Inn	Supported	Not supported
Hypothesis. 4	OInD → TC → Inn	Not supported*	Not supported
Part Two: the mediation test		Individual level	Group level
Hypothesis. 5	TC's mediation on PInD → Inn	Supported (PM found)	Supported (FM found)
Hypothesis. 6	TC's mediation on OInD → Inn	Not supported	Not supported
Hypothesis. 7	RC's mediation on PSD → JS	Supported (FM found)	Not supported
Hypothesis. 8	RC's mediation on OSD → JS	Not supported	Not supported
Part Three: the moderation test			
Hypothesis. 9	TI's moderation on PSD → RC → JS	Supported	
Hypothesis. 10	TI's moderation on OSD → RC → JS	Supported	
Hypothesis. 11	TI's moderation on PInD → TC → Inn	Not supported	
Hypothesis. 12	TI's moderation on OInD → TC → Inn	Not supported	
Hypothesis. 13	TR's moderation on PSD → RC → JS	Supported	
Hypothesis. 14	TR's moderation on OSD → RC → JS	Supported	
Hypothesis. 15	TR's moderation on PInD → TC → Inn	Supported	
Hypothesis. 16	TR's moderation on OInD → TC → Inn	Supported	
Hypothesis. 17	OD's moderation on PSD → RC → JS	Supported	
Hypothesis. 18	OD's moderation on OSD → RC → JS	Supported	
Hypothesis. 19	OD's moderation on PInD → TC → Inn	Supported	
Hypothesis. 20	OD's moderation on OInD → TC → Inn	Not supported	
Hypothesis. 21	OC's moderation on PSD → RC → JS	Supported	
Hypothesis. 22	OC's moderation on OSD → RC → JS	Supported	
Hypothesis. 23	OC's moderation on PInD → TC → Inn	Not supported	
Hypothesis. 24	OC moderation on OInD → TC → Inn	Not supported	
Hypothesis. 25	GL's moderation on PSD → RC → JS	Supported	
Hypothesis. 26	GL's moderation on OSD → RC → JS	Supported	
Hypothesis. 27	GL's moderation on PInD → TC → Inn	Not supported	
Hypothesis. 28	GL's moderation on OInD → TC → Inn	Not supported	

Perceived Social Diversity (PSD); Objective Social Diversity (OSD); Relationship Conflict (RC); Job Satisfaction (JS);
 Perceived Information Diversity (PInD); Objective Information Diversity (OInD); Task conflict (TC); Innovativeness (Inn);
 Partial Mediation (PM); Full Mediation (FM); Task Interdependence (TI); Task Routineness (TR); Openness to Diversity (OD);
 Openness to Conflict (OC); Group Longevity (GL); * SEM models were confirmed

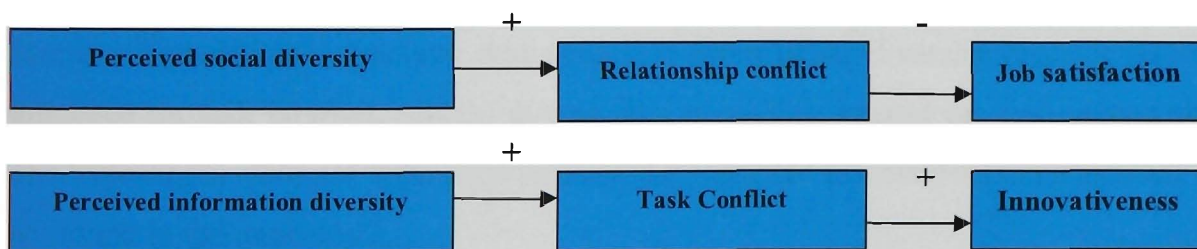
One thing worthy of mention is that the present research is the first research (to the researcher's knowledge) that has directly examined the diversity-conflict-performance paradigm and that has operationalised diversity based on multiple dimensions. Whereas recent discussion has focused on the relationship between diversity, conflict,

and performance, their review was still based on research examining bivariate relationships (Jehn et al., 2008). Thus, the current discussion will refer to the literature for in/consistency from the perspective of bivariate relationships (i.e. two-way relationships) and the diversity conceptualisation that is based on single-attributes because of the unavailability of such knowledge. In addition, as the analyses were carried at both the individual and group levels, the discussion will proceed accordingly.

8.1.1 The individual level

At the individual level, Hypothesis 1 and Hypothesis 3 were supported. The findings indicate that perceived diversity had both positive and negative impacts on performance. In particular, perceived social diversity had a positive influence on relationship conflict, which, in turn, had a negative impact on job satisfaction. In contrast, perceived information diversity had a positive influence on task conflict, which, in turn, had a positive impact on innovativeness. The findings are depicted in Figure 8-1.

Figure 8-1 Two diversity-conflict-performance sub-paradigms



As shown in Figure 8-1, different types of diversity are positively related to different forms of conflict, which, in turn, impact on performance differently resulting in both negative and positive effects on diversity. The two-sub-paradigms do not fit into one model and they are independent to each other. Whereas it is difficult to refer this result to one theory or one study, the two sub-paradigms of diversity-conflict-performance are consistent with previous theories or research.

With respect to the PSD-RC-JS sub-paradigm, the findings are consistent with the existing literature, relational demography in particular. The relational demography theories such as similarity-attraction theory and SCT explain that people tend to

categorise each other based on perceived similarity and this categorisation induces them to like and trust in-groups members over out-groups leading to the development of poor interpersonal relationships between diverse people (Mannix & Neale, 2005; Richard et al., 2006; Tajfel & Turner, 1986). The finding is also consistent with one previous study that found negative associations between perceived social diversity (termed perceived visible dissimilarity) and group outcomes (measured by group involvement, referring to an individual's involvement in task-related processes) (Hobman et al., 2004).

In relation to the PInD-TC-Inn sub-paradigm, the finding confirms the previous theories, such as the information/decision-making approach which suggest that people are likely to report a higher level of task conflict when respective belief structures are presented. Specifically, group members who have perceived divergent preferences and interpretations of tasks and these divergences are likely to manifest themselves in task conflict (Henley & Price, 2004; Pelled et al., 1999; Simons & Peterson, 2000).

At the individual level, Hypothesis 2 and Hypothesis 4 were, unexpectedly, not supported. Hypothesis 2 argued that objective social diversity has a positive influence on relationship conflict, which, in turn, has a negative impact on job satisfaction. In contrast, Hypothesis 4 predicts that objective information diversity has a positive influence on task conflict, which, in turn, has a positive impact on innovativeness. The hypotheses were not supported because the predicted bivariate relationships were not found in the analyses.

With regard to Hypothesis 2, the forecasted positive relationship between objective social diversity and relationship conflict was not found. Instead, a negative relationship was shown ($\beta = -0.131$; $p < 0.041$) resulting in a positive effect of objective social diversity. The finding is contradictory to current theories, such as similarity-attraction theory and SCT (Goldberg, 2005; Hugenberg & Bodenhausen, 2004; Mannix & Neale, 2005), and the previous research (Jehn et al., 1997; Pelled et al., 1999), which suggested that objective social diversity is likely to increase relationship conflict.

While this is not the first research yielding a positive effect of objective social diversity [e.g. positive effects of racial diversity on firm performance were found in a national sample of 177 banks in the USA (Richard, McMillan, Chadwick, & Dwyer, 2003)], the inconsistency with theories may be due to a combination of two factors. The first factor is related to the possible Tokenism²⁰ influence, which is associated with the characteristics of the sample. The second factor is linked with the characteristics of tasks the participants were performing.

As shown in Table 7-4, three demographic measures have relatively large disproportion in terms of categories of women, white Anglo-Saxons (WAS), and Europeans. Specifically, women accounted for 68 per cent of the sample, WAS, 80 per cent of the sample and Europeans 90 per cent of the sample. In addition, the tasks were low in interdependence and were quite routine suggesting little need for interaction among group members to carry out their jobs. In a diverse group with “token” individuals performing highly routine tasks, the relationship conflict is likely to be low because there may be no interaction but polite co-existence between the “token” individuals and the majorities.

Apart from explanations from the perspective of interaction between task interdependence and task routineness, another possible reason behind the contradiction lies in correspondence between objective and perceived measures. That said, people may perceive high-level of dissimilarity due to the most salient attribute although the objective dissimilarity is at a lower level. In contrast, people may perceive low-level of diversity given no presence of salient attribute despite of that a high level of objective diversity actually exists. Explanations to such situations have been supported in the literature (G. B. Cunningham, 2007; H. M. Williams et al., 2007). Therefore, it seems reasonable that perceived social diversity and objective social diversity affected relationship conflict in different ways.

With respect to Hypothesis 4, it was not supported because the predicted positive relationship between objective information diversity and task conflict was not

²⁰ The theory of Tokenism predicts that individuals who are extremely different in an attribute from the rest of group hold high visibility positions, which, in turn, often create a negative situation for the “token” individuals (Riordan, 2000).

statistically significant ($\beta= 0.003$; $p=0.768$). The result is inconsistent with the existing theories, particularly, the information/decision-making approach, which predicts that people with diverse backgrounds are likely to possess a variety of perspectives and approaches to the problems in hand and the variety is likely to induce task conflict (Certo et al., 2006; Horwitz, 2005).

This inconsistency could be related to the characteristics of the tasks the participants were performing. In routine tasks, there is little need for group members to exchange information to carry out their jobs. As a result, the information-related debates are less likely causing low levels of task conflict.

One further noteworthy finding at the individual level is that all hypothetical models for the hypotheses were confirmed suggesting that the proposed structures of the constructs under examination were the best representation of the data. The finding is consistent with a growing literature that suggests that group processes may 'account for' the relationship between diversity and performance (Lawrence, 1997) and that diversity affects a number of group processes. Through them, a number of organisational outcomes occur (Pfeffer, 1983). Accordingly, the research provides empirical evidence in support of Pelled's Intervening Process Theory (1996) predicting that diversity influences performance entirely through group processes such as conflict and that diversity has no direct effects on performance.

8.1.2 The group level

Unexpectedly, the four hypotheses (Hypothesis 1 to Hypothesis 4) were not supported at the group level. The findings indicate that the proposed structures of the constructs under examination were not represented in the data. Diversity did not influence the conflict, which, in turn, had an impact on performance. With respect to the three-way relationship, this is inconsistent with the open-black-box approach (Lawrence, 1997) and intervening theories (Pelled, 1996).

There are possibly two factors that might contribute to inconsistency. The first factor is associated with group memberships. While there is little control over the team structures which are set by the participating organisations, the group formation in

some organisations was not ideal, as described in Chapter Six. For instance, the 18 work teams at PR and three teams at CP were based on call centres servicing a range of clients. Similarly, the seven teams at BS were based on the regions the members came from. It is very likely that the group memberships could be very ambiguous to the group members. That said, group members might not have the basic sense of 'belonging' and they might not have enough knowledge about what was going on in the groups. Thus, the responses towards perception of group-level constructs could be largely distorted. Consequently, the relationships produced in the analyses might not be true reflection of the predicted relationships at the group level.

The characteristics of tasks are the second factor that might account for the inconsistent findings. As discussed earlier, the tasks performed by the participants were quite independent and highly routine. In independent and routine tasks, group members are likely to be performing their jobs as individuals, therefore requiring little interaction and coordination among members. The group memberships were of little significance to group members, causing the salience of group identities to fade. Consequently, the dynamics between the constructs at the group level are likely to be undermined. Moreover, this factor relating to task characteristics would induce the distortion associated with the factor of group membership ambiguity.

8.1.3 Additional findings

While the purpose of this part of the analysis was to examine the diversity-conflict-performance paradigm, there were two additional findings that are noteworthy. The first finding is that all predicted bivariate relationships between conflict and performance were supported. Whereas the dual impact of conflict on performance might be not conclusive (Jehn & Mannix, 2001; Yeh & Chou, 2005), this research has confirmed both beneficial and detrimental effects of conflict in line with the growing literature (Amason & Mooney, 1999; G. Q. Chen et al., 2005; De Dreu & Beersma, 2005; Guerra et al., 2005; Jehn, 1994; Jehn, 1995; Jehn & Bendersky, 2003; Pearson et al., 2002; Sportsman, 2005; Tidd & Friedman, 2002).

Another additional finding is that the mediated relationship (the hypothetical model) is a better representation of the data than the partially mediated relationship (the

nested alternative model). This finding is shown in Table 8-2, which summarises model comparison results conducted in Chapter Seven. This finding provides additional support to the diversity-conflict-performance paradigm.

Table 8-2 Comparison of goodness of fit between hypothetical and alternative models

Models	Better-fitted models	
	Individual level	Group level
PSD → RC → JS	the hypothetical model	N/A
OSD → RC → JS	the hypothetical model	N/A
PInD → TC → Inn	the hypothetical model	N/A
OInD → TC → Inn	the hypothetical model	N/A

Perceived Social diversity (PSD); Objective social diversity (OSD); Relationship conflict (RC) Job satisfaction (JS) perceived Information diversity (PInD); objective information diversity (OInD); Task conflict (TC);

In summary, this part of the analysis found both negative and positive effects of perceived diversity at the individual level depicted in Figure 8-1 and it confirmed the diversity-conflict-performance paradigm. Thus, the integrated model proposed in Chapter Three is substantiated at the individual level and the diversity paradox in the literature could be explained.

8.2 Tests of Mediation Effects

The theoretical underpinnings of mediation testing are related to the open-black-box approach, which argues that group processes may account for the relationship between diversity and performance (Lawrence, 1997), building up a three-way relationship (i.e. diversity-group processes-performance) (Pelled, 1996). To test if conflict is a mediator between diversity and performance, four hypotheses (Hypothesis 5 to Hypothesis 8) were developed and tested.

Hypothesis 5 and Hypothesis 6 predict that task conflict mediates the relationships between perceived/objective information diversity and innovativeness. Similarly, Hypothesis 7 and Hypothesis 8 argue that relationship conflict mediates the relationship between perceived/objective social diversity and job satisfaction. The status of hypotheses is presented in

Table 8-1. As the analyses were carried at both the individual and group levels, the discussion will be proceeded with accordingly.

8.2.1 The individual level

At the individual level, Hypothesis 5 and Hypothesis 7 were supported. In particular, partial mediation effects were found for Hypothesis 5, while full mediation effects were proven in tests of Hypothesis 7. Based on Baron's interpretation criteria for partial mediation (1986), the finding demonstrates that task conflict is indeed potent, but not necessarily a sufficient condition for there to be an impact on innovativeness. It was said that innovativeness was not solely determined by task conflict.

According to Baron (1986), the full mediation found in the test of Hypothesis 7 was strong evidence that relationship conflict is a single and dominant mediator between perceived social diversity and job satisfaction. Together, the findings confirm the literature proposing that group processes such as conflict are likely to mediate the relationship between diversity and performance (Zaccaro et al., 2006). Moreover, the findings provide empirical evidence that the link between diversity and performance becomes less significant (or disappears) in the three-way relationship (Lawrence, 1997).

At the individual level, Hypothesis 6 and Hypothesis 8 however, were not supported because no mediation effect was found between the variables under examination. As shown in Table 7-22 and Table 7-24, Hypotheses 6 and 8 were not supported because the relationships between objective information/social diversity and innovativeness/job satisfaction were not significant, indicating that there was no effect to be mediated. The argument that the effects of perceived diversity may be stronger than the effects of objective diversity (Hobman et al., 2004) could provide an explanation for this contradiction. On the one hand, effects of perceived diversity were significant; on the other, no effect of objective diversity was proven.

8.2.2 The group level

At the group level, Hypothesis 5 was supported because full moderation effects were found in the analyses. The finding suggests that task conflict is a single and dominant mediator between perceived information diversity and innovativeness. This confirms

prior research. For example, it was demonstrated that intragroup conflict mediated the relationship between cultural diversity and group outcomes (Vodosek, 2005; Vodosek, 2007). Focusing on another process, other research has shown that functional diversity worked through external communications to increase performance, as measured by technical innovation, better budgets and faster schedules (Keller, 2001).

Unfortunately, Hypothesis 6, Hypothesis 7 and Hypothesis 8 were not supported because no mediation effect was found in the analyses. This is inconsistent with the exiting literature that group processes can be expected to mediate the relationship between diversity and performance. The inconsistency may be relevant to group formation in some organisations. The perception of respondents towards the group-level constructs was likely to be largely distorted given the ambiguousness of group memberships to the group members.

In sum, the test of mediation effects yielded empirical evidence that conflict could mediate the relationship between diversity and performance and that the link between diversity and performance may become less significant (or disappears) in a three-way relationship.

8.3 Tests of Moderation Effects

Five contextual factors were examined for moderation effects. Four hypotheses were proposed for each contextual factor with respect to moderation effects on the four sub-paradigms: PSD-RC-JS, OSD-RC-JS, PInD-TC-Inn, and OInD-TC-Inn. A total of 20 hypotheses were tested. The results were presented in Table 8-1.

The purpose of the moderation test was to examine whether the contextual factors were moderating the paradigm, but not the specific strengths of the moderation. Moreover, to the researcher's knowledge this is the first research to examine the moderation effects on the paradigm. Thus, the discussion will not cover the direction and strengths of moderation and will refer to the existing literature with respect to moderation effects on bivariate relationships such as the relationship between diversity and conflict, or/and the relationship between conflict and performance.

8.3.1 Moderation effects of task interdependence

Four hypotheses (Hypothesis 9 to Hypothesis 12) were tested for the moderation effects of task interdependence. Hypothesis 9 and Hypothesis 10 were supported while Hypothesis 11 and Hypothesis 12 were not. The finding that task interdependence moderates the SD-RC-JS sub-paradigm (both perceived and objective) is consistent with the existing literature. Task interdependence has been suggested as a moderator on the relationship between diversity and conflict due to the increased opportunity for conflict to occur in highly interdependent tasks (Horwitz, 2005; Jehn, 1995; Meade & Eby, 2007). It has also been argued that task interdependence is a moderator of the relationship between conflict and performance because of the increased salience of conflicts in interdependent tasks (Jehn & Bendersky, 2003). Empirically, the research provides evidence to an argument that task interdependence may diminish detrimental effects of diversity (Van der Vegt & Van De Vliert, 2005).

However, moderation effects of task interdependence were not proven on the InD-TC-Inn sub-paradigm. The explanation for the inconsistency may be related to the task characteristics. Variation in the level of social interaction and coordination between team members associated with task interdependence may have less impact on the dynamics of the effects of information diversity because there is little need for task-related information and perspectives (i.e. information diversity) to carry out the highly independent and routine tasks. This explains why task interdependence did not moderate any bivariate relationship included in the the InD-TC-Inn sub-paradigm as shown in Appendix H.

8.3.2 Moderation effects of task routineness on the paradigm

Similar to task interdependence, four hypotheses (Hypothesis 13 to Hypothesis 16) were developed and tested for the moderation effects in job routineness. As expected, four Hypotheses were supported. In addition, as seen in Appendix H, all bivariate relationships included in the diversity-conflict-performance paradigm were moderated

by job routineness. The finding provides empirical evidence for the prior theoretical arguments.

It has been argued that task routineness could act as a moderator of the relationship between diversity and conflict. Diversity is likely to impact differently on group members who are performing tasks at different levels of routineness due to the different need for social interaction and functional expertise and resources (Horwitz, 2005). Moreover, task routineness probably acts as a moderator on the relationship between conflict and performance. The dynamics between conflict and performance is likely to be influenced by variations in task routineness, which determines the need for group members to manage the conflict to carry out their task (Jehn & Bendersky, 2003; Kankanhalli et al., 2007).

8.3.3 Moderation effects of openness to diversity on the paradigm

Hypothesis 17, Hypothesis 18, Hypothesis 19 and Hypothesis 20 described the moderation effects of openness to diversity. Hypothesis 17, Hypothesis 18 and Hypothesis 19 were supported in the analyses, while Hypothesis 20 was not accepted.

The confirmation of hypotheses supports the existing literature proposing that openness to diversity is likely to moderate the relationship linking types of diversity to group processes and outcome effects because openness to diversity facilitates interpersonal interaction and task-related communication within groups (Hobman et al., 2004). There was empirical evidence that supported the moderation effects of openness to diversity (Hobman et al., 2003). The finding is also consistent with prior research that showed the impact of openness to diversity on job satisfaction among 326 library staff members in the US (Royse, Conner, & Miller, 2006) and that demonstrated the significance of openness to diversity to successful diversity management (Muhr, 2006).

Openness to diversity was found to have no moderation effect on the sub-paradigm of OInD-TC-Inn. This may be due to the characteristics of the tasks the participants were performing. Openness to diversity was suggested to encourage discussions and constructive conflict (Hobman et al., 2004). However, in independent and routine

tasks, people have little need for task-related interaction with their dissimilar peers to carry out their jobs. As a result, the paradigm may be less sensitive to the diversity climate.

8.3.4 Moderation effects of openness to conflict on the paradigm

Four hypotheses (Hypothesis 21, Hypothesis 22, Hypothesis 23 and Hypothesis 24) were formulated to describe the moderation effects of openness to conflict. Hypothesis 21 and Hypothesis 22 were confirmed and Hypothesis 23 and Hypothesis 24 were not supported in the analyses. The confirmation of the two hypotheses is consistent with the existing literature that openness to conflict moderates the effects of social diversity (both perceived and objective) (Jehn & Bendersky, 2003). Compared to a lower level of openness to conflict, people in a higher level of openness to conflict are likely to have different propensity to tolerate relationship conflict.

While openness to conflict was predicted to moderate the paradigm, the characteristics of tasks could explain why there was no moderation effect found. Similar to openness to diversity, the dynamics of the paradigm may be less sensitive to a climate of conflict. In independent and routine tasks, there is little need to exchange information and debate task-related issues with their dissimilar peers in order to carry out their jobs. That said, regardless of the level of openness to conflict, there was just not enough room for task conflict.

8.3.5 Moderation effects of group longevity on the paradigm

Four hypotheses (Hypothesis 25, Hypothesis 26, Hypothesis 27 and Hypothesis 28) were developed to describe the moderation effects of group longevity on the paradigm. Hypothesis 25 and Hypothesis 26 were accepted and Hypothesis 27 and Hypothesis 28 were not supported in the analyses.

Theoretically, it is likely that after working together for a period of time, group members from different backgrounds either develop a shared understanding of tasks or learn to anticipate and deflect opposition to their ideas by beginning to share each other's perspectives (Harrison et al., 2002). Over time, the boundaries between different categories may become blurred (Pelled et al., 1999). In this way, group longevity may diminish the effects of diversity. Empirically, group longevity was

found to moderate the relationship between diversity and group performance among workers in 54 work teams from 13 different organisations (Schippers, Den Hartog, Koopman, & Wienk, 2003).

However, the research found that the time is likely to diminish the boundaries across socially-related dissimilarities (i.e. social diversity) rather than information-related dissimilarities (i.e. information diversity). Confirmation of the two hypotheses in relation to social diversity is consistent with the existing literature that group longevity moderates the effects of social diversity (S. E. Jackson & Joshi, 2004).

No moderation effect was found in the tests on the InD-TC-Inn sub-paradigm. The explanation to this inconsistency is that the information-related dissimilarities are difficult to vary across time if there is little interaction in information exchanges or task-related debates among the diverse people.

To summarise the analysis, the research found that the social diversity-relationship conflict-job satisfaction sub-paradigm was moderated by all contextual factors, while the information diversity-task conflict-innovativeness sub-paradigm was shown to be moderated by task routineness. Moreover, the PInD-TC-Inn sub-paradigm was moderated by openness to diversity. The findings suggest that the dynamics of the paradigm are likely to vary in different research according to the variation of the research contextual factors. The diversity paradox could be understood from this perspective.

8.4 A Summary of the Chapter

In this chapter, the findings were discussed in three parts with respect to the expected and unexpected results. In the next chapter, contributions to knowledge, implications for practitioners, the potential limitations of the present research, and the possible directions for future research will be presented.

Chapter 9. Conclusion

In the previous chapter, the findings were discussed in three parts with respect to the expected and unexpected results. In this chapter, after a brief outline of the initial objectives of the present research, contributions of the research to knowledge on the topic will be articulated. Specifically, contributions will be presented with respect to diversity literature (Section 9.2.1.) and conflict literature respectively (Section 9.2.2.). Then, implications for practitioners will be pointed out to both diversity and conflict management. Following that, the potential limitations of the present research will be examined followed by the possible directions for future research. Concluding remarks will be presented at the end of the chapter.

9.1 The Present Research

Prior research on diversity in work teams has yielded mixed results and presented a diversity paradox, indicating extremely inconsistent, mixed and, sometimes, contradictory research results. This state of knowledge has attracted increasing research attention. While researchers have tried to dissect the diversity paradox from various perspectives, none of the perspectives have adequately explained the diversity paradox. In order to advance the knowledge of diversity, the present research intended to resolve the diversity paradox by applying five perspectives simultaneously: diversity conceptualisations, diversity theoretical frameworks, group processes, research contexts, and methodological issues.

The research conceptually classed diversity into two types (social and information diversity) and developed an integrated framework that predicts both negative and positive effects of diversity. Conflict has been elaborated into the relationship between diversity and performance forming the diversity-conflict-performance paradigm. Moderation effects of research contextual factors were also considered in the research. By doing so, this research was to explore the process of how group members perceive different types of diversity, and how these variations influence different forms of group conflict and, accordingly performance.

Subsequently, a number of hypotheses were developed based on the integrated theoretical framework. Specifically, the present research proposed that different types of diversity are likely to increase different forms of conflict, resulting in different effects of diversity. The research further posited that conflict mediates the relationship between diversity and performance. Moreover, the diversity-conflict-performance paradigm was predicted to be moderated by five contextual factors (i.e. task interdependence, task routineness, openness to diversity, openness to conflict, and group longevity).

To test the hypotheses, the present research was based on data from an online survey in 45 work teams from six Victorian organisations. 532 employees were nominated to participate in the survey. From these, a total of 280 participants provided responses that were usable. Given the particular characteristics of the present data, a multilevel SEM was used as the analysis tool for testing the diversity-conflict-performance paradigm and the mediation effects. Tests of moderation effects were carried out in a multi-group SEM.

The research found both negative and positive effects of perceived diversity at the individual level and it confirmed the diversity-conflict-performance paradigm. Moreover, the research yielded empirical evidence that conflict could mediate the relationship between diversity and performance. Furthermore, it was found that contextual factors moderated the paradigm, the social diversity-relationship conflict-job satisfaction in particular.

9.2 Contributions to Knowledge

The research has contributed to knowledge in various ways. While extending the literature of performance, its contributions are mainly relevant to diversity and conflict. The significance of this research is twofold relating to both theoretical development and practical concerns. The theoretical contributions will be discussed in this section, while the practical implications will be outlined in 9.3. With respect to the theoretical contributions, the discussion will focus on how the present research fills the gaps from the five perspectives that were addressed in Chapter 2.

9.2.1 Diversity literature: a better understanding of the diversity paradox

This is the first research that **directly** examines the diversity-conflict-performance paradigm using multilevel SEM. Although the research has not completely resolved the diversity paradox, it improves understanding of the diversity paradox. In particular, the research showed that diversity could impact on performance both negatively and positively depending on the types of diversity and the forms of conflict generated. Moreover, the research contributes to knowledge by filling gaps in the relevant literature.

9.2.1.1 Diversity Conceptualisations-two types of diversity

One problem in the literature of diversity conceptualisations was that a large number of attributes had been referred to as diversity and it had been suggested that the variety in diversity conceptualisations were a cause of the diversity paradox (Harrison et al., 2002; Harrison & Klein, 2007). A promising premise in the literature was that different attributes of diversity might have unequal effects on organisations or groups, or individuals (Mannix & Neale, 2005).

Following this argument, diversity was classified into two types: social diversity and information diversity in the research. Moreover, diversity was defined according to a group of attributes that have similar properties (visibility and job-relatedness). Furthermore, diversity was studied both as a subjective (perception) and an objective (distance) construct.

The research found different effects of perceived diversity at the individual level through a diversity-conflict-performance paradigm. In line with other studies (Christian et al., 2006; Taylor & Greve, 2006), the research provides empirical evidence that argues that information diversity behaves in a different way from social diversity. In doing so, this research extends the literature in diversity conceptualisations by conceptually categorising diversity into two types based on a group of attributes of similar levels of visibility and job-relatedness and proving their distinctive effects.

9.2.1.2 An integrated framework

A gap in the diversity theories was that there was no theory that was able to predict how different types of diversity operate differently to impact on performance. Increasing attention had focused on integrating the three commonly-used frameworks that were competing with each other predicting either negative or positive effects of diversity (Bunderson & Sutcliffe, 2002).

This research developed an integrated model that predicts both negative and positive effects of diversity. Accordingly, a number of hypotheses have been developed to propose that different types of diversity are likely to increase different forms of conflict, resulting in different effects of diversity. The findings support the propositions with respect to perceived diversity at the individual level substantiating the integrated model.

The research contributes to diversity theorisations by developing an integrated model and partially substantiating its propositions. As a result, the negative and positive effects found in some studies including the current one can be explained.

9.2.1.3 Opening the ‘black box’

There was a gap in the knowledge of understanding how group processes functioned between diversity and performance, which has been named the ‘black box’ (Lawrence, 1997). Intervening theories have been developed to open the ‘black box’ (Pelled, 1996). Because of the different roles of the group processes playing between the relationship between diversity and performance, intervening theories are adopted to explain the mixed effects of diversity (Jehn, 1999; Pelled, 1996; Pelled et al., 1999).

Taking the open-black-box approach, the research focuses on a particular intervening theory, the diversity-conflict-performance paradigm. Taking the approach a step further, two forms of conflict were elaborated into the relationship between diversity and performance forming the two sub-paradigms of diversity-conflict-performance.

The research confirmed the diversity-conflict-performance paradigm at the individual level with respect to perceived diversity.

The research is the first research that has directly examined an intervening theory and that provides supporting empirical evidence. Moreover, the research extends the diversity-conflict-performance paradigm by elaborating two forms of conflict to form two sub-paradigms.

9.2.1.4 Roles of Research Contexts

Understanding of how research contextual factors moderate the effects of diversity on performance was limited although the knowledge was considered helpful in explaining the inconsistent results in the literature (Haidt et al., 2003; Jehn & Bezrukova, 2004). In this research, a total of five contextual factors were predicted to moderate a particular intervening theory of diversity-conflict-performance.

The finding demonstrated the moderation effects of contextual factors on the intervening theory, particularly, the social diversity-relationship conflict-performance paradigm. In doing so, the research extends knowledge by exploring whether research contextual factors moderate the diversity-conflict-performance paradigm.

9.2.1.5 Methodologies

Current diversity measurement was limited in capturing the full meaning of diversity because it did not measure multiple identities of individuals at one time (Lau & Murnighan, 1998; Lau & Murnighan, 2005). Moreover, the nested data in the research presented great challenges to the data analysis process. All these gaps in methodologies were used to explain the diversity paradox.

To fill these gaps, the present research successfully measured diversity (perceived and objective) based on multiple attributes of similar properties. In addition, it adopted a multilevel SEM to deal with the nested data. To the research's knowledge, this is the first research conducted in multilevel SEM to explore the relationship between diversity, conflict and performance.

9.2.2 Conflict literature

While the aim of the research was to resolve the diversity paradox, it also extends the conflict literature. First, in line with prior studies (M. Chen, 2006; Guerra et al., 2005), the research empirically confirmed the duality of conflict typology: task conflict versus relationship conflict. The distinction between them was considered critical to understanding the circumstances in which conflict can be beneficial or detrimental to performance. The research provides evidence to close the debates in this regard.

Moreover, the research extends the growing literature that suggests that conflict might be a doubled-edged sword, with both beneficial impacts and detrimental effects (Amason & Mooney, 1999; G. Q. Chen et al., 2005; De Dreu & Beersma, 2005; Guerra et al., 2005). The research contributes to knowledge by proving that effects of conflict largely depend on the type of conflict generated: task or relationship conflict.

The third contribution of the research to knowledge is related to conflict measurement. While assessing and refining Jehn's conflict scale (Jehn, 1994; Jehn, 1995) was not the purpose of the present research, concerns were raised over Jehn's conflict scale with respect to adoption of its items. Although Jehn's conflict scale has been widely adopted by researchers (Rose & Shoham, 2004; Yang & Mossholder, 2004), a two-item structure rather than a four-item structure, was adopted. This is similar to another study (Pearson et al., 2002), in which a total of six items (three items each for relationship and task conflict) were proven to be the best version of Jehn's conflict scale.

9.3 Implications for Practitioners

There are clearly messages from the present study to practitioners, particularly with respect to diversity initiatives and conflict management. These implications will be separately described in the following sections.

9.3.1 Diversity initiatives

The rapid on-going demographic shifts in the population and workforce create a significant demand for managers to undertake diversity initiatives (Rangarajan & Black, 2007). In the meantime, dealing with diversity has played a prominent role in organisational management in recent years. Moreover, the effects of diversity presented in this research suggest that it is impossible to develop the potential of diversity without managing the negative influences. The discussion will present implications specifically addressing the two aspects of diversity initiatives: diversity management and diversity training.

Diversity management normally refers to the systematic and planned commitment on the part of organisations to recruit and retain employees with diverse backgrounds and abilities (Bassett-Jones, 2005). It is a strategic concept that involves changes in organisational structures, decision making and/or organisational culture and it focuses on the idea of valuing differences of non-dominant or under-represented social groups (Bassett-Jones, Brown, & Cornelius, 2007; Vinz & Dören, 2007). Diversity management provides a strategic guidance to diversity training.

Originally developed to reduce workplace inequity, diversity training is normally found within the HRM training and development domains of organisations. Diversity training is a diversity initiative that is designed to facilitate the integration of minority groups into the workplace, usually by attempting to confer on the entire workforce the skills, knowledge and motivation to work productively alongside dissimilar others and/or to effectively interact with a diverse customer population (Pendry, Driscoll, & Field, 2007). In contrast to diversity management, diversity training is less likely to be involved with strategic policy changes.

9.3.1.1 Diversity management

As indicated in the results of the present research as well as in the literature, the process of workplace diversification from the perspective of social-diversity dimensions does present challenges. Strengthening organisations' capacity for using the potential of the diversity of employees, managers should pay sufficient attention

to the strategic diversity policies and diversity-related organisational norms and values given the negative effects of social diversity.

The negative effects of diversity may be particularly severe in countries where there are still no anti-discrimination laws (Sub & Kleiner, 2007) and where there are historical social inequalities in social dimensions such as race and gender. For example, recent research using Swedish longitudinal data between 1979 and 2000 showed that women were facing the greatest hindrance to advancement at lower hierarchical levels and that these disadvantages attenuate with higher hierarchical levels (Bihagen & Ohls, 2006). Another example is related to the negative effects of race diversity, it was suggested that modern racism does not result in hate toward minorities, but rather discomfort, fear, and avoidance by majority members, which lessens majority members' commitment to the diverse group and organisations (Kossek & Lobel, 2006).

Under the pre-mentioned circumstances, a successful diversity strategy should be drawn up to change organisational culture and create more inclusive work environments where people from diverse backgrounds feel respected and recognised (Pless & Maak, 2004). In particular, diversity initiatives should emphasise EEO and AA aiming to promote equality. For example, company policies may ensure that employment decisions are made without regard to legally protected attributes such as race or gender. Moreover, special initiatives may also be developed to prevent current or future discrimination. Proportions of disadvantaged social groups (e.g. women) within certain positions may be targeted, creating an environment of fairness.

Moreover, organisational management policies should go beyond EEO and AA to the business case for diversity, effectively utilising the diversity that already exists and creating just workplaces (O'Leary & Weathington, 2006). As presented in the research findings, diversity does offer positive effects. Thus, good diversity management should not just seek to minimise the negative effects of diversity, and it should encourage members to accept the reality of diversity and to make the most from such differences (Kirton, Greene, & Dean, 2007). For example, diversity management programmes may be developed to encourage the development of positive emotion towards members in outgroups (people in different social categories).

9.3.1.2 Diversity training

Following the strategic guidance set by diversity management, diversity training remains a core aspect of diversity initiatives for many organisations (Pendry et al., 2007). It is designed to change employee attitudes about diversity and develop skills needed in order to work with a diverse workforce (De Cieri & Kramar, 2005). Up to 2007, there was little systematic assessment of diversity training and organisations were assuming positive effects of diversity training activities (De Meuse, Hostager, & O'Neill, 2007).

The findings suggest that perceived social diversity negatively impacts on performance via relationship conflict and that perceived information diversity has a positive influence on performance via task conflict. It is very likely that for an individual to be creative and to contribute with her/his unique views, she/he must feel comfortable in diversity and feel respected and free to self differentiate, in order not to develop personal conflicts with her/his fellow team members (Muhr, 2006).

Thus, diversity training may be developed to increase recognition of the diverse nature of employees in the workplace, raising members' awareness of the problems associated with misunderstanding or mishandling diversity, or conversely, the benefits of 'diversity friendly' behaviours (Paluck, 2006). Diversity training may include lectures, documental movies, role-plays and so forth (Paluck, 2006).

Moreover, given the persisting problems associated with diversity in race/culture, diversity training programmes may be developed to particularly target at help to individuals to function well in racially/culturally diverse groups by lessening relationship conflict, and encouraging task conflict to allow more favourable group outcomes.

9.3.2 Conflict management

While diversity professionals will benefit significantly from the present research, this study helps managers to benefit from conflict via conflict management. It is normally suggested that conflict management is a process that has two aspects. The first is

diagnosis. A diagnosis should indicate whether there is need for an intervention and the type of intervention needed (Rahim, 2002). The second aspect relates to how management develops conflict resolution policies making conflict work in the workplace.

Given the duality of conflict typology and conflict effects found in the research, the process of diagnosis seems very important. Managers have to understand the types of conflict in their workplace before employing conflict intervention. Traditionally, conflict management implies “reduction, elimination, or termination of conflict” (Rahim, 2002). However, doing so appears appropriate only when relationship conflict exists. For relationship conflict, minimisation is an option given its counterproductive effects. In particular, managers should not underestimate relationship conflict that may occur when members are from diverse demographic backgrounds.

If the diagnosis indicates the existence of task conflict, managers should take more complicated intervention. While the research found positive effects of conflict, it was suggested in the literature that high levels of task conflict are damaging (Jehn, 1995; Jehn & Bendersky, 2003). On the one hand, if task conflict is too high, interventions should be designed to help group members to focus on tasks in hand without generating any personal irritation. Proper conflict training should be provided to enable the employees involved to select and use the appropriate strategies to handle task conflict. On the other hand, if task conflict is absent or at the moderate level, task-related discussion should be encouraged. Management should employ suitable training to create a positive conflict climate.

9.4 Limitations

The quality of any research depends largely on the overall research design. Errors at various stages of the research process can result in low quality research. Therefore, the things that have gone wrong in this research are of significance to the discussion. Despite the obvious strengths that have been pointed out in the relevant chapters, the present research is not without its limitations. The limitations result from constraints imposed by the complexity of the research topic, exploring human behaviour in a

workplace context. The following section will examine the possible limitations in the present research.

The first limitation is related to the quantitative research strategy. While the rationale behind the choice of the research strategy is sound, the methodology had limitations too. For example, because there was a single method of collecting the data (self-report survey) in this research, there might be a chance that the data become too statistical, reducing interesting questions to totally incomprehensible numbers in the unstructured and complex social reality (de Vaus, 2002).

Moreover, a self-report survey may lack sufficient measures of perception and it cannot help if the information needed is behavioural (e.g. attitudes) (Goddard III & Villanova, 2006). Because variables such as openness to diversity and conflict measure people's attitudes in the research, a self-report survey could be improved by adopting a combined approach between quantitative strategy and qualitative strategy because of their inherent strengths.

Specifically, the quantitative and qualitative strategies have different focuses: quantitative studies emphasise the measurement and analysis of causal relationships between variables, not processes; in contrast, qualitative research emphasises the qualities and meanings of entities and processes (Bryman, 2001). Thus, instead of a sole method of data collection, both questionnaires and interviews could be designed for measuring different variables. Moreover, follow-up interviews could be carried out to investigate how respondents have made sense of the questions. By doing so, research can not only discover the reality and verify the theories, but also find answers for how the impact is created and what it means to people.

The second limitation is associated with the characteristics of the sample. While it is impossible to control characteristics of a sample in research involving work groups, the characteristics of the sample in the present research suggest that caution should be taken when generalising the research findings across other contexts. As seen in Table 7-4, three demographic measures produced relatively large and disproportionately large categories: women, WAS, and Europeans, accounting for 68 per cent, 80 per cent and 90 per cent, respectively. Although there are reasonable explanations for

these characteristics (for example, due to particular industries being traditional employers of women), there might be influences of tokensim occurring and the effects of diversity might therefore be alleviated.

The third possible limitation lies in the percept-percept bias. While reasonable procedures (i.e. procedural remedies) have been taken to prevent the occurrence of the percept-to-percept bias (Konrad, Prasad, & Pringle, 2006; Podsakoff et al., 2003), it is still technically possible that the research results have been plagued by systematic biases of percept-to-percept inflation. For example, respondents who tend to react favourably towards the world are likely to produce self-reports that mirror themselves (Crampton & Wagner III., 1994) resulting in an artificial variation of people's perceptions. It has been suggested in the literature that percept-to-percept bias could be significantly reduced if data are obtained from different sources or at different time (For example, dependent variables about performance are measured by managers' rating while independent variables about group conflicts are collected from group members themselves) (Podsakoff, 2003). Although it was relatively difficult to obtain data from different sources or at different time in the present research, the biases could be significantly reduced in research if such techniques were used in the future.

Formation of groups yielded a possible fourth limitation. In field research, researchers have to rely on organisations to form groups with little control over the team structures. This was the case in the present research. The group formation in some participating organisations in the research was potentially problematic as described in Chapter Six. Formation of groups in these organisations (e.g. PR, CP and BS) was not task oriented and group memberships could be very ambiguous to the group members. Thus, the dynamics between the constructs could be distorted. Although it may increase the difficulty of sampling to set tighter requirements for work group structures, it is better if groups are clearly task-oriented and formally created.

The fifth limitation is related to the sample size. There were only 45 teams that have been included in the analysis at the group level. As SEM is very sensitive to sample size, caution should be taken due to the limited power at the group level to detect significance of group effects.

9.5 Directions for Future Research

As addressed in the preceding discussion, the research made significant contributions to knowledge. While extending the literature, the research revealed opportunities for potential research revenues. In particular, future research could be particularly valuable in areas relevant to the integrated framework, the intervening theory, and research contextual factors.

9.5.1 Further testing the integrated framework

The research advanced diversity theorisations by developing an integrated model that explains how different types of diversity operate differently to impact on performance. However, its propositions were only substantiated at the individual level with regard to perceived diversity. The theory is still at an early stage of its development and further research is needed, particularly at the group level.

Future research could use more rigorous research design based on real world practice to address limitations identified in the preceding section. First, multilevel SEM should be continually adopted in future research where data are nested. When dealing with nested data, multilevel modelling is necessary, not just because it provides more accurate results in terms of precision of estimates but also because it is conceptually more adequate than single-level modelling (Chan, 2006).

Second, as addressed earlier, research results are likely to be distorted when there is ambiguousness in group formation. Thus, in order to get more accurate results, future research may consider using groups that are clearly task-oriented and formally created leading to less ambiguity in group membership.

Third, the sample size is important in SEM. It is easy to achieve statistical significance in a large sample because of the higher likelihood of sample error in a small sample (de Vaus, 2002; Tomarken & Waller, 2005). Accordingly, future research may consider a research design involving a large number of groups. In doing so, the researcher/s may be able to address interesting questions situated at multiple levels, particularly the aggregating levels.

9.5.2 Further advancing the intervening theories

The research examined the diversity-conflict-performance paradigm and yielded supporting evidence at the individual level with respect to perceived diversity. While theoretical progress has been made in the theorisation of intervening theories, future research is still needed. First, because the diversity-conflict-paradigm was only proven at the individual level with regard to perceived diversity, it is meaningful to examine the feasibility of the paradigm in other research context/s, particularly at the aggregating levels.

Second, given the significance of intervening theories in explaining the diversity paradox (Kulik, 2004; Reagans, Zuckerman, & McEvily, 2004; Reagans & Zuckerman, 2001), future research could significantly improve the theorisation by investigating other group processes that have been considered in great detail in the literature such as cohesion/social integration and communication (Jackson et al., 2003; Jehn, 1999; Lawrence, 1997; Mannix & Neale, 2005; Pelled, 1996; Pfeffer, 1983).

9.5.3 Examining the strengths of moderation effects

The research improved the understanding of the moderating roles of contextual factors on the diversity-conflict-performance paradigm. In the meantime, the findings implied areas for future research. First, using more rigorous research design, other moderators could be explored. For example, group sizes (Pelled et al., 2000) and group types (Webber & Donahue, 2001) have been suggested as moderators on the effects of diversity.

Second, because the research was interested in whether there was such an effect, but not in what the effects are, future research could assess the direction and strengths of the presumed moderation effects of specific contextual factors on the diversity-conflict-performance paradigm. In doing so, the knowledge about how contextual factors moderate the effects of diversity may be significantly improved.

9.6 Conclusions

Despite intensive efforts to measure and predict the effects of group diversity on performance, research has produced extremely inconsistent and mixed results. This state of knowledge has presented a diversity paradox suggesting coexisting and conflicting effects of diversity. In order to explain the paradox and therefore improve our understanding of diversity, a three-way relationship (i.e. diversity-conflict-performance identified as a paradigm) has been suggested as a promising explanation. This thesis explores the effects of diversity via the paradigm, thereby offering a deeper insight into the diversity paradox.

In general, the research provided answers to its research question with regard to the processes through which group members perceive various types of diversity, and how variations in their perception influence different forms of group conflicts and, accordingly performance. Specifically, the research found that at the individual level, perceived social diversity had a positive impact on relationship conflict, which in turn exerted a negative influence on job satisfaction and that perceived information diversity had a positive effect on task conflict, which, in turn, influenced innovativeness positively. Accordingly, the research concludes that different types of diversity are likely to cause distinctive effects on performance by generating different forms of conflict and that diversity influences performance indirectly by the diversity-conflict-performance paradigm at the individual level.

Moreover, the research showed that conflict is mediating the relationship between diversity and performance. However, the mediation effects were proven only for perceived diversity. Specifically, task conflict was found to be a partial mediator of the relationship between perceived information diversity and innovativeness at the individual level, but fully mediating at the group level. In contrast, only partial mediation effects were found on the relationship between perceived social diversity and job satisfaction for relationship conflict at the individual level.

Furthermore, the research found that the diversity-conflict-performance paradigm was moderated by a number of research-contextual factors. The research then concludes that different effects of diversity are likely to be present in other research where

research contextual factors vary. While indicating complex relationships between diversity, conflict, and performance, the research explains the current diversity paradox and it also sheds light on future research.

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Appendix A The Final Report

	<h2>Final Project Report</h2> <p>Human Research Ethics Committee (HREC)</p>
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ALL QUESTIONS MUST BE ANSWERED.
Please type your responses into the boxes provided. Boxes will expand to fit your response.

1) Project Details:

Project No:	D07-105
Project Name:	Distinguishing the positive and negative impact of diversity on performance

2) Principal Researcher Details:

Full Name:	B. O'Meara
School/Section:	School of Business
Phone:	3648
Fax:	
Email:	b.o'meara@ballarat.edu.au

3) Project Status:

Please indicate the current status of the project:	
<input checked="" type="checkbox"/> Data collection complete	<input type="checkbox"/> Abandoned
Completion date: 31/1/2008	Please give reason:

4) Special Conditions:

If this project was approved subject to conditions, were these met?	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No * NB: If 'no', please provide an explanation below:

5) Changes to project:

Were any amendments made to the originally approved project?	
<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes * NB: Please provide details:



Final Project Report

Human Research Ethics Committee (HREC)

6) Storage of Data:

Please indicate where the data collected during the course of this project is stored:

computers which are only accessible by researchers.

6) Research Participants:

Were there any events that had an adverse effect on the research participants?

No Yes * NB: Please provide details:

7) Summary of Results:

Please provide a summary of the results of the project:

The results are due to be summarised in Jan/Feb. 2009.

8) Feedback:

The HREC welcomes any feedback on:

- difficulties experienced with carrying out the research project; or
- appropriate suggestions which might lead to improvements in ethical clearance and monitoring of research.

9) Signatures:

Principal Researcher:	<i>B.R.O. Meard</i>	Date:	<i>16/12/08</i>
	Print name: <i>B.R.O. MEARD</i>		
Other/Student Researchers:	<i>John Olin</i>	Date:	<i>15/12/08</i>
	Print name: <i>John</i>		
	Date:	
	Print name:		

Please return to the Ethics Officer, Mt. Helen campus, as soon as possible.

Appendix B The questionnaire

PROJECT TITLE

Distinguishing positive and negative impact of diversity on performance

RESEARCHERS

Principal Researcher/s :

Dr. Bernard O'Meara

Names of other Senior and Associated Researchers :

Dr. Steven McEachern Mr. John Qin

EXPLANATION OF PROJECT

Dear _____,

My name is John Qin, and I am a PhD student in the School of Business at the University of Ballarat. I am writing to you to invite you to participate in a survey project designed to investigate the relationship between diversity, conflict and performance in student project groups. I am working under the supervision of Dr. Bernard O'Meara and Dr. Steve McEachern, from the School of Business at the University of Ballarat, as part of my PhD studies. You have been identified as a possible participant in your role as a student of the University of Ballarat MBA program.

We hope that your participation in this project will benefit you through providing you with a deeper understanding of the relationship between diversity, conflict and performance in your student project groups, and workplace teams more generally. This project has been approved by the University's Human Research Ethic Committee (HREC).

This survey should take you approximately 5-8 minutes to complete. In addition, this survey is anonymous and your contact details will not be obtained in this project. However, for identifying your group membership, you are requested to provide your student ID number at the end of the questionnaire. This ID number will be deleted after the groups have been identified, and no further identification of your responses will be possible.

Your participation in this project is completely voluntary, and apart from completing the survey, you are not required to participate in any further activity. Your participation in this project does not involve any risks to you. However, if you are uncomfortable responding to any particular questions, you can choose not to respond. You are also free to withdraw your consent and to discontinue participation in the study at any time (up until the time the data is aggregated for reporting purposes). In order to do so, simply contact the principal researcher, Bernard O'Meara, advising him of your desire to withdraw from the study.

Should you withdraw, all information provided by you will be removed from the study database. You should note however that once the data has been aggregated it is unable to be identified, and from this point it is not possible to withdraw consent to participate. Your consent or withdrawal from participation in this project will not affect your ongoing assessment.

In order to protect confidentiality of your data, the collected data will be stored on a secure database. You should note however that the confidentiality of information that you provide is subject to legal limitations (e.g., subpoena or a freedom of information claim). Finally, you should note that the data collected in this project will be removed from the database and destroyed after a period of five years.

If you have any questions, or you would like further information regarding the project titled Distinguishing Positive and Negative Impact of Diversity please contact the Principal Researcher Dr. Bernard O'Meara of the School of Business 03 53279648 or email b.omeara@ballarat.edu.au

Should you (i.e. the participant) have any concerns about the ethical conduct of this research project, please contact the Executive Officer, Human Research Ethics Committee, Research & Graduates Studies Office, University of Ballarat, PO Box 663, Mt Helen VIC 3353. Telephone: (03) 5327 9765, Email: ub.ethics@ballarat.edu.au

Section One

About your experience and your perception of other group members' experience in your work team. Please circle the number on each scale that applies to you.

1. Generally speaking, you were very satisfied with this project team.
2. You frequently thought of swapping to other project team.
3. You were generally satisfied with the roles you did in this project team.
4. You believe that most people on this team were very satisfied with their roles.
5. People on your project often thought of swapping to other team/s.
6. The main function of members was to follow others' instructions in your team.
7. A person could get in a lot of trouble by being different in your team.
8. People in your team were expected to deal with problems in the same way.
9. A person could not do things that were too different in your team.
10. The team leader or people taking role of team leader usually got credit for other's ideas.

Section TWO:

Information about your team and job/task characterizes.

The following statements describe your teams and work. Please circle the number on each scale that applies to you.

11. You had a one-person job; you rarely had to check or work with other team members.
12. You had to work closely with your team members to do you work properly.
13. In order to complete your work, your teammates and you had to exchange information and advice.
14. The methods you followed in your work were about the same for dealing with all types of tasks, regardless of the activity.
15. Your job was very routine.
16. You felt like you were doing the same thing over and over again.

Section THREE

Your perception of your similarity to your team members. Please circle the number on each scale that applies to you.

17. You felt you were visibly dissimilar to other team members.

18. In terms of visible characteristics (e.g. age, gender, ethnicity/race), you thought you were different from other team members.
19. In your team, members enjoy doing jobs with people of different race/ethnicity, gender and/or age.
20. In your team, members make an extra effort to listen to people of different race/ethnicity, gender and or age.
21. You felt you were professionally and/or educationally dissimilar to other team members.
22. In terms of functional background (e.g. professional background and/or work experiences), you thought you was different from other team members.
23. In your team, members enjoy doing jobs with people from different professional background and/or work experiences.
24. In your team, members make an extra effort to listen to people who are from different professional background and/or work experiences.

Section FOUR

About your perception of the relationship between group members. Please circle the number on each scale that applies to you.

25. How much conflict of ideas was there in your team?
26. How different were your views on the content of your project?
27. How much did you talk through disagreements about your team projects?
28. How much disagreement was there about task procedure in your team?
29. How often did people get upset while working in your team?
30. How much were personality conflicts evident in your team?
31. How much emotional tension was there in your team?
32. How much interpersonal friction was there in your team?
33. In your team, your team members thoroughly and sincerely evaluated different alternatives.
34. The job quality improved when all the team members participated.
35. In your team, the dissenting opinions were encouraged.
36. The team members enjoyed debating different ideas.

Section FIVE

Information about you (please tick the category relevant to you).

37. Your Gender Male Female

38. Your Race/ethnicity :

Australian (Please specify): _____

Oceanian (Please specify): _____

North-west European (Please specify): _____

Southern and eastern European (Please specify): _____

North African and middle eastern (Please specify):

South-east Asian (Please specify): _____

North-east Asian (Please specify): _____

Southern and central Asian (Please specify): _____

People of the Americas (Please specify): _____

Sub-saharan African (Please specify): _____

39. What language do you speak at home?

English

Another language Please specify _____

40. How would you describe your visual appearance?

41. Your Age:

Under 30 30-39 40-49 50-59 60 and above

42. Your Educational level (years):

Certificate Level 4 Advanced Diploma and Diploma Level

Bachelor Degree Level Graduate Diploma and Graduate Certificate Level

Postgraduate Degree Level Other (please specify)

43. Your Tenure (years serves in the organization):

Less than one year 1-3 years 4-10 years 11 years above

44. How long have you worked in your current team in months?

45. Your Functional background (your job function):

Please specify your occupation (e.g. Manager):

That concludes the survey – thank you for your contribution.

Appendix C Piloting test results

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
N	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Valid	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Mean	5.30	5.88	5.53	5.00	5.41	2.88	2.50	3.50	3.05	2.50	2.90	3.75	3.65	4.18	2.83	4.05	2.68	2.78	2.45	2.53	3.14	2.26
SD	1.90	1.48	1.32	1.87	1.58	1.36	1.69	1.84	1.63	1.36	1.57	1.91	1.98	2.10	1.53	1.68	1.54	1.80	1.66	1.95	1.20	1.67
Variance	3.60	2.21	1.74	3.49	1.95	1.86	2.87	3.38	2.66	1.85	2.45	3.64	3.93	4.40	2.35	2.82	2.38	3.26	2.77	3.79	1.44	2.80
Skewness	-1.14	1.35	-1.01	-1.14	0.61	0.24	1.15	0.27	0.47	0.68	0.68	0.10	0.27	-0.14	0.71	-0.32	0.49	0.77	1.24	1.15	-0.02	1.31
Error Skewness	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Standard deviation (SD); Job satisfaction (1-5); Innovativeness (6-10); Social diversity (11-12); Information diversity (13-14); Task conflict (15-18); Relationship conflict (19-22)																						

Appendix D The participation invitation

A letter inviting participation in a research-based survey:

Distinguishing positive and negative effects of Diversity on Performance

A deeper insight into the diversity paradox

Dear

My name is John Qin and I am undertaking a PhD at University of Ballarat (UB). My Principal Supervisor is Dr. Bernard O'Meara a senior lecturer in Human Resource Management and my Associate Supervisor is Dr. Steven McEachern a lecturer in Management.

I am inviting your organisation to participate in my PhD. research project. This is survey-based research attempting to investigate the relationship between group diversity, conflict and performance (please see more details in appendix ONE). This research has been approved by the Human Research Ethical Committee of the University and is conditional upon your organisation's consent to participate in the project.

The survey is short and it should take your employees 5-8 minutes to complete. Furthermore, your employees' participation in this project is completely voluntary and they are free to withdraw or discontinue their participation in this project at any time.

The survey will only be administrated to your employees who are working in groups or teams. However, the anonymity of each employee will be maintained. Although it is impossible to identify both your organisation and your employees after data collection, this project will still strictly comply with legislative requirements, particularly in relation to confidentiality.

Through your organisation's participation, this project will improve our knowledge and theory of the impact of diversity at the group level. In the meantime, I believe that the results of the survey will be helpful for your organisation, which will be available in the research report either through the research database of UB or a hard copy from the researchers. Specifically, as the research model shows (please refer to appendix TWO), your organisation may find a 'business case' for diversity by managing the complexity as well as helping your employees to establish a general awareness of workplace diversity .

Since I work in Melbourne at home during the weekdays, please contact me via the following:

Postal address: 26/20 Wynnstay Road Prahran Victoria 3181

Email: qingui123@hotmail.com or j.qin@ballarat.edu.au

Tel. & Fax: 03 95296731

Mobile: 0403 716 521

I look forward to your early reply in anticipation!

Yours sincerely

John Qin

PhD candidate in Management

Appendix E Covariance matrixes²¹

Covariance Matrix at the individual level (without objective diversity variables)

rowtype	varname	JS1	JS4	INN1	INN2	SOD1	SOD2	INFD1	TC1	TC4	RC3	RC4
N		280	280	280	280	280	280	280	280	280	280	280
cov	JS1	1.6817										
cov	JS4	0.7472	1.5356									
cov	INN1	-0.4277	-0.2912	2.3522								
cov	INN2	-0.7823	-0.5196	0.8899	2.4151							
cov	SOD1	-0.2723	-0.1072	0.0494	0.6581	2.2251						
cov	SOD2	-0.2665	-0.2366	0.1286	0.8070	1.2316	2.8268					
cov	INFD1	-0.2281	-0.0537	0.1344	0.4054	1.0580	0.8336	2.5198				
cov	TC1	-0.2974	-0.3599	0.1350	0.3826	0.2904	0.2737	0.2866	1.7355			
cov	TC4	-0.5757	-0.5042	0.3128	0.5835	0.2777	0.3644	0.2044	1.1578	1.8844		
cov	RC3	-0.6132	-0.5947	0.2864	0.6975	0.4099	0.3654	0.2767	0.9969	1.0086	2.0000	
cov	RC4	-0.4934	-0.4820	0.3461	0.7382	0.4992	0.3648	0.3513	1.0056	1.0520	1.6070	1.7727
Job satisfaction (JS); Innovativeness (Inn.); Social diversity (SOD); Information diversity (INFD); Task conflict (TC); Relationship conflict (RC);												

Covariance Matrix at the group level (without objective diversity variables)

rowtype	varname	JS1	JS4	INN1	INN2	SOD1	SOD2	INFD1	TC1	TC4	RC3	RC4
N		45	45	45	45	45	45	45	45	45	45	45
cov	JS1	0.1860										
cov	JS4	0.0878	0.1668									
cov	INN1	-0.1609	-0.0322	0.2809								
cov	INN2	-0.1216	-0.0919	0.1374	0.1622							
cov	SOD1	0.0122	-0.0609	-0.0868	-0.0532	0.1467						
cov	SOD2	-0.0061	-0.0602	-0.0202	-0.0824	0.1612	0.2527					
cov	INFD1	-0.1794	-0.1240	0.1484	0.1063	0.0378	0.0725	0.2067				
cov	TC1	-0.1465	-0.0800	0.0758	0.1059	0.0010	-0.0316	0.1414	0.1530			
cov	TC4	-0.1814	-0.1817	0.0819	0.1453	0.0960	0.0683	0.2175	0.1857	0.3271		
cov	RC3	-0.1818	-0.1593	0.0200	0.1230	0.0634	-0.0043	0.2073	0.2261	0.3098	0.3981	
cov	RC4	-0.2628	-0.2147	0.0443	0.1568	0.0715	0.0129	0.2781	0.2900	0.3814	0.4860	0.6465
Job satisfaction (JS); Innovativeness (Inn.); Social diversity (SOD); Information diversity (INFD); Task conflict (TC); Relationship conflict (RC);												

²¹ For purpose of simpleness, the matrixes only include indicators after model modification.

Covariance Matrix at the individual level (with objective diversity variables)

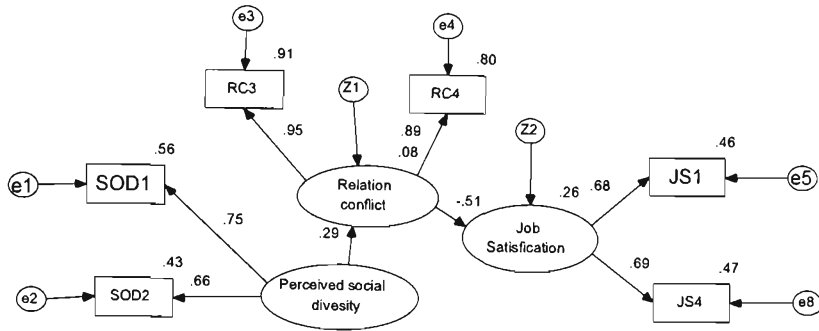
Row type	Var name	JS1	JS4	INN1	INN2	SOD1	SOD2	INFD1	TC1	TC4	RC3	RC4	OSD	OIND
N		259	259	259	259	259	259	259	259	259	259	259	259	259
cov	JS1	1.6485												
cov	JS4	0.7251	1.5237											
cov	INN1	-0.4284	-0.2552	2.4080										
cov	INN2	-0.7947	-0.5476	0.9025	2.4645									
cov	SOD1	-0.2925	-0.1367	0.0529	0.7170	2.2697								
cov	SOD2	-0.3419	-0.3126	0.1834	0.9026	1.2339	2.8383							
cov	INFD1	-0.2722	-0.0889	0.1410	0.4567	1.0892	0.8485	2.4939						
cov	TC1	-0.2780	-0.3323	0.1233	0.4187	0.2997	0.2835	0.3102	1.7754					
cov	TC4	-0.5827	-0.4817	0.2984	0.6320	0.2702	0.3799	0.1832	1.1646	1.8846				
cov	RC3	-0.5939	-0.5537	0.2653	0.7544	0.4568	0.4436	0.2844	1.0219	1.0076	2.0412			
cov	RC4	-0.4593	-0.4383	0.3263	0.7877	0.5434	0.4207	0.3701	1.0147	1.0344	1.6215	1.7796		
cov	OSD	-0.0031	0.0021	0.0215	-0.0107	0.0202	0.0195	0.0125	-0.0030	-0.0032	-0.0319	-0.0202	0.0215	
cov	OIND	0.0143	-0.0061	0.0004	-0.0104	-0.0038	-0.0143	-0.0013	-0.0017	-0.0028	0.0094	0.0085	-0.0011	0.0161
Job satisfaction (JS); Innovativeness (Inn.); Social diversity (SOD); Information diversity (INFD); Task conflict (TC); Relationship conflict (RC); Objective social diversity (OSD); Objective information diversity (OIND)														

Covariance Matrix at the group level (with objective diversity variables)

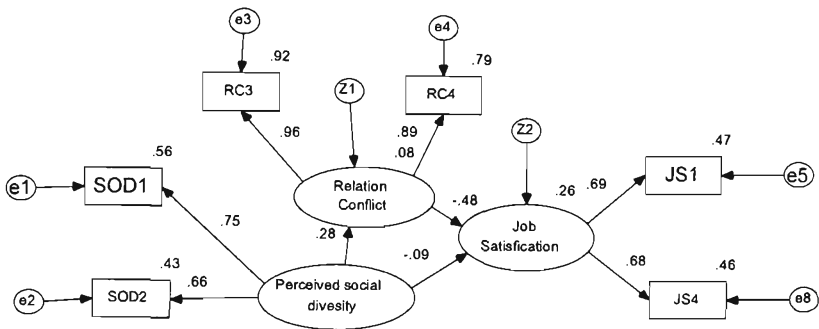
Row typ	Var Name	JS1	JS4	INN1	INN2	SOD1	SOD2	INFD1	TC1	TC4	RC3	RC4	OSD	OIND
N		38	38	38	38	38	38	38	38	38	38	38	38	38
cov	JS1	0.1905												
cov	JS4	0.0799	0.1763											
cov	INN1	-0.1789	-0.0361	0.3303										
cov	INN2	-0.1164	-0.0883	0.1563	0.1850									
cov	SOD1	0.0138	-0.0756	-0.0916	-0.0558	0.1650								
cov	SOD2	-0.0153	-0.0829	-0.0091	-0.0866	0.1720	0.2638							
cov	INFD1	-0.1832	-0.1278	0.1741	0.1153	0.0433	0.0828	0.2218						
cov	TC1	-0.1580	-0.0801	0.0974	0.1225	0.0015	-0.0312	0.1657	0.1921					
cov	TC4	-0.1898	-0.1972	0.1066	0.1656	0.1155	0.0858	0.2556	0.2326	0.4002				
cov	RC3	-0.1727	-0.1499	0.0218	0.1143	0.0808	0.0201	0.2188	0.2545	0.3530	0.4096			
cov	RC4	-0.2582	-0.2038	0.0465	0.1319	0.0924	0.0506	0.2882	0.3160	0.4208	0.4912	0.6544		
cov	OSD	-0.0048	-0.0064	0.0183	0.0266	-0.0094	-0.0152	0.0160	0.0214	0.0272	0.0236	0.0117	0.0260	
cov	OIND	0.0042	0.0049	0.0131	0.0494	-0.0264	-0.0595	-0.0066	0.0202	0.0197	0.0077	-0.0116	0.0181	0.0392
Job satisfaction (JS); Innovativeness (Inn.); Social diversity (SOD); Information diversity (INFD); Task conflict (TC); Relationship conflict (RC); Objective social diversity (OSD); Objective information diversity (OIND)														

Appendix F Standardised parameter estimates

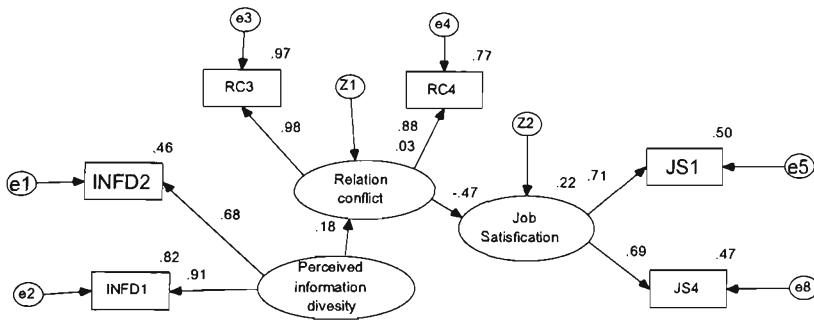
SEM test for the PSD-RC-JS model (at the individual level)



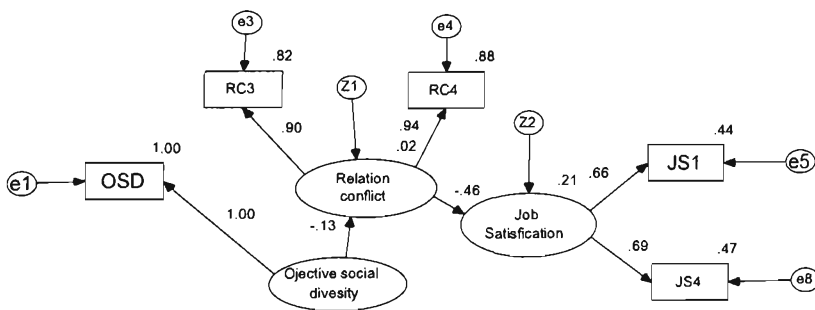
SEM test for the PSD-RC-JS model (at the individual level: Type A)



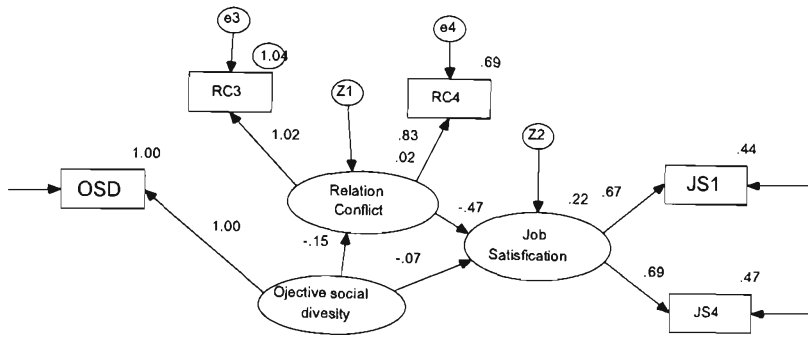
SEM test for the PInD-RC-JS (at the individual level: Type B)



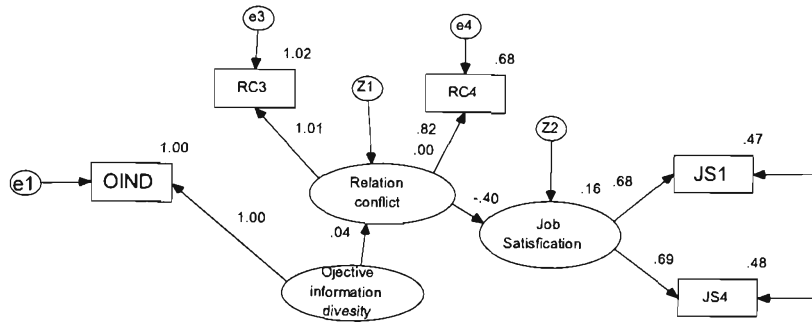
SEM test for the OSD-RC-JS model (at the individual level: Hypothetical models)



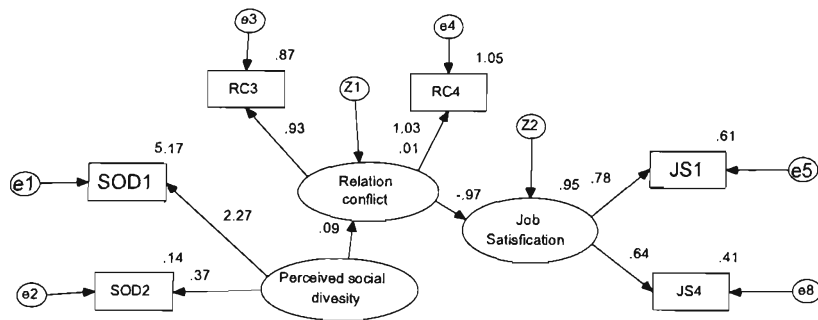
SEM test for the OSD-RC-JS model (at the individual level: Type A)



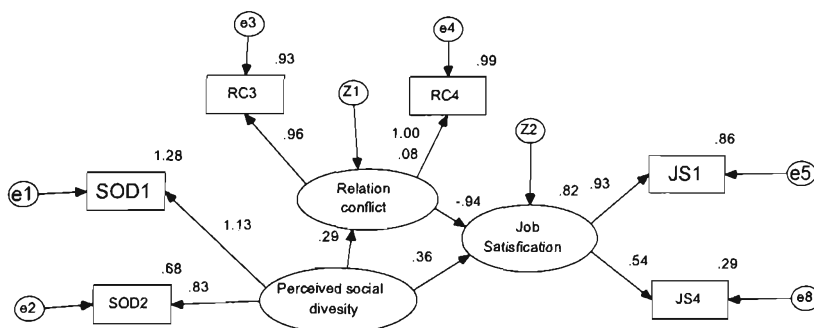
SEM test for the OIND-RC-JS (at the individual level: Type B)



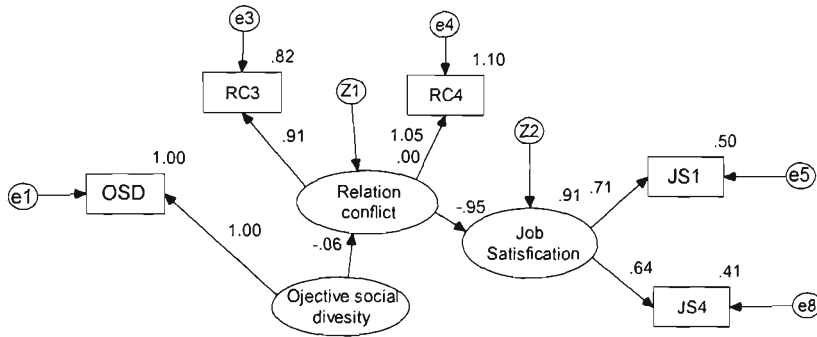
SEM test for the PSD-RC-JS model (at the group level: Hypothetical models)



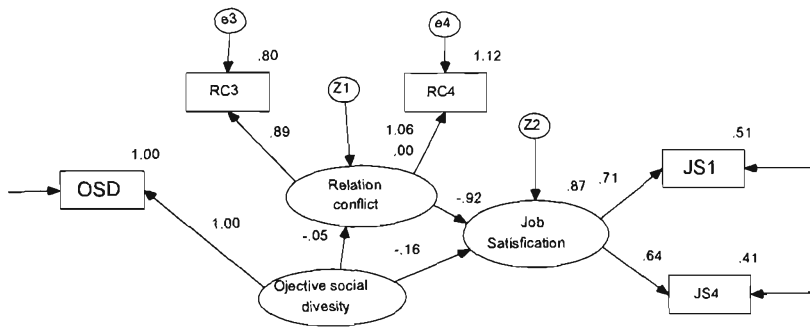
SEM test for the PSD-RC-JS model (at the group level: Type A)



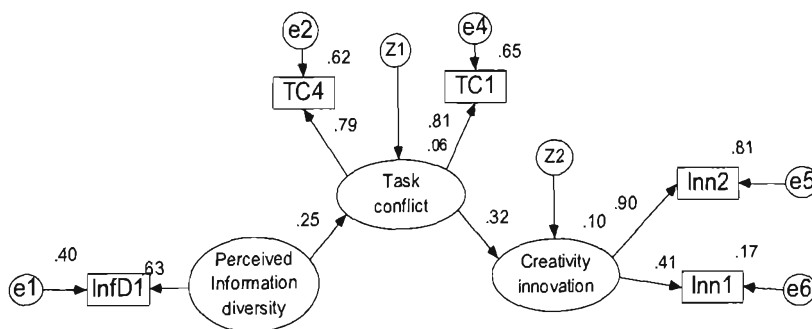
SEM test for the OSD-RC-JS model (at the group level: Hypothetical models)



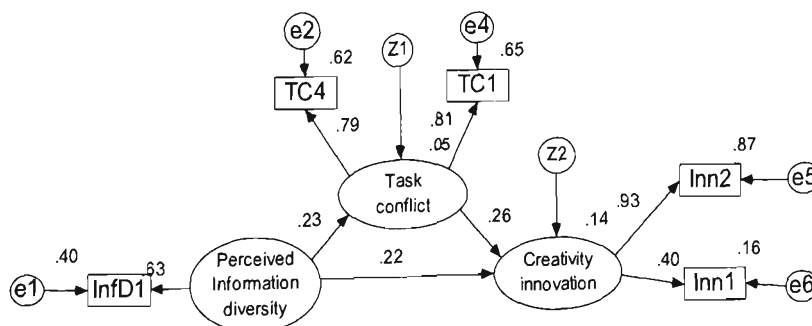
SEM test for the OSD-RC-JS model (at the group level: Type A)



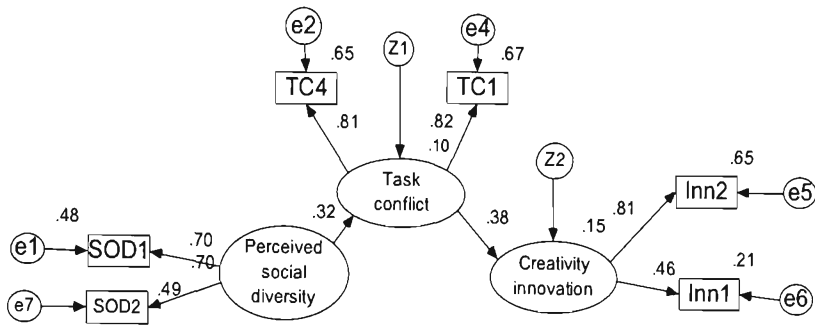
SEM test for the PInD-TC-Inn (at the individual level: Hypothetical model)



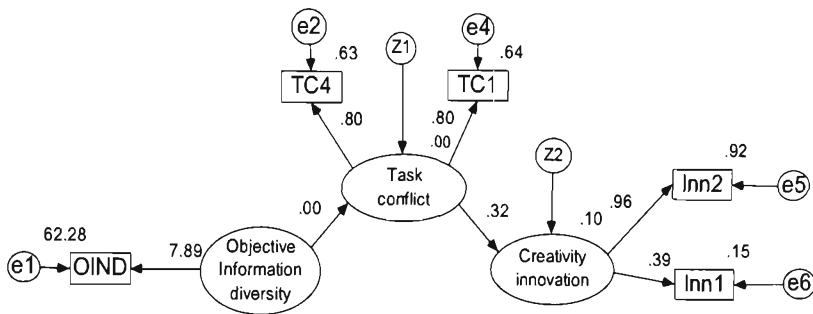
SEM test for the PInD-TC-Inn (at the individual level: Type A)



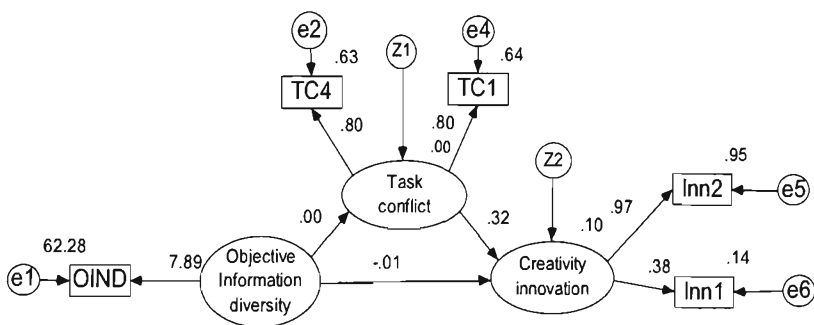
SEM test for the PSD-TC-Inn (at the individual level: Type B)



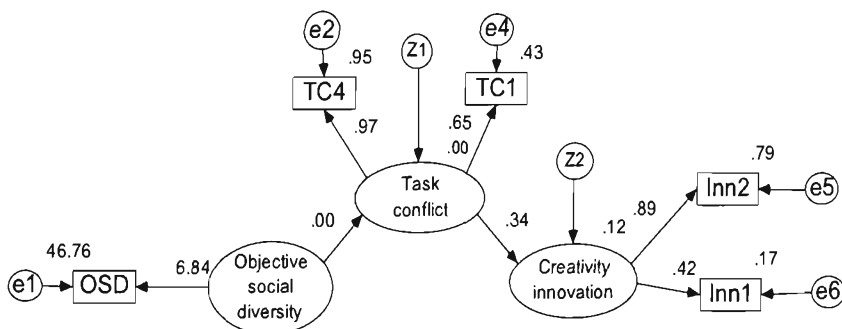
SEM test for the OInD-TC-Inn (at the individual level: Hypothetical model)



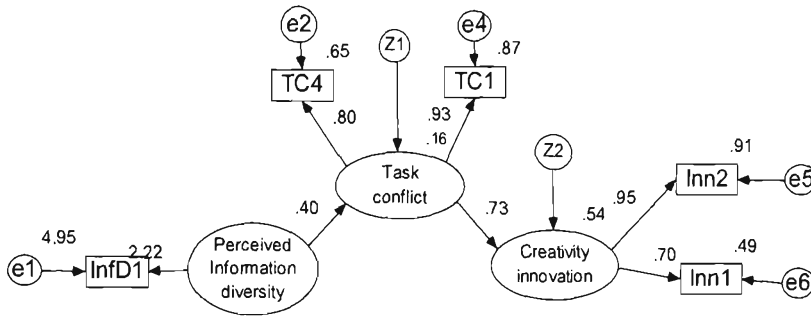
SEM test for the OInD-TC-Inn (at the individual level: Type A)



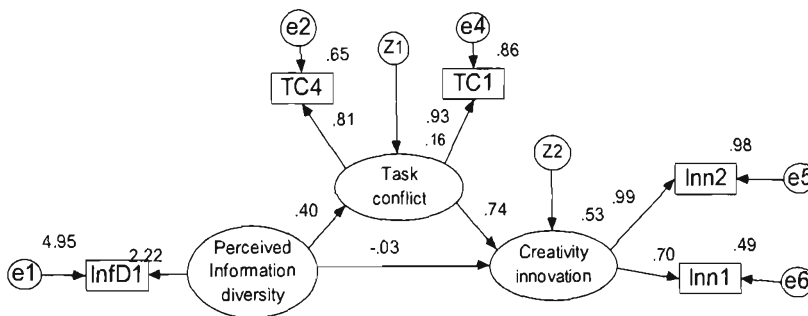
SEM test for the model of OSD-TC-Inn (at the individual level: Type B)



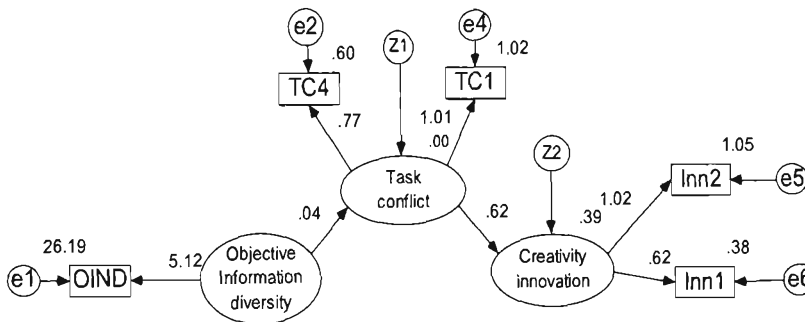
SEM test for the PIInD-TC-Inn (at the group level: Hypothetical model)



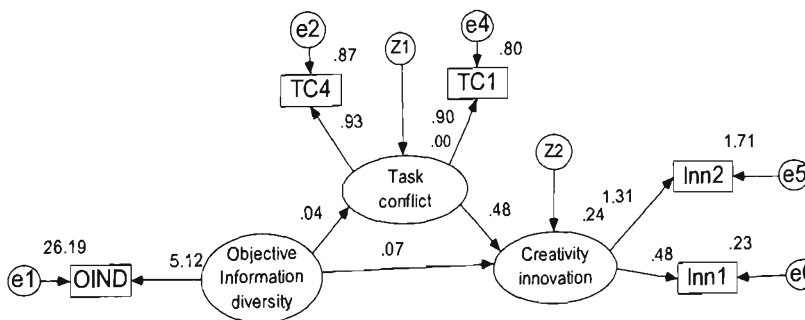
SEM test for the PIInD-TC-Inn (at the group level: Type A)



SEM test for the OInD-TC-Inn (at the group level: Hypothetical model)

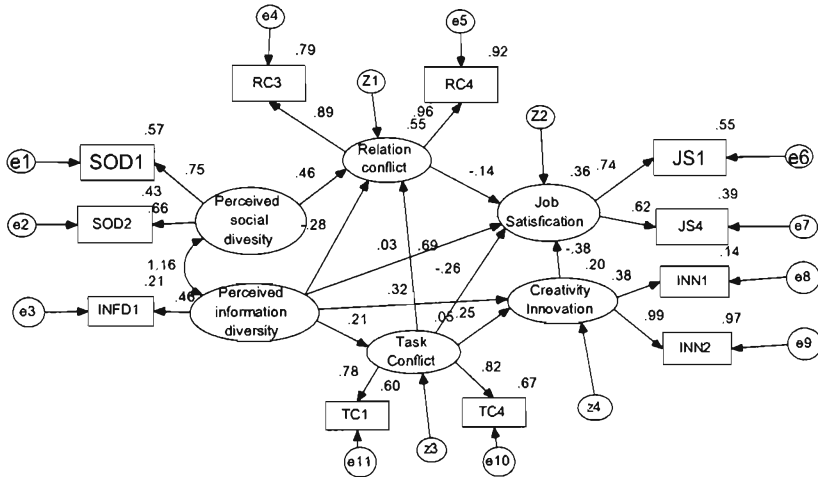


SEM test for the OInD-TC-Inn (at the group level: Type A)



SEM test for the paradigm (at the individual level: Perceived diversity)

(chi square=50.998; df=34; p=0.031)



Appendix G The bivariate relationships

Table G-1 Bivariate relationships in the SD-RC-JS sub-paradigm

Hypotheses	Bivariate relationships	β (p) (i)	β (p) (ii)
H1	PSD-RC	<u>0.285 (p<0.001)</u>	0.096 (p=0.153)
	ibid. (Alternative model)	<u>0.280 (p<0.001)</u>	<u>0.286 (p=0.015)</u>
	RC-JS	<u>-0.506 (p<0.001)</u>	<u>-0.973 (p<0.001)</u>
	ibid. (Alternative model)	<u>-0.481 (p<0.001)</u>	<u>-0.943 (p<0.001)</u>
	PSD-JS (Alternative model)	-0.087 (p=0.334)	<u>0.358 (p<0.001)</u>
H2	OSD-RC	<u>-0.131 (p=0.041)</u>	-0.060 (p=0.686)
	ibid. (Alternative model)	<u>-0.133 (p=0.038)</u>	-0.059 (p=0.687)
	RC-JS	<u>-0.506 (p<0.001)</u>	<u>-0.952 (p<0.001)</u>
	ibid. (Alternative model)	<u>-0.459 (p<0.001)</u>	<u>-0.906 (p<0.001)</u>
	OSD-JS (Alternative model)	-0.065 (p=0.379)	-0.163 (p=0.181)

β (i) at the individual level; β (ii) at the group level ; p values (p); Perceived Social diversity (PSD); Objective Social diversity (OSD); Relationship Conflict (RC); Job Satisfaction (JS)

Table G-2 Bivariate relationships in the InD-TC-Inn sub-paradigm

Hypotheses	Bivariate relationships	β (p) (i)	β (p) (ii)
H3	Perceived InD-TC	<u>0.247 (p=0.022)</u>	<u>0.396 (p<0.001)</u>
	ibid. (Alternative model)	<u>0.230 (p=0.033)</u>	<u>0.401 (p<0.001)</u>
	TC-Inn	<u>0.323 (p<0.001)</u>	<u>0.735 (p<0.001)</u>
	ibid. (Alternative model)	<u>0.256 (p<0.001)</u>	<u>0.744 (p<0.001)</u>
	Perceived InD-Inn (Alternative model)	<u>0.219 (p=0.036)</u>	-0.032 (p=0.379)
H4	Objective InD-TC	0.003 (p=0.768)	0.043 (p=0.186)
	ibid. (Alternative model)	0.002 (p=0.817)	0.039 (p=0.250)
	TC-Inn	<u>0.324 (p<0.001)</u>	<u>0.621 (p<0.001)</u>
	ibid. (Alternative model)	<u>0.318 (p<0.001)</u>	<u>0.484 (p<0.001)</u>
	Objective InD-Inn (Alternative model)	-0.006 (p=0.439)	<u>0.073 (p<0.001)</u>

β (i) at the individual level; β (ii) at the group level ; p values (p); Perceived Information diversity (PInD); Objective Information diversity (OInD); Task conflict (TC); Innovativeness (Inn.);

Appendix H Chi-square test results of moderation tests on bivariate relationships in the paradigm

Models	Task Interdependence (H9 to H12)			Task Routineness (H13 to H16)			Openness to Diversity (H17 to H20)			Openness to Conflict (H21 to H24)			Group Longevity (H25 to H28)		
	χ^2	df	P	χ^2	df	p	χ^2	Df	p	χ^2	df	p	χ^2	df	p
	N/A	N/A	<0.05	N/A	N/A	<0.05	N/A	N/A	<0.05	N/A	N/A	<0.05	N/A	N/A	<0.05
PSD-RC*	2.278	4	0.850	3.744	4	0.442	2.300	4	0.686	8.590	4	0.072	10.486	4	0.033
ibid.**	10.156	11	0.516	35.678	11	0.000	27.099	11	0.004	46.565	11	0.000	17.973	11	0.082
χ^2 test	7.878	7	0.343	31.934	7	<u>0.000</u>	24.799	7	<u>0.001</u>	37.975	7	<u>0.000</u>	7.487	7	0.380
OSD-RC*	5.073	2	0.079	0.038	2	0.981	0.332	2	0.847	6.634	2	0.036	0.337	2	0.845
ibid.**	11.503	5	0.042	36.678	5	0.000	16.002	5	0.007	35.869	5	0.000	6.216	5	0.286
χ^2 test	6.430	3	0.092	36.640	3	<u>0.000</u>	15.670	3	<u>0.001</u>	29.235	3	<u>0.000</u>	5.879	3	0.118
PSD-JS*	12.452	11	0.712	10.735	11	0.826	16.251	11	0.436	24.172	11	0.086	28.550	11	0.003
ibid.**	24.290	16	0.012	22.082	16	0.024	32.150	16	0.001	51.281	16	0.000	35.455	16	0.004
χ^2 test	11.838	5	<u>0.037</u>	11.347	5	<u>0.045</u>	15.899	5	<u>0.007</u>	27.109	5	<u>0.000</u>	6.905	5	0.228
OSD-JS*	1.771	2	0.413	0.071	2	0.965	3.952	2	0.139	0.576	2	0.750	0.575	2	0.750
ibid.**	17.837	5	0.003	17.780	5	0.003	28.387	5	0.000	30.589	5	0.000	8.116	5	0.150
χ^2 test	16.066	3	<u>0.001</u>	17.709	3	<u>0.001</u>	24.435	3	<u>0.000</u>	30.013	3	<u>0.000</u>	7.541	3	0.057
RC-JS*	0.207	2	0.902	1.389	2	0.499	6.177	2	0.046	2.167	2	0.338	2.045	2	0.360
ibid.**	20.726	11	0.036	54.981	11	0.000	47.225	11	0.000	63.484	11	0.000	22.781	11	0.019
χ^2 test	20.519	9	<u>0.015</u>	53.592	9	<u>0.000</u>	41.048	9	<u>0.000</u>	61.317	9	<u>0.000</u>	20.736	9	<u>0.014</u>
PlnD-TC*	0.033	2	0.983	0.261	2	0.877	0.037	2	0.981	0.533	2	0.766	0.209	2	0.901
ibid.**	2.975	5	0.704	14.701	5	0.012	13.738	5	0.017	5.861	5	0.320	10.765	5	0.056
χ^2 test	2.942	3	0.401	14.440	3	<u>0.002</u>	13.701	3	<u>0.003</u>	5.328	3	0.149	10.556	3	<u>0.014</u>
OlnD-TC*	0.000	1	0.991	0.012	1	0.914	0.656	1	0.418	0.019	1	0.891	0.164	1	0.685
ibid.**	2.040	6	0.916	21.357	6	0.002	6.972	6	0.323	6.068	6	0.416	8.354	6	0.213
χ^2 test	2.040	5	0.844	21.345	5	<u>0.001</u>	6.316	5	0.277	6.049	5	0.301	8.190	5	0.146
PlnD-Inn*	0.001	1	0.980	0.056	1	0.813	0.261	1	0.610	0.087	1	0.767	0.588	1	0.443
ibid.**	3.837	5	0.573	17.102	5	0.004	17.280	5	0.004	9.200	5	0.101	2.493	5	0.778
χ^2 test	3.836	4	0.429	21.357	6	<u>0.002</u>	17.019	4	<u>0.002</u>	9.113	4	0.058	1.905	4	0.753
OlnD-Inn*	0.004	1	0.947	0.750	1	0.387	0.118	1	0.731	0.109	1	0.741	0.057	1	0.811
ibid.**	3.368	6	0.761	18.035	6	0.006	8.596	6	0.198	8.917	6	0.178	2.383	6	0.881
χ^2 test	3.364	5	0.644	21.357	6	<u>0.002</u>	8.478	5	0.132	8.808	5	0.117	2.326	5	0.802
TC-Inn*	11.112	4	0.025	9.465	4	0.050	11.307	4	0.023	10.463	4	0.033	12.015	4	0.017
ibid.**	11.336	10	0.332	30.808	10	0.001	15.092	10	0.129	18.186	10	0.052	12.286	10	0.266
χ^2 test	0.224	6	1.000	21.357	6	<u>0.002</u>	3.785	6	0.706	7.723	6	0.259	0.271	6	1.000

Perceived Social Diversity (PSD); Objective Social Diversity (OSD); Relationship Conflict (RC); Job Satisfaction (JS); Perceived Information Diversity (PlnD); Objective information Diversity (OlnD); Task conflict (TC); Innovativeness (Inn); P (significance values); * No constraints; ** Constraints; Chi-square difference test (χ^2 test); ;
hypothesis 9 -28 (H 9 -28)