THE CHARACTERISTICS OF THE CULTURE OF CATHOLIC

SECONDARY SCHOOLS IN HONG KONG:

ATTITUDES OF STUDENTS TOWARDS THEIR SCHOOL

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ABSTRACT

The characteristics of the culture of Catholic secondary schools in Hong

Kong: Attitudes of students towards their school

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Research indicates that the Catholic school culture is exceptionally conducive to high quality education and student achievement. Over the years, Catholic secondary schools in Hong Kong have provided quality education with excellent rates of student achievement. However, these schools have faced challenges, resulting in a downgrading of the quality of education. The Catholic education reform proposed in 2000 by the Diocesan Synod, with the intention of restoring high quality Catholic secondary schooling in Hong Kong, emphasized the cultivation of a positive school culture. During the reform period, principals and teachers conducted interim reviews to gain knowledge of those characteristics specific to a positive Catholic secondary school culture, an insight which is invaluable for ensuring effective education and the formulation of improvement plans that will shape a positive educational environment. This study was designed to examine the characteristics of

the culture of Catholic secondary schools in Hong Kong through an investigation of students' attitudes towards their school. Flynn's circular interaction model (Flynn, 1993) was used as a framework, and with empirical and theoretical support for their possible significance to school culture, the variables were selected.

A survey adopted from an instrument by Flynn and Mok (2002) was employed in this research. The instrument, "Attitudes of students towards their school", examined five aspects: (1) student's relationship with teachers; (2) student morale; (3) student's perception of the principal; (4) student attitude to discipline; and (5) student attitude to religious education. The items selected from Flynn and Mok's (2002) instrument were translated into Chinese for this study. The factor structure and reliability of the instrument were inspected, and the results suggested that it was an adequate indicator for assessing the students' attitudes towards their school.

The students' attitudes towards their school were developed by analysing 3,478 useable survey responses from students currently enrolled in Secondary One to Secondary Three at 18 aided Catholic secondary schools in Hong Kong. An interpretation of students' attitudes towards their school, including the effects of gender, school type and religious background on them, as well as the impact of the interaction between these predictors, unveiled the characteristics of the culture of Catholic secondary schools in Hong Kong. The analysis indicated that teachers' professionalism and caring attitudes towards

students contributed to the students' satisfactory sense of community. Principals preferred the provision of good education and students' academic achievements, but not religious education. Meanwhile, schools emphasized conformity and cultivation of an orderly school atmosphere. In addition, the influences of school culture were more positive among students in all-girls' schools and students with the same religious affiliation as the school.

Seemingly, improvement measures should be taken before a positive culture and high quality Catholic secondary school education in Hong Kong can be restored. Improvement work should involve the development of the concept of discipline as discipleship in schools. Catholic secondary schools should also pay particular attention to curricula and religious education. Moreover, school leadership should make full use of the opportunity to reveal the school's commitment to apostolic cultivation.

 (496 words)

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LIST OF ABBREVIATIONS

Term	Abbreviation
Attitudes of students towards their school	ASTS
Chi-square	χ^2
Design effect	Deff
Intraclass correlation coefficient	ICC
Mean square	MNSQ
Secondary one	S1
Secondary two	S2
Secondary three	S3

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CHAPTER 1

INTRODUCTION

Over the years, Catholic secondary schools in Hong Kong have provided quality education with excellent student achievement (Mok, 2007). Research has indicated that school culture significantly influences the effectiveness of school, both in terms of academic performance and the students' values and character formation (Muhammad, 2009; Turan & Bektas, 2013). The Catholic school culture, possessing requisite conditions for the development of a positive environment, has been shown to be exceptionally conducive to high quality education (Bryk, Lee, & Holland, 1993; Flynn & Mok, 2002; Mok & Flynn, 1998; Negis-isik & Gursel, 2013; Rhea, 2011; Turan & Bektas, 2013). In past years, the distinctive school culture of the Catholic secondary schools of Hong Kong nurtured a high quality of secondary education and a high level of student achievement (Catholic Diocese of Hong Kong, 2002). However, the region's Catholic secondary schools faced a number of challenges, resulting in a downgrading of educational quality (Catholic Diocese of Hong Kong, 2002, Catholic Education Office, Hong Kong, n.d.). In 2000, the Diocesan Synod put forth a proposal for Catholic education reform, with the intention of restoring high quality Catholic schooling, and emphasized both the construction of knowledge and the enhancement of the personal quality of students in Hong Kong (Catholic Education Office, Hong Kong, n.d.). Thus, one of the key

projects of the Diocese of Hong Kong included the reformation of Catholic Secondary education. These reforms have been underway for more than 10 years and are still ongoing (Religious education, 2014). An interim review and evaluation is crucial to the success of an organization's reform project to help the people involved determine the effectiveness of the existing policies and to formulate plans for remedial action (Gronlund & Linn, 1990). Thus, during the reform period in Hong Kong, Catholic secondary school principals and teachers conducted interim reviews to scrutinize the efficacy of the efforts they have made and to develop improvement plans to meet the objective of restoring quality Catholic secondary education. Fullan, McKenzie, Getty, and Hamilton (2014) pointed out that, if a school intends to improve the quality of its education and enhance student achievement, principals and teachers should become familiar with the characteristics of a positive school culture and identify ways to shape the school environment accordingly. Therefore, an integral part of the interim reviews was for principals and teachers to gain knowledge of those characteristics specific to the Catholic secondary school culture, an insight which is invaluable for ensuring effective education and the formulation of improvement plans that will shape a positive school culture. The present research focuses on the investigation of the characteristics of the culture in Hong Kong's Catholic secondary schools.

This chapter provides an overview of this research and is divided into five sections. The first section presents the background of this research. The second, third and fourth sections state the problem, the purpose of the research and the

significance of the research. The last section outlines the organization of the thesis.

1.1 Background of the research

This section provides an overview of the background of the present research. The discussion includes the contributions of Catholic secondary education in Hong Kong (Section 1.1.1), the positive culture conducive to high quality Catholic secondary education in Hong Kong (Section 1.1.2), the challenges faced by Catholic secondary schools in Hong Kong (Section 1.1.3), and the reforms underway in the region's Catholic secondary education system (Section 1.1.4).

1.1.1 Contributions of Catholic secondary education in Hong Kong

Catholic secondary education has been taking place in Hong Kong for more than 160 years (Catholic Diocese of Hong Kong, 2002). The schools are led by the Most Rev. Cardinal John Tong, Bishop of Hong Kong, who is represented by the Episcopal Delegate for Education. Over the years, Catholic secondary schools in Hong Kong provided high quality education to a significant number of students in Hong Kong. According to the statistics as of 31 August, 2013 (Catholic Diocese of Hong Kong, 2013), Hong Kong has a total of 264 Catholic schools (31 kindergarten, 107 primary and 85 middle and secondary schools; two vocational schools; 30 adult education institutes; seven special schools; and

two post-secondary institutes). The percentages of some categories of Hong Kong's Catholic schools are listed in Table 1.1. The figures reveal that the number of Catholic primary and secondary schools accounts for a large proportion of the Catholic schools in Hong Kong.

Table 1.1

Percentage of Catholic Schools in Hong Kong

Level	Catholic school [a]	Local school [b]	Row %
Kindergarten	31	869	3.57%
Primary	107	526	20.34%
Middle and Secondary	85	485	17.53%
Special	7	60	11.67%

Note. [a] Figure based on 31 August 2013 statistics from the Catholic Diocese of Hong Kong; [b] Figure based on August 2013 statistics from the Education Bureau of the Government of the HKSAR.

According to the statistics as of 31 August, 2013 (Catholic Diocese of Hong Kong, 2013), the Catholic Diocese of Hong Kong, Caritas Hong Kong and 25 religious congregations are the sponsoring bodies of these Catholic schools in Hong Kong, and the Catholic Church is the largest school sponsor of primary and secondary schools in Hong Kong. These Catholic schools have educated 165,781 Hong Kong students (10,576 in kindergarten, 67,225 in primary schools, 70,977 in middle and secondary schools, 204 in vocational schools, 14,669 in adult education institutes, 592 in special schools, and 1,538 in post-secondary institutes), and 9.71% or 16,096 of these students are Catholic. Moreover, out of 165,781, 70,977 (42.81%) are students at the middle and secondary levels, thus accounting for a significant proportion of students in Catholic schools in Hong Kong. The percentages of students in Hong Kong's Catholic schools are listed in Table 1.2.

Table 1.2

Percentage of Students in Catholic Schools in Hong Kong

Level	Students in Catholic schools[b]	Students in local schools[b]	Row %
Kindergarten	10,576	169,843	6.23%
Primary	67,225	320,918	20.95%
Middle and Secondary	70,977	395,345	17.95%
Special	592	7,904	7.49%

Note. [a] Figure based on 31 August 2013 statistics from the Catholic Diocese of Hong Kong; [b] Figure based on August 2013 statistics from the Education Bureau of the Government of the HKSAR.

The statistics (Catholic Diocese of Hong Kong, 2013), as of 31 August, 2013, also indicate that the total number of staff serving Catholic schools in Hong Kong was 11,278, including 28 priests, 79 sisters, 13 brothers, 3,288 lay men, 7,739 lay women, 31 male pastoral assistants and 100 female pastoral assistants. Among the lay teachers, 2,885 were Catholic (25.58%).

The high quality of education provided by the Catholic secondary schools was appreciated by Hong Kong's society. Over the years, parents and students have given their assurances and demonstrated their confidence in Hong Kong's Catholic secondary schools by choosing these schools for their education (Mok, 2007). Many prominent elite from society who graduated from Catholic secondary schools, including the former Chief Executive Officer of Hong Kong, Sir Donald Tsang Yam-kuen (Encounter of two heroes, 2007), Hong Kong political activist, Mr. Alan Leong Kah-kit (Encounter of two heroes, 2007), and chairman of one of the largest property developers in Hong Kong, Mr. Thomas Kwok Ping-kwong (Experience sharing on the success of the Hong Kong celebrities, n.d.), are evidence of Catholic secondary schools providing good quality education conducive to a high level of student achievement.

1.1.2 The positive culture conducive to high quality Catholic secondary education in Hong Kong

Research results on the enhancement and effectiveness of schools showed that school culture plays a crucial role not only on the success of educational advancement and reform, but also character formation and student achievement (Angelides, 2001; Fullan, 2007; Gun & Caglayan, 2013; Maslowski, 2006; Negis-isik & Gursel, 2013; Sailes, 2008).

Culture is an excellent instrument for school leaders to know the school's traditions, norms and expectations intuitively and accurately (Deal & Kent, 1999). The influences of school culture on the life and learning in the school are great and have more of an impact than the state department of education, the school board, or even the principal could ever have (Barth, 2002). A positive school culture could encourage teacher collaboration, which ultimately enhances student achievement (Fullan, 2007). Several studies have found that school culture was the key to the development of quality education with a high level of student achievement (Barth, 2002; Fullan, 2007; Schein, 2010).

Gun and Caglayan (2013) further found that the success or failure of a school is closely related to the attitude and behaviour of its members, including students and staff, and school culture is a powerful influence on these factors. Moreover, a positive school culture can underpin the morale, attitude and performance of staff, especially the teachers (James & Connolly, 2009). These results could further explain the effects of school culture on students' attitudes and achievements, as well as school effectiveness. The positive morale, attitude

and performance of the staff, instilled by a positive school culture, increases a school's potential to develop the best students and create an effective environment (Dwyer, 1993; Flynn, 1993; Gun & Caglayan, 2013; James & Connolly, 2009).

School culture also has a substantial influence on the students' life, including their character formation and academic achievements (Barth, 2002; Bell & Kent, 2010; Deal & Kent, 1999; Dumay, 2009; Elbot & Fulton, 2008; Flynn, 1993; Flynn & Mok, 2002; Gruenert, 2000; Kythreotis, Pashiardis, & Kyriakides, 2010; Mok & Flynn, 1997, 1998; Negis-isik & Gursel, 2013; Sailes, 2008; Turan & Bektas, 2013; van der Westhuizen, Oosthuizen, & Wolhuter, 2008). A positive school culture is essential for high-achieving schools (Van der Westhuizen, Mosoge, Swanepoel, & Coetsee, 2005). Mok and Flynn (1998) examined the effects of the Catholic school culture on the performance of Year 12 students in a public examination in Australia. The results indicated that a positive school culture is a good predictor of high achievement in public examinations. Moreover, a positive relationship exists between school culture and learners' discipline (van der Westhuizen et al., 2008), and schools with negative cultures are at risk of experiencing a range of adverse mental health and behavioural problems (DeWit, Offord, Sanford, Rye, Shain, & Wright, 2000). School culture, in summary, plays a key role in specifying the quality of school education and the students' attitudes and achievements. Its power can be addressed from the perspective of both the process itself and the product it yields. It is a means for not only forming learning models but also transforming students' attitudes and behaviours.

Schools established by sponsoring bodies from different backgrounds always aspire to accomplish missions entrusted to them by the sponsoring bodies. Sponsoring bodies with religious backgrounds prefer schools to teach religion to their students (Henk, Maney, Baxter, & Montejano, 2013), in addition to cultivating the general educational objectives. Catholics believe that their schools possess a unique quality, or culture, which cannot be found in other schools but is located in their religious faith dimension (Erricker, 2010; Flynn & Mok, 2002; Henk et al., 2013). Research findings in western countries such as the United States (US) and Australia, on Catholic school culture indicated that those schools possessing the requisite standards for the development of a positive culture, were exceptionally capable of high quality education, which, in turn, had a positive effect on students' academic achievements and development by instilling desirable values, beliefs and behaviours appreciated by the broader society (Bryk et al., 1993; Flynn & Mok, 2002; Mok & Flynn, 1998; Negis-isik & Gursel, 2013; Rhea, 2011; Turan & Bektas, 2013). By the same token, it is the distinctive school culture in Hong Kong's Catholic secondary schools that creates an environment conducive to high quality education and a high level of student achievement (Catholic Diocese of Hong Kong, 2002).

1.1.3 Challenges faced by Catholic secondary schools in Hong Kong

In spite of the positive school culture, high quality education, and excellent achievements, Catholic secondary schools in Hong Kong are faced with challenges. This section gives a brief account of these challenges, which are discussed in detail in Section 2.7.

The first of these challenges concerns the examination-driven learning environment in Hong Kong. Education has always been interpreted by Hong Kong people as the legitimate and nearly only way for upward social mobility, and they are inclined to evaluate education in terms of student academic achievements (Chan, Chen, & Chong, 2010; Cheng, 1997). Under these circumstances, the vast majority of secondary schools in Hong Kong, including Catholic secondary schools, were forced to focus their efforts solely on academic achievement.

The second challenge concerns the secularization in Catholic schools of Hong Kong. In recent years, the percentage of Catholic teachers in Catholic schools decreased from 69% in 1961 to 25.58% in 2013, and the percentage of Catholic students in Catholic schools decreased from 26% in 1953 to 9.71% in 2013 (Catholic Diocese of Hong Kong. 2013; Mok, 2007) respectively. Under these circumstances, teachers generally lacked a good knowledge to carry out the Catholic educational mission, which would be discussed in more detail in Section 2.6.2, making it difficult to secure the distinctive Catholic character of the schools (Mok, 2007). Studies have found that students with the same

religious affiliation as their school are higher achievers than their less religious counterparts (Jeynes, 2003; Wighting & Liu, 2009). In this regard, the continuous decline in percentage of Catholic teachers and students in Hong Kong's Catholic schools negatively affect the accomplishment of the school educational mission (Catholic Diocese of Hong Kong; Mok, 2007) and student achievements (Jeynes, 2003; Wighting & Liu, 2009).

The third challenge concerns the leadership of Catholic secondary school principals. Due to the examination-driven learning environment, principals in Hong Kong, including Catholic secondary school principals, are inclined to place emphasis on the provision of a good education to prepare students for further education and future employment (Catholic Diocese of Hong Kong, 2002; Chan et al., 2010).

The fourth challenge involves the preferences of teachers teaching in Catholic secondary schools. Teachers with the same religious affiliation as the serving school are at a great advantage to cultivate a positive culture in the schools (Gun & Caglayan, 2013). The percentage of Catholic teachers in Hong Kong's Catholic schools dropped from 69% in 1961 to 25.58% in 2013 (Catholic Diocese of Hong Kong, 2013; Mok, 2007). Worse still, secondary teachers in Hong Kong were only specialized in the subject they taught, but lacked formal training in taking care of students' psychological and mental growth (Chan et al., 2010). In addition to a heavy teaching load, Catholic secondary school teachers were also weighed down with non-teaching duties, such as form master/mistress, extra-curricular activities and club advisors (Chan et al., 2010; Pang, 1990). When teachers are required to spend almost all their

time and effort on their school work, it is difficult to find time to work on students' character formation.

The fifth challenge concerns the issue of teacher redundancy in Hong Kong. In the past 10 years, the number of students in Hong Kong has been declining; however, the Hong Kong government failed to implement effective measures to relieve the problem, which has led to territory-wide teacher redundancies and school closures (Mok, 2007; Mok, 2010). In this regard, the teachers' morale, including those in the Catholic secondary schools, was negatively affected, with some teachers opting to leave the teaching profession (Mok, 2010).

Hence, the challenges faced by Hong Kong's Catholic secondary schools affected the quality of the services delivered, which, in turn, had a negative impact on the culture of these schools. Consequently, failing to sustain the positive school culture downgraded the schools' educational quality and student achievements (Catholic Diocese of Hong Kong, 2002; Catholic Education Office, Hong Kong, n.d.).

1.1.4 Reforms underway in Catholic secondary education system of Hong Kong

With the intention of improving the quality of Catholic education in Hong Kong, between March 2000 and December 2001, the Diocesan Synod called for a holistic reform in Catholic education in Hong Kong with the secondary level being one of the key reform projects (Catholic Diocese of Hong Kong, 2002).

This section briefly outlines the reform of Catholic secondary education in Hong Kong, which will be discussed in detail in Section 2.8.

In response to the call for reforms, two major policies involving Catholic secondary schools in Hong Kong were launched by the Catholic Diocese of Hong Kong. First, the Religious & Moral Education Curriculum Task Group, established in 2004, introduced a "Religious & Moral Education Curriculum" document (RME Curriculum Task Group, 2006) in June 2006. The orientation in this curriculum pointed to both academic and spiritual aspects fitting both Catholic and non-Catholic students from kindergarten to senior secondary students. Supportive work, such as teachers' professional development and support from parish and diocesan organizations, was arranged. The curricula started in primary one and secondary one of the Catholic schools, respectively, in the 2011–2012 academic year, and moved up to the next level every subsequent academic year. By the 2013–2014 academic year, it had reached primary three and secondary three, respectively. The curricula are expected to be extended to other levels in coming years (Catholic Education Office, Hong Kong, n.d.).

Second, beginning with the 2005–2006 academic year, Catholic schools in Hong Kong were subsidized to employ pastoral care-related staff, such as school chaplains and pastoral assistants, to offer religious support services to students (Pastoral care work in Catholic schools, 2007, November, 25). By 31 August, 2013, 131 pastoral care assistants were working in Catholic schools, including secondary schools (Catholic Diocese of Hong Kong, 2013). The pastoral care assistants basically serve the function of promoting and organizing

programs, such as prayer gatherings, pilgrimages and celebrations, to help students with their religious formation (The prospect of school pastoral care work, 2011,). However, the schools, especially secondary schools, found it difficult to recruit quality assistants due to the limited monthly salary and contract basis working term.

It is expected that the reforms will address the challenges and help restore the standard of quality Catholic secondary education in Hong Kong. By 2013, the reforms had been carried out for nine years and are still underway (Catholic Education Office, Hong Kong, n.d.). The reforms are likely to last for several more years in order to achieve the desired goals.

1.2 Statement of the problem

During the Catholic education reform period, educators, especially the principals and teachers, must conduct interim reviews to scrutinize the efficacy of their efforts, and identify ways to modify the strategies and plans so that the objective of restoring quality Catholic secondary education in Hong Kong can finally be attained. Knowledge of the characteristics of the culture specific to Catholic secondary schools is a great help in this respect.

As discussed in Section 1.1.2, a positive school culture is crucial to foster quality Catholic education with a high level of student achievement in Hong Kong. Principals and teachers knowledgeable about the characteristics of the culture of their schools might be able to understand how culture influences measureable outcomes, which is essential for developing quality education and

enhancing student achievements (Deal & Kent, 1999; Fullan, 2007; Fullan et al., 2014). Thus, an investigation of the characteristics of the culture of Catholic secondary schools in Hong Kong may be beneficial for concerned principals and teachers. It is expected that this insight will prove invaluable to principals and teachers who are working to create an exceptional Catholic secondary school culture conducive to quality education and a high level of student achievement. Bell and Kent (2010) pointed out that, to have a realistic self-evaluation of school culture, it is important to unveil the way in which culture is perceived by the students who are a significant component of the school culture. Not much can be learned from the available literature about survey research on the characteristics of the culture of Catholic secondary schools in Hong Kong from the students' perspective, and limited information is available on this topic.

1.3   Purpose of the research

The focus of the present study was to investigate the characteristics of the culture of Catholic secondary schools in Hong Kong through a detailed investigation of students' attitudes towards their school. For the proposed quantitative research, the characteristics of the culture of 18 Catholic secondary schools in Hong Kong were investigated. The goal of the present research was to be able to help principals and teachers in Hong Kong's Catholic secondary schools to obtain knowledge on the characteristics of the culture of their schools. This insight is invaluable as Catholic secondary school principals and teachers conduct interim reviews during the reform period to scrutinize the efficacy of

the efforts they have made and develop improvement plans to shape a positive school culture.

1.4 Significance of the research

Three significant theoretical and practical factors are brought about by this study. First, the present study initiates the investigation of the characteristics of the culture of Catholic secondary schools in Hong Kong through a quantitative investigation on the attitudes of students towards their school. Second, the results of the present study can help principals and teachers, who intend to review and scrutinize the efficacy of their efforts, to understand the current level of implementation and to develop improvement plans to shape a positive school culture. Third, the present study develops a Chinese version of an instrument, with validity and reliability, to investigate the characteristics of the culture of Catholic secondary schools in Hong Kong through the measurement of students' attitudes towards their school. The availability of the instrument sparks similar studies to be carried out in Hong Kong and even in other Chinese countries.

1.5 Organization of the thesis

This thesis comprises five chapters. Chapter 1 is the introductory chapter. Chapter 2 reviews the theories and previous research findings related to school culture and Catholic school culture in Hong Kong, and identifies the gaps in the research. Chapter 3 describes the research methodology. Chapter 4 reports the

results of the study. Chapter 5, the concluding chapter, discusses the contributions, implications and recommendations of the thesis in regard to Catholic secondary schools in Hong Kong, the limitations of this study and possibilities for future research.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews the literature related to the present study. It contains thirteen sections: concept of culture (Section 2.1); concept of school culture (Section 2.2); school culture and the attitudes of students (Section 2.3); conceptual models of school culture (Section 2.4); Flynn's circular interaction model: the way towards a positive Catholic school culture (Section 2.5); the culture of Catholic secondary schools in Hong Kong: its core beliefs and values (Section 2.6); factors influencing the quality of Catholic secondary education in Hong Kong: impacts encountered by schools that affect the achievement of a positive culture (Section 2.7); reform of Catholic secondary education in Hong Kong (Section 2.8); research gaps (Section 2.9); literature guiding the present study (Section 2.10); conceptual framework (Section 2.11); key influences (Section 2.12); and, last, research questions and hypothesis (Section 2.13).

2.1 Concept of culture

For decades, hundreds of definitions for the term "culture" have been given by researchers. The term culture, which is derived from the Latin cultūra, was defined as "the beliefs, way of life, art, and customs that were shared and accepted by people in a particular society; the attitudes and beliefs about

something that were shared among a particular group of people or in a particular organization" (*Dictionary of contemporary English*, 2009, p. 411).

Geertz (1973) defined culture as a "historically transmitted pattern of meaning embodied in symbols" (p. 89). He perceived culture as simply a pattern of meanings expressed in symbolic forms that would be passed on from one generation to the next. Moreover, he pointed out that culture played a crucial role in governing the way the people interact, cultivate their value system and develop their attitude towards life. Flynn and Mok (2002) described culture as "the enrichment of the minds and hearts of people through education and association with the great masterpieces of art, literature, music and science, together with other expressions of the fine arts". As a member of a particular group, people will learn certain aspects of the lifestyle, i.e. the culture, of that group. Such culture is shared through social interactions and implies an expectation of continuity within a community. Schein (2010) defined culture as "a pattern of shared basic assumptions learned by a group as it solved its problems of external adaptation and internal integration, which has worked well enough to be considered valid, and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (p. 18).

From the theological perspective, culture, in response to God's words in Genesis, is a process of cultivation towards betterment of human society and the lives of men and women in the world:

> Let us make (human persons) in our own image, in the likeness
>
> of ourselves . . . God blessed them, saying: "Be fruitful; multiply;
>
> fill the earth and conquer it . . .". (Genesis 1:26–28)

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In this sense, culture can be viewed as the process of development and humanization of life in the world. Not only does this evolution lead to the development of a perfect human being, but it also helps the formation of a new age and full humanity until it reaches its fulfilment in Jesus.

From the above discussions, culture can be interpreted as the distinct mode of life of a social group and its characteristics are three-fold. First, culture is shared through social interactions among people of a social organization or members of a society. Second, culture is learned by members of a particular group through interactions and is assimilated through modelling. Third, culture is continuously passed on from one generation to the next, in the form of social heritage.

2.2 Concept of school culture

Deal and Kent (1999) asserted that students, parents, teachers and principals have always sensed a special force within the school environment, which is powerful, pervasive, and notoriously elusive. However, this force was difficult to describe, elaborate or define. Some terms, such as school climate, school ethos or school culture, have been used to describe it. "School culture" was commonly accepted as the most appropriate and accurate term to describe this "force" (Deal & Kent, 1999; Flynn, 1993). Organizational culture is a general term to describe the culture of an organization, such as a company, a factory, an office, a section of a governmental department and a school. School

culture can then be viewed as organizational culture with distinct features in a school setting (Maslowski, 2006; van der Westhuizen et al., 2008).

In the past decades, researchers and scholars have tended to define organizational culture from their perspective. Hoy and Miskel (2008) characterized organizational culture as a "system of shared orientations". Not only did it generate a cohesive force within the unit, but also gave it a distinct identity. Martin (2002) concluded that cultural researchers were inclined to define organizational culture as values, norms or thoughts that were shared by most of an organization's members. Sailes (2008) opined that school culture is an organized set of values, norms and faith for a group of people to interact and communicate, but not a collection of demographic details on its people, social background or geographical factors. Kythreotis et al. (2010) perceived school culture as a system of shared orientations that give the unit a distinct identity and hold it together. Barth (2002) gave a more technical definition of school culture as "a complex pattern of norms, attitudes, beliefs, values, ceremonies, traditions, and myths that are deeply ingrained in the very core of the organization. It is the historically transmitted pattern of meaning that wields astonishing power in shaping what people think and how they act" (p. 7).

Van der Westhuizen et al. (2005) defined organizational culture as "the intangible foundation that encompassed common values, assumptions, norms, and convictions, which served as guidelines for the behaviour of individuals in an organization" (p. 93). They found that school culture comprises at least 22 factors and these factors can broadly be classified into two categories, namely the intangible and the tangible. The intangible factors, such as beliefs, norms

and thoughts, were attributed to the basis for the tangible factors among individuals within organizations, i.e. the collective attitudes, behaviours and actions. They also found that these attitudes, behaviours and actions of individuals and groups would also reinforce the established "picture of responses" of individuals and groups, i.e. the tangible element of the culture. In this regard, these two factors, the intangible and the tangible, reciprocally affect one another, eventually establishing a dynamic state of equilibrium, which could be described as the culture of an organization.

In past years, many researchers studying organizational culture were inclined to view organizational culture from the realist perspective, claiming that organizational culture was one of the major variables residing in an objective, measurable and real social world external to the individual (Alvesson, 2002; James & Connolly, 2009). Organizational culture, from this perspective, was the agreed rules that governed cognitive and affective aspects, and guided the ways members of an organization did things (Fullan, 2001). The concept of meaning, interpretation and symbolic significance was of vital importance to a deeper and further understanding of the concept of organizational culture (Alvesson, 2002; Frost, Moore, Louis, Lundberg, & Martin, 1991). Meaning referred to one's interpretation of an object and shaped the relationship between the person and that object, and a symbol was a material object, such as an emblem or token, that represented something immaterial (Alvesson, 2002). What a symbol represented was subject to one's interpretation. Organizational culture, in turn, was a collective process of interpretation taking place in a

shared frame of reference of beliefs, expressive symbols and values (James & Connolly, 2009).

2.3 School culture and the attitudes of students

Culture is not a physical being; therefore, it is difficult to perceive school culture by analyzing its definition and explanations (Deal, 1985). However, the morale, attitude and performance of school staff and students are instilled by the school culture (Bell & Kent, 2010; Dwyer, 1993; Flynn, 1993; Gun & Caglayan, 2013; James & Connolly, 2009). Bell and Kent (2010) revealed that research has investigated school culture mainly from the perspectives of teachers, while a review of inventories for inspecting school culture by Maslowski (2006) has shown that the inventories developed for measuring school culture focus mainly on the perspectives of teachers and school administrators. Turan and Bektas (2013) found that there was a positive relationship between the leadership practices of teachers and school culture in primary education.

Teachers are not the only group within a school that can help when investigating school culture. Bell and Kent (2010) pointed out that, to have a realistic understanding of school culture, it is important to unveil the way in which culture is perceived by the students, who are a significant component of the school culture. The way that students encounter and transmit school culture is an important component that determines the culture of a school (Bell & Kent, 2010). In other words, the culture of a school is internalized by the students, as exhibited by their attitudes towards their school (Bell & Kent, 2010; Flynn, 1993; Maslowski, 2006). The attitudes of students toward their school are

multifaceted, and as evidenced by Flynn's (1993) research, can be measured using six scales: student relationship with teachers, student morale, student perception of the principal, student attitude to discipline, student attitude to religion and student attitude to religious education. These six scales are discussed in more detail in Section 2.11.

2.4 Conceptual models of school culture

Models on school culture contribute to the study of school culture. They allow for an examination of the concept of school culture through an analysis of individual components that help to shape the culture of schools. In the past, scholars have tended to focus on the development of models of organizational culture other than in the educational setting (Bell & Kent, 2010). Bell and Kent (2010) pointed out that some existing models of organizational culture actually resisted the application of educational settings. Research seeking to develop a model of organizational culture tended to adopt the concept of organizational culture as stipulated in the last paragraph of Section 2.2: (1) organizational culture was one of the major variables of an organization that influenced the behaviour, attitudes and values of the members, and (2) organizational culture was a collective process of interpretation taking place in a shared frame of reference of beliefs, expressive symbols and values. This frame of reference was basically the analytical framework of Schein's model of organizational culture (Schein, 1985), which was the most preferred model of organizational culture among scholars in the field of educational administration (Maslowski, 2006). In 2008, Schoen and Teddlie (2008) extended the framework of Schein's

model and suggested a new model of school culture. Schoen and Teddlie's model provided a conceptual framework, specifically, for the analysis of school culture. Flynn (1993) introduced a circular interaction model for the analysis of Catholic school culture, which was commonly referred to by scholars studying Catholic school culture in Australia (Belmonte & Cranston, 2009; Cook, 1998; Dorman, 2009; Flynn & Mok, 2002; Mok & Flynn, 1997, Mok & Flynn, 1998). Three models, Schein's model of organizational culture (Section 2.4.1), Schoen and Teddlie's model of school culture (Section 2.4.2) and Flynn's circular interaction model of Catholic school culture (Section 2.4.3), will be discussed. Moreover, the selection of an appropriate model of school culture for the present study will also be presented in Section 2.4.4.

2.4.1 Schein's model of organizational culture

Schein (1985) introduced a conceptual framework of organizational culture as a tool for analysing organizational culture. He intended to analyse culture in a time dimension at different levels, ranging from very tangible visible artefacts to invisible basic assumptions, as shown in Figure 2.1. These three levels of organizational culture were: (1) artefacts: the visible organizational structures and processes; (2) espoused beliefs and values: the strategies, goals and philosophies; and (3) the basic underlying assumptions: the unconscious, taken-for-granted beliefs and values (Schein, 2004, p. 26).

In Schein's model of culture, the "deepest", least tangible level of culture, yet comprising the core of school culture, embraces the basic underlying assumptions shared by teachers. Schein (1992) defined the basic

assumptions as the essence of culture, while the other two levels could be used as tools for interpreting the basic assumptions. He (Schein, 2004) preferred that basic assumptions be non-negotiable and axiomatic for group members. Basic assumptions were similar to theories-in-use because both were taken for granted and were difficult to change. However, the two were also different because theories-in-use were not patterned lists of values or beliefs, whereas basic assumptions were implicit cultural paradigms.

Artefacts	Visible organizational structures and processes (difficult to decipher)
Espoused Beliefs and Values	Strategies, goals, philosophies (espoused justifications)
Underlying Assumptions	Unconscious, taken-for-granted beliefs, perceptions, thoughts, and feelings (ultimate source of values and actions)
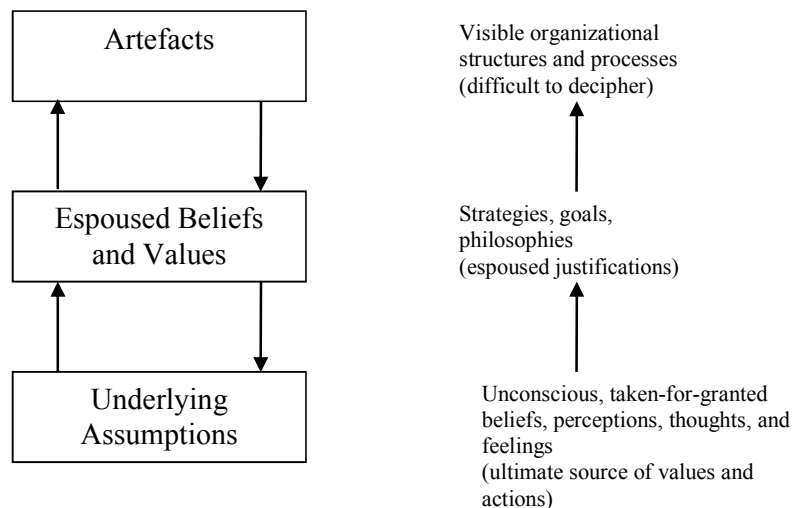
Figure 2.1 Levels of culture (Schein, 2004, p. 26)

The second level of culture was 'espoused beliefs and values' consisting of beliefs, values, ethos, philosophies, ideologies, ethical and moral codes, and attitudes (Schein, 2004). Espoused beliefs were likely to be the established beliefs or values of a group member, who was usually the leader of the group, but which has not been sufficiently transformed into stable conditions to influence the direction of behaviour of the organizational members. If the leader

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of an organization could convince the group to act on his beliefs and they felt that such values or beliefs were effective, these would first convert into shared values or beliefs, and finally into a shared assumption (Schein, 2004, p. 28). Most of the behaviour to be observed at the artefacts level could be predicted by the beliefs and values at this conscious level.

The third level of Schein's cultural analysis, artefacts, was on the surface and consisted of artefacts and practices. It included all the things in the physical environment and the behavioural patterns of the group members that one saw, heard, and perceived when joining a new group with a brand new culture. The results of group behaviour, such as buildings, office layouts, and physical arrangements, an organization's written and spoken language, technology, clothing, rites, ceremonies, heroes and heroines, as well as symbols, were all included in this artefacts level (Schein, 1992). In cultural artefacts, the basic assumptions, beliefs and behavioural patterns of a school were transformed and could be mirrored in behaviour. Artefacts were those things easy to observe because they were tangible, visible and audible, and were processes and results associated with behaviours of group members.

Concerning the inventories for measuring school culture, using Schein's model of organizational culture as the framework, Maslowski (2006) revealed that six validated instruments were best suited for reasons of efficiency and standardization, for measuring the cultural elements, i.e. basic assumptions, values and cultural artefacts, or comparing cultures across schools. These inventories made use of the items that reflected school staff's behaviours and practices to interpret values and norms which, in turn, converted to the school

culture as stated by Schein's model of organizational culture (Schein, 2010). However, inventories exploring school culture from the students' perspective could hardly be found (Bell & Kent, 2010).

2.4.2 Schoen and Teddlie's model of school culture

Schoen and Teddlie (2008) interpreted school culture as a construct consisting of four dimensions that existed at different levels of abstraction. They agreed with Schein's (1992) interpretation that school culture could be analysed at three different levels of abstraction, artefacts, espoused beliefs and basic assumptions, but suggested that each level of abstraction could be analysed from four dimensions. A graphical representation of the model is illustrated in Figure 2.2.
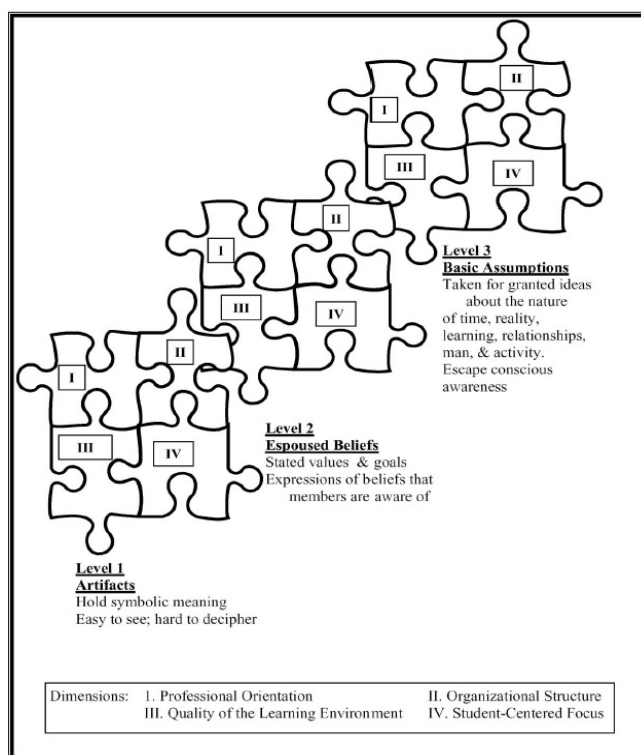
Figure 2.2 Schoen and Teddlie's model of school culture (Schoen & Teddlie, 2008, p. 142)

The four dimensions in each level of abstraction were: (I) professional orientation: the involvement of the school's teaching staff in student-centred professional growth and development programmes; (II) organizational structure: organizational factors, such as the leadership style of the principal, the degree of consensus and commitment regarding school goals, and relationships within the school that affected the way the school operated; (III) quality of the learning environment: student construction and utilization of knowledge, and the emphasis of this dimension was the extent that school functions could involve the students in meaningful, cognitively challenging experiences; and (IV) student-centred focus: assessment of the extent that school policy, functions, and traditions could meet the needs of students (Schoen & Teddlie, 2008). As

seen in Figure 2.2, the puzzle pieces are interlocked. This symbolizes the overlapping and complementary nature of the dimensions. For example, teacher leadership in a school could be demonstrated in different domains. A teacher's leading role in the development of school-based curriculum would be considered an indicator of Dimension I, and a teacher's participation in the strategic planning of school policy indicated the characteristics of Dimension II.

The model of school culture developed by Schoen and Teddlie (2008) provided a framework for describing, discussing and comparing school functions across four dimensions of school culture and allowed culture to be examined across three levels at which culture was manifested.

Schoen and Teddlie (2008) developed and proposed a theoretical framework of the model of school culture, but did not present any specific instrument or inventory to measure different aspects of the model. The literature review revealed that no inventory or research design using Schoen and Teddlie's model as the conceptual framework was developed to assess and compare school cultures.

2.4.3 Flynn's circular interaction model of Catholic school culture

Flynn (1993) introduced another conceptual framework as a tool for analysing Catholic school culture. On the basis of research on school culture by Millikan (1987), Flynn suggested a circular interaction model which perceived Jesus Christ as the heart of four key dimensions of the school culture: (1) the

core beliefs and values; (2) the expressive symbols; (3) the traditions; and (4) the patterns of behaviour. The core beliefs and values of a school, which formed the soul of school culture, indicated what principals and teachers believed to be desirable, good, right or wrong, and were the cornerstones of a positive culture (Deenmamode, 2011). The expressive symbols of a school referred to visible expressions, such as the school mottoes, school ceremonies and school magazines, which can reinforce the core beliefs and values of the school (Flynn, 1993). The traditions of a school referred to the expressive manifestation of the core beliefs and values to be lived out by the school community and passed on from one generation to the next, and shared with the students through the story and history of a school, such as the curriculum, pastoral care system, award system and heroes. Patterns of behaviour in the school referred to the patterns of behaviour or rituals, generated from the core beliefs and values of the school, among students. Figure 2.3 illustrates the conceptual framework of Flynn's model on Catholic school culture (Flynn & Mok, 2002, p. 161).

The exploration of a school's culture can assist the school to define its purpose and mission

CREATION STORY
Core Beliefs and Values of the School

- Persons: their spiritual nature
- Education: development of the whole person through relationships
- Faith in Jesus: Gospel values
- The Church: mission of evangelization in the world
- Catholic traditions and values: Eucharist, Mary
- Social Justice: the poor

SOUL OF THE CULTURE
What the school stands for

Meaning is stored in symbol

Meaning is transmitted through myths

SYMBOLS
Expressive Symbols of the School

- Religious symbols: Cross, Mary
- School community
- School retreats
- School badges and mottoes
- Choice of Catholic Schools
- School magazines
- Physical environment
- School expectations

MODELS OF THE CULTURE
Visible expressions of what school is about

Jesus Christ

MYTHS
Traditions of the School

- Gospel: to know Jesus Christ
- Stories and myths
- Charisma of religious congregations
- Goals and objectives
- Education provided by school
- Heroes and heroines
- Religious education
- Experience of school life

STORY OF THE CULTURE
What the school is aiming at

Symbols are expressed in rituals

Myths are reflected in rituals

RITUALS
Patterns of Behavior in the School

- Religious development
- Christian development
- Liturgy and worship
- Rites and rituals
- Journey of youth in faith
- Patterns of discipline
- Patterns of relationships
- Leadership of the school

WAY OF LIFE/THE CULTURE
How things are done around here

Through an exploration of its "Culture", a school can develop a renewed sense of mission

Figure 2.3   The culture of Catholic schools (Flynn & Mok, 2002, p. 161)

The model focused on the description of the culture of Catholic schools from a comprehensive perspective and suggested that these four key dimensions, with Jesus Christ as the heart, have similar weights. Such elements of school culture could be analysed simultaneously, even though its parts could be recognized distinctly. The model, which could be called a circular interaction

model, emphasized the interaction between the four key dimensions to create a positive Catholic school culture. For example, core beliefs and values were stored in symbols or transmitted through traditions of the school; symbols were expressed in patterns of behaviour; and traditions were reflected in patterns of behaviour in the school.

Flynn's circular interaction model of Catholic school culture explicitly addressed content through proposed dimensions. The model's research design was specifically developed to assess and compare Catholic school culture in Catholic schools in Australia (Flynn, 1993). Instruments, with established constructs for validity and reliability, developed by Flynn and Mok (2002) were used to collect attitudes and perceptions of the students, parents and school staff.

2.4.4 Selection of an appropriate model of school culture for the present study

The three models, Schein's (1985) model of organizational culture, Schoen and Teddlie's (2008) model of school culture and Flynn's (1993; Flynn & Mok, 2002) circular interaction model of Catholic school culture, offered authentic conceptual frameworks for the investigation of school culture. One point worth mentioning is the school's core beliefs and values. All three models highlighted the ultimate and essential role of a school's core beliefs and values in creating a positive school culture. Both Schein (2004) and Schoen and Teddlie (2008) agreed that the basic assumptions comprising the core beliefs and values of school culture were the essence of culture, while the other two levels were used

as tools for interpreting the basic assumptions, with the preference that basic assumptions be non-negotiable and axiomatic for group members. Flynn (1993) indicated that, with exemplary and missioned school core beliefs and values, the four dimensions of Catholic school culture were interwoven to create a positive Catholic school culture.

The analytical process of culture in both Schein's (1985) model of organizational culture and Schoen and Teddlie's (2008) model of school culture was developed from the time perspective or defining the levels of culture. The levels of culture were phased in systematically through a time framework from a superficial level to a deeper level. The interpretation of a school culture was first initiated from the decoding of the superficial level and, then, followed by an analysis of the subsequent levels. Flynn's model (1993) was different from Schein's (1985) and Schoen and Teddlie's (2008) models in that it did not prefer the analytical process of culture from the time perspective or defining the levels of culture, but favoured the interpretation of school culture from a comprehensive perspective. The power of Flynn's (1993) model is that the holistic features of Catholic school culture can be interpreted from a comprehensive perspective as the four dimensions, which contain the apostolic purpose, are interwoven, even though the individual parts can be recognized distinctly. Since the ultimate goal of the present study is to help principals and teachers of Catholic secondary schools in Hong Kong gain knowledge about the characteristics of the culture of their schools for their review of the schools' effectiveness and formulation of school improvement plans, conducting the investigation from a comprehensive perspective is deemed most appropriate.

Principals and teachers in Hong Kong tend to conduct school reviews from a comprehensive perspective by first inspecting the school work in different domains and the ways these interweave; second, by conducting a holistic evaluation on the performance of the school based on findings from the school work inspection; and, thereafter, by formulating improvement plans. It is expected that investigating the characteristics of school culture from a comprehensive perspective, which is in line with the school review methodology, is more accessible to principals and teachers, who will be able to more readily assimilate the present study's findings with the outcomes of their school reviews and, more importantly, formulate school improvement plans.

With respect to inventories based on the conceptual framework of Schein's model, instruments for assessing school culture were mainly developed from the perspective of school staff's behaviours and practices, and lacked the students' perspective. This was not an uncommon preference for researchers because Schein's (1985) model of organizational culture was dominant in the managerial literature, and assessments of organizational culture focussed on the managerial and staff levels and the practices of the organization (James & Connolly, 2009). Because of Schoen and Teddlie's (2008) newly developed model of school culture, no inventory using the conceptual framework of this model was found, as revealed in the literature review. The instruments developed for assessing school culture using Flynn's (1993) model as the conceptual framework differed from Schein's (1985) model in that it collected data from different stakeholders of the school, including students, parents and school staff. The views of principals and teachers when investigating the

features of school culture are important, but they are not the only group that can serve this purpose. This principal/teacher-centred approach diagnoses only one aspect of the way in which culture is formed within schools, and the students' involvement and experiences are important indicators of the culture of any school (Bell & Kent, 2010; Maslowski, 2006). Bell and Kent (2010) further pointed out that, to have a realistic understanding of school culture, it is important to unveil the way in which culture is perceived by the students, who are a significant component of the school culture. The focus of the present study is to investigate the characteristics of the culture of Catholic secondary schools in Hong Kong through a detailed investigation of the students' attitudes towards their school.

A model specifically designed for assessing Catholic school culture is deemed appropriate for the present study because it embraces Catholic-related criteria and conditions for a comprehensive inquiry of Catholic secondary schools in Hong Kong. To conclude, Flynn's (1993) circular interaction model of Catholic school culture is the most suitable model and will be used as the conceptual framework for the present study because: (1) principals and teachers will more readily be able to assimilate the findings on the characteristics of the culture of Catholic secondary schools in Hong Kong derived from this model with their interpretations of their individual school reviews; (2) Flynn's (1993) model embraces Catholic-related criteria and conditions for a comprehensive inquiry of the characteristics of the culture of Catholic secondary schools in Hong Kong; and (3) the model supports measuring the attitudes of students towards their school with validated instruments.

2.5 Flynn's circular interaction model: The way towards a positive Catholic school culture

This section discusses the characteristics of a positive Catholic school culture using Flynn's (1993) circular interaction model. The following parts will further elaborate the four dimensions of the model: the core beliefs and values of the Catholic school (Section 2.5.1), the expressive symbols of the Catholic school (Section 2.5.2), the traditions of the Catholic school (Section 2.5.3) and the patterns of behaviour in the Catholic school (Section 2.5.4).

2.5.1 Core beliefs and values of the Catholic school: Its soul

The core beliefs and values reflect the soul of the culture (Deenmamode, 2011; Flynn, 1993) and are of paramount importance to the development of a positive school culture (Deenmamode, 2011). Belief can be defined as one's feeling that something is definitely true or definitely exists (*Dictionary of contemporary English*, 2009, p. 138) and value can be defined as one's ideas about what is right and wrong, or what is important in life, and carries a sense of obligation giving meaning and purpose to a person's daily life (*Dictionary of contemporary English*, 2009, p. 1942). People holding values, together with strong beliefs, tend be highly motivated towards action displayed in everyday life.

The core beliefs and values contribute, to a large extent, to the creation of a positive culture in Catholic schools, and without argument, the Church's educational mission influences the core beliefs and values of the Catholic schools (Congregation for the Clergy, 1997; Second Vatican Council, 1965; The Sacred Congregation for Catholic Education, 1977). The following paragraphs provide an overview of the core beliefs and values of the Catholic schools.

A. The educational mission of the Church

God the Father sent His only Son, Jesus Christ, to establish God's Kingdom, in His mysterious plan of love, to bring about the spiritual rebirth of mankind (Congregation for Catholic Education, 2007; Congregation for the Clergy, 1997; Flynn, 1993; The Sacred Congregation for Catholic Education, 1977). For the sake of fostering His spiritual supremacy and continuing His salvation work, Jesus Christ founded the Church, living by the power of the Spirit and serving as a visible entity. The sole objective of the Church, in this sense, is to serve humans until they come to the fullness of Christ, and the Church can simply be treated as human society promoting more education (Congregation for Catholic Education, 2007; the Sacred Congregation for Catholic Education, 1977). The Church provides education aiming at the formation of the whole person, serving the needs of a society, and the development of a world that is more human (Congregation for Catholic Education, 2007; Congregation for the Clergy, 1997; Second Vatican Council, 1965).

B. The function and roles of Catholic schools

The Church uses different means and approaches, which Jesus Christ has given, to accomplish her saving mission. One of the means the Church employs is to establish her own schools. The Sacred Congregation for Catholic Education (1977) describes the relationship between the Church and a Catholic school as:

> The educational aims of the Catholic school in the world of today perform an essential and unique service for the Church herself. (para. 15)

Since a school is a community where knowledge and concepts of mankind, of the society, of the world, and of history are acquired and established, the Church considers the schools, in first priority, to be places to promote the formation of the whole man (Congregation for Catholic Education, 2007; the Sacred Congregation for Catholic Education, 1977). In this regard, the Catholic school is a place for the person and of the persons, and should aim at forming the person in the integral unity of his being (Congregation for Catholic Education, 2007). The Second Vatican Council (1965) clearly stated the role of a Catholic school as follows:

> The Catholic school can be such an aid to the fulfillment of the mission of the People of God and to the fostering of the dialogue between the Church and mankind, to the benefit of both, it retains even in our present circumstances the utmost importance. (para. 2 of Section 8)

The purpose of Catholic schools is not only to convey goals and to the formation of whole man, but also to build a school community with religious atmosphere that can help youth building their personal lives according to a new man created in righteousness and true holiness.

C. The mission and vision of Catholic schools

The Congregation for Catholic Education (1988) characterizes a Catholic school in this way:

> The Catholic school pursues cultural goals and the natural development of youth to the same degree as any other school. What makes the Catholic school distinctive is its attempt to generate a community climate in the school that is permeated by the Gospel spirit of freedom and love. It tries to guide the adolescents in such a way that personality development goes hand in hand with the development of the "new creature" that each one has become through baptism. It tries to relate all of human culture to the good news of salvation so that the light of faith will illumine everything that the students will gradually comes to learn about the world, about life, and about the human person. (para. 1)

The above statement provides a clearer picture of the core values of a Catholic school, especially in its religious paradigm. It is presumed that a Catholic school, as an educational institute with specific missions, should put special emphasis on the school climate, the character and value formation of the students, the students' relationship building between the Gospel and culture,

and the teaching of knowledge with the light of faith. Catholic education, in this sense, is an example of transformational education which emphasizes the development of the whole person, and stresses the connection between the inner spiritual world of the student and the outer world of the curriculum (Flynn, 1993). The emphasis of Catholic education is two-fold. First, it stresses education in the life of humankind, and recognizes that the objectives of education are to nurture the children and young people with moral values, cultivate personal faithfulness, and foster a better understanding and love in Christ. Second, Catholic education emphasizes the formation of the person who has aspirations in his or her life, and who has a sense of citizenship and is willing to contribute for the good of society. It is concerned with awakening, cultivating, and developing the inner life of its students, in its unfailing solicitude, to reach their fullness in life.

The duties of the Catholic school, as expected by the Roman Curia, depict its core beliefs and values. The Sacred Congregation for Catholic Education (1977) indicated the mission and vision of the Catholic school in this way:

> Its task is fundamentally a synthesis of culture and faith, and a synthesis of faith and life: the first is reached by integrating all different aspects of human knowledge through the subjects taught, in the light of the Gospel; the second in the growth of the virtues characteristic of the Christian. (para. 37)

The Catholic school education not only aims at teaching academic subjects, but it also has an apostolic purpose, and tends to extend education by integrating faith and culture into a student's personal integration of faith and life. With an

aim to develop a student into a complete Catholic, the mission of a Catholic school should include the integration of faith and life as part of cultivating a student to become what God wishes him to be.

In conclusion, it is the lofty, noble and saintly beliefs and values of Catholic education that are attributed to a positive and distinctive Catholic school culture. However, the successful transmission of the core beliefs and values relies heavily on the expressive symbols, the traditions, and the patterns of behaviour of Catholic schools (Flynn, 1993).

2.5.2 The expressive symbols of the Catholic school: Its models

For a positive school culture to influence the stakeholders, i.e. the students, teachers and parents, the core beliefs and values of a Catholic school must be expressed openly and celebrated in the form of expressive symbols (Flynn, 1993). The expressive symbols of a Catholic school are simply the visible and affective expressions of what the school stands for and tend to reflect models of the culture.

2.5.2.1 The visible expressions

The visible expressions that remind the people daily of God's presence in the Catholic school (Vogtner, 2012) include various items, such as school badges and mottoes, school uniforms, religious symbols, school handbooks, magazines and newsletters. School ceremonies such as assemblies, graduations,

and speech days are also included in this dimension. Smart (1998) pointed out that visible expressions manifest the soul of the school, i.e. its core beliefs and values, and are important because people are always impressed with visible expressions and draw inferences from these.

2.5.2.2 The affective expressions

The sense of community is one of the major affective expressions of the Catholic school. It can be defined as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together'' (McMillan & Chavis, 1986, p. 9). Moreover, influential and penetrating affective expressions, such as a good sense of community, have the power to cultivate a set of values which are common and accepted by the group, to introduce activities that are shared by the group and signify their membership, and to foster a caring social relationship that is distinctive from other groups (Wighting & Liu, 2009). Furthermore, lower levels of student delinquency, drug use and student "burn out" are found in schools that foster a community spirit (Sayer, Beaven, Stringer, & Hermena, 2013). In order to build a Catholic school with a high sense of community, Catholic schools should intentionally make the school's religious mission clear to the parents, students and teachers, and create a high level of religious commitment among teachers (Congregation for the Clergy, 1997; Flynn, 1993). The school should also give all the support it can to help members in the school, including teachers, non-teaching staff, parents and students, to adopt a Christian way of life (The Sacred Congregation

for Catholic Education, 1977). To help transmit the lofty and saintly Catholic school beliefs and values successfully, the principals should create a special atmosphere animated by the Gospel spirit of freedom and charity, and be aware of their leadership and roles in the school (Second Vatican Council, 1965; Flynn, 1993).

2.5.3 The traditions of the Catholic school: Its story

The traditions of Catholic schools describe goals and reveal the story or history of the culture in the lives of its people. A school's traditions give us important information about its aims and objectives through its goals, curriculum and heroes, as well as the processes the school uses to achieve these. Such important assets are also the decisive elements for creating and sustaining the positive culture of Catholic schools. These traditions are transmitted through stories or myths in which the core beliefs and values of the school in action can be handed down from one generation to the next. Two traditions of paramount importance, namely the curriculum and the religious education the Catholic schools provide, will be discussed in the following subsections.

2.5.3.1 The curriculum of the Catholic school

If education means the development of the whole person, it should recognize the wholeness of the learner and stress the connection between the inner spiritual world of the student and the outer world of the curriculum (Flynn, 1993). The imparting of knowledge and the development of the whole person

are equally important in the curriculum of a Catholic school. It is a mistake to treat subjects as playing a subsidiary role to faith or just as a means of cultivating human values (The Sacred Congregation for Catholic Education, 1977). Essentially, teaching individual subjects and the total formation of an individual are complementary. As mentioned earlier, the teaching of individual subjects can help students to not only gain and integrate knowledge, skills and intellectual methods, but also fosters the development of moral and social attitudes (The Sacred Congregation for Catholic Education, 1977). The acquisition and assimilation of these values, which are the essential elements of the cultural heritage of mankind, can guide a student towards eternal realities (The Sacred Congregation for Catholic Education, 1977). Thus, Catholic education is an example of transformational education which emphasizes the development of the whole person. Krebbs (2012, p. 183) said that one of the major characteristic features of Catholic education is the building of communities through learning and faith. Catholic schools, other than the inculcation of knowledge, are expected to preserve the faith and to use the Gospel as their moral guide. Catholic education recognizes and appreciates the contribution which is made by the academic subjects, where there are many situations in teaching when students are inspired by insight of faith, towards the development of a mature Christian person. These knowledge and human values are contributive not only to one's total commitment to Christ, but also to the development of one's personality and willingness to serve the community (The Sacred Congregation for Catholic Education, 1977). Flynn (1993, p. 20) stated that the curriculum of a Catholic school, with a mission for the transformation

of the whole person, should include "the physical, intellectual, vocational, social, emotional, aesthetic, moral and religious dimensions".

When teaching aims not only at the assimilation of objective values, but also targets for apostolic purpose, the Catholic school curriculum extend from an integration of faith and culture to a student's personal integration of faith and life. Aiming at developing a student into a complete Catholic, the Catholic school curriculum includes the integration of faith and life as part of a lifetime work in cultivating a student to become what God wish him to be. The curriculum of a Catholic school should regard Christ as the model on whom the Catholic builds his life and, according to the Catholic Doctrine, nurture students in the gradual formation of lasting virtues and charity, which is the life-giving spirit that transform a man of virtue into a man of Christ (Congregation for the Clergy, 1997). Moreover, the curriculum should also serve the mission of helping non-Christians to discover the mystery of Christ that goes beyond all human understandings (Congregation for the Clergy, 1997).

2.5.3.2 The religious education of the Catholic school

Religious education of the Catholic schools "fits into the evangelising mission of the Church" (Congregation for Catholic Education, 2009, para. 17) and plays an important role to the human formation and personal development of the students, facilitating the securing of a vital harmony between faith and culture (Congregation for Catholic Education, 2009, para. 10). It also helps witnessing the Jesus Christ and demonstrating the Christian life to the students (Congregation for Catholic Education, 2007, para. 15). Religious education also

serves the purpose of developing the personal and social responsibility and other virtues of the students (Congregation for Catholic Education, 2009, para 10). Religious education can effectively cultivate the senses, so all may see, hear, and taste the goodness of Jesus. It is this knowledge and these activities that advise people of the school's core beliefs and values and allow them to encounter a living, loving God at Catholic schools (Vogtner, 2012). Flynn (1993, p. 221) pointed out that there are two distinct features of religious education in Catholic schools. First, religious education should be a subject discipline, which is highly related to the school's mission and vision within the school's curriculum structure. Second, religious education in Catholic school embraces the formal and informal curricula. The formal curriculum means the religious education classes and activities that form part of the regular school timetable by way of lectures, directed study, discussion groups, forums, retreats, liturgical festivals of the Church year, special school celebrations and service programmes. The value of the formal religious education curriculum is its capability to involve students in a controlled and well-organised study (Elias, 2012). The informal religious education curriculum refers to the implicit learning experiences that affect the religious education outcomes, such as the attitudes of the staff to religious education and witnessing the lives of teachers in the school. Without the positive attitudes and support of the staff to religious education, a positive school culture can hardly be shaped.

2.5.4 Patterns of behaviour in the Catholic school: Its rituals and way of life

Rituals are patterns of behaviour that express the ways of life of a certain social grouping. Flynn (1993) stressed that the core beliefs and values of a Catholic school, together with its curriculum and religious education, give rise to distinctive patterns of meaning and behaviour, i.e. the distinctive ways of life, amongst students, teachers and parents. The patterns of meaning and behaviour, i.e. the rituals, would then be accepted as the way of life of that school. Class routines, patterns of discipline and the outcomes of schooling, which is distinct in different schools, can be divided into taxonomy under patterns of behaviour.

Rites and rituals remind the people daily of God's presence in the school and are linked to school activities, routines, policies and arrangements, such as the reward and punishment scheme, the pastoral care policies, the school timetable, assemblies, prayers, pilgrimages and celebrations, all of which contribute to a positive Catholic school culture and reflect the core beliefs and values and traditions of a school (Elias, 2012; Flynn, 1993). Rites and rituals should be reviewed periodically to ensure that they still reflect the core beliefs and values and traditions of the school (Flynn, 1993)

The discussion of students' patterns of behaviour, in the present study, would be placed under school discipline. Research results showed that school discipline is highly related to school culture and effectiveness. Order and discipline are deemed to be prerequisites for effective education and learning events, whereas the lack of order and discipline has a negative impact on an

effective school culture. Van der Westhuizen et al. (2008) maintained that an orderly, safe, but not rigid, discipline contributes to a positive and effective school culture. Flynn (1993) concluded that, rather than authoritarian discipline, Catholic school discipline should demonstrate the concept of discipleship and cultivate an orderly and respectful school atmosphere, which is conducive to a positive school culture.

2.5.5 Summary

Flynn's (1993) circular interaction model adopts a comprehensive approach and interprets the culture of Catholic schools from four dimensions, with Jesus Christ as the heart. The four dimensions, i.e. core beliefs and values, expressive symbols, traditions, and patterns of behaviour, have similar weights and are interwoven, even though its parts can be recognized distinctly. Discussions in this section unveiled the details of the core beliefs and values of Catholic education and the necessary components of the dimensions for the creation of a positive Catholic school culture. According to Flynn's circular interaction model, one of the dimensions is the school's Catholic mission to instil core beliefs and values, while the other three similarly weighted dimensions, holding the apostolic purpose, are interwoven to create the distinctive Catholic school culture.

2.6 The culture of Catholic secondary schools in Hong Kong: Its core beliefs and values

As discussed in Section 1.1.1, in past years, Catholic secondary schools in Hong Kong provided a high level of education. Undoubtedly, it was the missioned, exemplary and saintly core beliefs and values, as pointed out by Flynn (1993) that laid the foundation for the development of a distinctive culture conducive to quality Catholic secondary education in Hong Kong.

The Diocesan Synod Documents (Catholic Diocese of Hong Kong, 2002) iterated the core beliefs and values in Catholic secondary education of Hong Kong as stemming from Jesus Christ, while the educational mission of the Catholic Church originated in the total transformation of mankind in the Catholic philosophy of life, which aimed at nurturing people with moral values, and cultivating them with a personal faithfulness. The objectives were to be achieved by enlightening one's spiritual life and by helping humankind to renew life with the changes of culture, times and society. The part on "HK Catholic Education and Culture" in The Diocesan Synod Documents (Catholic Diocese of Hong Kong, 2002) clearly state the vision of the Catholic Diocese in Hong Kong on education:

> To foster a community which cherishes and promotes Christ's teachings of love and service as well as the social values and love of life in its own culture, and which strikes a balance between the development of the quality of livelihood and the development of the quality of spiritual life. (Section 2.1)

The mission of the Catholic Diocese of Hong Kong on secondary education is in line with that of the Diocese of Rome (Catholic Diocese of Hong Kong, 2002). As mentioned earlier, Catholic secondary education in Hong Kong stresses the importance of education in the life of humankind, and recognizes that the objectives of education are to nurture the children and young people with moral values, and cultivate a personal faithfulness, together with a better knowledge and love of God.

2.7 Factors influencing the quality of Catholic secondary education in Hong Kong: Impacts encountered by schools that affect the achievement of a positive culture

Other than the missioned, exemplary and saintly core beliefs and values of the Catholic secondary schools in Hong Kong, the creation and preservation of a positive Catholic secondary school culture also depends on the presence and interaction of a group of people, such as the principal and teachers, to include, maintain and balance the necessary components in each of the three dimensions, the expressive symbols, the traditions and the patterns of behaviour (Flynn, 1993; Turan & Bektas, 2013). In practice, different circumstances arising from both the broader society and the school itself, such as the impact from the broader societal culture (Section 2.7.1), secularization in Catholic schools of Hong Kong, (Section 2.7.2), leadership of the principal (Section 2.7.3) and

readiness of the teachers (Section 2.7.4), brought about schools' different degrees of emphasis on apostolic cultivation and their inclination to weigh differently the components in these three dimensions. The special features of these three dimensions, which evolved from their weight in schools and the ways the components interweave, made up the unique characteristics of the culture of Catholic secondary schools in Hong Kong. These characteristics in school culture contained either strong or weak and functional or non-functional cultural elements and might influence the Catholic secondary schools in Hong Kong from achieving a positive culture.

2.7.1 Impacts of the broader societal culture

People in Hong Kong generally were inclined to evaluate education in terms of student academic achievements and interpreted education as the legitimate and nearly the only way for upward social mobility (Cheng, 1997). Students in the schools were encouraged to strive for excellence in academic performance. Cheng (1997) said that the findings of various international comparative studies indicated Hong Kong was among the Eastern Asian communities which enjoyed high prestige in terms of student achievement.

The amount of schooling one possessed in Hong Kong was the most important factor determining one's future occupation and income (Postiglione, 1997). Furthermore, one's occupation greatly affected different aspects of their lives, such as living accommodation, health care and the educational opportunities of their children. Thus, the school system in Hong Kong was expected to help raise one's chances for a better life. Everyone was provided

with a fair opportunity to receive education and, through assessments, those who were most qualified for the important and well-paid positions in society would be selected.

Under these circumstances, instead of a mastery school goal structure, where the environment emphasized the importance of learning and understanding, and valued effort and individual improvement (Wolters, 2004), a performance school goal structure, where the environment emphasized achievement and competition between students but undervalued effort and individual improvement (Skaalvik & Skaalvik, 2013), was generally rooted in the schools of Hong Kong. The vast majority of schools in Hong Kong, especially secondary schools, were inclined to put their efforts on students' academic achievements. Unavoidably, Catholic secondary schools in Hong Kong were always busily engaged in developing and implementing an effective curriculum for students' academic achievements, but not for the character formation of an individual (Chan et al., 2010; Pang, 1990).

As stated by Flynn's (1993) circulation interaction model, the creation of a positive Catholic school culture needs the interaction of the four similarly weighted dimensions. It is expected that, as one of the most important components of the traditions dimension, the subject-oriented but not the whole-person development curriculum of the Catholic secondary schools in Hong Kong gave rise to flawed interactions between the traditions and the core beliefs and values dimensions, resulting in ineffective transmission of the school's core beliefs and values to the students and the cultivation of a positive Catholic secondary school culture in Hong Kong was consequently affected.

2.7.2 Secularization in Catholic schools of Hong Kong

Secularization refers to the removal of influence of religious groups from a society or an institution (*Dictionary of contemporary English*, 2009, p. 1574). In recent years, the percentage of Catholic teachers in Catholic schools decreased from 69% in 1961 to 25.58% in 2013, and the percentage of Catholic students in Catholic schools decreased from 26% in 1953 to 9.71% in 2013 (Catholic Diocese of Hong Kong. 2013; Mok, 2007) respectively. In other words, more and more teachers and students in Catholic schools were of lay people (Catholic Diocese of Hong Kong, 2002; Mok, 2007). The decreasing percentages of Catholic teachers and students made it difficult to cultivate a religious atmosphere or to nurture the faith formation in Catholic schools of Hong Kong, (Catholic Diocese of Hong Kong, 2002). Studies found that students, having the same religious affiliation with the school, have better achievements than their less religious counterparts (Jeynes, 2003; Wighting & Liu, 2009). In this regard, Catholic schools in Hong Kong, in general, are liable to have a downgrade in student achievements.

2.7.3 Leadership of the principal

To cultivate a positive school culture, Catholic secondary school principals in Hong Kong should not only focus on their educational and administrative roles, but also emphasize their roles as symbolic leaders, culture builders and religious leaders (Flynn, 1993; Turan & Bektas, 2013). They should formulate

policies and plans in their schools to ensure balanced weights in the three dimensions, the expressive symbols, the traditions and the patterns of behaviour. Flynn and Mok (2002) viewed leadership of Catholic school principals from five dimensions: (1) the educational leadership of the principal: emphasis on the provision of a good education and helping students prepare well for better academic achievement, further education and future employment; (2) the religious leadership of the principal: emphasis on the religious nature of the school; (3) the school leadership of the principal: emphasis on the establishment of a wise leadership and direction of the school community in a Catholic school; (4) the principal as a community builder in the school: emphasis on the building of good morale, good relationships between staff and students, and an excellent sense of community and belonging in the Catholic school; and (5) the pastoral leadership of the principal: emphasis on the pastoral care work for students and his or her availability to staff and students for advice, guidance and help.

As discussed in Section 2.7.1, the broader society brought about the performance goal structure of the Catholic secondary schools in Hong Kong that emphasized students' academic achievements. Principals received signals about which values were important in schools (Skaalvik & Skaalvik, 2011), and policies and plans formulated by them tended to be academic and career-oriented. In order to elevate their competitive power, principals tended to put most of the resources on academic work, but were less likely to spare energy on the character and value formation of students, relationship building of the students between Gospel and culture, and the teaching of knowledge with the light of faith. Together with the problem of secularization as stated in Section

2.7.2, religious education, one of the important components of the traditions dimension as stated in Flynn's circular interaction model (Flynn, 1993), was generally not the major concern of the principals (Catholic Diocese of Hong Kong, 2002). They preferred the visible expressions of the school, such as school magazines, ceremonies, assemblies and speech days, students' academic performance, but ignored the soul of the school, i.e. its core beliefs and values. Moreover, principals could hardly put effort on the development of caring relationships between teachers and students, which is essential for the establishment of a school's affective symbol (Flynn, 1993). All these gave rise to flawed interactions between the four differently weighted dimensions, resulting in the ineffective transmission of the school's core beliefs and values to the students. The cultivation of a positive Catholic secondary school culture in Hong Kong was consequently affected.

2.7.4 Readiness of the teachers

All teachers, including Catholic secondary school teachers in Hong Kong, were increasingly held directly accountable by both the profession and the community (Brown, 1997; Chan et al., 2010). They were required to meet high standards of classroom management and student learning, develop and implement effective curricula, and devise fair and efficient school policies. All these imposed negative influence to the teachers' feeling of belonging (Skaalvik & Skaalvik, 2011), bringing about emotional exhaustion (Skaalvik & Skaalvik, 2013).

Most teachers were subject-trained when they graduated from university and, thus, specialized in subject teaching but lacked formal training in taking care of students' psychological and mental growth. Although most of the teachers held professional qualifications in teaching, they did not instil a concrete framework or vision on the character development of an individual. In this regard, the objectives of education to nurture the children and young people with moral values became a blur, especially when with the heavy workload of Hong Kong teachers. In addition to the heavy teaching load, Catholic secondary school teachers were heavily loaded with many non-teaching duties, such as form master/mistress, extra-curricular activities and club advisors (Chan et al., 2010; Pang, 1990). Under these circumstances, they were articulate and immersed in subject-teaching, but the lines to work in alignment with the core beliefs and values were blurred. It was impractical to conceive of teachers having the initiative or motivation to spare energy on the character and value formation of students, relationship building of the students between Gospel and culture, and the teaching of knowledge with the light of faith.

In the past few years, the number of students in Hong Kong has been declining, but the Hong Kong government failed to take effective measures to remedy the situation, which has led to teacher redundancies and the closure of schools (Mok, 2007, 2010). Teacher morale was largely affected and fell to a low level in general. Worse still, some teachers opted to leave the teaching profession (Mok, 2010, June). In such an environment, the overall quality of Catholic secondary education was, unavoidably, affected.

All these would negatively affect the readiness of teachers to help establishing the expressive symbols and the setting up of distinctive traditions in Catholic secondary schools, and gave rise to flawed interactions between the four differently weighted dimensions, resulting in the ineffective transmission of the school's core beliefs and values. The cultivation of a positive Catholic secondary school culture in Hong Kong was consequently affected.

2.8 Reform of Catholic secondary education in Hong Kong

With an intention to regain the quality of Catholic education in Hong Kong, the Diocesan Synod, held between March 2000 and December 2001, called for a holistic reform in Catholic education in Hong Kong (Catholic Diocese of Hong Kong, 2002). Inevitably, Catholic secondary education was one of the key reform projects.

The Synod critically reviewed the milieu of Catholic education in Hong Kong. They agreed that, over the past year, interactions between the exemplary and saintly core beliefs and values and the outstanding policies, schemes and programmes of the secondary schools produced quality Catholic secondary education in Hong Kong; however, at the same time, they admitted that the quality of Catholic secondary education in Hong Kong was deteriorating due to a number of factors as stipulated in Section 2.7 (Catholic Diocese of Hong Kong, 2002). Focusing on the problems, the Synod expressed its concern that schools should not only make intellectual assessments, but also character

assessments, such as a person's moral, spiritual, physical, and social formation. They suggested that the Catholic Diocese of Hong Kong strengthen religious education by providing curricula on religious and moral studies to the Catholic schools (Catholic Diocese of Hong Kong, 2002). In response to the recommendations, the Catholic Education Office of the Catholic Diocese of Hong Kong established the Religious & Moral Education Curriculum Task Group in May 2004 (Catholic Education Office, Hong Kong, n.d.), who eventually published a "Religious & Moral Education Curriculum" document (RME Curriculum Task Group 2006) in June 2006. This document served as a compass for the implementation of religious and moral education in Catholic kindergartens, primary and secondary schools in Hong Kong. The curriculum, in this respect, was formulated and relevant teaching materials were prepared. The core elements of this curriculum are moral and spiritual values, and the orientation in this curriculum points to both the academic and spiritual aspects appropriate for both Catholic and non-Catholic students. The students' acceptance of Christian faith is assumed throughout the curriculum.

Moreover, a programme for the teachers' professional development was implemented prior to introducing the curriculum. The focus of the programme was on teachers' attitudes towards students. The achievements arising from excellent curriculum content or sophisticated pedagogic skills could never supersede the positive impact from a teacher's caring and loving attitude towards students and their internalization of values. To make the curriculum a success, parish and diocesan organizations were required to collaborate with the schools and offer support to school pastoral workers and school liturgies

through different means, such as participating in school religious activities and providing up-to-date audio-visual teaching materials. The curricula started in primary one and secondary one of the Catholic schools, respectively, in the 2011–2012 academic year, and moved up to the next level every subsequent academic year. By the 2013–2014 academic year, it reached the primary three and secondary three levels, respectively. The curricula are expected to be extended to other levels in the coming years (Catholic Education Office, Hong Kong, n.d.).

Concerning the pastoral care work in schools, the Diocesan Synod suggested that the Catholic Diocese introduce the "One Chaplain for Each School" policy (Catholic Diocese of Hong Kong, 2002). They suggested that each Catholic school employ pastoral care-related staff, such as school chaplains and pastoral assistants. The scope of the pastoral staff's work was manifold, and included helping students with their religious formation, running catechumen classes, conducting school-wide prayer gatherings and organizing regular "spiritual counselling" meetings. On this issue, the Diocese made some changes or enhancements in recent years. First, the Diocese of Hong Kong accepted the suggestion of the Diocesan Synod and set up a School Pastoral Care Group, under the administration of the Catholic Education Office, to formulate policies and provide support and guidance for the pastoral care work in Catholic schools. Second, the Catholic Education Office supported the school pastoral care work by allocating an amount of not more than five million Hong Kong dollars a year, starting with the 2005–2006 academic year, to help each Catholic school in Hong Kong employ pastoral care staff (Pastoral care work in

Catholic schools, 2007). As of 31 August, 2013, 131 pastoral care assistants were working in Catholic schools, including secondary schools (Catholic Diocese of Hong Kong, 2013). Some of the main responsibilities of the pastoral care assistants included promoting and organizing programs, such as prayers gatherings, pilgrimages and celebrations to help students with their religious formation (The prospect of school pastoral care work, 2011). However, the schools, especially secondary schools, found it difficult to recruit quality assistants due to the limited monthly salary and contract basis working term.

The reforms implemented by the Catholic Diocese of Hong Kong should have made some improvements in the Catholic secondary schools' curricula, religious education and the cultivation of a religious and caring atmosphere. These improvements, that directly enhanced the quality of expressive symbols, traditions and patterns of behaviour, brought about desirable ways these dimensions interweaved, resulting in a bettering of both the school culture and the quality of Catholic secondary education in Hong Kong. By 2013, the reforms had been underway for nine years and are still ongoing (Catholic Diocese of Hong Kong, 2013; Catholic Education Office, Hong Kong, n.d.; RME Curriculum Task Group, 2006). These school reforms are a long-lasting "battle" and are likely to last for several more years in order to achieve the desired goals.

2.9 Research gaps

During the Catholic education reform period, principals and teachers of the Catholic secondary schools in Hong Kong conducted interim reviews to scrutinize the efficacy of their efforts and develop improvement plans to meet the objective of restoring quality education in Catholic secondary education. Since school culture is vital to the fostering of quality education, knowledge about the characteristics of the culture would be of great help in diagnosing the efficacy of the efforts the schools have made. Thus, an account of these characteristics in Hong Kong's Catholic secondary schools would assist principals and teachers to obtain knowledge on the culture of their schools. As the principals and teachers are working to create an exceptional Catholic school culture conducive to quality Catholic secondary education and a high level of student achievement, such insight is deemed invaluable.

However, the literature review revealed two research gaps. First, not much could be found on survey studies that sought to analyse the characteristics of the culture of Catholic secondary schools in Hong Kong, and knowledge on this topic was sparse. Second, no suitable instrument had been developed to investigate the characteristics of the culture of Hong Kong's Catholic secondary schools. To fill the gap, the present study aims at investigating the characteristics of the culture in Hong Kong's Catholic secondary schools through a survey research approach using an instrument, in Chinese, modified from the instrument of Flynn and Mok (2002).

2.10 Literature guiding the present study

The primary aim of the present study was to investigate the characteristics of the culture of Catholic secondary schools in Hong Kong through a detailed investigation, using a survey research approach, on the attitudes of students towards their school. The theoretical framework of the present study adopted a comprehensive perspective using Flynn's circular interaction model of Catholic school culture, as proposed by Marcellin Flynn in his book, *The Culture of Catholic Schools* (1993). This study was conducted from the students' perspective based on six aspects of students' attitudes towards their school: student relationship with teachers, student morale, student perception of the principal, student attitude to discipline, student attitude to religion and student attitude to religious education, as mentioned by Flynn and Mok (2002). In the quantitative part of the study, this information was obtained through an instrument devised by Flynn and Mok (2002). The interpretation of the findings was mainly based on the above literature with reference to other studies on school culture and school effectiveness.

2.11 Conceptual framework

Based on Flynn's model (1993), the culture of Catholic secondary schools in Hong Kong includes four key dimensions: core beliefs and values, expressive symbols, traditions and patterns of behaviour. With Jesus Christ as the heart, these four dimensions and the ways they interweave foster the culture of Catholic secondary schools in Hong Kong. Interpretation of the contents of

these four dimensions, in turn, explored the characteristics of the culture of Catholic secondary schools in Hong Kong.

As discussed in Section 2.3, culture is not a physical being; it is difficult to perceive school culture by analysing its definition and explanations (Deal, 1985). However, the morale, attitude and performance of school staff and students are instilled by the school culture (Bell & Kent, 2010; Dwyer, 1993; Flynn, 1993; Gun & Caglayan, 2013; James & Connolly, 2009) and the way the students encountered and transmitted the school culture was an important component that determined the culture of a school (Bell & Kent, 2010). The culture of the Catholic secondary schools in Hong Kong, which is made up of four interwoven dimensions that embrace the educational activities, has been internalized by the students as exhibited by the students' attitude towards their school (Bell & Kent, 2010; Flynn, 1993; Maslowski, 2006). In this regard, the attitudes of students towards their schools are a valid means to manifest the characteristics of the culture of Catholic secondary schools in Hong Kong.

Flynn's (1993) pointed out that the attitudes of students consists of six scales: student relationship with teachers, student morale, student perception of the principal, student attitude to discipline, student attitude to religion and student attitude to religious education. These six scales, by and large, can display the features of the components of the four dimensions in Flynn's model, and, in turn, the characteristics of the culture of Catholic secondary schools in Hong Kong. Descriptions of the six scales are as follows:

● Student relationship with teachers: This refers to the relationship between students and teachers developed through interaction and communication in

the school (Ping, 2013). Crosnoe, Johnson, and Elder (2004) pointed out that school culture and the quality of student-teacher relationships shared a reciprocal relationship. Teachers' willingness to go out of their way to assist students professionally contributed to the sense of community in the schools. This relationship is not only important to socio-emotional development (Silver, Measelle, Armstrong, & Essex, 2005), but also serves to support the development of important social and psychological skills of the students (Baker, 2006). Positive student-teacher relationships serve as a resource for students at risk of school failure, whereas conflict or disconnection between students and staff may compound that risk (Ladd & Burgess, 2001). This relationship can help unveiling the culture of a school in a sense that it indicates the extent: (1) the students' sense of community to the school has developed; (2) the teachers' sense of community to the school has developed; (3) the teachers are academically oriented or aiming at students' whole-person development; (4) the teachers support the pastoral care work; and (5) school discipline demonstrates the concept of discipleship and cultivates an orderly and respectful school atmosphere.

- Student morale: Flynn (1993) referred to student morale as the confidence students have in teachers and the mutual respect between them, which leads to identifying with the school and accepting its goals. It indicates the relationship between the students and the school environment, and is an important measure of the culture of a school. Young (2000, p. 161) defined morale as a state of mind that is determined by one's degree of satisfaction with the environment where he lives, works or studies. Mackenzie (2007)

pointed out that morale is more often influenced by external factors than internal ones. Student morale can help unveiling the culture of a school in a sense that it indicates the extent: (1) the school has developed a sense of community, which is an important component of the affective expression; (2) the school has developed a sense of belonging and a sense of community in the students; (3) the students recognize the school goals and its environment; and (4) that confidence has developed between the students and teachers.

- Student perception of the principal: As symbolic leaders, principals of Catholic schools represent what the schools stand for. As leaders of schools, principals should also be cultural and moral guides who pioneer the creation and development of a positive culture in the school (Turan & Bektas, 2013). Catholic school principals should not only focus on their educational and administrative roles, but also their roles as symbolic leaders, culture builders and religious leaders (Flynn, 1993). As discussed in Section 2.7.3, students' perceptions of the leadership of Catholic secondary school principals emanates from five aspects: educational, religious, pastoral, school leadership, and the principal as a community builder. Student perception of the principal can help unveiling the culture of a school in a sense that it indicates the extent: (1) the school principal emphasises the provision of good education; (2) the school principal emphasises religious cultivation; (3) the school principal emphasises the establishment of good leadership and the direction of the school community; (4) the school principal emphasises morale building, good

relationships between staff and students, and a sense of belonging in the school; and (5) the school principal emphasises the availability of staff to students for advice, guidance and help.

- Student attitude to discipline: This refers to the attitude and degree of voluntary obedience of the student to the influence and leadership of the mature and adult educator in the school (van der Westhuizen et al., 2008). As discussed in Section 2.5.4, student discipline is one of the major components attributed to the students' patterns of behaviour and is highly related to the school's culture and effectiveness. Van der Westhuizen, et al. (2008) maintained that an orderly, safe, but not rigid, discipline contributes to a positive and effective school culture. Flynn (1993) concluded that, rather than authoritarian discipline, Catholic school discipline should demonstrate the concept of discipleship and cultivate an orderly and respectful school atmosphere, which is conducive to a positive school culture. Students' attitudes towards the school's discipline practices can indicate the extent the school demonstrates the concept of discipleship and cultivates an orderly and respectful school atmosphere, as well as the extent the school is authoritarian towards discipline of the school.

- Student attitude to religion: This is reflected in the students' acceptance of the religious goals of the school. It is directly applicable to assessing Catholic school culture because it can indicate the extent: (1) the students appreciate the religion of the school; and (2) the school appreciates the cultivation of its religious environment (James & Heft, 1997)

- Student attitude to religious education: The attitudes of students towards

different aspects of religious education in the school environment include content, teaching pedagogy, teaching performance, and students' personal comments on the religious classes (Flynn, 1993). As discussed in Section 2.5.3.2, religious education that embraces core beliefs and values of Catholic education is a valuable tradition for Catholic schools. Student attitude to religious education can indicate the extent: (1) the students appreciate religious education in school; (2) the students appreciate the knowledge obtained from religious education; (3) the students appreciate the teaching pedagogy of the religious classes in the school; and (4) the teaching of religious classes in the school is well planned and prepared.

2.12 Key influences

A review of the literature showed that students' attitudes were influenced by personal and contextual factors: gender, school type and student's own religious background (Sahin & Erkal, 2010; Slavin, 2012; Wighting & Liu 2009). The focus of the present study was to investigate the characteristics of the culture of Catholic secondary schools in Hong Kong through a detailed investigation of students' attitudes towards their school using a survey research approach. Thus, efforts would be made to address how students' attitudes are affected by gender, school type and the student's own religious background. The following sections review empirical studies on three key influences on school culture: gender (Section 2.12.1), school type (Section 2.12.2) and

religious background (Section 2.12.3). Interaction effects between gender, school type and religious background will also be discussed in Section 2.12.4.

2.12.1 Gender

The literature review showed that gender differences exist in achievements, attitudes and behaviours (Slavin, 2012). Slavin (2012) indicated that differences between males and females in attitudes and behaviours originated out of different experiences, including reinforcement by adults for different types of attitudes and behaviours. In schools, boys received more disapproval and blame from their teachers than girls (Brophy & Evertson, 1981). Girls were expected to be well-behaved and to show more positive attitudes towards their school. Gender differences also emerged in students' evaluations of the teaching effectiveness of lecturers (Krahn & Bowlby, 1997). In a study of university students enrolled in distance learning, Rovai and Baker (2005) reported that females were found to have a stronger sense of community than males. Flynn (1993) found that female students showed significantly more positive attitudes than male students, as regards to student morale, relationships with teachers, attitude to discipline, perception of the principal and attitude to religious education. To sum up, gender role influences on the students' attitudes towards their school were expected, with girls expected to show more positive attitudes towards their schools.

2.12.2 School type

Over the years, different studies have shown conflicting results regarding the influences of single-sex and coeducational schooling on student achievements. Counter arguments on single-sex schooling pointed out that co-educational schools could provide an open environment, in which girls were able to compete with boys, enabling both boys and girls to be prepared for real-life situation (Shah & Conchar, 2009). A study by Pahlke, Hyde and Allison (2014) compared co-educational and single-sex schooling, and found that the latter was only slightly more advantageous to students' performance and attitudes. However, an argument in favour of single-sex schooling was that such a learning environment could be empowering and nurturing, and was conducive to positive educational achievements (James, 2009; Kessels & Hannover, 2008; Sax, 2005; Slavin, 2012). Thus, to investigate the effect of school type on the attitudes of students towards their school in the present study, this factor was categorized into two groups: single-sex Catholic secondary schools and co-educational Catholic secondary schools.

2.12.3   Religious background

Concerning the effects of religion on academic achievement, religiously committed children perform better on most academic measures than their less religious counterparts (Jeynes, 2003). Moreover, a significant relationship exists between sense of community and religious commitment (Wighting & Liu, 2009). Students with the same religious affiliation as their school showed the

highest sense of school community. In this regard, it is expected that students with different religious backgrounds will show different attitudes towards their school. Specifically, Catholic students would have a more positive attitude towards their school.

2.12.4 Interaction effects between gender, school type and religious background

Flynn (1993) found that the interaction between students' gender, i.e. male or female, and school type, i.e. single-sex or co-educational, had a significant effect on their attitudes towards their school, such as the student's relationship with teachers and attitude to discipline. Year 12 girls in all-girls' Catholic schools were more religious in their approach to life than those in co-educational schools. Kessels and Hannover (2008) also found that girls from single-sex schools developed a better physically-related self-concept of their abilities than girls from co-educational schools. In this regard, the present study also investigates the interaction effects between gender, school type and students' religious background on their attitudes towards their school.

2.13 Research questions and hypothesis

The objective of the present study was to investigate the characteristics of the culture of Catholic secondary schools in Hong Kong through a detailed investigation on students' attitudes towards their school. As discussed in Sections 2.7 and 2.8, the culture of Catholic secondary schools in Hong Kong

was largely affected by the impacts from the broader societal culture and the school's different degrees of emphasis on apostolic cultivation. It was expected that the Catholic educational reforms by the Diocese of Hong Kong, which have been carried out for the past nine years, could cultivate a better culture in Hong Kong's Catholic secondary schools, placing balanced emphases on curriculum, religious education and the cultivation of a religious and caring atmosphere. It is hypothesized that, after nine years of reforms in Catholic secondary education, the culture of Catholic secondary schools in Hong Kong would be characterized by the following: (1) concerning the affective expression of the school, a positive sense of community among teachers and students; (2) concerning the traditions of the school, a balanced curriculum emphasizing the imparting of knowledge and the development of the whole person, with religious education highlighted; (3) concerning the patterns of behaviour in the school, the cultivation of the concept of discipline as discipleship.

Based on the conceptual framework and the objectives of the present research, the following research questions were formulated:

Overarching Research Question: What are the characteristics of the culture of Catholic secondary schools in Hong Kong?

Research questions pertaining to the six aspects of students' attitudes towards their Catholic secondary school in Hong Kong:

Research Question 1:   What is the student relationship with teachers in Hong Kong's Catholic secondary schools?

This research question intends to portray the student relationship with teachers in Hong Kong's Catholic secondary schools. The student relationship with teachers refers to the relationship between students and teachers developed through interaction and communication in the school. The literature review found that gender (Flynn, 1993), school type (Shah & Conchar, 2009) and the student's own religious background influenced student-teacher relationship (Wighting & Liu, 2009). Efforts will be made to address the effects of gender, school type and the student's own religious background on the student relationship with teachers in Hong Kong's Catholic secondary schools.

Research Question 2:   What is the student morale in Hong Kong's Catholic secondary schools?

This research question intends to portray student morale in the Catholic secondary schools of Hong Kong. Student morale refers to the confidence students have in their teachers and the mutual respect between them, which leads to identifying with the school and accepting its goals. The literature review found that gender (Flynn, 1993), school type (Shah & Conchar, 2009) and the student's own religious background (Wighting & Liu, 2009) influenced student morale. Efforts will be made to address the effects of gender, school type and students' own religious background on student morale in Hong Kong's Catholic secondary schools.

Research Question 3:   What is the students' perception of the principals in Hong Kong's Catholic secondary schools?

This research question intends to portray the students' perceptions of the principals in the Catholic secondary schools of Hong Kong. Student perception

of the principal refers to the leadership of the principals as perceived by the students. The literature review found that gender, school type and the student's own religious background influenced student perception of the principal. Efforts will be made to address the effects of gender (Flynn, 1993), school type (Shah & Conchar, 2009) and the student's own religious background (Wighting & Liu, 2009) on student perception of the principal in Hong Kong's Catholic secondary schools.

Research Question 4:   What is the students' attitude to discipline in Hong Kong's Catholic secondary schools?

This research question intends to portray the students' attitude to discipline in the Catholic secondary schools of Hong Kong. Student attitude to discipline refers to the attitude and degree of voluntary obedience by the students to the influence and leadership of the mature and adult educator in the school. The literature review found that gender (Flynn, 1993), school type (Shah & Conchar, 2009) and the student's own religious background (Wighting & Liu, 2009) influenced student attitude to discipline. Efforts will be made to address the effects of gender, school type and students' own religious background on students' attitude to discipline in Hong Kong's Catholic secondary schools.

Research Question 5: What is the students' attitude to religion in Hong Kong's Catholic secondary schools?

This research question intends to portray the students' attitude to religion in the Catholic secondary schools of Hong Kong. Student attitude to religion refers to students' acceptance of the religious goals of the school. The literature review found that gender (Flynn, 1993), school type (Shah & Conchar, 2009) and the

student's own religious background (Wighting & Liu, 2009) influenced student attitude to religion. Efforts will be made to address the effects of gender, school type and the student's own religious background on student attitude to religion in Hong Kong's Catholic secondary schools.

Research Question 6:   What is the students' attitude to religious education in Hong Kong's Catholic secondary schools?

This research question intends to portray the students' attitude to religious education in the Catholic secondary schools of Hong Kong. Student attitude to religious education refers to the attitude of the students towards different aspects of religious education in the school, including: content, teaching pedagogy, teaching performance, and students' personal comments on the religious classes. The literature review found that gender (Flynn, 1993), school type (Shah & Conchar, 2009) and the student's own religious background (Wighting & Liu, 2009) influenced student attitude to religious education. Efforts will be made to address the effects of gender, school type and the student's own religious background on the students' attitude to religious education in Hong Kong's Catholic secondary schools.

CHAPTER 3

METHODOLOGY

Through a detailed investigation on the attitudes of students towards their school using a survey research approach, the objective of the present study examining the characteristics of the culture of Catholic secondary schools in Hong Kong was achieved. This chapter gives a detailed description of the present study's research process, and discusses the survey research approach (Section 3.1), samples (Section 3.2), the Attitudes of Students towards Their School (ASTS) instrument (Section 3.3), methods to construct the scales of the ASTS instrument (Section 3.4), variables of the study (Section 3.5), ethical issues in relation to the study (Section 3.6), the research procedure (Section 3.7), and the methods of analysis used to address the research questions (Section 3.8).

3.1 Survey research approach to the present study

Assessment methods usually involve direct measures, such as surveys and interviews, and most school culture research studies were carried out by means of survey research questionnaires completed by students, parents, teachers and principals (Maslowski, 2006). The advantages of using a survey research approach are two-fold. First, a survey research design can provide numeric

descriptions of attitudes and opinions of a sample of the population (Creswell, 2003), which could be manipulated and analysed objectively using statistical methods. Second, it was established that the instrument from Flynn and Mok (2002) on Catholic school culture, which would be discussed in more detail in Section 3.3, was valid and reliable.

3.2 Samples

Data for the present study were collected from a sample of secondary one (S1) to secondary 3 (S3) students from Catholic secondary schools in Hong Kong. Criteria for choosing the schools and students were: (1) samples should be students of Catholic secondary schools in Hong Kong; (2) samples should be self-contained and mature enough to give sensible views on the questions being asked in this study; (3) instead of busily engaged in the external examination and related activities, samples should be available and actively involved in the school; (4) for a broader representation of the population, samples should consist of boys and girls from different school types. With reference to the above criteria, students from S1 to S3 single-sex and co-educational Catholic secondary schools in Hong Kong were chosen for the present study.

All 87 Catholic secondary schools in Hong Kong linked to the Catholic Diocese of Hong Kong were invited, 18 of which agreed to participate in the present study. The achieved sample comprises 3,523 S1 to S3 participants from 18 out of 87 single-sex and co-educational aided Catholic secondary schools in Hong Kong. According to Education Ordinance (1997), aided school means

"any school that receives subsidies from the Hong Kong Government in accordance with the code of aid for primary schools, the code of aid for secondary schools or the code of aid for special schools…". Due to the failure of some participants to indicate their gender on the survey, 3,478 useable S1 to S3 student-response surveys from 18 aided Catholic secondary schools in Hong Kong were analysed in the present study. A stratified two-stage cluster sampling method was used to select the sample classes and students. In the first stage, strata were formed in terms of form-levels, e.g. secondary one. A random sample of two classes from each of the three forms (the strata) within a school was selected. Once a class was selected, the whole intact class (the cluster) was included in the sample.

Briefly, the attitudes of the students towards their school in the present study were developed by analysing 3,478 useable S1 to S3 student-response surveys from 18 aided Catholic secondary schools in Hong Kong. The number of participants in terms of school type, year level and gender are listed in Table 3.1, and the percentage of participants from the schools in terms of gender, religious background and year level are listed in Table 3.2. The number of schools and participants from each type of school are listed in Table 3.3. As can be seen in Table 3.1, both the number of single-sex and co-educational schools participated in the present study was nine, and distribution of male and female students were similar, being 55.8% for male students and 44.2% for female students. From Table 3.2, it can be seen that the distribution of students with no religion ranged from 61.2% to and 82.3%, across the 18 schools. With one school being exceptional high in percentage of Catholic students being 32.8%,

the distribution of Catholic students ranged from 5.8% to 17.7% as shown in Table 3.2, across the 17 schools. As seen in Table 3.3, the distribution of students from single-sex schools (50.9%) and co-educational schools (49.1%) was similar.

Table 3.1

Number of Participants in Terms of School Type, Year Level and Gender

School Code	School Type	Gender						Male(%[a])	Female(%[a])	Total (%)[a]
		Year Level								
		S1		S2		S3				
		Male	Female	Male	Female	Male	Female			
1	SS	72	\	68	\	68	\	208 (6.0)	\	208 (6.0)
2	SS	70	\	70	\	69	\	209 (6.0)	\	209 (6.0)
5	SS	73	\	76	\	83	\	232 (6.7)	\	232 (6.7)
9	SS	52	\	46	\	56	\	154 (4.4)	\	154 (4.4)
10	SS	71	\	71	\	75	\	217 (6.2)	\	217 (6.2)
15	SS	\	70	\	72	\	54	\	196 (5.6)	196 (5.6)
16	SS	\	65	\	68	\	69	\	202 (5.8)	202 (5.8)
17	SS	\	70	\	72	\	72	\	214 (6.2)	214 (6.2)
18	SS	\	72	\	65	\	\	\	137 (3.9)	137 (3.9)
3	CS	42	28	36	32	34	35	112 (3.2)	95 (2.7)	207 (5.9)
4	CS	38	13	52	0	57	0	147 (4.2)	13 (0.4)	160 (4.6)
6	CS	32	26	43	26	36	34	111 (3.2)	86 (2.5)	197 (5.7)
7	CS	30	37	22	43	26	49	78 (2.3)	129 (3.7)	207 (6.0)
8	CS	24	39	41	32	34	37	99 (2.8)	108 (3.1)	207 (5.9)
11	CS	37	23	23	23	31	16	91 (2.6)	62 (1.8)	153 (4.4)
12	CS	34	36	33	35	35	35	102 (2.9)	106 (3.1)	208 (6.0)
13	CS	30	30	34	28	32	27	96 (2.8)	85 (2.4)	181 (5.2)
14	CS	36	28	25	39	25	36	86 (2.5)	103 (3.0)	189 (5.5)
	Total	641	537	640	535	661	464	1942(55.8)	536 (44.2)	3478(100.0)[b]

Note. \ stands for not applicable; S1 = Secondary one; S2 = Secondary two; S3 = Secondary three; SS = single-sex Catholic secondary school; CS = Co-educational Catholic secondary school. [a] The calculation is based on a total of 3,478 students who provided information on their gender; [b] total number of participants is smaller than 3,523 because some participants failed to give their gender.

Table 3.2

Percentage of Participants of Schools in Terms of Gender, Religious Background and Year Level

School code	Year Level (n = 3523)			Gender (n = 3478)		Religious Background (n = 3489)			
	S1	S2	S3	Male	Female	Catholic	Christian	Non-Christian religion	No religion
1	34.6%	32.7%	32.7%	100.0%	\	16.5%	9.0%	3.5%	71.0%
2	33.5%	33.5%	33.0%	100.0%	\	5.8%	13.0%	1.0%	80.2%
3	34.4%	33.0%	32.5%	54.1%	45.9%	17.7%	4.4%	6.9%	70.9%
4	30.9%	32.7%	36.4%	91.9%	8.1%	13.8%	4.4%	3.8%	78.1%
5	31.5%	32.8%	35.8%	100.0%	\	8.5%	11.6%	3.6%	76.3%
6	29.8%	34.8%	35.4%	56.3%	43.7%	8.2%	10.8%	6.7%	74.2%
7	32.4%	31.0%	36.6%	37.7%	62.3%	7.1%	10.0%	3.8%	79.0%
8	31.1%	15.3%	53.6%	47.8%	52.2%	8.3%	16.0%	8.7%	67.0%
9	33.8%	29.9%	36.4%	100.0%	\	13.5%	10.1%	9.5%	66.9%
10	32.7%	32.7%	34.6%	100.0%	\	10.3%	11.3%	3.8%	74.6%
11	37.4%	33.7%	28.8%	59.5%	40.5%	12.4%	15.0%	11.1%	61.4%
12	33.8%	32.9%	33.3%	49.0%	51.0%	13.0%	13.5%	1.4%	72.1%
13	32.4%	35.1%	32.4%	53.0%	47.0%	12.4%	8.5%	6.8%	72.3%
14	34.2%	33.7%	32.1%	45.5%	54.5%	9.1%	6.5%	2.2%	82.3%
15	35.7%	36.7%	27.6%	\	100.0%	14.0%	6.7%	2.1%	77.2%
16	32.2%	33.7%	34.2%	\	100.0%	10.0%	9.0%	5.0%	76.0%
17	32.7%	33.6%	33.6%	\	100.0%	8.5%	15.0%	2.8%	73.7%
18	52.6%	47.4%	\	\	100.0%	32.8%	6.0%	0.0%	61.2%

Note. \ stands for not applicable; S1 = Secondary one; S2 = Secondary two; S3 = Secondary three.

Table 3.3

Number of Schools and Number of Participants in Each Type of School

Type	No. of schools	No. of participants		
		Male (%)[a]	Female (%)[a]	Total(%)[a]
Single-sex school (boys)	5	1020 (29.3)	\	1020 (29.3)
Single-sex school (girls)	4	\	749 (21.6)	749 (21.6)
Co-educational school	9	922 (26.5)	787 (22.6)	1709 (49.1)
Total	18	1942 (55.8)	1536 (44.2)	3478 (100.0)

Note. \ stands for not applicable. [a] The calculation is based on a total of 3,478 students who provided information on their gender.

3.3 Instrument

The Attitudes of Students towards Their School (ASTS) instrument was used in the present study to measure the participants' demographic and home

background and the six aspects of attitudes of students towards their school: (1) student relationship with teachers; (2) student morale; (3) student perception of the principal; (4) student attitude to discipline; (5) student attitude to religion; and (6) student attitude to religious education. The ASTS instrument was developed for the present study based on the questionnaire used by Flynn and Mok (2002) in their study on Catholic schools because of the relevance and appropriateness of the questionnaire. The English ASTS instrument was then translated into Chinese.

Flynn and Mok (2002) used the instrument in their studies to explore changes in Year 12 students' experiences in Australia's Catholic schools over the periods of 1972-1982-1990-1998. All of the scales in the instrument measuring different aspects of Catholic schools were validated with the samples of Catholic schools in Australia (Flynn & Mok, 2002, p. 70). The properties of the scales of the instrument were investigated by factor analysis and reliability analysis. Construct validity and reliability were established. Parts of the students' questionnaire from Flynn and Mok's instrument (Section 1.1 students' background, Sections 2.4 school culture, and Section 2.5 religious education) were selected and modified to build the ASTS instrument in this study. Dr. Michael Bezzina, Director of the Teaching and Learning Section of the Catholic Education Office of the Archdiocese of Sydney, on behalf of the late Br. Marcellin Flynn, and Professor Magdalena M.C. Mok granted permission to use and modify their instrument.

In the present study, the Chinese version of the ASTS instrument, which was translated from the English version, was used. The translation team was

comprised of one experienced secondary school Chinese teacher and one experienced secondary school English teacher, both of whom are bilingual speakers experienced in providing guidance to adolescents. The Chinese version of the ASTS instrument, which was translated from the English version by the secondary school Chinese teacher, was back translated into English by the secondary school English teacher to ensure the two versions maintain equivalent meaning. Then, the back-translated versions were compared with the original versions by the researcher to corroborate the completeness and accuracy of the meaning of the translated work. Errors and ambiguities in the ASTS instrument were then spotted and eradicated. This procedure could help minimize ambiguity in regards to terminology and reduce students' misunderstanding of sense and sentences. A pilot test, which will be discussed in detail in Section 3.7.1, was performed to evaluate the suitability of the questionnaire for students in the present study and to spot and eradicate errors. Initial checking of the validity and reliability of the ASTS instrument was performed in the pilot test.

Section 1 of the ASTS instrument, consisting of 12 items, collected background information on the participants. Eleven questions from Flynn and Mok's instrument and one added question asking the year level of the participants were built into Section 1. The items of Section 1, which were clustered into three groups, are illustrated in Table 3.4.

Table 3.4

Participant's Background Information with Category Label

Item	Category Label
Participant's personal information	
1 Please indicate your sex	1. Male 2. Female
2 What is your religion?	1. Catholic 2. Christian 3. Non-Christian religion 4. No religion
3 Which form you are now attending?	1. S1 2. S2 3. S3
4 Where were you born?	1. In Hong Kong 2. In Mainland China 3. In Macau 4. In an Asian country 5. Others
12 How important would you say religion is in your life?	1. Of no importance at all 2. Not very important 3. Of some importance 4. Fairly important 5. Very important
Participant's parents and home information	
5 Where was your father born?	1. In Hong Kong 2. In Mainland China 3. In Macau 4. In an Asian country 5. Others
6 What is your mother's religion?	1. Catholic 2. Christian 3. Non-Christian religion,
7 What is your father's religion?	4. No religion
8 What was the final level of your father's formal education?	1. Does not receive formal education 2. Primary level 3. Junior Secondary level 4. Senior Secondary level
9 What was the final level of your mother's formal education?	5. Tertiary level or above
10 With regard to your parents:	1. Both my parents are living at home 2. One of my parents has died 3. Both my parents have died 4. My parents are divorced 5. My parents are separated
11 Are there any religious pictures or objects (e.g. Cross, holy pictures, books, etc.) displayed at home?	1. Yes 2. No

Section 2 of the ASTS survey, consisting of 39 items, assessed the attitudes of the students towards their schools and these questions were adopted from Section 2.4 of Flynn and Mok's (2002) instrument. As in the original instrument, Section 2 of the ASTS instrument measured five scales on the attitudes of students towards their school: student relationship with teachers, student morale, student perception of the principal, student attitude to discipline and student attitude to religion. Section 3 of the ASTS survey, consisting of 17 questions, measured one scale: attitude of students to religious education. These questions were mainly from Sections 2.5 of Flynn and Mok's (2002) instrument.

The response options of the items on a five-point Likert-type scale were: strongly disagree, disagree, neutral, agree and strongly agree. The correspondence between the six measurement scales included in the survey research and the items in the ASTS instrument are presented in Table 3.5. The psychometric properties of the six scales of the ASTS instrument, i.e. the factor structure, unidimensionality and reliability, were inspected using Rasch model analysis, exploratory factor analysis (EFA) and Cronbach's alpha coefficient, and are presented in Section 3.5.

Table 3.5

Correspondence Between the Measurement Scales and the Questions on the Attitudes of Students towards Their School (ASTS)

Scale	Item number on the ASTS[a]
Student relationship with teachers	14, 16, 18, 22, 23, 24, 30, 38, 41, 43 and 47
Student morale	13, 19, 26, 27, 28, 31, 33[c], 34, 35[c], 37, 44, 48 and 50
Student perception of the principal	20, 29, 39, 46 and 51
Student attitude to discipline	15, 17, 25, 36[c], 40, 42 and 49[c]
Student attitude to religion[b]	21, 32 and 45
Student attitude to religious education	52, 53, 54, 55, 56[c], 57, 58, 59, 60, 61[c], 62[c], 63, 64, 65, 66, 67[c] and 68[c]

Note. [a] Content of the items of the scales was found in Appendix B; [b] the scale was finally removed from the ASTS instrument after the validation analyses, which found the scale to be of poor quality and low reliability; [c] the item was finally removed from the scale due to poor quality.

3.4 Methods to construct the scales of the ASTS instrument

The ASTS instrument was first factor analysed using Exploratory Factor Analysis with SPSS (version 21). Exploratory Factor Analysis was used in this study to determine the best-fitting factor structure, as suggested by the data, from the pattern of students' responses to the items designed to measure their

attitudes toward Hong Kong Catholic schools (Cai, 2013). The factor structure in turn indicated the characteristics of the culture of Catholic secondary schools in Hong Kong. Scales were tentatively formed basing on results of the Exploratory Factor Analysis. Next, Rasch analysis was conducted using the Winsteps software (Linacre, 2013) (version 3.72.3) to construct Rasch measurement scales. Principal component analysis of the residuals in the Rasch analysis was undertaken to ascertain unidimensionality of each scale. The methods of exploratory factor analysis and Rasch analysis to develop dimensionality of the scales were described in Section 3.4.1.

Also described in Section 3.4.2 were methods for analysing the psychometric properties of the scales in the ASTS instrument according to the Rasch model (Bond & Fox, 2007). The methods included checking the extent to which the data fitted the Rasch model at the item level, scale level and the category level (Bond & Fox, 2007; Linacre, 2013).

The methods of establishing the reliability from the perspectives of classical test theory, i.e. internal consistency of the scales (Cronbach's Alpha), and of Rasch reliability were presented in Section 3.4.3.

3.4.1 Dimensionality of the scales of the ASTS instrument

This section presents the methods to analyze the dimensionality of the scales of the ASTS instrument. Two approaches of analysis on dimensionality, including exploratory factor analysis and Rasch model analysis were discussed.

Using the same grouping strategies employed by the original instrument, the ASTS was grouped into six scales. Exploratory factor analysis, using statistical program SPSS (version 21), was performed to explore the structure underpinning items making up the scales of the ASTS for measuring the students' attitudes towards their school. An exploratory factor analysis was undertaken with maximum likelihood method of extraction followed by an oblique (Direct Oblimin) method of rotation. The number of factors to be retained was determined by using the "eigenvalues > 1.00" rule and by the scree plot (Cai, 2013).

The Rasch measurement provides a theoretical model for the construction of an interval measurement scale. In the present study, the Winsteps (version 3.72.3) computer program was used to fit the data to the Rasch model. Unidimensionality of the measure is established through principal component analysis of the Rasch residuals. Principal component analysis of the Rasch residuals, i.e. observed response minus their expectations, was used to determine whether there was only one variance component explaining the structure of participant data (Wright, 1996). If the eigenvalue of the unexplained variance in the first contrast was less than two, then the eigenvalue of the first contrast was in the noise level and it showed the unidimensionality of the scale (Linacre, 2013).

3.4.2 Psychometric properties of the scales in the ASTS

Rasch measurement produces fit statistics, at item level, for item and persons to show whether all items contributed adequately to their own domain

(Liu & Boone, 2006). The computer program helped calculating the infit and outfit means square (MNSQ) statistics and the acceptable range for infit and outfit MNSQ values was between 0.5 – 1.5 (Linacre, 2013). A MNSQ value greater than 1.5 was an indication that the item failed to define the same construct as the other items did in a scale. A MNSQ value lower than 0.5 indicated that the item might be redundant and a MNSQ value about 1.0 was ideal.

Concerning the analysis of the ASTS instrument using Rasch measurement framework at scale level, person and item reliability and separation of measures were investigated. High person reliability in the Rasch measurement framework means that there is strong probability that persons with higher Rasch measures actually had higher abilities than persons with lower Rach measures. Similarly, high item reliability in the Rasch measurement framework indicates strong confidence that items with higher Rasch measures actually were more difficult to be endorsed than items with lower Rasch measures (Linacre, 2013). In the context of this study, person ability means the students' attitudes toward their schools. For instance, in the 'Student morale' scale, which was to be discussed in more details later, students with higher person ability in this scale were those students who had more positive student morale, and students with lower person ability were those with less positive student morale.

In the Rasch measurement framework, reliability could be indicated using the person separation coefficient, which reflected the extent to which persons could be classified according their abilities, and the item separation coefficient, which reflected the extent to which items could be classified according to their

level of difficulty to be endorsed. In the context of this study, a scale with high person separation coefficient implied that the scale could classify students according to their scale measures into those with more or less positive attitudes toward their schools. Low person separation, with person separation coefficient <2 and person reliability index <0.8, with a relevant people sample implied that the scale of the instrument might not be sensitive enough to distinguish between high and low performers and more items may be needed (Linacre, 2013). In the same way, item separation was used to verify the item hierarchy. Low item separation, with item separation coefficient <3 and item reliability index <0.8, implied the person sample was not large enough to confirm the item difficulty hierarchy of the scale of the instrument (Linacre, 2013). In general, person reliability index has the same meaning as that of the Cronbach's Alpha coefficient. However, the calculation of the Cronbach's Alpha included the extreme scores and this would overestimate the reliability.

Point-measure correlation, which measured the correlation between the observations on an item and the corresponding person measures, of the scales of the ASTS instrument provided by Rasch measurement reflected the item quality. If the value of the correlation was too small compared with items in the same scale, then the item did not correlate well with the other items in the same scale (Linacre, 2013). If the correlation was negative, something might have gone wrong, such as the reversed survey item, etc. because a negative point-measure correlation meant that what the item measured was opposite to what the other items in the scale measured.

Concerning the analysis of the ASTS instrument using Rasch measurement framework at the category level, step measure, average measure and category fit statistics were used as diagnostic tools for assessing category functioning (Bond & Fox, 2007). The average measure, which was the average of the ability estimates for all participants who chose a particular category, was expected to be advance monotonically with categories for each scale of the ASTS instrument (Linacre, 2013). The category fit of the scales of the instrument was evaluated by the infit and outfit MNSQ for each rating category and the expected range should be between the value of 0.5 – 1.5 (Linacre, 2013). The step measure parameter that defined the boundaries between categories was expected to increase monotonically with categories for each scale of the ASTS instrument and improper functioning of the scale was signaled when disordering of step measures occurs (Linacre, 2013).

3.4.3 Reliability of the scales of the ASTS instrument

Two approaches, including Cronbach's Alpha coefficient (using the SPSS software, version 21) in classical test theory, and Rasch model analysis on reliability index and point-measure correlation (using the Winsteps software (Linacre, 2013)) as discussed in Section 3.4.2, were used to assess the reliability of the scales of ASTS instrument.

3.5 Variables of the study

Altogether, six variables, each corresponding to one scale measuring the attitudes of students towards their school, were investigated in the present research: (1) student relationship with teachers, (2) student morale, (3) student perception of the principal, (4) student attitude to discipline, (5) student attitude to religion and (6) student attitude to religious education. The psychometric properties, i.e. the factor structure, unidimensionality and reliability, of the scale of that variable were inspected using exploratory factor analysis, Rasch model analysis, and Cronbach's Alpha coefficient. Modification was made, wherever necessary, to establish unidimensionality and reliability of the scale.

The conceptual definition, operational definition and psychometric properties of the six variables of the attitudes of students towards their school were discussed in the following paragraphs.

3.5.1 The variable: Student relationship with teachers

3.5.1.1 Conceptual definition

Student relationship with teachers refers to the relationship between students and teachers developed through interaction and communication in the school (Ping, 2013). This relationship is not only important to socio-emotional development (Silver et al., 2005) but also serves to support the development of important social and psychological skills of the students (Baker, 2006).

3.5.1.2 Operational definition

The scale used to measure the variable 'student relationship with teachers' consisted of 11 five-point Likert-type items. The 'student relationship with teachers' scale was made up of items 14, 16, 18, 22, 23, 24, 30, 38, 41, 43 and 47 in the ASTS instrument, as shown in Table 3.5. The response options of the items of the scale were strongly disagree, disagree, neutral, agree and strongly agree. An example item was '14 Teachers are well qualified and have good teaching skills'.

3.5.1.3 Establishing dimensionality of the scale

Dimensionality of the 'student relationship with teachers' scale was discussed from the perspectives of exploratory factor analysis and Rasch model analysis:

A. Exploratory factor analysis

The Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.95, and the Bartlett's test of sphericity achieved a statistically significant level ($\chi^2(55) = 17926.48$, $p<0.001$). These indices indicated that the data of this scale were suitable for exploratory factor analysis.

All items fall into one single factor in the exploratory factor analysis as only one factor has eigenvalue greater than one. Table 3.6 summarizes the factor analysis results. The factor accounted for 53.12% of variance in the data. The factor loadings ranged from 0.54 to 0.80, with '23 teachers have a professional attitude towards their teaching', having the highest factor loading

of 0.80. Results of exploratory factor analysis supported the use of the scale to measure student relationship with teachers.

Table 3.6

Pattern Matrix of Factor Analysis of the 'Student Relationship with Teachers' Scale (n = 3357)

	Item	Factor 1
14.	Teachers are well qualified and have good teaching skills	**0.75**
16.	Teachers in this school show a good deal of school spirit	**0.74**
18.	Teachers know students as individuals at this school	**0.66**
22.	Teachers give the impression they want to be part of the school community	**0.74**
23.	Teachers have a professional attitude towards their teaching	**0.80**
24.	Teachers carry out their work with energy and pleasure	**0.75**
30.	Teachers take a personal interest in me	**0.78**
38.	Most teachers give students sufficient encouragement	**0.78**
41.	If students have difficulty with their school work, teachers give up their time	**0.67**
43.	Teachers show that people are more important than rules	**0.54**
47.	Teachers here are caring and willing to assist students who need help	**0.77**
% variance		53.12
Cumulative variance		53.12
Eigenvalue		5.84

Note. Variables with factor loadings of equal to or larger than |0.40| are bolded.

B. Rasch model analysis

The data were next subjected to Rasch analysis to confirm dimensionality. The eigenvalue of the unexplained variance in first contrast for the scale at 1.8 was below the cut-off value of 2 (Linacre, 2013), and indicated unidimensionality of the scale. Both the results from exploratory factor analysis and from Rasch analysis showed that the 'student relationship with teacher' scale was unidimensional.

3.5.1.4 Psychometric properties

The psychometric properties of the 'student relationship with teachers' scale were analysed using Rasch measurement and classical test theory. Results of the Rasch model and classical test theory analysis, which are presented in the following paragraphs, both showed that the scale 'students relationship with teachers' was reliable to measure student relationship with teachers in Catholic secondary schools of Hong Kong.

A. Rasch model analysis

(a) At the item level

Item fit statistics of the 'student relationship with teachers' scale are reported in Table 3.7 to show how well the data matched the Rasch model. Infit and outfit MNSQ for all the items were within the accepted range of 0.5－1.5. Inspection of the point-measure correlation values of the items, ranged from 0.57 to 0.78, in Table 3.7 which implied that the items correlated well with each other.

Table 3.7

Item Difficulty, Standard Error, Infit and Outfit Statistics and Point-measure Correlation for the Items of the 'Student Relationship with Teachers' Scale

Item	Participant's Response			
	Item Difficulty	Infit (MNSQ)	Outfit (MNSQ)	Point-measure Correlation
14. Teachers are well qualified and have good teaching skills	-0.27 (0.03)	0.81	0.81	0.73
16. Teachers in this school show a good deal of school spirit	-0.12 (0.03)	0.93	0.92	0.72
18. Teachers know students as individuals at this school	0.31 (0.03)	1.13	1.14	0.66
22. Teachers give the impression they want to be part of the school community	0.16 (0.03)	0.85	0.84	0.73
23. Teachers have a professional attitude towards their teaching	-0.38 (0.03)	0.77	0.75	0.78
24. Teachers carry out their work with energy and pleasure	0.25 (0.03)	0.98	0.99	0.74
30. Teachers take a personal interest in me	0.07 (0.03)	0.91	0.89	0.77
38. Most teachers give students sufficient encouragement	0.26 (0.03)	0.86	0.85	0.76
41. If students have difficulty with their school work, teachers give up their time	-0.46 (0.03)	1.36	1.31	0.66
43. Teachers show that people are more important than rules	0.58 (0.03)	1.43	1.45	0.57
47. Teachers here are caring and willing to assist students who need help	-0.41 (0.03)	0.91	0.89	0.76

Note. Estimated standard error of the parameter in brackets; MNSQ stands for 'mean square'.

(b) At the scale level

From Table 3.8, the high value of item reliability index, 0.99, indicated that the items making up the scale were internally consistent. Review of the Rasch person reliability index for the scale indicated that the scale, with an index value of 0.90, reached adequate level of internal reliability. Both person and item separation indices were at least 0.90. To conclude, results from Rasch analysis showed high reliability of the 'student relationship with teachers' scale.

Table 3.8

Cronbach's Alpha and Rasch Reliabilities of the 'Student Relationship with Teachers' Scale (n=3357)

No. of Items	Cronbach's Alpha	Rasch Measurement			
			Separation Coefficient	Reliability Index	Range of point-measure Correlation
11	0.91	Person	3.01	0.90	0.57 - 0.78
		Item	11.81	0.99	

Note. Estimated standard error of the parameter in brackets.

(c) At the category level

Table 3.9 shows that the average measure increased monotonically across the rating scale categories. Infit and outfit MNSQ statistics of the five category labels were acceptable and within the accepted range of 0.5 – 1.5. The step measures for the scale were ordered monotonically and functioned as expected. These indicated that the category of the 'students relationship with teachers' scale functioned normally.

Table 3.9

Category Functioning Statistics of the 'Student Relationship with Teachers' Scale

Category Label[a]	Average Measure	Infit (MNSQ)	Outfit (MNSQ)	Step Measure
1	-2.16	1.08	1.14	NONE
2	-1.03	1.05	1.05	-2.50
3	0.04	0.87	0.88	-2.25
4	1.59	0.87	0.84	0.98
5	2.87	1.27	1.19	3.77

Note. MNSQ stands for 'mean square'. [a]Category label (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

B. Classical test theory analysis on the reliability of the scale

From Table 3.8, the Cronbach's Alpha coefficient, 0.91, of the 'students relationship with teachers' scale showed that the reliability of the scale was high.

3.5.2 The variable: Student morale

3.5.2.1 Conceptual definition

Student morale is defined as a state of mind that is determined by the students' degree of satisfaction to the environment where they study (Young, 2000, p.161). Mackenzie (2007) pointed out that morale is often influenced more by external factors than internal ones.

3.5.2.2 Operational definition

The scale used to measure the variable 'student morale' consisted of 13 five-point Likert-type items. The 'student morale' scale was made up of items 13, 19, 26, 27, 28, 31, 33, 34, 35, 37, 44, 48 and 50 on the ASTS instrument, as shown in Table 3.10. The response options of the items of the scale were strongly disagree, disagree, neutral, agree and strongly agree. An example item was '31. I have been happy at school'.

3.5.2.3 Establishing dimensionality of the scale

Dimensionality of the 'student morale' scale was discussed from the perspectives of exploratory factor analysis and Rasch model analysis:

A. Exploratory factor analysis

The Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.93, and the Bartlett's test of sphericity achieved a statistically significant level ($\chi^2(78) = 20159.26$, $p<0.001$). These indices indicated that the data of this scale were suitable for exploratory factor analysis.

All items fall into two factors in the exploratory factor analysis as two factors have eigenvalue greater than one. Table 3.10 summarizes the factor analysis results. The two factors accounted for 56.20% of variance in the data. However the scale designed was intended to measure only one factor. This indicated that modification of the scale was needed. Analysis of factor loadings found that the second factor was dominated by loadings of '33 I would send my children to a Catholic school' and '35 If I had to do it all over again, I would attend a Catholic school'. The factor loadings for the first factor ranged from 0.53 to 0.02, with item '50 There is happy atmosphere in this school' having the highest factor loading of 0.80.

Table 3.10

Pattern Matrix of Factor Analysis of the 'Student Morale' Scale (n = 3350)

Item		Factor 1	Factor 2
13.	Students here think a lot of their school	**0.56**	0.05
19.	This school has a good academic name in the local community	**0.62**	0.04
26.	Adequate counselling help is available to students	**0.61**	-0.09
27.	Everyone has a lot of fun at this school	**0.76**	-0.24
28.	A good spirit of community exists amongst students of your form	**0.73**	-0.23
31.	I have been happy at school	**0.78**	-0.24
33.	I would send my children to a Catholic school	**0.58**	**0.67**
34.	Students at this school do not mind wearing the school uniform	**0.53**	0.26
35.	If I had to do it all over again, I would attend a Catholic school	**0.64**	**0.63**
37.	Everyone tries to make you feel at home at this school	**0.72**	-0.04
44.	My experience of this school has been a happy one	**0.72**	-0.19
48.	I am happy to be a student at this school	**0.79**	-0.06
50.	There is happy atmosphere in this school	**0.80**	-0.22
% variance		47.13	9.07
Cumulative variance		47.13	56.20
Eigenvalue		6.13	1.18

Note. Variables with factor loadings of equal to or larger than |0.40| are bolded.

B. Rasch model analysis

The data were next subjected to Rasch analysis to confirm dimensionality. The eigenvalue of the unexplained variance in first contrast for the scale at 2.3 was above the cut-off value 2 (Linacre, 2013), and indicated the multi-dimensionality of the scale. Both of the results from exploratory factor analysis and Rasch analysis showed that the 'student morale' scale was multi-dimensional and modification of the scale was needed.

C. Modification of the scale to establish its undimensionality

Items 33 and 35, which were shown to be the source of the second factor, were removed from the scale. The modified 'student morale' scale was analysed on its dimensionality. After removing items 33 and 35, the Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.94, and the Bartlett's

test of sphericity achieved a statistically significant level ($\chi^2(55) = 16600.48$, $p<0.001$). These indices indicated that the data of this modified scale were suitable for exploratory factor analysis. All items fall into one single factor in the exploratory factor analysis as only one factor has eigenvalue greater than one. Table 3.11 summarizes the factor analysis results. The factor accounted for 50.09% of variance in the data. The factor loadings ranged from 0.51 to 0.82, with item '50 There is happy atmosphere in this school', having the highest factor loading of 0.82. Results of exploratory factor analysis supported the use of the modified scale to measure student morale with teachers.

Table 3.11

Pattern Matrix of Factor Analysis of the Modified 'Student Morale' Scale (n = 3381)

Item	Factor 1
Q13. Students here think a lot of their school	**0.56**
Q19. This school has a good academic name in the local community	**0.62**
Q26. Adequate counselling help is available to students	**0.62**
Q27. Everyone has a lot of fun at this school	**0.78**
Q28. A good spirit of community exists amongst students of your form	**0.75**
Q31. I have been happy at school	**0.80**
Q34. Students at this school do not mind wearing the school uniform	**0.51**
Q37. Everyone tries to make you feel at home at this school	**0.72**
Q44. My experience of this school has been a happy one	**0.74**
Q48. I am happy to be a student at this school	**0.79**
Q50. There is happy atmosphere in this school	**0.82**
% variance	50.09
Cumulative variance	50.09
Eigenvalue	5.51

Note. Variables with factor loadings of equal to or larger than |0.40| are bolded.

The data were next subjected to Rasch analysis to confirm dimensionality. The eigenvalue of the unexplained variance in first contrast for the modified scale at 1.9 was below the cut-off value of 2 (Linacre, 2013), and indicated unidimensionality of the scale. Both of the results from exploratory

factor analysis and Rasch analysis showed that the modified 'student morale' scale was unidimensional.

3.5.2.4 Psychometric properties

The psychometric properties of the modified 'student morale' scale were analysed using Rasch measurement and classical test theory. Results of Rasch model and classical test theory analysis, which are discussed in more detail in the following paragraphs, both showed that the modified scale 'student morale' was reliable to measure student morale in Catholic secondary schools of Hong Kong.

A. Rasch model analysis

(a) At the item level

Item fit statistics of the modified 'student morale' scale are reported in Table 3.12 to show how well the data matched the Rasch model. Infit and outfit MNSQ for all the items were within the accepted range of 0.5－1.5, except for item '34 Students at this school do not mind wearing the school uniform'. Both the infit and outfit MNSQ values of item 34, 1.67 and 1.72, were greater than the cut-off value of 1.5. As the values of this item were only slightly larger than the cut-off value, with no irregularity in other aspects, item 34 was kept. Inspection of the point-measure correlation values of the items, ranged from 0.56 to 0.79, in Table 3.12 found that the items correlated well with each other.

Table 3.12

Item Difficulty, Standard Error, Infit and Outfit Statistics and Point-measure Correlation for the Items of the Modified 'Student Morale' Scale

Item	Participant's Response			
	Item Difficulty	Infit (MNSQ)	Outfit (MNSQ)	Point-measure Correlation
13. Students here think a lot of their school	0.08 (0.03)	0.96	0.99	0.57
19. This school has a good academic name in the local community	-0.31 (0.03)	1.17	1.15	0.63
26. Adequate counselling help is available to students	-0.06 (0.03)	1.03	1.01	0.63
27. Everyone has a lot of fun at this school	0.18 (0.03)	0.84	0.84	0.75
28. A good spirit of community exists amongst students of your form	0.16 (0.03)	0.86	0.85	0.74
31. I have been happy at school	-0.27 (0.03)	0.91	0.87	0.77
34. Students at this school do not mind wearing the school uniform	0.50 (0.02)	1.67	1.72	0.56
37. Everyone tries to make you feel at home at this school	0.67 (0.03)	0.88	0.90	0.70
44. My experience of this school has been a happy one	-0.77 (0.03)	1.07	1.02	0.71
48. I am happy to be a student at this school	0.04 (0.03)	0.85	0.83	0.77
50. There is happy atmosphere in this school	-0.21 (0.03)	0.74	0.71	0.79

Note. Estimated standard error of the parameter in brackets. MNSQ stands for 'mean square'.

(b) At the scale level

From Table 3.13, the high value of item reliability index, 1.00, indicated that the items making up the scale were internally consistent. A review of the Rasch person reliability index for the scale indicated that the scale, with an index value of 0.86, reached an adequate level of internal reliability. Both person and item separation indices were at least 0.86. To conclude, the results from the Rasch analysis showed high reliability of the modified 'student morale' scale.

Table 3.13

Cronbach's Alpha and Rasch Reliabilities of the Modified 'Student Morale' Scale (3381)

No. of items	Cronbach's Alpha		Rasch Measurement		
			Separation Coefficient	Reliability Index	Range of point-measure Correlation
11	0.90	Person	2.49	0.86	0.56 - 0.79
		Item	14.30	1.00	

Note. Estimated standard error of the parameter in brackets.

(c) At the category level

Table 3.14 showed that the average measure increased monotonically across the rating scale categories. Infit and outfit MNSQ statistics of the five category labels were acceptable and within the accepted range of 0.5 – 1.5. The step measure for the scale did not function as expected and was slightly disordered between categories 1 to 3. Nonetheless the disordering was minor and would only have a slight influence on the quality of the scale.

Table 3.14

Category Functioning Statistics of the Modified 'Student Morale' Scale

Category Label[a]	Average Measure	Infit (MNSQ)	Outfit (MNSQ)	Step Measure
1	-1.83	1.05	1.08	NONE
2	-0.91	1.03	1.03	-1.94
3	-0.04	0.87	0.88	-2.08
4	1.26	0.87	0.85	0.92
5	2.31	1.28	1.19	3.10

Note. MNSQ stands for 'mean square'. [a]Category Label (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

B. Classical test theory analysis on the reliability of the scale

From Table 3.13, the Cronbach's Alpha coefficient, 0.90, of the modified 'student morale' scale indicated that the reliability of the scale was high.

3.5.3 The variable: Student perception of the principal

3.5.3.1 Conceptual definition

As symbolic leaders, principals of Catholic schools represent what the schools stand for. Student perception of the principal refers to the students' perception of the leadership of the principal in the school. Leadership of the Catholic school principals, as perceived by the students, can be classified into five categories: (1) educational; (2) religious; (3) school leadership; (4) principal as community builder; and (5) pastoral.

3.5.3.2 Operational definition

The scale used to measure the variable 'student perception of the principal' consisted of five five-point Likert-type items. The 'student perception of the principal' scale was made up of items 20, 29, 39, 46 and 51 in the ASTS instrument, as shown in Table 3.5. The response options of the items of the scale were strongly disagree, disagree, neutral, agree and strongly agree. An example item was '29. The principal ensures that the school provides a good education to students'.

3.5.3.3 Establishing dimensionality of the scale

Dimensionality of the 'student perception of the principal' scale was discussed from the perspectives of exploratory factor analysis and Rasch model analysis:

A. Exploratory factor analysis

The Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.85, and the Bartlett's test of sphericity achieved a statistically significant level ($\chi^2(10) = 5643.01$, $p<0.001$). These indices indicated that the data of this scale were suitable for exploratory factor analysis.

All items fall into one single factor in the exploratory factor analysis as only one factor has eigenvalue greater than one. Table 3.15 summarizes the factor analysis results. The factor accounted for 58.54% of variance in the data. This factor represented the 'student perception of the principal' scale. The factor loadings ranged from 0.64 to 0.82, with item '39 The Principal encourages a sense of community and belonging in the school', having the highest factor loading of 0.82. Results of the exploratory factor analysis supported the use of the scale to measure the student perception of the principal.

Table 3.15

Pattern Matrix of Factor Analysis of the 'Student Perception of the Principal' Scale (n = 3427)

	Item	Factor 1
20.	I can approach the Principal for advice and help	**0.64**
29.	The Principal ensures that the school provides a good education to students	**0.80**
39.	The Principal encourages a sense of community and belonging in the school	**0.82**
46.	The Principal places importance on the religious nature of the Catholic school	**0.74**
51.	The Principal provides good leadership of the school community	**0.81**
	% variance	58.54
	Cumulative variance	58.54
	Eigenvalue	2.93

Note. Variables with factor loadings of equal to or larger than |0.40| are bolded.

B. Rasch model analysis

The data were next subjected to Rasch analysis to confirm dimensionality. The eigenvalue of the unexplained variance in first contrast for the scale at 1.4

was well below the cut-off value of 2 (Linacre, 2013), and indicated unidimensionality of the scale. Both the results from exploratory factor analysis and from Rasch analysis showed that the 'student perception of the principal' scale was unidimensional.

3.5.3.4 Psychometric properties

The psychometric properties of the 'student perception of the principal' scale were analysed using Rasch measurement and classical test theory. The results of both the Rasch model and classical test theory analysis, which were presented in the following paragraphs, indicated that the scale for the variable 'student perception of the principal' was reliable to measure the student perception of the principal in Catholic secondary schools of Hong Kong.

A. Rasch model analysis

(a) At the item level

Item fit statistics of the scale are reported in Table 3.16 to show how well the data matched the Rasch model. Infit and outfit MNSQ for all the items were within the accepted range of 0.5 – 1.5. Inspection of the point-measure correlation values of the items, ranged from 0.63 to 0.80, in Table 3.16 implied that the items correlated well with each other.

Table 3.16

Item Difficulty, Standard Error, Infit and Outfit Statistics and Point-measure Correlation for the Items of the 'Student Perception of the Principal' Scale

Scale		Participant's Response			
		Item Difficulty	Infit (MNSQ)	Outfit (MNSQ)	Point-measure Correlation
20.	I can approach the Principal for advice and help	1.16 (0.03)	1.26	1.45	0.68
29.	The Principal ensures that the school provides a good education to students	-0.59 (0.03)	0.89	0.87	0.79
39.	The Principal encourages a sense of community and belonging in the school	-0.05 (0.03)	0.83	0.80	0.80
46.	The Principal places importance on the religious nature of the Catholic school	-0.39 (0.03)	1.00	0.96	0.73
51.	The Principal provides good leadership of the school community	-0.13 (0.03)	0.94	0.90	0.79

Note. Estimated standard error of the parameter in brackets. MNSQ stands for 'mean square'.

(b) At the scale level

From Table 3.17, the high value of item reliability index, 1.00, indicated that the items making up the scale were internally consistent. A review of the Rasch person reliability index for the scale indicated that the scale, with an index value of 0.81, reached adequate level of internal reliability. Both person and item separation indices were at least 0.81. To conclude, results from Rasch analysis showed high reliability of the 'student perception of the principal' scale.

Table 3.17

Cronbach's Alpha and Rasch Reliabilities of the 'Student Perception of the Principal' Scale (n=3427)

No. of items	Cronbach's Alpha	Rasch Measurement			
			Separation Coefficient	Reliability Index	Range of point-measure Correlation
5	0.82	Person	2.05	0.81	0.63 - 0.80
		Item	20.88	1.00	

Note. Estimated standard error of the parameter in brackets.

(c) At the category level

Table 3.18 showed that the average measure increased monotonically across the rating scale categories. Infit and outfit MNSQ statistics of the five category labels were acceptable and within the accepted range of 0.5 – 1.5. The step measures for the scale were ordered monotonically and functioned as expected. This indicated that the category of the scale functioned normally.

Table 3.18

Category Functioning Statistics of the 'Student Perception of the Principal' Scale

Category Label[a]	Average Measure	Infit (MNSQ)	Outfit (MNSQ)	Step Measure
1	-2.74	1.12	1.23	NONE
2	-1.60	0.98	0.97	-2.82
3	-0.11	0.87	0.92	-2.52
4	1.76	0.88	0.83	1.35
5	3.04	1.28	1.28	3.99

Note. MNSQ stands for 'mean square'. [a] Category Label (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

B. Classical test theory analysis on the reliability of the scale

From Table 3.17, the Cronbach's Alpha coefficient, 0.82, of the 'student perception of the principal' scale showed that the reliability of the scale was high.

3.5.4 The variable: Student attitude to discipline

3.5.4.1 Conceptual definition

Student attitude to discipline refers to the voluntary obedience of the student to the influence and leadership of the mature and adult educator in the

school and the students' personal appropriation of the knowledge, attitudes and ideals (van der Westhuizen, et al., 2008).

3.5.4.2 Operational definition

The scale that used to measure the variable 'student attitude to discipline' consisted of 7 five-point Likert-type items. The 'student attitude to discipline' scale was made up of items 15, 17, 25, 36, 40, 42 and 49 in the ASTS instrument, as shown in Table 3.5, with items 36 and 42 being reverse coded. The response options of the items of the scale were strongly disagree, disagree, neutral, agree and strongly agree. An example item was '17 Students are given sufficient freedom here'.

3.5.4.3 Establishing dimensionality of the scale

Dimensionality of the 'student attitude to discipline' scale was discussed from the perspectives of exploratory factor analysis and Rasch model analysis:

A. Exploratory factor analysis

The Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.69, and the Bartlett's test of sphericity achieved a statistically significant level ($\chi^2(21) = 2899.19$, $p<0.001$). These indices indicated that the data of this scale were suitable for exploratory factor analysis.

All items fall into two factors in the exploratory factor analysis as two factors have an eigenvalue greater than one. Table 3.19 summarizes the factor analysis results. The two factors accounted for 49.54% of variance in the data.

However the scale designed was intended to measure only one factor. This indicated that modification of the scale was needed. Analysis of factor loadings found that the second factor was dominated by loadings of items '25 Discipline presents no real problems in this school', '36 Teachers here never explain why they ask you to do things', and '42 There are too many rules which restrict students' freedom'. The two items, 36 and 42, were the questions expecting reverse response. However the scale designed was intended to measure only one factor, i.e. student attitude to discipline. The factor loadings of the first factor ranged from 0.38 to 0.77, with item '17 Students are given sufficient freedom here', having the highest factor loading of 0.77.

Table 3.19

Pattern Matrix of Factor Analysis of the 'Student Attitude to Discipline' Scale (n = 3419)

Item		Factor 1	Factor 2
15.	Students here know the standard of conduct expected of them	**0.71**	-0.10
17.	Students are given sufficient freedom here	**0.77**	0.13
25.	Discipline presents no real problems in this school	**0.44**	**-0.52**
36.*	Teachers here never explain why they ask you to do things	0.19	**0.71**
40.	There are ways to have school rules changed if most students disagree with them	**0.50**	-0.29
42.*	There are too many rules which restrict students' freedom	0.38	**0.62**
49.	School rules here encourage self-discipline and responsibility	**0.69**	-0.03
% variance		31.33	18.21
Cumulative variance		31.33	49.54
Eigenvalue		2.19	1.28

Note. Variables with factor loadings of equal to or larger than |0.40| are bolded; * stands for 'the negative item was reverse coded'.

B. Rasch model analysis

The data were next subjected to Rasch analysis to confirm dimensionality. The eigenvalue of the unexplained variance in first contrast for the scale was 1.7, which was below the cut-off value of 2, and indicated the unidimensionality of the scale. However the result was not in accordance with

that from the exploratory factor analysis. Thus, modification of the 'student attitude to discipline' scale was needed.

C. Modification of the scale to establish its undimensionality

Items 36 and 42, which were shown to be the source of the second factor, were removed from the scale. The modified 'student attitude to discipline' scale was analysed on its dimensionality. After removing items 36 and 42 from the scale, the Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.72, and the Bartlett's test of sphericity achieved a statistically significant level ($\chi^2(10) = 2268.67$, $p<0.001$). These indices indicated that the data of this modified scale were suitable for exploratory factor analysis. All items fall into one single factor in the exploratory factor analysis as only one factor has an eigenvalue greater than one. Table 3.20 summarizes the factor analysis results. The factor accounted for 42.29% of variance in the data. The factor loadings ranged from 0.50 to 0.74, with item '15 Students here know the standard of conduct expected of them', and item '17 Students are given sufficient freedom here', having the highest factor loading of 0.74. The results of the exploratory factor analysis supported the use of the modified scale to measure student attitude to discipline.

Table 3.20

Pattern Matrix of Factor Analysis of the Modified 'Student Attitude to Discipline' Scale (n = 3427)

	Item	Factor 1
15.	Students here know the standard of conduct expected of them	**0.74**
17.	Students are given sufficient freedom here	**0.74**
25.	Discipline presents no real problems in this school	**0.50**
40.	There are ways to have school rules changed if most students disagree with them	**0.52**
49.	School rules here encourage self-discipline and responsibility	**0.71**
% variance		42.29
Cumulative variance		42.29
Eigenvalue		2.11

Note. Variables with factor loadings of equal to or larger than |0.40| are bolded.

The data were next subjected to Rasch analysis to confirm dimensionality. The eigenvalue of the unexplained variance in first contrast for the scale was 1.7, which was below the cut-off value of 2 (Linacre, 2013), and indicated unidimensionality of the scale. The results from both the exploratory factor analysis and Rasch analysis showed that the modified 'student attitude to discipline' scale was unidimensional.

3.5.4.4 Psychometric properties

The psychometric properties of the modified 'student attitude to discipline' scale were analysed using Rasch measurement and classical test theory. Both the results of analysis from Rasch model and classical test theory, which were presented in the following paragraphs, indicated that the modified scale for the variable 'student attitude to discipline' was reliable to measure student attitude to discipline in Catholic secondary schools of Hong Kong.

A. Rasch model analysis

(a) At the item level

Item fit statistics of the modified 'student attitude to discipline' scale are reported in Table 3.21 to show how well the data matched the Rasch model. Infit and outfit MNSQ for all the items were within the accepted range of 0.5 – 1.5. Inspection of the point-measure correlation values of the items, ranged from 0.57 to 0.70, in Table 3.21 found that the items correlated well with each other.

Table 3.21

Item Difficulty, Standard Error, Infit and Outfit Statistics and Point-measure Correlation for the Items of the Modified 'Student Attitude to Discipline' Scale

Item	Participant's Response			
	Item Difficulty	Infit (MNSQ)	Outfit (MNSQ)	Point-measure Correlation
15. Students here know the standard of conduct expected of them	-0.68 (0.02)	0.78	0.77	0.67
17. Students are given sufficient freedom here	-0.17 (0.02)	1.07	1.05	0.70
25. Discipline presents no real problems in this school	0.69 (0.02)	1.07	1.11	0.57
40. There are ways to have school rules changed if most students disagree with them	0.92 (0.02)	1.13	1.15	0.60
49. School rules here encourage self-discipline and responsibility	-0.75 (0.02)	0.91	0.88	0.65

Note. Estimated standard error of the parameter in brackets. MNSQ stands for 'mean square'.

(b) At the scale level

From Table 3.22, the high value of item reliability index, 1.00, indicated that the items making up the modified 'student attitude to discipline' scale were internally consistent. A review of the Rasch person reliability index for the modified scale indicated that the scale, with an index value of 0.67, reached

adequate level of internal reliability. To conclude, results from Rasch analysis

showed high reliability of the modified 'student attitude to discipline' scale.

Table 3.22

Cronbach's Alpha and Rasch Reliabilities of the Modified Scale: Student Attitude to Discipline (3427)

No. of items	Cronbach's Alpha	Rasch Measurement			
			Separation Coefficient	Reliability Index	Range of point-measure Correlation
5	0.64	Person	1.44	0.67	0.57 - 0.70
		Item	28.66	1.00	

Note. Estimated standard error of the parameter in brackets.

(c) At the category level

Table 3.23 shows that the average measure increased monotonically across

the rating scale categories. Infit and outfit MNSQ statistics of the five category

labels were acceptable and within the accepted range of 0.5 – 1.5. The step

measure for the scale functioned as expected. This indicated that the category of

the modified 'student attitude to discipline' scale functioned normally.

Table 3.23

Category Functioning Statistics of the Modified 'Student Attitude to Discipline' Scale

Category Label[a]	Average Measure	Infit (MNSQ)	Outfit (MNSQ)	Step Measure
1	-1.73	1.04	1.07	NONE
2	-0.91	0.98	0.97	-1.81
3	-0.15	0.90	0.89	-1.71
4	0.94	0.84	0.85	0.74
5	1.60	1.38	1.27	2.77

Note. MNSQ stands for 'mean square'. [a]Category Label (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

B. Classical test theory analysis on the reliability of the scale

From Table 3.22, the Cronbach's Alpha coefficient of the modified 'student attitude to discipline' scale, 0.64, met the 0.5 cut-off value for reliability for dissertation research (Hair, Black, Babin, Anderson, & Tatham, 2006). This indicated that the reliability of the scale was acceptable.

3.5.5 The variable: Student attitude to religion

3.5.5.1 Conceptual definition

Student attitude to religion refers to the students' acceptance of the religious goals of the school.

3.5.5.2 Operational definition

The scale used to measure the variable 'student attitude to religion' consisted of three five-point Likert-type items. The 'student attitude to religion' scale was made up of items 21, 32 and 45 in the ASTS instrument, as shown in Table 3.5. The response options of the items of the scale were strongly disagree, disagree, neutral, agree and strongly agree. An example item was '45. Catholic teachers here set an example of what it means to be a practising Catholic'.

3.5.5.3 Establishing dimensionality of the scale

Dimensionality of the 'student attitude to religion' scale was discussed from the perspectives of exploratory factor analysis and Rasch model analysis:

A. Exploratory factor analysis

Since there were only three items for the 'student attitude to religion' scale, no exploratory factor analysis could be done.

B. Rasch model analysis

The data were next subjected to Rasch analysis to confirm dimensionality. The eigenvalue of the unexplained variance in first contrast for the scale was 1.7, which was below the cut-off value of 2 (Linacre, 2013), indicated the unidimensionality of the 'student attitude to religion' scale.

3.5.5.4 Psychometric properties

The psychometric properties of the 'student attitude to religion' scale were analysed using Rasch measurement and classical test theory. As both the results of the alpha coefficient and the Rasch person reliability index of the scale presented in the following paragraphs were below from the cut-off value of 0.5, and the number of items was too few, it was difficult to render measures to improve the quality of the scale, the 'student attitude to religion' scale, and it was removed from ASTS instrument.

A. Rasch model analysis

(a) At the item level

Item fit statistics of the 'student attitude to religion' scale are reported in Table 3.24 to show how well the data matched the Rasch model. Infit and outfit MNSQ for all the items were within the accepted range of 0.5－1.5. Inspection

of the point-measure correlation values of the items, ranged from 0.61 to 0.75,

as shown in Table 3.24 implied that the items correlated well with each other.

Table 3.24

Item Difficulty, Standard Error, Infit and Outfit Statistics and Point-measure
Correlation for the Items of the 'Student Attitude to Religion' Scale

Item	Participant's Response			
	Item Difficulty	Infit (MNSQ)	Outfit (MNSQ)	Point-measure Correlation
21. Senior students understand and accept the religious goals of the school	0.20 (0.03)	0.81	0.77	0.69
32. This school places too much emphasis on external conformity to rules and regulations	-0.05 (0.03)	1.19	1.13	0.61
45. Catholic teachers here set an example of what it means to be a practising Catholic	-0.15 (0.03)	0.99	0.95	0.75

Note. Estimated standard error of the parameter in brackets. MNSQ stands for 'mean square'.

(b) At the scale level

From Table 3.25, the high value of item reliability index, 0.96, indicated

that the items making up the 'student attitude to religion' scale were internally

consistent. A review of the Rasch person reliability index for the scale indicated

that the scale, with an index value of 0.50, could not reach adequate level of

internal reliability. To conclude, the results from Rasch analysis showed low

reliability of the 'student attitude to religion' scale.

Table 3.25

Cronbach's Alpha and Rasch Reliabilities of the 'Student Attitude to Religion'
Scale (n=3448)

No. of items	Cronbach's Alpha	Rasch Measurement			
			Separation Coefficient	Reliability Index	Range of point-measure Correlation
3	0.45	Person	1.00	0.50	0.61 - 0.75
		Item	4.92	0.96	

Note. Estimated standard error of the parameter in brackets.

(c) At the category level

Table 3.26 showed that the average measure increased monotonically across the rating scale categories. Infit and outfit MNSQ statistics were acceptable for the five category labels and within the accepted range of 0.5 – 1.5. The step measures for the scale were ordered monotonically and functioned as expected. This indicated that the category of the scale functioned normally.

Table 3.26

Category Functioning Statistics of the 'Student Attitude to Religion' Scale

Category label[a]	Average Measure	Infit (MNSQ)	Outfit (MNSQ)	Step Measure
1	-2.05	1.03	1.04	NONE
2	-1.16	1.03	0.90	-2.61
3	-0.01	0.87	0.87	-2.50
4	1.52	0.87	0.76	1.71
5	2.04	1.27	1.35	3.40

Note. MNSQ stands for 'mean square'. [a]Category Label (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

B. Classical test theory analysis on the reliability of the scale

From Table 3.25, the Cronbach's Alpha coefficient of the 'student attitude to religion' scale, 0.45, could not meet the 0.5 cut-off value for reliability for dissertation research. This indicated low reliability of the scale.

3.5.6 The variable: Student attitude to religious education

3.5.6.1 Conceptual definition

Student attitude to religious education refers to the attitude of the students towards different aspects of the religious programmes in the school including:

content, teaching pedagogy, teaching performance, and students' personal comments on the religious classes. Religious education, which embraced core beliefs and values of Catholic education, is a valuable tradition for catholic schools (Flynn, 1993).

3.5.6.2 Operational definition

The scale used to measure the variable, 'student attitude to religious education', consisted of 17 five-point Likert-type items. The 'student attitude to religious education' scale was made up of items 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67 and 68 in the ASTS instrument, as shown in Table 3.5, with items 56 and 61 reverse coded. The response options of the items of the scale were strongly disagree, disagree, neutral, agree and strongly agree. An example item was '54 R. E. classes have been interesting'.

3.5.6.3 Establishing dimensionality of the scale

Dimensionality of the 'student attitude to religious education' scale was discussed from the perspectives of exploratory factor analysis and Rasch model analysis:

A. Exploratory factor analysis

The Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.95, and the Bartlett's test of sphericity achieved a statistically significant level ($\chi^2(136) = 32289.34$, $p<0.001$). These indices indicated that the data of this scale were suitable for exploratory factor analysis.

All items fall into two factors in the exploratory factor analysis as they have an eigenvalue greater than one. Table 3.27 summarizes the factor analysis results. The two factors accounted for 57.86% of variance in the data, indicating that modification of the 'student attitude to religious education' scale was needed. An analysis of factor loadings found that the second factor was dominated by loadings of items '56 R.E. classes do not arouse much interest on the part of student' and '61 R.E. classes in my form take up too much time', which were the questions expecting reverse response. However the scale designed was intended to measure only one factor, i.e. student attitude to religious education. The factor loadings of the first factor ranged from 0.07 to 0.84, with item '54 R.E. classes have been interesting, having the highest factor loading of 0.84'.

Table 3.27

Pattern Matrix of Factor Analysis of the 'Student Attitude to Religious Education' Scale (n = 3283)

Item		Factor 1	Factor 2
52.	I have enjoyed R.E. classes this year	**0.79**	0.26
53.	The study of other religions has helped me to appreciate my own religion	**0.73**	-0.06
54.	R.E. classes have been interesting	**0.84**	0.22
55.	R.E. classes are related to real life and to my needs	**0.77**	0.05
56.*	R.E. classes do not arouse much interest on the part of student	0.07	**0.74**
57.	If R.E. classes were voluntary, I would still attend them	**0.79**	0.05
58.	This school has a good programme in my form	**0.79**	-0.01
59.	More emphasis should be placed on knowledge and content in R.E.	**0.66**	-0.28
60.	R.E. classes are taken seriously by students	**0.74**	-0.04
61.*	R.E. classes in my form take up too much time	0.09	**0.76**
62.	Assessment through assignment or examination should form part of the R.E. courses	**0.56**	-0.38
63.	R.E. teachers allow sufficient time for discussion	**0.69**	-0.02
64.	R.E. classes are well prepared and taught	**0.73**	0.09
65.	R.E. subject is taught at a level comparable with that of other subjects	**0.66**	-0.16
66.	I have enjoyed studies of religion courses in R.E.	**0.83**	0.24
67.	Assignments and assessment in R.E. are necessary	**0.71**	-0.20
68.	Written work in R.E. helps me to understand religion	**0.74**	-0.15
% variance		48.29	9.58
Cumulative variance		48.29	57.86
Eigenvalue		8.21	1.63

Note. Variables with factor loadings of equal to or larger than |0.40| are bolded; * = the negative item was reverse coded.

B. Rasch model analysis

The data were next subjected to Rasch analysis to confirm dimensionality. The eigenvalue of the unexplained variance in first contrast for the scale was 2.4, which was above the cut-off value of 2 (Linacre, 2013), indicated the multi-dimensionality of the scale and the results. The results from both the exploratory factor analysis and Rasch analysis showed that the 'student attitude to religious education' scale was multi-dimensional and modification of the scale was needed.

C. Modification of the scale to establish its undimensionality

Items 56, 61, 62, 67 and 68, which were shown to be the source of the second factor, were removed from the scale. The modified 'student attitude to religious education' scale was analysed for dimensionality. After removing the items from the scale, the Kaiser-Meyer-Olkin measure of sampling adequacy index was 0.95, and the Bartlett's test of sphericity achieved a statistically significant level ($\chi^2(66) = 2512.88$, $p<0.001$). These indices indicated that the data of this modified scale were suitable for exploratory factor analysis. All items fall into one single factor in the exploratory factor analysis as only one factor has an eigenvalue greater than one. Table 3.28 summarizes the factor analysis results. The factor accounted for 58.22% of variance in the data. The factor loadings ranged from 0.65 to 0.86, with item '54 R.E. classes have been interesting', having the highest factor loading of 0.86. The results of the exploratory factor analysis supported the use of the modified scale to measure student attitude to religious education.

Table 3.28

Pattern Matrix of Factor Analysis of the Modified 'Student Attitude to Religious Education' Scale (n = 3334)

Item	Factor 1
52. I have enjoyed R.E. classes this year	**0.82**
53. The study of other religions has helped me to appreciate my own religion	**0.73**
54. R.E. classes have been interesting	**0.86**
55. R.E. classes are related to real life and to my needs	**0.78**
57. If R.E. classes were voluntary, I would still attend them	**0.78**
58. This school has a good programme in my form	**0.80**
59. More emphasis should be placed on knowledge and content in R.E.	**0.67**
60. R.E. classes are taken seriously by students	**0.75**
63. R.E. teachers allow sufficient time for discussion	**0.70**
64. R.E. classes are well prepared and taught	**0.76**
65. R.E. subject is taught at a level comparable with that of other subjects	**0.65**
66. I have enjoyed studies of religion courses in R.E.	**0.84**
% variance	58.22
Cumulative variance	58.22
Eigenvalue	6.99

Note. Variables with factor loadings of equal to or larger than |0.40| are bolded.

The data were next subjected to Rasch analysis to confirm dimensionality. The eigenvalue of the unexplained variance in first contrast for the scale was 2.0, which was equal to the cut-off value of 2 (Linacre, 2013), indicating unidimensionality of the scale. The results from both the exploratory factor analysis and Rasch analysis showed that the modified 'student attitude to religious education' scale was unidimensional.

3.5.6.4 Psychometric properties

The psychometric properties of the modified 'student attitude to religious education' scale were analysed using Rasch measurement and classical test theory. The results from both the Rasch model and classical test theory analysis, which are discussed in more detail in the following paragraphs, indicated that the modified scale for the variable 'student attitude to religious education' was

reliable to measure student attitude to religious education in Catholic secondary schools of Hong Kong.

A. Rasch model analysis

(a) At the item level

Item fit statistics of the modified 'student attitude to religious education' scale are reported in Table 3.29 to show how well the data matched the Rasch model. Infit and outfit MNSQ for all the items were within the accepted range of 0.5 – 1.5. Inspection of point-measure correlation values of the items, ranged from 0.65 to 0.83, in Table 3.29 found that the items correlated well with each other.

Table 3.29

Item Difficulty, Standard Error, Infit and Outfit Statistics and Point-measure Correlation for the Items of the Modified 'Student Attitude to Religious Education' Scale

Item	Participant's Response			
	Item Difficulty	Infit (MNSQ)	Outfit (MNSQ)	Point-measure Correlation
52. I have enjoyed R.E. classes this year	-0.28 (0.03)	0.97	0.96	0.80
53. The study of other religions has helped me to appreciate my own religion	0.25 (0.03)	1.00	1.00	0.72
54. R.E. classes have been interesting	-0.08 (0.03)	0.81	0.78	0.83
55. R.E. classes are related to real life and to my needs	-0.15 (0.03)	1.02	0.99	0.77
57. If R.E. classes were voluntary, I would still attend them	0.59 (0.03)	0.96	0.97	0.76
58. This school has a good programme in my form	-0.05 (0.03)	0.78	0.74	0.78
59. More emphasis should be placed on knowledge and content in R.E.	0.03 (0.03)	1.15	1.10	0.66
60. R.E. classes are taken seriously by students	0.48 (0.03)	1.02	1.02	0.73
63. R.E. teachers allow sufficient time for discussion	-0.25 (0.03)	1.11	1.05	0.69
64. R.E. classes are well prepared and taught	-0.62 (0.03)	0.92	0.88	0.75
65. R.E. subject is taught at a level comparable with that of other subjects	0.16 (0.03)	1.26	1.26	0.65
66. I have enjoyed studies of religion courses in R.E.	-0.09 (0.03)	0.92	0.88	0.82

Note. MNSQ stands for 'mean square'.

(b) At the scale level

From Table 3.30, the high value of item reliability index, 0.99, indicated that the items making up the scale were internally consistent. A review of the Rasch person reliability index for the scale indicated that the scale, with an index value of 0.91, reached adequate level of internal reliability. Both person and item separation indices were at least 0.91. To conclude, results from Rasch analysis showed high reliability of the modified 'student attitude to religious education' scale.

Table 3.30

Cronbach's Alpha and Rasch Reliabilities of the Modified 'Student Attitude to Religious Education' Scale (3283)

No. of items	Cronbach's Alpha		Rasch Measurement		
			Separation Coefficient	Reliability Index	Range of point-measure Correlation
12	0.93	Person	3.21	0.91	0.65 - 0.83
		Item	11.78	0.99	

Note. Estimated standard error of the parameter in brackets.

(c) At the category level

Table 3.31 shows that the average measure increased monotonically across the rating scale categories. Infit and outfit MNSQ statistics of the five category labels were acceptable and within the accepted range of 0.5 – 1.5. The step measure for the modified 'student attitude to religious education' scale functioned as expected. This indicated that the category of the modified 'student attitude to religious education' scale functioned normally.

Table 3.31

Category Functioning Statistics of the Modified 'Student Attitude to Religious Education' Scale

Category Label[a]	Average Measure	Infit (MNSQ)	Outfit (MNSQ)	Step Measure
1	-2.53	1.07	1.11	NONE
2	-1.28	0.96	0.92	-2.57
3	-0.10	0.83	0.88	-2.09
4	1.30	0.93	0.85	1.34
5	2.58	1.31	1.25	3.32

Note. MNSQ stands for 'mean square'. [a]Category Label (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

B. Classical test theory analysis on the reliability of the scale

From Table 3.30, the Cronbach's Alpha coefficient, 0.93, of the modified 'student attitude to religious education' scale indicated that the reliability of the scale was high.

3.5.7 The finalized scales of ASTS instrument that measures the variables

The discussion in Sections 3.5.1 through 3.5.6 showed that: (1) irregularities and complications occurred on reliability, unidimensionality and validity of the scales 'student morale', 'student attitude to discipline' and 'student attitude to religious education', and modifications were made; and (2) due to the limited number of items, poor quality and low reliability, the scale 'student attitude to religion' was removed from the ASTS instrument. Finally, five variables were investigated in the present research: (1) student relationship with teachers; (2) student morale; (3) student perception of the principal; (4) student attitude to discipline; and (5) student attitude to religious education. The dimensionality and reliability of the five finalized scales of the ASTS instrument that measured the five variables were all within acceptable ranges. The five finalized scales with the items of the ASTS instrument are shown in Table 3.32.

Table 3.32

The Finalised scales with items of the ASTS instrument

Item
Scale: student relationship with teachers (11 items) (Cronbach's Alpha = 0.91)
14. Teachers are well qualified and have good teaching skills
16. Teachers in this school show a good deal of school spirit
18. Teachers know students as individuals at this school
22. Teachers give the impression they want to be part of the school community
23. Teachers have a professional attitude towards their teaching
24. Teachers carry out their work with energy and pleasure
30. Teachers take a personal interest in me
38. Most teachers give students sufficient encouragement
41. If students have difficulty with their school work, teachers give up their time
43. Teachers show that people are more important than rules
47. Teachers here are caring and willing to assist students who need help
Scale: student morale (11 items) (Cronbach's Alpha = 0.90)
13. Students here think a lot of their school
19. This school has a good academic name in the local community
26. Adequate counselling help is available to students
27. Everyone has a lot of fun at this school
28. A good spirit of community exists amongst students of your form
31. I have been happy at school
34. Students at this school do not mind wearing the school uniform
37. Everyone tries to make you feel at home at this school
44. My experience of this school has been a happy one
48. I am happy to be a student at this school
50. There is happy atmosphere in this school
Scale: student perception of the principal (5 items) (Cronbach's Alpha = 0.82)
20. I can approach the Principal for advice and help
29. The Principal ensures that the school provides a good education to students
39. The Principal encourages a sense of community and belonging in the school
46. The Principal places importance on the religious nature of the Catholic school
51. The Principal provides good leadership of the school community
Scale: student attitude to discipline (5 items) (Cronbach's Alpha = 0.64)
15. Students here know the standard of conduct expected of them
17. Students are given sufficient freedom here
25. Discipline presents no real problems in this school
40. There are ways to have school rules changed if most students disagree with them
42. There are too many rules which restrict students' freedom
Scale: student attitude to religious education (12 items) (Cronbach's Alpha = 0.93)
52. I have enjoyed R.E. classes this year
53. The study of other religions has helped me to appreciate my own religion
54. R.E. classes have been interesting
55. R.E. classes are related to real life and to my needs
57. If R.E. classes were voluntary, I would still attend them
58. This school has a good programme in my form
59. More emphasis should be placed on knowledge and content in R.E.
60. R.E. classes are taken seriously by students
63. R.E. teachers allow sufficient time for discussion
64. R.E. classes are well prepared and taught
65. R.E. subject is taught at a level comparable with that of other subjects
66. I have enjoyed studies of religion courses in R.E.

3.6 Ethical issues of the study

Concerning the ethical issues for this research, approval was sought from the Human Research Ethics Committee of the Hong Kong Institute of Education. An application form for an Ethical Review was submitted to the Committee. While this study was not expected to inflict physical or psychological harm on the participants or place the participants in danger, in order to prevent or minimize unpredictable occasions for harm, all procedures including developing instruments were carefully administered.

Implicit ethical issues in this study were resolved by the Human Research Ethics Committee of the Hong Kong Institute of Education (see Appendix D for Letter of Approval for Ethical Review from HKIED). Verbal approval from the Episcopal Delegate for Education of the Catholic Diocese of Hong Kong and official approvals from the participating schools' principals were also requested. Issues most likely to cause concern were those of confidentiality, privacy and consent to use the research data. A letter requesting cooperation in this study, together with a consent form, information sheet and sample questionnaires were sent to participating schools requesting formal approval for this study (see Appendix E and Appendix F for details). Each school principal was informed of the "the purpose of this study", and that "all data related to participants will remain confidential, and will be identifiable by codes known to the researcher", "data will be used exclusively for the study and will not be used for any other purpose", and "participants have a right to withdraw at any time". Information sheet and consent form inviting students' participation in this study were

distributed to students and parents through the schools asking for consent for this study (see Appendix F and Appendix H for details).

3.7 Research procedures of the study

Before the research was conducted to collect data in the schools, a pilot test was performed. This section presents the pilot study (Section 3.7.1) and the data collection procedure for the main study (Section 3.7.2).

3.7.1 Pilot study

Once the ethical issues of this study were resolved by the Human Research Ethics Committee of the Hong Kong Institute of Education, the researcher administered questionnaires to a sample school for pilot tests. The purposes of the pilot test were to ensure standard instruction procedures, to refine the content and wording of the instrument, and to test the reliability of these instruments. The initial draft of the Chinese ASTS instrument, as shown in Appendix A, was trialled in a group (n = 91) of S3 male students who were not part of the present study. Cronbach's alphas (α) were computed for testing internal consistencies within these instruments.

As shown in Table 3.33, Cronbach's alpha coefficient of the six scales, student relationship with teachers, student morale, student perception of the principal, student attitude to discipline, student attitude to religion and student attitude to religious education, were all above the 0.5 cut-off value for dissertation research, indicating an acceptable level of reliability (Hair, Black,

Babin, Anderson, & Tatham, 2006). To conclude, the reliability of the six

scales was all within the acceptable level and could be used in the present study.

Table 3.33

Descriptive Statistics and Reliabilities of the Scales of the Initial Draft of ASTS Instrument

Scale[a]	No. of items	No. of participants	Scale Mean[b]	α
Student relationship with teachers	11	91	3.20(0.84)	0.94
Student moral	13	91	3.08(0.81)	0.92
Student perception of the principal	5	91	2.94(0.90)	0.88
Student attitude to discipline	7	91	2.83(0.73)	0.68
Student attitude to religion	3	91	3.07(0.83)	0.66
Student attitude to religious education	17	91	3.03(0.71)	0.92

Note. Estimated standard error of the parameter in brackets. α = Cronbach's Alpha coefficient.
[a] Correlation of the scales to the questions was based on Flynn and Moks' instrument (Flynn & Mok, 2002); [b] Possible range of the scale was 1 to 5, higher scores represented more positive attitude.

Upon receiving comments and suggestions from the participants, one

question, asking the year level of the participants, was added as item 2 in the

questionnaire. In addition, four items were reorganized to enhance clarity and

readability of the instrument.

3.7.2 Data collection procedures of the study

As the research was performed in the schools, information sheets were

distributed prior to commencing the research. Each participant was informed as

to "the purpose of this study", and that "data will be used exclusively for the

study and will not be used for any other purpose", "all data related to

participants will remain confidential, and will be identifiable by codes known to

the researcher" and "participants have a right to withdraw at any time". Data

collection forms were then administered to participants who remained

anonymous. Alternatively, pseudonyms were used in place of the actual names of individuals or schools.

For the sake of accuracy and confidentiality, an expert company was selected for the distribution and collection of the questionnaires and related documents. Confidentiality was stressed and iterated to the staff of the company handling the questionnaires. The instruments and the students' information sheet were administered directly to the sample students by their class teachers. The class teachers were required to collect the completed questionnaires and put them into the provided paper bags. The paper bags were then sealed by the class teachers concerned. The company was responsible for the collection of the completed questionnaires and data capturing. Immediately upon completion of the data capturing process, the completed questionnaires were locked in a store room which was reserved for this purpose. The store room was actually in the researcher's home, and no one, other than the researcher, could access the room.

3.8 Analysis methods to address the research questions

The first step in the investigation of the students' attitudes towards their schools was to conduct the Rasch analysis and descriptive analysis. The descriptive statistics of the scales and their items were expected to unveil the underlying structure and patterns of the students' responses of their school experiences which, in turn, would manifest the features of the components of the four dimensions of school culture. It is the special features of these

components that make up the unique characteristics of the culture of Catholic secondary schools in Hong Kong. The technique involved the computation of descriptive statistics, using SPSS (version 21), such as frequency distribution, means and standard deviations for the items and scales. The Rasch analysis yielded the Wright map, which could give information on the distribution of the participants' scores and each item's difficulty (Linacre, 2013). The second step was the multilevel analyses of the attitudes of the students towards their schools and the effects of gender, school type and religious background on them, using MLwiN (version 2.26). Then, the interaction effects between these predictors were examined. The discussion in this section includes descriptive analysis (Section 3.8.1), Rasch analysis (Section 3.8.2), multilevel analysis of the effects of gender, school type, and religious background and the interactions of these predictors (Section 3.8.3), and the assessment of the multicollinearity of the variables, gender, school type and religious background (Section 3.8.4).

3.8.1 Descriptive analysis on the attitudes of students towards their school

Results of the descriptive statistics of the items of the five scales and the mean scores of each scale were obtained using the statistical program, SPSS (version 21) from raw data. A mid-value mean score of 3 on the scales indicated the participant's neutral attitude to the item. For values larger than 3, the larger the value, the higher the degree the participant agreed with the item. For values

less than 3, the lower the value, the higher the degree the participant disagreed with the item.

3.8.2 Rasch analysis on the attitudes of students towards their school

The Rasch measurement gives a Wright map (Linacre, 2013), which shows the estimation and distribution of the participants' scores on the left side, and the item difficulty on the same logit scale on the right side. The left-hand side of the plot shows the participants' responses and the right-hand side shows the item difficulty for each expected score zone. Participants with higher scores and items with more difficulty in each score zone are located at a higher position on the map. Participants showing lower scores and items with less difficulty in each score zone are displayed in the lower portion of the plot (Linacre, 2013). Effective targeting occurred when the participants' scoring was evenly distributed (Boone & Scantlebury, 2006).

3.8.3 Multilevel analysis of the effects of gender, school type, religious background and the interactions of these predictors on the attitudes of students towards their school

In the present study, multilevel analysis was used to investigate the effects of gender, school type, religious background and the interaction of these

predictors on the students' attitudes towards their school. The computer program MLwiN (version 2.26) (Rasbash, Steele, Browne, & Goldstein, 2012) was used to conduct the analysis. The following sections will discuss the reasons for using multilevel analysis (Section 3.8.3.1), multilevel analysis using plausible values (Section 3.8.3.2), building a hierarchical structure for the multilevel model (Section 3.8.3.3), and the development of a suitable model for the multilevel analysis of students' attitudes towards their school (Section 3.8.3.4).

3.8.3.1   Reasons for using multilevel analysis

Multilevel analysis was needed to explain the individual level outcomes with school level characteristics (Goldstein, 2011; Hox, 2002). The reasons for using multilevel analysis in the present study are two-fold. First, research on school culture always involves data collected at two or more levels and, in turn, such data are inherently hierarchical in character (Flynn & Mok, 2002). In the present study, S1 to S3 students in the sample Catholic secondary schools form the focus of the investigation. In this sense, students are nested in schools. The collected data can be interpreted as coming from two levels, namely the individual student and the school level. In the present study, the data will be interpreted from two levels, i.e. students nested within schools, but not three levels, i.e. students nested within classes and classes within schools. The reason for this is that students from different classes in a school develop in the same learning environment (school culture) and under the custody of the same group of teachers and staff and, thus, are expected to have similar school life

experiences. This clustering effect would lead to a situation whereby some clusters within a higher level will tend to share more similarities with each other, than with those not in the same higher level (Hox, 1995). The development of a student's attributes, such as values, beliefs, moral code, attitude and behaviour, does not takes place in isolation, but is simultaneously influenced by the school to which he or she is attached. As a result, the average correlation between variables measured on students from the same school, i.e. the intraclass correlation, will be higher than the average correlation between variables on students from different schools. In this regard, students from the same school, which has a distinctive culture different from other schools, are expected to have more similar school life experiences than those from other schools. Thus, the students' responses to the questionnaire in the present study reflected their influences at the level of their school. Rasbash et al. (2012) pointed out that an analysis without recognition of the existence of clustering, such as a student level analysis with no school term, would cause a serious problem of underestimating the standard errors of regression coefficients. Multilevel modelling is an efficient and effective way to fix this problem. Goldstein (2011) pointed out that, upon modelling the manner in which students are grouped within schools, estimates of regression coefficients are more statistically efficient, making it possible to study the extent to which schools differ from the responses of students with different backgrounds.

Second, the strength of multilevel modelling, compared to the classical test theories such as the ANOVA, is its ability to estimate between-group variation, while also including group-level covariates in an attempt to explain between-

group variation (Rasbash et al., 2012). Moreover, it also ensures that the relationships between the predictors and the dependent variables were tested at the same level as they were interpreted.

With a view to estimating the proportion of variance in each of the predictors explained by each school on school culture, multilevel analysis was employed. Two hierarchical levels, student level and school level, were considered. The students' gender and religious background were the two student-level predictors, and school type was the school-level predictor.

3.8.3.2 Multilevel analysis using plausible values

In the present study, there are 18 schools in the school level, with an average of 193 students in each school, which is consistent for sampling with an acceptable power described in the multilevel literature (Raudenbush & Liu, 2000). The five sets of plausible values for each scale of the ASTS instrument produced by ConQuest (Wu, Adams, & Wilson, 2007) were used to indicate participant's attitudes and used as data for the multilevel analysis. Calculating statistics five times using the five sets of plausible values can incorporate the measurement error into the analysis and, thus, produce unbiased estimates (OECD, 2009; Wu et al., 2007). With a view to enhancing the accuracy of the results, all the multilevel analyses in the present study were performed using the five sets of plausible values. Only the results of all five plausible value sets meeting the level of significance would be considered valid for that measure.

The major analytic technique employed was logistic regression, using MLwiN (version 2.26) software (Rasbash et al., 2012). This program allows for

estimations whereby the responses within a school, i.e. within a cluster, are not independent and, thus, are more likely to be more homogeneous than between schools. The parameters were estimated using the iterative generalized least squares (IGLS) method (Rasbash et al., 2012). All possible interaction effects were examined to look at the possibility of any interaction among the predictors.

3.8.3.3 Building a hierarchical structure for the multilevel model

To start the discussion of a multilevel model, a multilevel model with no predictors, i.e. an empty or unconditional model, is explained in the first instance. An unconditional model is a multilevel regression analysis used to estimate whether there are any variations between upper level units. Taking the scale 'student relationship with teachers' as a dependent variable for illustration, an unconditional model with a two-level structure is represented by equation (3.1) (Luke, 2004; Rasbash et al., 2012):

$$\text{Level 1: } y_{ij} = \beta_{0j} + e_{ij}$$

$$Level\ 2: \beta_{0j} = \beta_0 + u_{0j}$$

$$u_{0j} \sim N\ (0, \sigma_{u0}^2)$$

$$e_{ij} \sim N\ (0, \sigma_e^2) \tag{3.1}$$

Where

y_{ij}– dependent variable, i.e. the scale, student relationship with teachers, for student i in school j;

β_{0j}– intercept coefficient, i.e. mean value for school j;

β_0 – intercept term, i.e. mean value of dependent variable across all subjects in all schools;

e_{ij} – level 1 residual error term, student effects, represents variability between students within a school;

u_{0j} – level 2 residual error term, school effects, represents variability between schools;

σ_{u0}^2 – variance between schools;

σ_e^2 – variance between students within a school.

Equation (3.1) represents a two-level hierarchical structure with students at level 1 nested within schools at level 2. This model is also termed a variance components model because the residual variance is partitioned into components, which are assumed to be mutually independent, corresponding to each level in the hierarchy (Goldstein, 2011; Rasbash et al., 2012). In equation (3.1), β_{0j} forms the fixed part of the model; u_{0j} and e_{ij} form the random part of the model and these two values are random quantities whose means equal zero, usually following a normal distribution with variances of σ_{u0}^2 and σ_e^2, respectively.

The first step in building a multilevel model was to decide which level of analysis in each scale of the ASTS instrument should be performed. A formal and empirical evidence for assessment was provided by a correlation coefficient, the intraclass correlation coefficient, where "class" can be replaced by any group. Luke (2004) stated that the intraclass correlation coefficient measures the proportion of variance in the dependent variable that is accounted for by

groups, i.e. level 2 unit, and the equation for the intraclass correlation coefficient is given as follows:

$$\text{intraclass correlation coefficient} = \frac{\sigma_{u0}^2}{\sigma_{u0}^2 + \sigma_e^2} \tag{3.2}$$

The values of the terms, σ_{u0}^2 and σ_e^2, should be obtained by the variance components model as shown in equation (3.1). The intraclass correlation coefficient can also be interpreted as the estimated proportion of group level variance compared to the estimated total variance (Hox, 1995). If the intraclass correlation coefficient is 0.05 or more, the hierarchical data structure should not be ignored. However, one-level models should be considered if the intraclass correlation coefficient is smaller than 0.05 (Escobar, Alarcón, Blanca, Fernández-Baena, Rosel, & Trianes, 2013).

Design effect is another index for the indication of the presence of the hierarchical data structure. Conceptually, design effect is the squared standard error when a multilevel design is used divided by the squared standard error when a standard design is used (Rowe, Lama, Onikpo, & Deming, 2002). Muthen and Satorra (1995) stated that design effect equals:

$$\text{Design effect} = 1 + (\text{cluster sample size - 1}) \text{ x ICC} \tag{3.3}$$

Where ICC = intraclass correlation coefficient.

Many researchers undertake multi-level modelling when the design effects exceed 2 (Muthen & Satorra, 1995). Instead of using the intraclass correlation coefficient, researchers prefer the design effect as an indicator for multilevel modelling (Muthen & Satorra, 1995).

3.8.3.4 Development of a best-fitting model for multilevel analysis of students' attitudes towards their school

The purpose of multilevel modelling in the present study was to investigate the effects on the students' attitudes towards their schools once controls were introduced for individual-related correlates of students' attitudes towards their schools. The student-level predictors are gender (male, female) and religious background (Catholic, Christian, religion other than Catholic and Christian, no religion), and the school-level predictor is school type (coeducational school, single-sex school). All three predictors were transformed into categorical variables. 'Male', 'coeducational Catholic secondary school' and 'Catholic' are designated as the reference categories. The coding system for the two predictors was: gender (0 = male, 1 = female) and school type (0 = co-educational Catholic secondary school, 1 = single-sex Catholic secondary school). Dummy codes were used for the four-category religious background variable, assigning 1 if the individual belonged to a specific category or 0 to the remaining categories. The three dummy variables created for religious background are: religious background (Christian), religious background (religion other than Catholic and Christian), and religious background (no religion).

The present study focused on the general picture of the effects, including the interaction effects, of these predictors on students' attitudes towards their school. These effects are assumed to be homogeneous across the school level. In this regard, a random intercept model, a more suitable model in multilevel analysis for the design, was used in the present study. In the random intercept model, the means of the dependent variables are allowed to vary when the

predictors are introduced into the model, but the slopes are not allowed to vary because the effect of each predictor is homogenous across the school level. The procedures for each of the five sets of data for establishing multilevel modelling are listed as follows:

1. Unconditional model, as discussed in Section 3.8.3.3, is established to determine the hierarchical structure for the multilevel model;

2. Predictors, gender, school type, and the dummy variables of religious background are introduced into the model as fixed and random effects, followed by all possible interactions. The likelihood ratio test is used to estimate the drop in deviance of the model that includes all the predictors with respect to the respective unconditional model. Its statistic has a chi-square (χ^2) distribution, with the number of degrees of freedom being equal to the difference in the number of parameters of the two models. If the inclusion of the predictors significantly decreased the deviance and a significant value of χ^2, i.e. at the $p = .05$ level, could be attained, this indicates that at least one of the predictors in the model significantly explains the dependent variable (Goldstein, 2011; Hox, 2002; Luke, 2004). The school-level variance was also checked by computing the t-ratio. The significance of the t-ratio indicated that, after controlling for gender, school type, religious background of the students and the interaction of these predictors, significant between-school variances existed in the dependent variable. The conditional intraclass correlation is then calculated to measure the proportion of variance of the schools accounted for by the variability of the dependent variable after controlling for all predictors in

the model.

3. The predictors and the interactions of these predictors that were not significant by means of the *t*-ratio were removed from the model. Based on the results, the finalized best-fitting model with significant predictors and interactions of these predictors could then be determined. The best-fitting model was further affirmed with the value of the increase in the deviance, i.e. chi-square (χ^2), after the exclusion of insignificant predictors and interactions from the full model. Insignificance of the chi-square value indicates that the removed predictors and interactions were not significant to explain the students' attitudes towards their schools.

3.8.3.5 Analysis of the effects of gender, school type, religious background, and the interactions of these predictors on the attitudes of students towards their school

Multilevel analysis of the finalized best-fitting random intercept model with significant predictors and interactions was performed to determine the extent the predictors and interactions of these predictors explain the variability in students' attitudes towards their school. Upon the introduction of these predictors and interactions into the model, the mean of the dependent variable, i.e. each of the five scales of students' attitudes towards their school, was allowed to vary, but the slopes were not allowed to vary because the effect of each predictor and interaction is assumed to be homogenous across the school level. To indicate the statistical significance of the mean difference for each comparison, *t*-ratios are used. A significant value of *t*-ratio, i.e. at the *p* = .05

level, indicates that the estimated mean difference of that category of predictor or interaction is significantly different from the reference category, suggesting an attitude difference within the independent group, i.e. the predictor or interaction of the predictors among the participants.

As the predictors may include two-way and even three-way interactions, inspection of the significance of individual predictors was started from the highest level of interaction, i.e. gender by school type by religious background. If a three-way interaction effect was significant, lower level effects of individual predictors were neglected. If not, two-way interaction effects were then inspected. If any of the two-way interaction effects was significant, the main effects of individual predictors were neglected. If none of the interaction effects were significant, the main effects of the individual predictors were interpreted.

Conclusively, the multilevel analysis (Goldstein, 2011) on the effects of gender, school type, and religious background, and their interactions on each of the five scales of the attitudes of the students towards their school, 'student relationship with teachers', 'student morale', 'student perception of the principal', 'student attitude to discipline' and 'student attitude to religious education', were conducted in three steps. First, five sets of plausible values (Wu, 2005) were generated using ConQuest software (Wu et al., 2007). Analyses for the next two steps were repeated for each set of plausible values. The averaged values across these five sets were reported. In the second step of the analysis, an unconditional model with no predictors was fitted to the Rasch measures of student morale. This step aimed to identify the proportion of

between-schools variance to the total variance of the scale. The third step of the analysis was to fit a full model to the Rasch measures by including student gender and religion as student-level predictors, and school-type as a school-level predictor. The interaction between these predictors was also included in the full model. This step was preceded by checking whether or not the predictors had multicollinearity issues (Stern, 2010). The tasks that followed aimed to identify if student gender, religion, and school-type had any effect on the scale. The full and null models were compared using the change in deviance (Goldstein, 2011; Hox, 2002; Luke, 2004) to ascertain whether the predictors were collectively effective, and the statistical significance of the main and interaction effects of each predictor was inspected for their individual effect on the scale.

3.8.4 Multicollinearity assessment of the variables: gender, school type and religious background

Before multilevel analysis of the effects of gender, school type and religious background on students' attitudes towards their school was conducted, a multicollinearity assessment was performed to confirm that there was no correlation among the independent variables, gender, school type, and religious background of students. Multicollinearity refers to correlations among the independent variables only. It has detrimental effects on regression analysis and may even cause the results to be unexplainable (Pedhazur & Schmelkin, 1991).

The variance inflation factor is an index to help detect multicollinearity. The variance inflation factor, produced by performing linear regression analysis using SPSS (version 21), measures whether the amount of variances of the estimated coefficients increased over the case of no correlation among the independent variables, when linear regression was performed (Hinton, 2004; Norusis, 2008). If no two independent variables are correlated, all the variance inflation factors should be 1. However, if the variance inflation factor of any one of the independent variables is greater than 10.00, then there is multicollinearity associated with that variable (Stern, 2010).

CHAPTER 4

RESULTS

This chapter presents results of the analysis addressing the research questions. The chapter begins with descriptions of the demographic characteristics of the participants' backgrounds (Section 4.1). This is followed by six sections on the attitudes of students towards their school, namely, student relationship with teachers (Section 4.2), student morale (Section 4.3), student perception of the principal (Section 4.4), student attitude to discipline (Section 4.5), student attitude to religion (Section 4.6) and student attitude to religious education (Section 4.7). For Sections 4.2 to 4.5 and 4.7, the findings from three sets of analyses using multilevel analysis are presented, as follows: (1) descriptive statistics on the distribution of students' attitudes at the item level; (2) distribution of the Rasch item measures against the Rasch person measures on an attitude scale using the Wright map (Linacre, 2013); and (3) the effects of student gender, school type and religious background, and the interaction of these predictors, on students' attitudes towards school. For Section 4.6, descriptive statistics on the distribution of students' attitudes at the item level were discussed. The chapter ends with an overview of the findings for the study research questions regarding the culture of the Catholic secondary schools in Hong Kong (Section 4.8).

4.1 Demographic characteristics of the participants' background information

This part presents the demographic characteristics culled from the participants' background information. In the following sections, demographic characteristics of participants' personal information (Section 4.1.1) and participants' parents and home information (Section 4.1.2) are reported.

4.1.1 Demographic characteristics of participants' personal information

The sample comprised 3,478 students with slightly more males (55.84%) than females (44.16%). The majority had no religion (71.48%), and a relatively small percentage of the students were Catholic (11.53%) or Christian (9.95%). The students were evenly distributed in the three year levels, with 33.84% for S1, 32.78% for S2 and 33.38% for S3. The majority of the participants were born in Hong Kong (72.51%). With regard to the degree of importance that religion played in their life, the students mainly considered that it was either of some importance (33.47%), not very important (21.48%) or of no importance at all (20.8%). Details of these demographic characteristics are shown in Table 4.1.

Table 4.1

Demographic Characteristics of Student Participants

Student demographic characteristics	Frequency	% of total sample size of 3478
Gender		
Male	1942	55.84%
Female	1536	44.16%
Religion		
Catholic	401	11.53%
Christian	346	9.95%
Non-Christian religion	152	4.37%
No religion	2486	71.48%
Missing	93	2.67%
Year level		
Secondary 1	1177	33.84%
Secondary 2	1140	32.78%
Secondary 3	1161	33.38%
Place of birth		
In Hong Kong	2522	72.51%
In Mainland China	780	22.43%
In Macau	4	0.12%
In an Asian country	43	1.24%
Others	73	2.10%
Missing	56	1.60%
Degree of importance of religion in student's life		
Of no importance at all	725	20.85%
Not very important	747	21.48%
Of some importance	1164	33.47%
Fairly important	585	16.82%
Very important	233	6.70%
Missing	24	0.68%

4.1.2 Demographic characteristics of participants' parents and home information

As shown in Table 4.2, the students' fathers were mainly born in Hong Kong (59.29%) and Mainland China (32.43%). The majority of the parents had no religion (78.46% for father, 70.70% for mother) and only a small percentage of the parents were Catholic (4.77% for father, 6.53% for mother). More than

40% of the parents reached the senior secondary level (41.46% for the father, 44.97% for the mother) and about one-quarter of the parents ended their education at junior secondary level (24.44% for the father, 24.21% for the mother). The majority of the students were living at home with their parents (83.93%). More than half of the family did not have religious pictures or objects displayed at home (56.27%).

Table 4.2

Demographic Characteristics of Students' Parents and Home Information

Parental demographic characteristics and home background	Frequency	% of total sample size of 3478
Father's place of birth		
In Hong Kong	2062	59.29%
In Mainland China	1128	32.43%
In Macau	43	1.24%
In an Asian country	114	3.28%
Others	69	1.98%
Missing	62	1.78%
Father's religious affiliation		
Catholic	166	4.77%
Christian	142	4.08%
Non-Christian religion	398	11.45%
No religion	2729	78.46%
Missing	43	1.24%
Mother's religious affiliation		
Catholic	227	6.53%
Christian	240	6.90%
Non-Christian religion	498	14.32%
No religion	2459	70.70%
Missing	54	1.55%
Father's final level of education		
Does not receive formal education	81	2.33%
Primary level	348	10.00%
Junior secondary level	850	24.44%
Senior secondary level	1442	41.46%
Tertiary level or above	619	17.80%
Missing	138	3.97%
Mother's final level of education		
Does not receive formal education	112	3.22%
Primary level	396	11.39%
Junior secondary level	842	24.21%

Senior secondary level	1564	44.97%
Tertiary level or above	459	13.20%
Missing	105	3.01%
Parents' marital status		
Both the parents are living at home	2919	83.93%
One of the parents has died	106	3.05%
Both the parents have died	9	0.26%
The parents are divorced	306	8.80%
The parents are separated	96	2.76%
Missing	42	1.20%
Display of religious pictures or objects (e.g. Cross, holy pictures, books, etc.) at home		
Yes	1463	42.06%
No	1957	56.27%
Missing	58	1.67%

4.2 Student relationship with teachers

This section aims to answer research question 1, which inquired about the student relationship with teachers in the Catholic secondary schools of Hong Kong.

4.2.1 Descriptive statistics on attitudes towards student relationship with teachers

Eleven items were constructed to measure students' attitudes towards teachers in the Catholic secondary schools of Hong Kong. The students indicated their attitudes by choosing one of five options (strongly disagree, disagree, neutral, agree and strongly agree). Table 4.3 presents the students' responses to the 11 items. The items are arranged in descending order of endorsement by the students. That is, the more positive attitudes are arranged at the top of the table.

Table 4.3

Descriptive Statistics on the 'Student Relationship with Teachers' Scale (n = 3357)

	Student relationship with teachers	% SD	% D	% N	% A	% SA	mean[a]
41.	If students have difficulty with their school work, teachers give up their time	4%	6%	36%	41%	14%	3.54
47.	Teachers here are caring and willing to assist students who need help	3%	5%	40%	40%	12%	3.53
23.	Teachers have a professional attitude towards their teaching	3%	6%	39%	43%	10%	3.52
14.	Teachers are well qualified and have good teaching skills	2%	6%	41%	44%	7%	3.48
16.	Teachers in this school show a good deal of school spirit	3%	7%	42%	40%	8%	3.43
30.	Teachers take a personal interest in me	5%	7%	44%	35%	9%	3.35
22.	Teachers give the impression they want to be part of the school community	3%	7%	51%	32%	7%	3.32
24.	Teachers carry out their work with energy and pleasure	4%	11%	44%	33%	8%	3.29
38.	Most teachers give students sufficient encouragement	5%	9%	45%	35%	6%	3.28
18.	Teachers know students as individuals at this school	4%	9%	48%	33%	6%	3.27
43.	Teachers show that people are more important than rules	6%	9%	55%	24%	7%	3.16
	Average Response	4%	8%	44%	36%	8%	3.38

Note. SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.
[a] mean value obtained by averaging the responses of all the participants (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

As shown in Table 4.3, of the 11 items, only a very small percentage were allocated to the options of strongly disagree (ranging from 2%–6%, with an average of 4% across the 11 items) and disagree (ranging from 5%–11%, with an average of 8% across the 11 items). The strongly agree option also attracted endorsement from only a small percentage of students (ranging from 6%–14%, with an average of 8% across the 11 items). In comparison, quite a high percentage of students opted for agree (ranging from 24%–41%, with an average of 36% across the 11 items), and neutral (ranging from 36%–55%, with

an average of 44% across the 11 items) options. These results indicate that the students were, in general, not negative in their attitudes towards teacher-student relations and, in fact, between 31% (item 43) and 55% (item 41) held positive attitudes. The proportion of students who indicated that they were neutral (average of 44% across the 11 items) reflected that a relatively large proportion of students either did not have sufficient experience to form an opinion, did not have strong feelings on student-teacher relations in their school or were loath to give their opinion. The slight inclination toward positive attitudes regarding student-teacher relations is further illustrated by the item mean raw scores on the right-most column of Table 4.3. On a scale of 1 to 5, the item means ranged from 3.16 (item 43) to 3.54 (item 41) across the 11 items.

As shown in Table 4.3, the students acknowledged that teachers would give up their time if they were having difficulty with their school work (55% agree/strongly agree). They also thought their teachers had a professional attitude towards their teaching (53% agree/strongly agree) and were caring and willing to assist them when needed (52% agree/strongly agree). However, students were less convinced that teachers wanted to be part of the school community (39% agree/strongly agree) or that they carried out their work with energy and pleasure (41% agree/strongly agree). Worst still, students were less convinced that teachers thought treating the students properly was more important than abiding by the rules (31% agree/strongly agree), or that they knew them as individuals in school (39% agree/strongly agree).

4.2.2 The Wright map of the 'student relationship with teachers' scale

The distribution of Rasch person measure against the Rasch item measure, or the Wright map (Linacre, 2013) is presented in Figure 4.1. An inspection of the Wright map (Figure 4.1) shows that both the item measures and person measures were widely spread and evenly clustered around the mean, suggesting an effective targeting within the student-teacher relations scale. The relative positions of the person mean and item mean showed a good alignment between person and item. The person mean was higher that the item mean, indicating a positive attitude on average of the participants toward student-teacher relations at Catholic secondary schools.

```
INPUT: 3523 PERSON  11 ITEM  REPORTED: 3510 PERSON  11 ITEM  5 CATS WINSTEPS 3.72.3
--------------------------------------------------------------------------------
          PERSON - MAP - ITEM - Expected score zones (Rasch-half-point thresholds)
                 <more>|
    7            .  +
                    |
                    |
                    |
             .   |
    6            .  +
                    |
                    |
             .   |
             .   |
    5               +
             .   |
             .   |
             .   |                                                    Q43 .45
             .   |                                  Q18 .45 Q24 .45 Q38 .45
    4          # T+                                      Q22 .45 Q30 .45
             .# |                                                Q16 .45
             .   |                                  Q14 .45 Q23 .45 Q47 .45
             .# |                                                Q41 .45
             .# |
    3          .# +
             .### |
            .##### |
           .###### S|
    2            .  +
            .##### |
           .###### |                                          Q43 .35
           .###### |
             .   |                         Q18 .35 Q22 .35 Q24 .35 Q38 .35
    1        ###### +                                         Q30 .35
            .##### |                                          Q16 .35
            .##### M|T                          Q14 .35 Q23 .35 Q47 .35
             .   |S                                           Q41 .35
            .##### |
    0        .##### +M
            .##### |
             .   |S
      .############ |T
             .### |
   -1          .## S+                                    Q43 .25
             .## |
             .## |                         Q22 .25 Q24 .25 Q38 .25
             .## |                                        Q30 .25
             .# |                                         Q16 .25
   -2          .# +                         Q23 .25 Q41 .25 Q47 .25
             .# |
             .   |
             . T|                                    Q43 .15
             .   |
   -3          .  +   Q18 .15 Q22 .15 Q24 .15 Q38 .15
             .   |                                   Q30 .15
             .   |                                   Q16 .15
             .   |                    Q14 .15 Q23 .15 Q47 .15
                    |                                   Q41 .15
   -4            .  +
             .   |
             .   |
                    |
                    |
   -5            .  +
                 <less>|
  EACH "#" IS 32. EACH "." IS 1 TO 31
            Scale:Student relationship with teachers
```

Figure 4.1 Wright map of the 'student relationship with teachers' scale

4.2.3 Effects of gender, school type, and religious background on student relationship with teachers

Before the discussion of multilevel analysis, the multicollinearity assessment is reported. The multicollinearity assessment using SPSS (version 21) indicated that the variance inflation factors for the three independent variables of gender, school type and religious background of approximately 1.00 were well below the cut-off value of 10.00 (Stern, 2010). This shows that, upon performing linear regression using student relationship with teachers as a dependent variable, no correlation existed between the three independent variables.

4.2.3.1 Building a hierarchical structure for a multilevel analysis of student relationship with teachers

Table 4.4 shows the results of the unconditional model for each of the five sets of plausible values and the average across the five sets, including coefficients for each parameter, the variance of each level, their standard errors, the intraclass correlation coefficient, the design effect, the deviance (-2 log-likelihood), and the number of significant parameters (fixed and random).

Table 4.4

Summary of Unconditional Model for Student Relationship with Teachers

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.595 (0.082)	7.26**	0.596 (0.082)	7.27**	0.599 (0.085)	7.05**
Random effects						
σ_{0j}^2	0.114 (0.041)	2.78**	0.113 (0.040)	2.83**	0.122 (0.043)	2.84**
σ_e^2	1.565 (0.037)	42.30**	1.551 (0.037)	41.92**	1.543 (0.037)	41.70**
ICC[a]	0.0679		0.0679		0.0733	
Deviance[b]	11623.948		11593.150		11576.729	
Deff [c]	14.22		14.22		15.27	
Parameters	3		3		3	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.600 (0.084)	7.14**	0.599 (0.081)	7.40**	0.598 (0.083)	7.22**
Random effects						
σ_{0j}^2	0.120 (0.043)	2.79**	0.110 (0.039)	2.82**	0.116 (0.041)	2.81**
σ_e^2	1.548 (0.037)	41.84**	1.554 (0.037)	42.00**	1.552 (0.037)	41,95**
ICC[a]	0.0719		0.0661		0.0694	
Deviance[b]	11587.433		11598.288		11595.910	
Deff [c]	15.01		13.87		14.52	
Parameters	3		3		3	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. [a] ICC (intraclass correlation coefficient) = σ_{0j}^2 / ($\sigma_{0j}^2 + \sigma_e^2$); [b] Deviance (-2LL) = negative log likelihood; [c] Deff (design effect) = 1 + (195.7 – 1) * ICC. *p<.05 **p<.01.

As shown in Table 4.4, the results of the five sets of plausible values were very similar. The random effects at both between-school (σ^2_{0j}) and within-school (σ^2_{ej}) levels were statistically significant. The average between-school variance was estimated as 0.116, and the five sets of *t*-ratio of the school-level variance, σ_{0j}^2, showed that the school-level was significant (*t*-ratio ranged from 2.78 to 2.84 across the five sets of plausible values, *df* = 3, *p* < .01). The average variance between-students within schools was estimated as 1.552, and the five sets of *t*-ratio of the student-level variance, σ^2_e, showed that the student-level was significant (*t*-ratio ranged from 41.70 to 42.30 across the five sets of plausible values, *df* = 3, *p* < .01). The intraclass correlation coefficient

values, ranging from 0.0661 to 0.0733 across the five sets of plausible values, were larger than the cut-off value of 0.05 (Escobar et al., 2013). This indicates that schools accounted for an average of approximately 6.94% of the variability of student relationship with teachers. The intraclass correlation coefficient values, i.e. smaller than 8%, showed that between-school variation was small in comparison to the total variation. The design effect values, ranging from 13.87 to 15.27 across the five sets of plausible values, were greater than the cut-off value of 2.00 (Muthen & Satorra, 1995).

To conclude, the significance of the *t*-ratio for school variance, intraclass correlation coefficient value and the design effect value clearly indicate that variations in student relationship with teachers existed between schools, and a two-level model, with students at level 1 nested within schools at level 2, was needed to analyse the students' relationships with teachers.

4.2.3.2 Development of a full model with predictors fitted for the multilevel analysis of student relationship with teachers

Using student relationship with teacher as a dependent variable, all predictors, namely student gender, school type, religious background, and all possible interactions of these predictors, were introduced into the unconditional model to form the full model. The results in Table 4.5 show that the inclusion of all the predictors caused a significant reduction (χ^2 ranging from 468.41 to 485.35 across the five sets of plausible values, $df = 15$, $p < .01$) in the deviance of the model for each of the five sets of plausible values. This indicated that, after controlling for school effect, at least one of the predictors was significant

to explain student relationship with teachers. The *t*-ratios of school-level variance, σ^2_{0j}, showed that the school-level variance for the full model of each set of plausible values was significant (*t*-ratio ranging from 2.55 to 2.65 across the five sets of plausible values, *df* = 18, *p* < .05 or < .01). This indicated that, after controlling for gender, school type and religious background of students, and interaction of these predictors, there was still significant between-school variance in student-teacher relations. The value of the conditional intraclass correlation, i.e. 0.0326 on average, indicated that, after controlling for all predictors and the interactions of these predictors in the model, school accounted for 3.26% of the variability of student relationship with teachers. The proportion of variance was rather small though statistically significant.

To start, the inspection of the significance of the predictors and their interaction from the three levels of interaction, gender by school type by religious background, found that the three-way interaction effect was not significant. None of the three interactions, gender by school type by religious background (Christian), gender by school type by religious background (religion other than Catholic and Christian) or gender by school type by religious background (no religion), were significant. Inspection of the two levels of interaction revealed that: (1) the two-way interaction effect of gender by school type was significant (*t*-ratio ranged from 2.03 to 2.55 across the five sets of plausible values, *df* = 18, *p* < .05), which was illustrated by plotting the relationship between school type and student relationship with teachers as a function of gender, as shown in Figure 4.2; (2) the two-way interaction effect of gender by religious background was significant for interaction of gender by

religious background (no religion) (*t*-ratio ranging from 2.53 to 3.23 across the five sets of plausible values, $df = 18$, $p < .05$ or $p < .01$), which was illustrated by plotting the relationship between students' religious background, students with Catholic religion and no religion, and student relationship with teachers as a function of gender, as shown in Figure 4.3, but it was not significant for interactions of gender by religious background (Christian) or gender by religious background (religion other than Catholic and Christian); and (3) the two-way interaction effects of school type by all categories of religious background were not significant. Given the significance of the two-way interaction effects, the main effects of individual predictors were not interpreted.

Based on the results, the best-fitting model for the multilevel analysis of student relationship with teachers was a two-level random intercept model, with students at level 1 nested within schools at level 2, with student gender, school type, religious background and two-way interaction effects, and gender by school type and gender by religious background as predictors.

Table 4.5

Summary of the Effects for Two-level Full Model for Student Relationship with Teachers

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.673(0.136)	4.95**	0.691(0.136)	4.32**	0.743(0.136)	5.46**
GD[a]	-0.477(0.192)	-2.48*	-0.537(0.192)	-2.80**	-0.513(0.191)	-2.69**
ST[b]	0.146(0.209)	0.70	0.115(0.209)	0.55	0.099(0.209)	0.47
Religious background[c]						
CH	-0.254(0.181)	-1.40	-0.199(0.180)	-1.11	-0.243(0.179)	-1.36
NON-CH	-0.242(0.217)	-1.12	-0.208(0.216)	-0.96	-0.291(0.215)	-1.35
NO-REL	-0.326(0.124)	-2.63**	-0.357(0.123)	-2.90**	-0.421(0.123)	-3.42**
Interaction effects						
GD*ST	0.608(0.299)	2.03*	0.670(0.299)	2.24*	0.675(0.299)	2.26*
GD*CH	0.448(0.273)	1.64	0.436(0.272)	1.60	0.405(0.271)	1.49
GD*NON-CH	0.254(0.320)	0.79	0.234(0.319)	0.73	0.194(0.318)	0.61
GD*NO-REL	0.518(0.205)	2.53*	0.597(0.204)	2.93**	0.551(0.203)	2.71**
ST*CH	-0.138(0.249)	-0.55	-0.104(0.247)	-0.42	-0.159(0.247)	-0.64
ST*NON-CH	-0.340(0.319)	-1.07	-0.373(0.318)	-1.17	-0.346(0.317)	-1.09
ST*NO-REL	0.210(0.180)	1.17	0.238(0.179)	1.33	0.301(0.178)	1.69
GD*ST*CH	-0.019(0.376)	-0.05	-0.031(0.374)	-0.08	-0.010(0.373)	-0.03
GD*ST*NON-CH	0.378(0.502)	0.75	0.465(0.500)	0.93	0.525(0.498)	1.05
GD*ST*NO-REL	-0.332(0.278)	-1.19	-0.391(0.276)	-1.42	-0.393(0.275)	-1.43
Random effects						
σ^2_{0j}	0.051 (0.020)	2.55*	0.052(0.020)	2.60**	0.053(0.020)	2.65**
σ^2_e	1.555 (0.038)	40.92**	1.540(0.038)	40.53**	1.528(0.037)	41.30**
ICC[d]	0.0316		0.0327		0.0335	
Deviance [e]	11155.541		11124.005		11098.115	
Parameters	18		18		18	
Deviance_UN	11623.948		11593.150		11576.729	
χ^2 [f]	468.41**		469.15**		478.61**	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Fixed effects						
Intercept	0.704(0.136)	5.18**	0.745(0.136)	5.48**	0.711(0.136)	5.08**
GD[a]	-0.517(0.191)	-2.71**	-0.586(0.191)	-3.07**	-0.526(0.191)	-2.75**
ST[b]	0.055(0.208)	0.26	0.050(0.208)	0.24	0.093(209)	0.44
Religious background[c]						
CH	-0.157(0.179)	-0.88	-0.209(0.180)	-1.16	-0.212(0.180)	-1.18
NON-CH	-0.123(0.215)	-0.57	-0.171(0.216)	-0.79	-0.207(0.216)	-0.96
NO-REL	-0.360(0.123)	-2.93**	-0.419(0.123)	-3.41**	-0.377(0.123)	-3.06**
Interaction effects						
GD*ST	0.751(0.298)	2.52*	0.760(0.298)	2.55*	0.693(0.299)	2.32*
GD*CH	0.315(0.271)	1.16	0.510(0.271)	1.88	0.423(0.272)	1.55
GD*NON-CH	0.094(0.318)	0.30	0.202(0.318)	0.64	0.196((0.319)	0.61
GD*NO-REL	0.547(0.203)	2.70**	0.659(0.204)	3.23**	0.574(0.204)	2.82**
ST*CH	-0.040(0.247)	-0.16	-0.119(0.247)	-0.48	-0.112(0.247)	-0.45
ST*NON-CH	-0.520(0.317)	-1.64	-0.397(0.317)	-1.25	-0.395(0.318)	-1.24
ST*NO-REL	0.298(0.178)	1.67	0.352(0.179)	1.97	0.280 (0.179)	1.57
GD*ST*CH	-0.154(0.373)	-0.41	-0.043(0.374)	-0.11	-0.051(0.374)	-0.14
GD*ST*NON-CH	0.581(0.498)	1.17	0.392(0.499)	0.79	0.468(0.500)	0.94
GD*ST*NO-REL	-0.416(0.275)	-1.51	-0.572(0.276)	-2.07*	-0.421(0.276)	-1.52
Random effects						
σ_{0j}^2	0.052(0.020)	2.60**	0.051(0.020)	2.55*	0.052(0.020)	2.60**
σ_e^2	1.530(0.037)	41.35**	1.536(0.037)	41.51**	1.538(0.037)	41.16**
ICC[d]	0.0329		0.0321		0.0326	
Deviance [e]	11102.079		11114.582		11118.864	
Parameters	18		18		18	
Deviance_UN	11587.433		11598.288		11595.910	
χ^2 [f]	485.35**		483.71**		477.05**	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. GD = gender; ST = school type; CH = Christian; NON-CH = religion other than Catholic and Christian; NO-REL = no religion; Deviance_UN = deviance of unconditional model. [a] Reference category of gender: male; [b] Reference category of school type: co-educational Catholic secondary school; [c] Reference category of religious background: Catholic; [d] ICC (intraclass correlation coefficient) = $\sigma_{0j}^2 / (\sigma_{0j}^2 + \sigma_e^2)$; [e] Deviance (-2LL) = negative log likelihood; [f] χ^2 = Deviance_UN - Deviance. *p<.05 **p<.01.

Figure 4.2 Relationship between school type and student relationship
with teachers as a function of gender
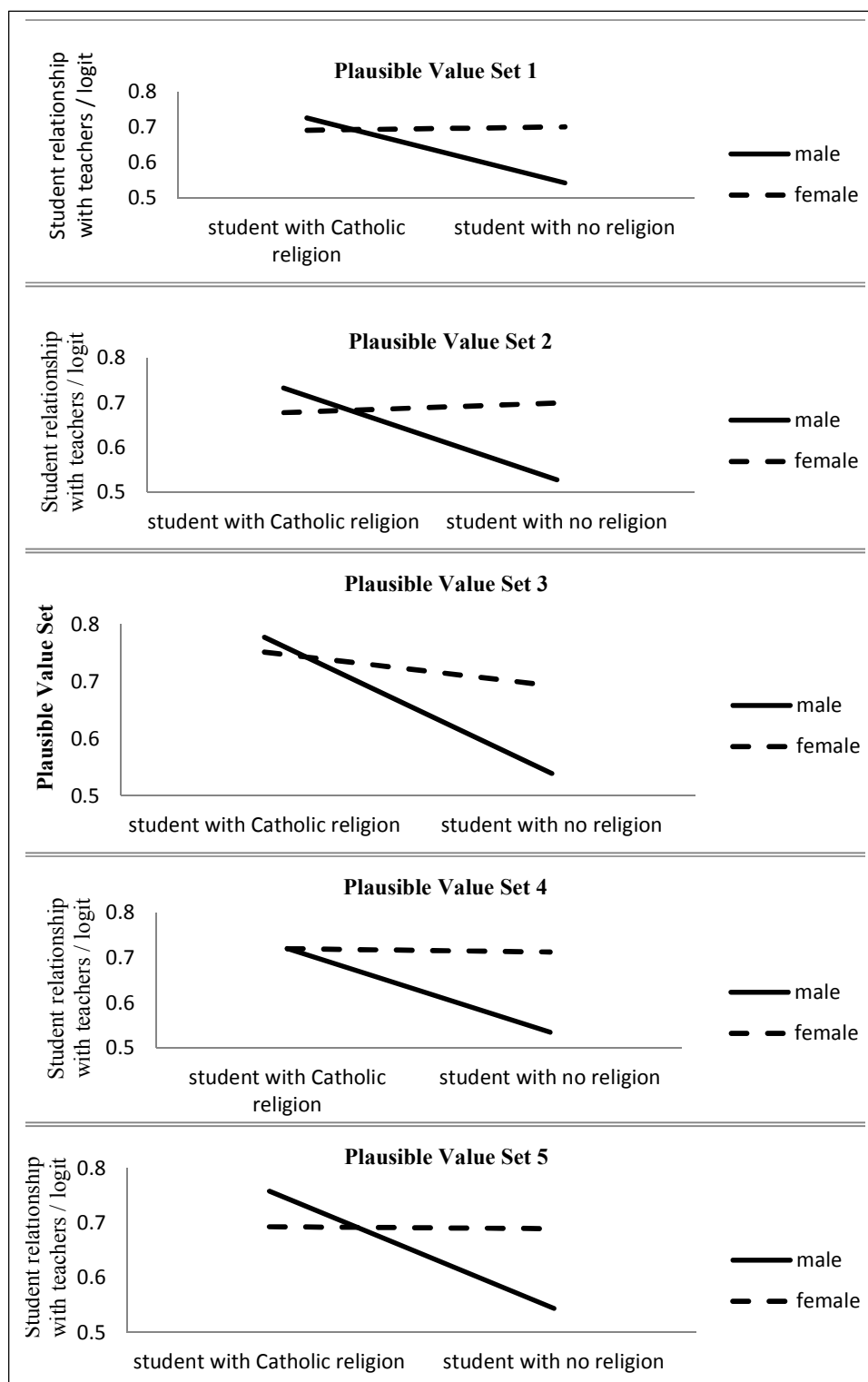
Figure 4.3 Relationship between students' religious background,
students with Catholic religion and no religion, and student
relationship with teachers as a function of gender

The results in Table 4.6 show that the interaction term between gender and school type was statistically significant (*t*-ratio ranging from 1.98 to 2.55 across the five sets of plausible values, *df* = 10, *p* < .05). This interaction, as depicted in Figure 4.2, shows that gender moderated the relationship between school type and student relationship with teachers, such that the relationship was weaker for male students than for female students in single-sex schools, but the relationship was similar for male and female students in co-educational schools. Compared to female students, the difference in the students' relationship with teachers between male students from both coeducational and single-sex schools was smaller. Moreover, the difference in the relationship with teachers between female and male students was larger in single-sex schools, compared to coeducational schools. The relationship of female students from single-sex schools with their teachers was relatively the warmest and most positive.

Table 4.6

Summary of the Effects for the Best-fitting Two-level Model with predictors for Student Relationship with Teachers

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.616(0.116)	5.31**	0.624(0.116)	5.38**	0.657(0.117)	5.62**
GD[a]	-0.357(0.137)	-2.61**	-0.394(0.136)	-2.90**	-0.380(0.136)	-2.79**
ST[b]	0.271(0.140)	1.94	0.261(0.141)	1.85	0.287(0.142)	2.02*
Religious background[c]						
CH	-0.351(0.124)	-2.83**	-0.278(0.123)	-2.26*	-0.359(0.123)	-2.92**
NON-CH	-0.397(0.159)	-2.50**	-0.378(0.159)	-2.38*	-0.448(0.158)	-2.84**
NO-REL	-0.223(0.090)	-2.48**	-0.242(0.089)	-2.72**	-0.275(0.089)	-3.09**
Interaction effects						
GD*ST	0.383(0.177)	2.16*	0.400(0.179)	2.23*	0.411(0.180)	2.28*
GD*CH	0.474(0.186)	2.55*	0.433(0.185)	2.34*	0.442(0.185)	2.39*
GD*NON-CH	0.386(0.241)	1.60	0.389(0.240)	1.62	0.377(0.239)	1.58
GD*NO-REL	0.343(0.137)	2.50*	0.391(0.137)	2.85**	0.351(0.136)	2.58**
Random effects						
σ_{0j}^2	0.052(0.020)	2.60**	0.053(0.021)	2.52*	0.055(0.021)	2.62**
σ_e^2	1.558(0.038)	41.00**	1.544(0.038)	40.63**	1.534(0.037)	41.46**
ICC[d]	0.0323		0.0332		0.0346	
Deviance [e]	11163.162		11133.136		11110.667	
Parameters	10		10		10	
Deviance_FU	11155.541		11124.005		11098.115	
$\chi^{2\ f}$	7.62		9.13		12.55	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Fixed effects						
Intercept	0.616(0.116)	5.31**	0.640(0.116)	5.52**	0.631(0.116)	5.43**
GD[a]	-0.366(0.136)	-2.69**	-0.370(0.136)	-2.72**	-0.373(0.136)	-2.74**
ST[b]	0.246(0.141)	1.74	0.278(0.141)	1.97*	0.269 (0.141)	1.90
Religious background[c]						
CH	-0.204(0.123)	-1.66	-0.307(0.123)	-2.50*	-0.300(0.123)	-2.43*
NON-CH	-0.360(0.158)	-2.28*	-0.351(0.159)	-2.21*	-0.387(0.159)	-2.44*
NO-REL	-0.216(0.089)	-2.43*	-0.249(0.089)	-2.80**	-0.241(0.089	-2.70**
Interaction effects						
GD*ST	0.456(0.179)	2.55*	0.352(0.178)	1.98*	0.400(0.179)	2.24*
GD*CH	0.258(0.185)	1.39	0.505(0.185)	2.73**	0.422(0.185)	2.28*
GD*NON-CH	0.313(0.239)	1.31	0.321(0.240)	1.34	0.357(0.240)	1.49
GD*NO-REL	0.333(0.136)	2.45*	0.358(0.137)	2.61**	0.355(0.137)	2.60**
Random effects						
σ^2_{0j}	0.054(0.021)	2.57*	0.053(0.020)	2.65**	0.053(0.021)	2.59**
σ^2_e	1.536(0.037)	41.51**	1.543(0.038)	40.61**	1.543(0.038)	41.04**
ICC[d]	0.0340		0.0332		0.0335	
Deviance [e]	11115.205		11130.232		11130.480	
Parameters	10		10		10	
Deviance_FU	11102.079		11114.582		11118.864	
$\chi^{2\ f}$	13.13		15.65*		11.62	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. GD = gender; ST = school type; CH = Christian; NON-CH = religion other than Catholic and Christian; NO-REL = no religion; Deviance_FU = deviance of the full model. [a] Reference category of gender: male; [b] Reference category of school type: co-educational Catholic secondary school; [c] Reference category of religious background: Catholic; [d] ICC (intraclass correlation coefficient) = $\sigma^2_{0j} / (\sigma^2_{0j} + \sigma^2_e)$; [e] Deviance (-2LL) = negative log likelihood; [f] χ^2 = Deviance - Deviance_FU. *p<.05 **p<.01.

The results in Table 4.6 show that the interaction term between gender and religious background, students with Catholic religion and no religion, was significant (*t*-ratio ranging from 2.45 to 2.85 across the five sets of plausible values, *df* = 10, *p* < .05 or *p* < .01). This interaction, as depicted in Figure 4.3, shows that gender moderated the relationship between religious background, students with Catholic religion and no religion, and student relationship with teachers, such that the relationship was weaker for female students than for male students if the students were Catholics, but stronger for female students than for male students if the students had no religion. Compared with male students, the difference in the relationship with teachers between female

students with Catholic religion and no religion was smaller. Moreover, the difference in the relationship with teachers between male and female students with no religion was larger, compared with those with Catholic religion. The interaction between gender and religious background (students with Catholic religion and Christian religion) or religious background (students with Catholic religion and religion other than Catholic and Christian) were not significant. This shows that there was no significant difference between female and male students with Catholic, Christian or other religion on student relationship with teachers. Among the students with Catholic and no religions, male students with no religion displayed the least positive relationship with teachers.

4.3 Student morale

This section aims to answer research question 2, which inquired about student morale in Catholic secondary schools of Hong Kong.

4.3.1 Descriptive statistics on student morale

Eleven items were constructed to measure student morale in Hong Kong's Catholic secondary schools. Students indicated their attitudes by choosing one of five options (strongly disagree, disagree, neutral, agree and strongly agree). Table 4.7 presents the students' responses to the 11 items. The items are arranged in descending order of endorsement by students. That is, the more positive attitudes are arranged at the top of the table.

Table 4.7

Descriptive Statistics on the 'Student Morale' Scale (n = 3369)

	Student morale	% SD	% D	% N	% A	% SA	mean[a]
44.	My experience of this school has been a happy one	4%	5%	34%	41%	17%	3.62
19.	This school has a good academic name in the local community	3%	7%	45%	33%	12%	3.43
31.	I have been happy at school	6%	8%	37%	38%	11%	3.41
50.	There is happy atmosphere in this school	5%	8%	41%	37%	9%	3.39
26.	Adequate counselling help is available to students	4%	8%	48%	34%	7%	3.32
48.	I am happy to be a student at this school	7%	8%	45%	31%	9%	3.28
13.	Students here think a lot of their school	3%	6%	58%	29%	4%	3.26
28.	A good spirit of community exists amongst students of your form	5%	12%	46%	29%	7%	3.22
27.	Everyone has a lot of fun at this school	6%	11%	46%	29%	8%	3.22
34.	Students at this school do not mind wearing the school uniform	11%	12%	43%	25%	8%	3.07
37.	Everyone tries to make you feel at home at this school	9%	14%	52%	21%	4%	2.98
	Average Response	6%	9%	45%	32%	9%	3.29

Note. SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.
[a] mean value obtained by averaging the responses of all the participants (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

As shown in Table 4.7, for all 11 items, only a small percentage were allocated to the options of strongly disagree (ranging from 3%–11%, with an average of 6% across the 11 items) and disagree (ranging from 5%–14%, with an average of 9% across the 11 items). The strongly agree option also attracted endorsement from only a small percentage of students (ranging from 4%–17 %, with an average of 9% across the 11 items). In comparison, quite a high percentage selected agree (ranged from 21%–41%, with an average of 32% across the 11 items), and neutral (ranging from 37%–58%, with an average of 45% across the 11 items) options. These results meant that student morale was, in general, not negative, and in fact between 33% (item 34) and 58% (item 44)

showed positive responses on student morale in their schools. A rather large proportion of students (ranging from 37%–58% with an average of 45% across the 11 items) selected the neutral option, reflecting that a relatively large proportion of students either did not have sufficient experience to form an opinion, did not have strong feelings on student morale or were loath to give their opinion. The slight inclination toward positive attitudes regarding student morale is further illustrated by the item mean raw scores on the right-most column of Table 4.7. On a scale of 1 to 5, the item means ranged from 2.98 (item 37) to 3.62 (item 44) across the 11 items.

As shown in Table 4.7, students considered that their experience of the school has been a happy one (58% agree/strongly agree). They also believed that there was a happy atmosphere in the school (46% agree/strongly agree) and they were happy at school (49% agree/strongly agree), respectively. Moreover the students believed that the school had a good academic name in the local community (45% agree/strongly agree). However, the students were less convinced that they did not mind wearing the school uniform at school (33% agree/strongly agree). The students were also less convinced that a good spirit of community exists among students of their form (36% agree/strongly agree) and that everyone had a lot of fun at school (37% agree/strongly agree). Worst still, students were less confident that everyone tried to make them feel at home at the school (25% agree/strongly agree).

4.3.2 The Wright map of the 'student morale' scale

The distribution of Rasch person measure against the Rasch item measure, or the Wright map (Linacre, 2013), is presented in Figure 4.4. An inspection of the Wright map in Figure 4.4 shows that both the item measures and person measures were widely spread and evenly clustered around the mean, suggesting an effective targeting within the student morale scale. The relative positions of the person mean and item mean showed a good alignment between person and item. The person mean was higher than the item mean, indicating a positive attitude on average of the participants towards student morale at Catholic schools.

```
INPUT: 3523 PERSON  11 ITEM  REPORTED: 3511 PERSON  11 ITEM  5 CATS WINSTEPS 3.72.3
--------------------------------------------------------------------------------
            PERSON - MAP - ITEM - Expected score zones (Rasch-half-point thresholds)
                <more>|
      6         .  +
                   |
                   |
                .  |
                   |
      5             +
                .  |
                .  |
                   |
                .  |
      4             +                                        Q37 .45
                .  |                                         Q34 .45
                .  |                              Q27 .45 Q28 .45
                   |                              Q13 .45 Q48 .45
              .#  T|                              Q26 .45 Q50 .45
      3       .#  +                               Q19 .45 Q31 .45
              .#  |
                .  |                                       Q44 .45
             .##  |
             .##  |
      2     .####  +
           .##### S|
            .####  |
           .######  |                         Q34 .35 Q37 .35
           .######  |
      1     .#####  +               Q13 .35 Q27 .35 Q28 .35
           .######  |T                       Q26 .35 Q48 .35
                .  |               Q19 .35 Q31 .35 Q50 .35
           .###### M|S
           .######  |
      0     .######  +M                          Q44 .35
           .######  |
        .###########  |S
            .#####  |                         Q37 .25
            .####  |T                         Q34 .25
     -1      .###  S+
            .####  |            Q13 .25 Q27 .25 Q28 .25
             .##  |                      Q26 .25 Q48 .25
             .###  |            Q19 .25 Q31 .25 Q50 .25
              .#  |
     -2       .#  +
                .  |                      Q37 .15 Q44 .25
              . T|                         Q34 .15
                .  |            Q27 .15 Q28 .15
                .  |        Q13 .15 Q26 .15 Q48 .15
     -3         .  +                      Q50 .15
                .  |            Q19 .15 Q31 .15
                .  |
                .  |                      Q44 .15
                .  |
     -4             +
                   |
                .  |
                   |
     -5         .  +
                <less>|
 EACH "#" IS 29. EACH "." IS 1 TO 28
            Scale(modified): Student morale
```

Figure 4.4 Wright map of the 'student morale' scale

4.3.3 Effects of gender, school type, and religious background on student morale

Before the discussion of the multilevel analysis, the multicollinearity assessment is reported. The multicollinearity assessment using SPSS (version 21) indicated that the variance inflation factors for the three independent variables, gender, school type and religious background of approximately 1.00 were well below the cut-off value of 10.00 (Stern, 2010). These showed that, upon performing linear regression using student morale as a dependent variable, there was no correlation between the three independent variables.

4.3.3.1 Building a hierarchical structure for the multilevel analysis of student morale

Tables 4.8 shows the results of the unconditional model for each of the five sets of plausible values and the average across the five sets, including coefficients for each parameter, the variance of each level, their standard errors, the intraclass correlation coefficient, the design effect, the deviance (-2 log-likelihood), and the number of significant parameters (fixed and random).

Table 4.8

Summary of Unconditional Model for Student Morale

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.384 (0.107)	3.59**	0.384 (0.106)	3.62**	0.385(0.109)	3.53**
Random effects						
σ^2_{0j}	0.198 (0.069)	2.87**	0.193 (0.067)	2.88**	0.203 (0.071)	2.86**
σ^2_e	1.609 (0.038)	42.34**	1.618 (0.039)	41.49**	1.647 (0.039)	42.23**
ICC[a]	0.1096		0.1066		0.1097	
Deviance[b]	11731.974		11750.824		11813.125	
Deff[c]	22.34		21.75		22.37	
Parameters	3		3		3	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.386 (0.107)	3.61**	0.390 (0.105)	3.71**	0.386(0.107)	3.61**
Random effects						
σ^2_{0j}	0.198 (0.069)	2.87**	0.192 (0.067)	2.87**	0.197(0.069)	2.87**
σ^2_e	1.632 (0.039)	41.85**	1.614 (0.039)	41.38**	1.624(0.039)	41.86**
ICC[a]	0.1082		0.1063		0.1081	
Deviance[b]	11780.561		11741.299		11763.557	
Deff[c]	22.07		21.70		22.05	
Parameters	3		3		3	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. [a] ICC (intraclass correlation coefficient) = σ^2_{0j} / $(\sigma^2_{0j} + \sigma^2_e)$; [b] Deviance (-2LL) = negative log likelihood; [c] Deff (design effect) = 1 + (195.7 – 1) * ICC. *p<.05 **p<.01.

As shown in Table 4.8, the results of the five sets of plausible values were very similar. The random effects at both between-school (σ^2_{0j}) and within-school (σ^2_{ej}) levels were statistically significant. The average between-school variance was estimated as 0.197, and the five sets of *t*-ratio of school-level variance, σ^2_{0j}, shows that school-level was significant (*t*-ratio ranging from 2.86 to 2.88 across the five sets of plausible values, *df* = 3, *p* < .01). The average variance between-students within schools was estimated as 1.624, and the five sets of *t*-ratio of student-level variance, σ^2_e, shows that student-level was significant (*t*-ratio ranging from 41.38 to 42.23 across the five sets of plausible values, *df* = 3, *p* < .01). The intraclass correlation coefficient values, ranging

from 0.1063 to 0.1097 across the five sets of plausible values, were larger than the cut-off value of 0.05 (Escobar et al., 2013). This indicates that schools accounted for an average of approximately 10.81% of the variability of student morale. The intraclass correlation coefficient values, which are larger than 8% but smaller than 12%, show that between-school variation was intermediate in comparison to the total variation. The design effect values, ranging from 21.70 to 22.37 across the five sets of plausible values, were greater than the cut-off value of 2.00 (Muthen & Satorra, 1995).

To conclude, the significance of the *t*-ratio for school variance, intraclass correlation coefficient value and the design effect value clearly indicate that variation in student morale existed between schools, and a two-level model, with students at level 1 nested within schools at level 2, was needed for analysis of student morale.

4.3.3.2 Development of a full model with predictors fitted for the multilevel analysis of student morale

Using student morale as a dependent variable, all predictors, gender, school type, religious background, and all possible interactions of these predictors, were introduced into the unconditional model to form the full model. The results in Table 4.9 show that the inclusion of all the predictors caused a significant reduction (χ^2 ranging from 492.307 to 521.058 across the five sets of plausible values, $df = 15$, $p < .01$) in the deviance of the model for each of the five sets of plausible values. This indicates that, after controlling for school effect, at least one of the predictors was a highly significant predictor to explain

student morale. The *t*-ratio of the school-level variance, σ^2_{0j}, shows that the school-level variance for the full model of each set of plausible values was significant (*t*-ratio ranging from 2.71 to 2.78 across the five sets of plausible values, $df = 18$, $p < .01$). This indicates that, after controlling for gender, school type and religious background of students, and the interaction of these predictors, there was still significant between-school variance in student morale. The value of the conditional intraclass correlation, 0.0551 on average, indicates that, after controlling for all predictors and interactions of these predictors in the model, school accounted for 5.51% of the variability of student morale. The proportion of variance was rather small though statistically significant.

To start, an inspection of the significance of the predictors and the interaction of these predictors from the three-level interaction, gender by school type by religious background, found that the three-way interaction effect was not significant. None of the three interactions, gender by school type by religious background (Christian), gender by school type by religious background (religion other than Catholic and Christian) or gender by school type by religious background (no religion), were significant. An inspection of the two-level of interaction revealed that: (1) the two-way interaction effect of gender by school type was significant (*t*-ratio ranging from 2.26 to 2.74 across the five sets of plausible values, $df = 18$, $p < .05$ or $< .01$), which was illustrated by plotting the relationship between school type and student morale as a function of gender, as shown in Figure 4.5; (2) the two-way interaction effect of gender by religious background was significant for the interaction of gender by religious background (no religion) (*t*-ratio ranging from 2.42 to 3.07 across the

five sets of plausible values, $df = 18$, $p < .05$ or $p < .01$), which was illustrated by plotting the relationship between students' religious background, students with Catholic religion and no religion, and student morale as a function of gender as shown in Figure 4.6. However, it was not significant for interactions of gender by religious background (Christian) or gender by religious background (religion other than Catholic and Christian); and (3) the two-way interaction effects of school type for all categories of religious background was not significant. Given the significant two-way interaction effects, the main effects of individual predictors were not interpreted.

Based on these results, the best-fitting model for the multilevel analysis of student morale was a two-level random intercept model, with students at level 1 nested within schools at level 2, for the gender, school type, religious background and two-way interaction effects, and gender by school type and gender by religious background as factors.

Table 4.9

Summary of the Effects for Two-level Full Model for Student Morale

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Fixed effects						
Intercept	0.507(0.154)	3.29**	0.557(0.153)	3.64**	0.497(0.155)	3.21**
GD[a]	-0.483(0.195)	-2.48*	-0.526(0.195)	-2.70**	-0.406(0.196)	-2.07*
ST[b]	0.144(0.241)	0.60	0.101(0.239)	0.42	0.109(0.243)	0.45
Religious background[c]						
CH	-0.287(0.183)	-1.57	-0.229(0.183)	-1.25	-0.234(0.185)	-1.26
NON-CH	-0.289(0.219)	-1.32	-0.261(0.220)	-1.19	-0.247(0.221)	-1.12
NO-REL	-0.458(0.125)	-3.66**	-0.521(0.125)	-4.17**	-0.469(0.126)	-3.72**
Interaction effects						
GD*ST	0.853(0.333)	2.56*	0.847(0.331)	2.56*	0.758(0.336)	2.26*
GD*CH	0.399(0.276)	1.45	0.423(0.277)	1.53	0.373(0.279)	1.34
GD*NON-CH	0.094(0.324)	0.29	0.119(0.325)	0.37	-0.031(0.327)	-0.09
GD*NO-REL	0.589(0.207)	2.85**	0.639(0.208)	3.07**	0.506(0.209)	2.42*
ST*CH	-0.130(0.252)	-0.52	-0.174(0.252)	-0.69	-0.108(0.254)	-0.43
ST*NON-CH	-0.516(0.323)	-1.60	-0.497(0.324)	-1.53	-0.472(0.326)	-1.45
ST*NO-REL	0.263(0.182)	1.45	0.286(0.182)	1.57	0.319(0.183)	1.74
GD*ST*CH	-0.150(0.380)	-0.39	-0.044(0.381)	-0.12	-0.097(0.384)	-0.25
GD*ST*NON-CH	0.571(0.508)	1.12	0.486(0.509)	0.95	0.687(0.513)	1.34
GD*ST*NO-REL	-0.492(0.281)	-1.75	-0.447(0.282)	-1.59	-0.350(0.283)	-1.24
Random effects						
σ_{0j}^2	0.096(0.035)	2.74**	0.092(0.034)	2.71**	0.096(0.035)	2.74**
σ_e^2	1.589(0.039)	40.74**	1.599(0.039)	41.00**	1.620(0.039)	41.54**
ICC[d]	0.0570		0.0544		0.0559	
Deviance [e]	11239.667		11258.548		11303.740	
Parameters	18		18		18	
Deviance_UN	11731.974		11750.824		11813.125	
χ^2 [f]	492.31**		492.28**		509.39**	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Fixed effects						
Intercept	0.523(0.152)	3.44**	0.578(0.153)	3.78**	0.532(0.153)	3.47**
GD[a]	-0.472(0.195)	-2.42*	-0.515(0.194)	-2.65*	-0.480(0.195)	-2.46*
ST[b]	0.095(0.237)	0.40	0.005(0.239)	0.02	0.091(0.240)	0.38
Religious background[c]						
CH	-0.203(0.184)	-1.10	-0.434(0.182)	-2.38*	-0.277(0.183)	-1.51
NON-CH	-0.253(0.220)	-1.15	-0.248(0.219)	-1.13	-0.260(0.220)	-1.18
NO-REL	-0.501(0.126)	-3.98**	-0.525(0.125)	-4.20**	-0.495(0.125)	-3.95**
Interaction effects						
GD*ST	0.835(0.329)	2.54*	0.907(0.331)	2.74**	0.840(0.332)	2.53*
GD*CH	0.365(0.277)	1.32	0.593(0.275)	2.16	0.431(0.277)	1.56
GD*NON-CH	0.108(0.325)	0.33	0.079(0.323)	0.24	0.074(0.325)	0.23
GD*NO-REL	0.591(0.208)	2.84**	0.636(0.207)	3.07**	0.592(0.208)	2.85**
ST*CH	-0.128(0.253)	-0.51	0.146(0.251)	0.58	-0.079(0.252)	-0.31
ST*NON-CH	-0.507(0.324)	-1.56	-0.512(0.322)	-1.59	-0.501(0.324)	-1.55
ST*NO-REL	0.324(0.183)	1.77	0.405(0.181)	2.24*	0.319(0.182)	1.75
GD*ST*CH	-0.119(0.382)	-0.31	-0.329(0.379)	-0.87	-0.148(0.381)	-0.39
GD*ST*NON-CH	0.415(0.510)	0.81	0.584(0.506)	1.15	0.549(0.509)	1.08
GD*ST*NO-REL	-0.425(0.282)	-1.51	-0.559(0.280)	-2.00*	-0.455(0.282)	-1.62
Random effects						
σ_{0j}^2	0.089(0.032)	2.78**	0.093(0.034)	2.74**	0.093(0.034)	2.74**
σ_e^2	1.604(0.039)	41.13**	1.581(0.038)	41.61**	1.599(0.039)	41.20**
ICC[d]	0.0526		0.0556		0.0551	
Deviance [e]	11268.292		11220.241		11258.098	
Parameters	18		18		18	
Deviance_UN	11780.561		11741.299		11763.557	
χ^2 [f]	512.27**		521.06**		505.46**	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. GD = gender; ST = school type; CH = Christian; NON-CH = religion other than Catholic and Christian; NO-REL = no religion; Deviance_UN = deviance of unconditional model. [a] Reference category of gender: male; [b] Reference category of school type: co-educational Catholic secondary school; [c] Reference category of religious background: Catholic; [d] ICC (intraclass correlation coefficient) = $\sigma_{0j}^2 / (\sigma_{0j}^2 + \sigma_e^2)$; [e] Deviance (-2LL) = negative log likelihood; [f] χ^2 = Deviance_UN - Deviance. *$p<.05$ **$p<.01$.

Figure 4.5　Relationship between school type and student morale as a function of gender
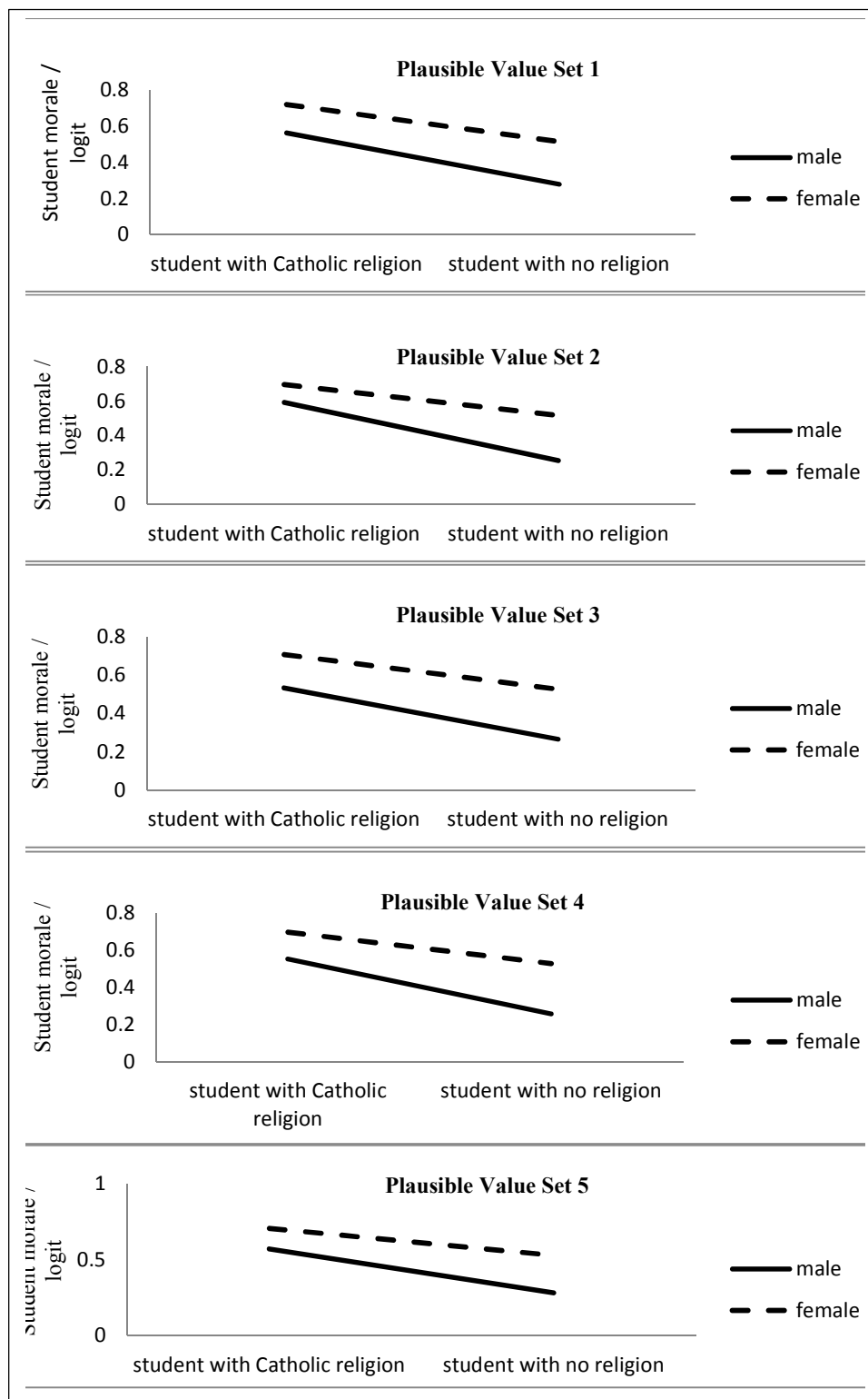
Figure 4.6 Relationship between students' religious background, students with Catholic religion and no religion, and student morale as a function of gender

The results in Table 4.10 show that the interaction term between gender and school type was statistically significant (*t*-ratio ranging from 2.16 to 2.38 across the five sets of plausible values, *df* = 10, *p* < .05). This interaction, as depicted in Figure 4.5, shows that gender moderated the relationship between school type and student morale, such that the relationship was weaker for male students than for female students in single-sex schools; however, there was little difference between male and female students in coeducational schools. Compared to female students, the difference in morale between male students from coeducational and single-sex schools was smaller than between female students from these two types of schools. Moreover, the difference in morale between female and male students was larger in single-sex schools, compared to coeducational schools. The morale of female students of single-sex schools was relatively the most positive.

Table 4.10

Summary of the Effects for the Best-fitting Two-level Model with predictors for Student Morale

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.436(0.137)	3.18**	0.480(0.136)	3.53**	0.405(0.138)	2.93**
GD[a]	-0.291(0.139)	-2.09*	-0.362(0.139)	-2.60**	-0.292(0.140)	-2.09*
ST[b]	0.299(0.185)	1.62	0.270(0.182)	1.48	0.310(0.185)	1.68
Religious background[c]						
CH	-0.384(0.125)	-3.07**	-0.352(0.125)	-2.82**	-0.323(0.126)	-2.56*
NON-CH	-0.524(0.161)	-3.25**	-0.488(0.162)	-3.01**	-0.462(0.163)	-2.83**
NO-REL	-0.331(0.091)	-3.64**	-0.382(0.091)	-4.20**	-0.315(0.092)	-3.42**
Interaction effects						
GD*ST	0.501(0.229)	2.19*	0.536(0.226)	2.37*	0.521(0.230)	2.27*
GD*CH	0.337(0.189)	1.78	0.426(0.189)	2.25*	0.364(0.190)	1.92
GD*NON-CH	0.280(0.244)	1.15	0.295(0.244)	1.21	0.232(0.246)	0.94
GD*NO-REL	0.325(0.139)	2.34*	0.404(0.139)	2.91**	0.333(0.140)	2.38*
Random effects						
σ^2_{0j}	0.099(0.036)	2.75**	0.095(0.035)	2.71**	0.099(0.036)	2.75**
σ^2_e	1.596(0.039)	40.92**	1.605(0.039)	41.15**	1.626(0.040)	40.65**
ICC[d]	0.0584		0.0559		0.0574	
Deviance [e]	11253.138		11272.438		11317.846	
Parameters	10		10		10	
Deviance_FU	11239.667		11258.548		11303.740	
$\chi^{2\ f}$	13.47		13.89		14.11	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Fixed effects						
Intercept	0.430(0.135)	3.19**	0.446(0.136)	3.28**	0.439(0.136)	3.22**
GD[a]	-0.317(0.139)	-2.28*	-0.302(0.138)	-2.19*	-0.313(0.139)	-2.25*
ST[b]	0.296(0.179)	1.65	0.293(0.183)	1.60	0.294(0.183)	1.61
Religious background[c]						
CH	-0.303(0.126)	-2.40*	-0.385(0.125)	-3.08**	-0.349(0.125)	-2.79**
NON-CH	-0.484(0.162)	-2.99**	-0.480(0.161)	-2.98**	-0.488(0.162)	-3.01**
NO-REL	-0.344(0.091)	-3.78**	-0.331(0.091)	-3.64*	-0.341(0.091)	-3.74**
Interaction effects						
GD*ST	0.531(0.223)	2.38*	0.490(0.227)	2.16*	0.516(0.227)	2.27*
GD*CH	0.338(0.189)	1.79	0.441(0.188)	2.35*	0.381(0.189)	2.02*
GD*NON-CH	0.278(0.245)	1.13	0.287(0.243)	1.18	0.274(0.244)	1.12
GD*NO-REL	0.373(0.140)	2.66**	0.350(0.139)	2.52*	0.357(0.139)	2.56*
Random effects						
σ^2_{0j}	0.092(0.034)	2.71**	0.096(0.035)	2.74**	0.096(0.035)	2.73**
σ^2_e	1.610(0.039)	41.28**	1.588(0.039)	40.72**	1.605(0.039)	40.95**
ICC[d]	0.0541		0.0570		0.0565	
Deviance [e]	11283.240		11236.076		11272.548	
Parameters	10		10		10	
Deviance_FU	11268.292		11220.241		11258.098	
χ^2 [f]	14.95		15.84*		14.45	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. GD = gender; ST = school type; CH = Christian; NON-CH = religion other than Catholic and Christian; NO-REL = no religion; Deviance_FU = deviance of the full model. [a] Reference category of gender: male; [b] Reference category of school type: co-educational Catholic secondary school; [c] Reference category of religious background: Catholic; [d] ICC (intraclass correlation coefficient) = $\sigma^2_{0j} / (\sigma^2_{0j} + \sigma^2_e)$; [e] Deviance (-2LL) = negative log likelihood; [f] χ^2 = Deviance - Deviance_FU. *$p<.05$ **$p<.01$.

The results of Table 4.10 show that the interaction term between gender and religious background, students with Catholic religion and no religion, was significant (*t*-ratio ranging from 2.34 to 2.91 across the five sets of plausible values, *df* = 10, *p* < .05 or *p* < .01). This interaction, as depicted in Figure 4.6, shows that gender moderated the relationship between religious background, students with Catholic religion and no religion, and student morale, such that student morale was lower for male students than for female students if the students had no religion, but the male and female difference in morale was not that great if the students were of the Catholic religion. Compared to male students, the difference in morale between female students with Catholic religion and no religion was smaller. Moreover, the difference in morale

between male and female students with no religion was larger, compared to those with Catholic religion. The interactions between gender and religious background (students with Catholic religion and Christian religion) or religious background (students with Catholic religion and religion other than Catholic and Christian) were not significant. These show that there was no significant difference on student morale between female and male students with Catholic, Christian or other religion respectively. Among the students with Catholic and no religion, the morale of female students with Catholic religion was relatively the most positive and the morale of male students with no religion was relatively the least positive.

4.4 Student perception of the principal

This section aims to answer research question 3, which inquired about student perception of the principal in Hong Kong's Catholic secondary schools.

4.4.1 Descriptive statistics on student perception of the principal

Five items were constructed to measure student perception of the principal in the Catholic secondary schools of Hong Kong. The students indicated their attitudes by choosing one of five options (strongly disagree, disagree, neutral, agree and strongly agree). Table 4.11 presents the students' response to the five items. The items are arranged in descending order of endorsement by students. That is, the more positive attitudes are arranged at the top of the table.

Table 4.11

Descriptive Statistics on the 'Student Perception of the Principal' Scale (n = 3427)

Student perception of the principal	% SD	% D	% N	% A	% SA	mean[a]
29. The Principal ensures that the school provides a good education to students	4%	6%	45%	36%	9%	3.40
46. The Principal places importance on the religious nature of the Catholic school	4%	5%	54%	30%	8%	3.33
51. The Principal provides good leadership of the school community	7%	6%	50%	30%	7%	3.25
39. The Principal encourages a sense of community and belonging in the school	6%	8%	50%	30%	6%	3.22
20. I can approach the Principal for advice and help	12%	19%	51%	15%	3%	2.80
Average Response	6%	9%	50%	30%	6%	3.20

Note. SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.
[a] mean value obtained by averaging the responses of all the participants (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

As shown in Table 4.11, for all five items, only a small percentage were allocated to the options of strongly disagree (ranged from 4%–12%, with an average of 6% across the five items) and disagree (ranged from 5%–19%, with an average of 9% across the five items). The strongly agree option also attracted endorsement from only a small percentage of students (ranging from 3%–9 %, with an average of 6% across the five items). In comparison, quite a high percentage of students opted for agree (ranging from 15%–36%, with an average of 30% across the five items), and neutral (ranging from 45%–54%, with an average of 50% across the five items). These results indicate that the students' perception of the principal was, in general, not negative, and in fact between 36% (item 39) and 45% (item 29) showed positive responses on the perception of the principal in their schools. A rather large proportion of students (ranging from 45%–54%, with an average of 50% across the five items)

indicated that they were neutral, reflecting that a relatively large proportion of students either did not have sufficient experience to form an opinion, did not have strong feelings on their perception of the principal or were loath to give their opinion. The slight inclination toward positive attitudes regarding student perception of the principal is further illustrated by the item mean raw scores on the right-most column of Table 4.11. On a scale of 1 to 5, the item means ranged from 2.80 (item 20) to 3.40 (item 29) across the five items.

As shown in Table 4.11, students considered that the principal ensured that the school provided a good education to them (45% agree/strongly agree) and agreed that the principal placed importance on the religious nature of the Catholic school (38% agree/strongly agree). The students also were of the opinion that principals placed emphasis on the establishment of good leadership (37% agree/strongly agree) and the building of a sense of belonging in the school (36% agree/strongly agree), respectively. However, students were less convinced that they could approach the principal for advice and help (18% agree/strongly agree, 31% disagree/strongly disagree).

4.4.2 The Wright map of the 'student perception of the principal' scale

The distribution of Rasch person measure against the Rasch item measure, or the Wright map (Linacre, 2013) is presented in Figure 4.7. An inspection of the Wright map in Figure 4.7 shows that both the scoring of the items and persons were widely spread and evenly clustered around the mean and this

result suggests an effective targeting within the student perception of the principal scale. The relative positions of the person mean and item mean show a good alignment between person and item. The person mean is higher than the item mean, indicating the positive perception of the principal of the participants on average.

```
INPUT: 3523 PERSON  5 ITEM  REPORTED: 3509 PERSON  5 ITEM  5 CATS WINSTEPS 3.72.3
--------------------------------------------------------------------------------
          PERSON - MAP - ITEM - Expected score zones (Rasch-half-point thresholds)
               <more>|
      6        .   +
                   |
               .   |
               .   |                                     Q20 .45
                   |
      5            +
                   |
               .   |
                   |
               .   |                                       Q39 .45
      4            +                                       Q51 .45
               . T|                                        Q46 .45
               .   |                                       Q29 .45
                   |
             .#   |
      3            +
               .   |
             .#### |                                   Q20 .35
               .   |
               S|
      2     .##### +
                   |
           .###### |
               .   |
               .   |T                    Q39  .35 Q51 .35
      1            +
           .###### |                          Q46 .35
               . S|                          Q29 .35
               . M|
           .###### |
      0            +M
                   |
         .###########|
                   |S
               .   |                    Q20 .25
     -1        .####  +
               .   |T
               S|
             .### |
               .   |
     -2         .#  +        Q39 .25  Q51 .25
               .   |                    Q46 .25
             .#   |        Q20 .15  Q29 .25
               .   |
               .   |
     -3         .   +
               . T|
               .   |
               .   | Q39 .15   Q51 .15
                   |
     -4         .   +           Q46 .15
                   |           Q29 .15
                   |
               .   |
                   |
     -5         .   +
               <less>|
  EACH "#" IS 57. EACH "." IS 1 TO 56
              Scale: Student perception of the principal
```

Figure 4.7 Wright map of the 'student perception of the principal'
                scale

4.4.3 Effects of gender, school type, and religious background on student perception of the principal

Before the discussion of the multilevel analysis, the multicollinearity assessment is reported. The multicollinearity assessment using SPSS (version 21) indicated that the variance inflation factors for the three independent variables, gender, school type and religious background, of approximately 1.00 were well below the cut-off value of 10.00 (Stern, 2010). This shows that, upon performing linear regression using the student perception of the principal as a dependent variable, there was no correlation between the three independent variables.

4.4.3.1 Building a hierarchical structure for the multilevel analysis of student perception of the principal

Tables 4.12 shows the results of the unconditional model for each of the five sets of plausible values and the average across the five sets including coefficients for each parameter, the variance of each level, their standard errors, the intraclass correlation coefficient, the design effect, the deviance (-2 log-likelihood), and the number of significant parameters (fixed and random).

Table 4.12

Summary of Unconditional Model for Student Perception of the Principal

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.202 (0.083)	2.43*	0.213(0.088)	2.42*	0.216 (0.088)	2.45*
Random effects						
σ_{0j}^2	0.117 (0.041)	2.85**	0.130 (0.046)	2.83**	0.132 (0.047)	2.81**
σ_e^2	1.544 (0.037)	41.73**	1.533 (0.037)	41.43**	1.547 (0.037)	41.81**
ICC[a]	0.0704		0.0782		0.0786	
Deviance[b]	11577.231		11554.120		11587.065	
Deff[c]	14.72		16.22		16.31	
Parameters	3		3		3	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.200 (0.088)	2.27*	0.192 (0.085)	2.26*	0.205(0.086)	2.37*
Random effects						
σ_{0j}^2	0.131 (0.046)	2.85**	0.123 (0.044)	2.80**	0.127(0.045)	2.83**
σ_e^2	1.537 (0.037)	41.54**	1.519 (0.036)	42.19**	1.536(0.037)	41.74**
ICC[a]	0.0785		0.0749		0.0761	
Deviance[b]	11563.061		11521.206		11560.537	
Deff[c]	16.29		15.59		15.83	
Parameters	3		3		3	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. [a] ICC (intraclass correlation coefficient) = σ_{0j}^2 / $(\sigma_{0j}^2 + \sigma_e^2)$; [b] Deviance (-2LL) = negative log likelihood; [c] Deff (design effect) = 1 + (195.7 − 1) * ICC. *p<.05   **p<.01.

As shown in Table 4.12, the results of the five sets of plausible values were very similar. The random effects at both between-school (σ^2_{0j}) and within-school (σ^2_{ej}) levels were statistically significant. The average between-school variance was estimated as 0.127, and the five sets of *t*-ratio of the school-level variance, σ^2_{0j}, showed that the school-level was significant (*t*-ratio ranging from 2.80 to 2.85 across the five sets of plausible values, *df* = 3, *p* < .01). The average variance between-students within schools was estimated as 1.536, and the five sets of *t*-ratio of student-level variance, σ^2_e, showed that the student-level was significant (*t*-ratio ranging from 41.43 to 42.19 across the five sets of

plausible values, $df = 3$, $p < .01$). The intraclass correlation coefficient values, ranging from 0.0704 to 0.0786 across the five sets of plausible values, were larger than the cut-off value of 0.05 (Escobar et al., 2013). This indicates that schools accounted for an average of about 7.61% of the variability of student perception of the principal. The intraclass correlation coefficient values, which are smaller than 8%, show that between-school variation was small in comparison to the total variation. The design effect values, ranging from 14.72 to 16.31 across the five sets of plausible values, were greater than the cut-off value of 2.00 (Muthen & Satorra, 1995).

To conclude, the significance of the t-ratio for school variance, intraclass correlation coefficient value and the design effect value clearly indicate that the variation in student perception of the principal existed between schools, and a two-level model, with students at level 1 nested within schools at level 2, was needed for analysis of student perception of the principal.

4.4.3.2 Development of a full model with predictors fitted for the multilevel analysis of student perception of the principal

Using student perception of the principal as a dependent variable, all predictors, gender, school type, religious background, and all possible interactions of these predictors, were introduced into the unconditional model to form the full model. The results in Table 4.13 show that the inclusion of all the predictors caused a significant reduction in the deviance of the model for each of the five sets of plausible values (χ^2 ranging from 489.806 to 501.114 across the five sets of plausible values, $df = 15$, $p < .01$). This indicates that, after

controlling for school effect, at least one of the predictors was a highly significant predictor explaining student perception of the principal. The t-ratio of school-level variance, σ^2_{0j}, shows that the school-level variance for the full model of each set of plausible values was significant (t-ratio ranging from 2.55 to 2.67 across the five sets of plausible values, $df = 18$, $p < .05$ or $< .01$). This indicates that, after controlling for gender, school type, religious background of students and the interaction of these predictors, there was still significant between-school variances in student perception of the principal. The value of the conditional intraclass correlation of 0.0346 on average indicates that, after controlling for all predictors and interactions of these predictors in the model, school accounted for 3.46% of the variability of student perception of the principal. The proportion of variance was quite small though statistically significant.

To start, an inspection of the significance of the predictors and interaction of these predictors from the three-level interaction, gender by school type by religious background, found that the three-way interaction effect was not significant. None of the three interactions, gender by school type by religious background (Christian), gender by school type by religious background (religion other than Catholic and Christian) or gender by school type by religious background (no religion), were significant. An inspection of the two-level interaction revealed that: (1) the two-way interaction effect of gender by school type was significant (t-ratio ranging from 2.49 to 3.02 across the five sets of plausible values, $df = 18$, $p < .05$ or $< .01$), which was illustrated by plotting the relationship between school type and student perception of the

principal as a function of gender, as shown in Figure 4.8; (2) the two-way interaction effect of gender by religious background was significant for the interaction of gender by religious background (no religion) (*t*-ratio ranging from 2.73 to 3.53 across the five sets of plausible values, $df = 18$, $p < .05$ or $p < .01$), which was further illustrated by plotting the relationship between students' religious background, students with Catholic religion and no religion, and student perception of the principal as a function of gender, as shown in Figure 4.9; however, it was not significant for interactions of gender by religious background (Christian) or gender by religious background (religion other than Catholic and Christian); (3) the two-way interaction effect of school type by all of the categories of religious background was not significant. Given the significant two-way interaction effects, the main effects of individual predictors were not interpreted.

Based on the results, the best-fitting model for the multilevel analysis of student perception of the principal was a two-level random intercept model, with students at level 1 nested within schools at level 2, for the gender, school type, religious background and two-way interaction effects, and gender by school type and gender by religious background as factors.

Table 4.13

Summary of the Effects for Two-level Full Model for Student Perception of the Principal

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.531(0.136)	3.90**	0.521(0.135)	3.86**	0.520(0.138)	3.77**
GD[a]	-0.516(0.190)	-2.72**	-0.530(0.190)	-2.79**	-0.585(0.191)	-3.06**
ST[b]	-0.032(0.208)	-0.15	0.013(0.207)	0.06	0.037(0.212)	0.17
Religious background[c]						
CH	-0.304(0.179)	-1.70	-0.332(0.178)	-1.87	-0.242(0.179)	-1.35
NON-CH	-0.502(0.215)	-2.33*	-0.463(0.214)	-2.16*	-0.434(0.215)	-2.02*
NO-REL	-0.645(0.122)	-5.29**	-0.639(0.122)	-5.24**	-0.633(0.123)	-5.15**
Interaction effects						
GD*ST	0.743(0.298)	2.49*	0.893(0.296)	3.02**	0.860(0.301)	2.86**
GD*CH	0.357(0.270)	1.32	0.369(0.269)	1.37	0.351(0.270)	1.30
GD*NON-CH	0.419(0.317)	1.32	0.327(0.316)	1.03	0.362(0.317)	1.14
GD*NO-REL	0.650(0.203)	3.20*	0.657(0.202)	3.25**	0.716(0.203)	3.53**
ST*CH	-0.102(0.246)	-0.41	-0.056(0.245)	-0.23	-0.165(0.246)	-0.67
ST*NON-CH	-0.146(0.316)	-0.46	-0.194(0.315)	-0.62	-0.245(0.316)	-0.78
ST*NO-REL	0.346(0.178)	1.94	0.345(0.177)	1.95	0.302(0.178)	1.70
GD*ST*CH	0.025(0.372)	0.07	-0.145(0.370)	-0.39	-0.115(0.372)	-0.31
GD*ST*NON-CH	0.147(0.497)	0.30	0.125(0.495)	0.25	0.327(0.498)	0.66
GD*ST*NO-REL	-0.455(0.275)	-1.65	-0.565(0.274)	-2.06*	-0.556(0.275)	-2.02*
Random effects						
σ_{0j}^2	0.052(0.020)	2.60**	0.051(0.020)	2.55*	0.057(0.022)	2.59**
σ_e^2	1.523(0.037)	41.16**	1.510(0.037)	40.81**	1.527(0.037)	41.27**
ICC[d]	0.0330		0.0327		0.0360	
Deviance [e]	11085.653		11057.296		11095.338	
Parameters	18		18		18	
Deviance_UN	11577.231		11554.120		11587.065	
χ^2 [f]	491.58**		496.82**		491.73**	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Fixed effects						
Intercept	0.470(0.137)	3.43**	0.441(0.136)	3.24**	0.497(0.136)	3.64**
GD[a]	-0.490(0.190)	-2.58**	-0.508(0.189)	-2.69**	-0.526(0.190)	-2.77**
ST[b]	0.009(0.211)	0.04	0.025(0.209)	0.12	0.010(0.209)	0.05
Religious background[c]						
CH	-0.207(0.178)	-1.16	-0.268(0.178)	-1.51	-0.271(0.178)	-1.52
NON-CH	-0.306(0.214)	-1.43	-0.331(0.213)	-1.55	-0.407(0.214)	-1.90
NO-REL	-0.563(0.122)	-4.61**	-0.542(0.121)	-4.48**	-0.604(0.122)	-4.95**
Interaction effects						
GD*ST	0.769(0.300)	2.56*	0.836(0.298)	2.81**	0.820(0.299)	2.75**
GD*CH	0.183(0.269)	0.68	0.279(0.268)	1.04	0.308(0.269)	1.14
GD*NON-CH	0.210(0.316)	0.66	0.258(0.315)	0.82	0.315(0.316)	1.00
GD*NO-REL	0.552(0.202)	2.73**	0.619(0.201)	3.08**	0.639(0.202)	3.16**
ST*CH	-0.062(0.245)	-0.25	-0.081(0.244)	-0.33	-0.093(0.245)	-0.38
ST*NON-CH	-0.357(0.315)	-1.13	-0.333(0.313)	-1.06	-0.255(0.315)	-0.81
ST*NO-REL	0.269(0.177)	1.52	0.298(0.176)	1.69	0.312(0.177)	1.76
GD*ST*CH	-0.022(0.371)	-0.06	0.024(0.369)	0.07	-0.047(0.371)	-0.13
GD*ST*NON-CH	0.507(0.495)	1.02	0.156(0.493)	0.32	0.252(0.496)	0.51
GD*ST*NO-REL	-0.350(0.274)	-1.28	-0.575(0.272)	-2.11*	-0.500(0.274)	-1.83
Random effects						
σ_{0j}^2	0.056(0.021)	2.67**	0.055(0.021)	2.62**	0.054(0.021)	2.61**
σ_e^2	1.512(0.037)	40.86**	1.498(0.036)	41.61**	1.514(0.037)	41.14**
ICC[d]	0.0357		0.0354		0.0346	
Deviance [e]	11061.947		11031.400		11066.327	
Parameters	18		18		18	
Deviance_UN	11563.061		11521.206		11560.537	
χ^2 [f]	501.11**		489.81**		494.21**	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. GD = gender; ST = school type; CH = Christian; NON-CH = religion other than Catholic and Christian; NO-REL = no religion; Deviance_UN = deviance of unconditional model. [a] Reference category of gender: male; [b] Reference category of school type: co-educational Catholic secondary school; [c] Reference category of religious background: Catholic; [d] ICC (intraclass correlation coefficient) = $\sigma_{0j}^2 / (\sigma_{0j}^2 + \sigma_e^2)$; [e] Deviance (-2LL) = negative log likelihood; [f] χ^2 = Deviance_UN - Deviance. *p<.05 **p<.01.

Figure 4.8 Relationship between school type and student perception of
the principal as a function of gender
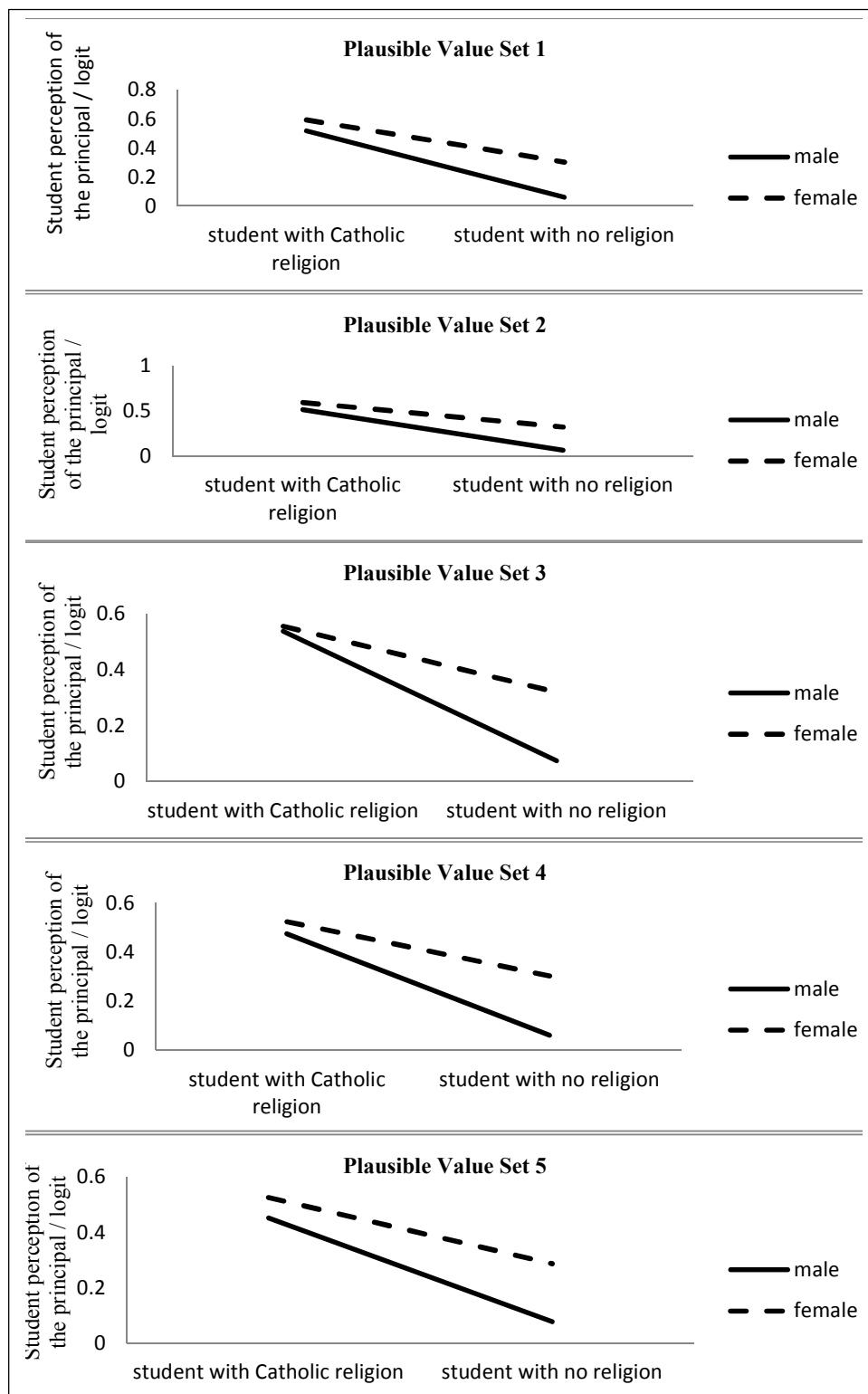
Figure 4.9 Relationship between students' religious background,
students with Catholic religion and no religion, and student
perception of the principal as a function of gender

The results of Table 4.14 show that the interaction term between gender and school type was statistically significant (t-ratio ranging from 2.33 to 2.91 across the five sets of plausible values, $df = 10$, $p < .05$ or $<.01$). This interaction, as depicted in Figure 4.8, shows that gender moderated the relationship between school type and student perception of the principal, such that the relationship was weaker for male students than for female students if the students were from single-sex schools; however, the perception of the principal was not different for male and female students if the students were from coeducational schools. Compared to female students, the difference in the perception of the principal between male students from coeducational and single-sex schools was smaller. Moreover, the difference in the students' perception of the principal between female and male students in single-sex schools was larger, compared to coeducational schools. The perception of the principal by female students of single-sex schools was relatively the most positive.

Table 4.14

Summary of the Effects for the Best-fitting Two-level Model with predictors for Student Perception of the Principal

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.423(0.116)	3.65**	0.411(0.115)	3.57**	0.431(0.119)	3.62**
GD[a]	-0.353(0.136)	-2.60**	-0.305(0.135)	-2.26*	-0.365(0.136)	-2.68**
ST[b]	0.204(0.141)	1.45	0.225(0.140)	1.61	0.230(0.147)	1.56
Religious background[c]						
CH	-0.393(0.122)	-3.22**	-0.394(0.122)	-3.23**	-0.363(0.123)	-2.95**
NON-CH	-0.567(0.158)	-3.59**	-0.550(0.157)	-3.50**	-0.545(0.158)	-3.45**
NO-REL	-0.479(0.089)	-5.38**	-0.473(0.089)	-5.31**	-0.486(0.089)	-5.46**
Interaction effects						
GD*ST	0.419(0.178)	2.35*	0.468(0.177)	2.64**	0.454(0.185)	2.45*
GD*CH	0.395(0.184)	2.15*	0.310(0.184)	1.68	0.310(0.185)	1.68
GD*NON-CH	0.455(0.238)	1.91	0.333(0.237)	1.41	0.426(0.239)	1.78
GD*NO-REL	0.419(0.136)	3.08**	0.360(0.135)	2.67**	0418(0.136)	3.07**
Random effects						
σ^2_{0j}	0.054(0.021)	2.57**	0.053(0.020)	2.65**	0.059(0.022)	2.68**
σ^2_e	1.528(0.037)	41.30**	1.515(0.037)	40.95**	1.532(0.037)	41.41**
ICC[d]	0.0341		0.0338		0.0371	
Deviance [e]	11096.208		11068.473		11108.262	
Parameters	10		10		10	
Deviance_FU	11085.653		11057.296		11095.338	
$\chi^{2\ f}$	10.56		11.18		12.92	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.390(0.118)	3.31**	0.351(0.117)	3.00**	0.401(0.117)	3.43**
GD[a]	-0.371(0.135)	-2.75**	-0.284(0.135)	-2.10*	-0.336(0.135)	-2.48*
ST[b]	0.184(0.145)	1.27	0.220(0.145)	1.52	0.213(0.144)	1.48
Religious background[c]						
CH	-0.265(0.122)	-2.17*	-0.339(0.121)	-2.80**	-0.351(0.122)	-2.88**
NON-CH	-0.469(0.157)	-2.99**	-0.482(0.157)	-3.07**	-0.523(0.157)	-3.32**
NO-REL	-0.433(0.089)	-4.87**	-0.397(0.088)	-4.51**	-0.454(0.089)	-5.11**
Interaction effects						
GD*ST	0.532(0.183)	2.91**	0.424(0.182)	2.33*	0.459(0.181)	2.54*
GD*CH	0.193(0.184)	1.05	0.288(0.183)	1.57	0.299(0.184)	1.63
GD*NON-CH	0.394(0.237)	1.66	0.286(0.236)	1.21	0.379(0.237)	1.59
GD*NO-REL	0.374(0.135)	2.77**	0.312(0.135)	2.31*	0.377(0.135)	2.78**
Random effects						
σ^2_{0j}	0.057(0.022)	2.59**	0.057(0.022)	2.59**	0.056(0.021)	2.62**
σ^2_e	1.516(0.037)	40.97**	1.504(0.037)	40.65**	1.519(0.037)	41.05**
ICC[d]	0.0362		0.0365		0.0356	
Deviance [e]	11071.305		11044.050		11077.660	
Parameters	10		10		10	
Deviance_FU	11061.947		11031.400		11066.327	
χ^2 [f]	9.36		12.65		11.33	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. GD = gender; ST = school type; CH = Christian; NON-CH = religion other than Catholic and Christian; NO-REL = no religion; Deviance_FU = deviance of the full model. [a] Reference category of gender: male; [b] Reference category of school type: co-educational Catholic secondary school; [c] Reference category of religious background: Catholic; [d] ICC (intraclass correlation coefficient) = $\sigma^2_{0j} / (\sigma^2_{0j} + \sigma^2_e)$; [e] Deviance (-2LL) = negative log likelihood; [f] χ^2 = Deviance - Deviance_FU. *$p<.05$ **$p<.01$.

The results in Table 4.14 show that the interaction term between gender and religious background, students with Catholic religion and no religion, was significant (*t*-ratio ranging from 2.31 to 3.08 across the five sets of plausible values, *df* = 10, *p* < .05 or < .01). This interaction, as depicted in Figure 4.9, shows that gender moderated the relationship between religious background, students with Catholic religion and no religion, and student perception of the principal, such that the relationship was weaker for female students than for male students if the students were Catholics, but stronger for female students than for male students if the students had no religion. Compared to male students, the difference in perception of the principal between female students with Catholic religion and no religion was smaller. Moreover, the difference in

perception of the principal between male and female students with no religion was larger, compared to those with Catholic religion. The interaction between gender and religious background (students with Catholic religion and Christian religion) or religious background (students with Catholic religion and religion other than Catholic and Christian) were not significant. This shows that there was no significant difference on the perception of the principal between female and male students with Catholic, Christian or other religion respectively. Among the students with Catholic and no religion, the perception of the principal by female students with Catholic religion was relatively the most positive, and the perception of the principal by male students with no religion was relatively the least positive.

4.5 Student attitude to discipline

This section aims to answer research question 4, which inquired about student attitude to discipline in Hong Kong's Catholic secondary schools.

4.5.1 Descriptive statistics on student attitude to discipline

Five items were constructed to measure the students' attitude to discipline in the Catholic secondary schools of Hong Kong. The students indicated their attitudes by choosing one of five options (strongly disagree, disagree, neutral, agree and strongly agree). Table 4.15 presents the students' response to the five

items. The items are arranged in descending order of endorsement by students. That is, the more positive attitudes are arranged at the top of the Table.

Table 4.15

Descriptive Statistics on the 'Student Attitude to Discipline' Scale (n = 3427)

Items	% SD	% D	% N	% A	% SA	mean[a]
49. School rules here encourage self-discipline and responsibility	3%	5%	40%	42%	11%	3.52
15. Students here know the standard of conduct expected of them	2%	6%	41%	42%	9%	3.49
17. Students are given sufficient freedom here	8%	13%	37%	33%	9%	3.23
25. Discipline presents no real problems in this school	11%	23%	48%	15%	3%	2.76
40. There are ways to have school rules changed if most students disagree with them	19%	18%	47%	13%	3%	2.63
Average Response	9%	13%	43%	29%	7%	3.13

Note. SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.
[a] mean value obtained by averaging the responses of all the participants (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

As shown in Table 4.15, for all five items, only a small percentage were allocated to the options of strongly disagree (ranging from 2%–19%, with an average of 9% across the five items) and disagree (ranged from 5%–23%, with an average of 13% across the five items). The strongly agree option also attracted endorsement from only a small percentage of students (ranging from 3%–11 %, with an average of 7% across the five items). In comparison, quite a high percentage of students opted for agree (ranging from 13%–42%, with an average of 29% across the five items), and neutral (ranging from 37%–48%, with an average of 43% across the five items). These results indicate that student attitude to discipline was, in general, not negative, and in fact between 42% (item 17) and 53% (item 49) showed positive responses to the discipline of their schools. A rather large proportion of students (ranging from 37%–48%,

with an average of 43% across the five items) indicated that they were neutral, reflecting that a relatively large proportion of students either did not have sufficient experience to form an opinion, did not have strong feelings on their attitude to school discipline or were loath to give their opinion. The slightly positive attitudes regarding school discipline can be further illustrated by the item mean raw scores on the right-most column of Table 4.15. On a scale of 1 to 5, the item means ranged from 2.63 (item 40) to 3.52 (item 49) across the five items.

As shown in Table 4.15, students considered that school rules could encourage self-discipline and responsibility of the students (53% agree/strongly agree) and students agreed that students in the school knew the standard of conduct expected of them (51% agree/strongly agree). Students also considered that students were given sufficient freedom in the school (42% agree/strongly agree). This shows the relatively positive attitude of the students to school discipline. However, students were less convinced that school discipline presented no real problems (18% agree/strongly agree, 34% disagree/strongly disagree), and that there were ways to have school rules changed if most students disagreed with them (16% agree/strongly agree, 37% disagree/strongly disagree).

4.5.2 The Wright map of the 'student attitude to discipline' scale

The distribution of Rasch person measure against the Rasch item measure, or the Wright map (Linacre, 2013), is presented in Figure 4.10. An inspection of the Wright map in Figure 4.10 shows that both the scoring of the items and persons were widely spread and evenly clustered around the mean and this result suggests an effective targeting within the student attitude to discipline scale. The relative positions of the person mean and item mean show a good alignment between person and item. The person mean has the same positioning with the item mean, indicating the participants' neutral attitude to school discipline on average.

```
INPUT: 3523 PERSON  5 ITEM  REPORTED: 3511 PERSON  5 ITEM  5 CATS WINSTEPS 3.72.3
-------------------------------------------------------------------------------
           PERSON - MAP - ITEM - Expected score zones (Rasch-half-point thresholds)
               <more>|
      5        .  +
                   |
                   |
               .   |
                   |
      4            +                                    Q40 .45
                   |
               .   |                                    Q25 .45
                   |
      3            +
               .   |                                    Q17 .45
                   |
             .#  |                                    Q15 .45  Q49 .45
                T|
      2        .  +
             .### |
               .  |                              Q40 .35
               .  |
             .##### |T                          Q25 .35
                S|
      1        .  +
         .####### |
               .  |S
         .######## |                            Q17 .35
               .  |
         .######## |
      0        . M+M                Q15 .35  Q49 .35
               .  |                 Q40 .25
     .############ |
               .  |                 Q25 .25
         .###### |S
                   |
     -1      .##### S+
                   |
             .## |T                Q17 .25
             .## |
               .  |        Q40 .15
             .# |        Q15 .15  Q49 .25
     -2            +        Q25 .15
             . T|
                   |
                   |
               .   |
                   |                Q17 .15
     -3        .  +
                   |
                   | Q15 .15  Q49 .15
                   |
               .   |
                   |
     -4        .  +
               <less>|
 EACH "#" IS 50. EACH "." IS 1 TO 49
            Scale(modified): Student attitude to discipline
```
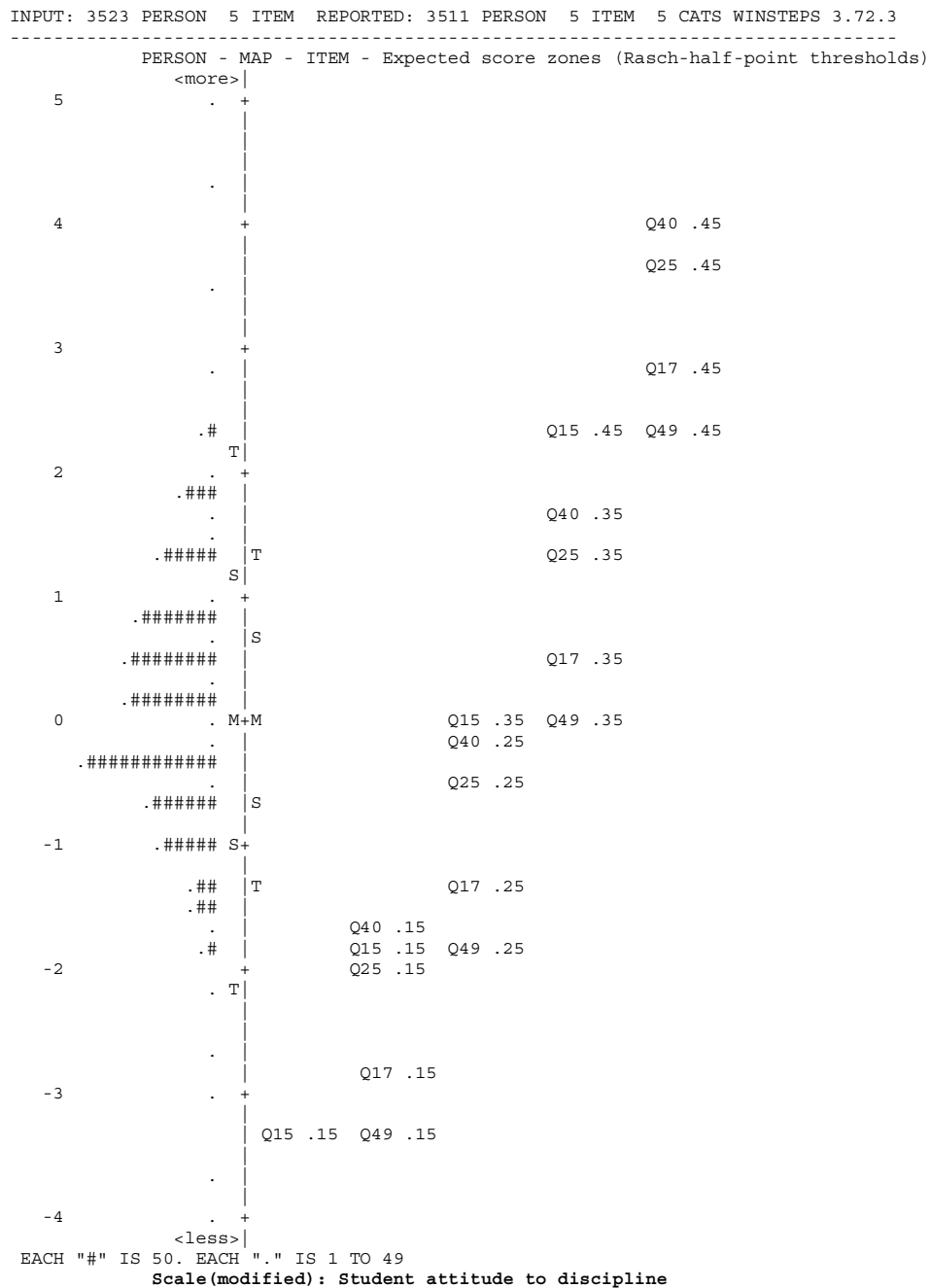
Figure 4.10 Wright map of the 'student attitude to discipline' scale

4.5.3 Effects of gender, school type, and religious background on student attitude to discipline

Before the discussion of the multilevel analysis, the multicollinearity assessment is reported. The multicollinearity assessment using SPSS (version 21) indicates that the variance inflation factors for the three independent variables, gender, school type and religious background of approximately 1.00 were well below the cut-off value of 10.00 (Stern, 2010). This shows that, upon performing linear regression using student attitude to discipline as a dependent variable, there was no correlation between the three independent variables.

4.5.3.1 Building a hierarchical structure for the multilevel analysis of student attitude to discipline

Tables 4.16 shows the results of the unconditional model of each of the five sets of plausible values and the average across the five sets including coefficients for each parameter, the variance of each level, their standard errors, the intraclass correlation coefficient, the design effect, the deviance (-2 log-likelihood), and the number of significant parameters (fixed and random).

Table 4.16

Summary of Unconditional Model for Student Attitude to Discipline

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.049 (0.078)	0.63	0.048 (0.080)	0.60	0.047 (0.080)	0.59
Random effects						
σ^2_{0j}	0.104 (0.036)	2.89**	0.109 (0.038)	2.87**	0.111 (0.039)	2.85**
σ^2_e	1.047 (0.025)	41.88**	1.041 (0.025)	41.64**	1.037 (0.025)	41.48**
ICC[a]	0.0904		0.0948		0.0967	
Deviance[b]	10213.528		10192.855		10180.150	
Deff[c]	18.59		19.46		19.83	
Parameters	3		3		3	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.049 (0.081)	0.60	0.045 (0.078)	0.58	0.048(0.079)	0.60
Random effects						
σ^2_{0j}	0.114 (0.040)	2.85**	0.104 (0.036)	2.89**	0.108(0.038)	2.87**
σ^2_e	1.045 (0.025)	41.80**	1.023 (0.024)	42.63**	1.039(0.025)	41.89**
ICC[a]	0.0984		0.0923		0.0945	
Deviance[b]	10210.198		10131.483		10185.643	
Deff[c]	20.15		18.97		19.40	
Parameters	3		3		3	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets.
[a] ICC (intraclass correlation coefficient) = $\sigma^2_{0j} / (\sigma^2_{0j} + \sigma^2_e)$; [b] Deviance (-2LL) = negative log likelihood; [c] Deff (design effect) = $1 + (195.7 - 1) * ICC$.
*p<.05   **p<.01.

As shown in Table 4.16, the results of the five sets of plausible values were very similar. The random effects at both the between-school (σ^2_{0j}) and within-school (σ^2_{ej}) levels were statistically significant. The average between-school variance was estimated as 0.108, and the five sets of *t*-ratio of school-level variance, σ^2_{0j}, show that the school-level was significant (*t*-ratio ranging from 2.85 to 2.89 across the five sets of plausible values, *df* = 3, *p* < .01). The average variance between-students within schools was estimated as 1.039, and the five sets of *t*-ratio of student-level variance, σ^2_e, show that the student-level was significant (*t*-ratio ranging from 41.48 to 42.63 across the five sets of

plausible values, $df = 3$, $p < .01$). The intraclass correlation coefficient values, ranging from 0.0904 to 0.0984 across the five sets of plausible values, were larger than the cut-off value of 0.05 (Escobar et al., 2013). This indicates that schools accounted for an average of about 9.45% of the variability of student attitude to discipline. The intraclass correlation coefficient values in the range of 8% and 12% show that between-school variation was intermediate in comparison to the total variation. The design effect values, ranging from 18.59 to 20.15 across the five sets of plausible values, were greater than the cut-off value of 2.00 (Muthen & Satorra, 1995).

To conclude, the significance of the t-ratio for school variance, intraclass correlation coefficient value and the design effect value clearly indicate that variation in student attitude to discipline existed between schools, and a two-level model, with students at level 1 nested within schools at level 2, was needed for analysis of student attitude to discipline.

4.5.3.2 Development of a full model with predictors fitted for the multilevel analysis of student attitude to discipline

Using student attitude to discipline as a dependent variable, all predictors, gender, school type, religious background and all possible interactions of these predictors, were introduced into the unconditional model to form the full model. Table 4.17 shows that the inclusion of all the predictors caused a significant reduction in the deviance in the five plausible value sets (χ^2 ranging from 413.411 to 432.450 across the five sets of plausible values, $df = 15$, $p < .01$). This indicates that, after controlling for school effect, at least one of the

predictors was a highly significant predictor to explain the students' attitude to discipline. The t-ratio of school-level variance, σ_{0j}^2, shows that the school-level variance for the full model of each set of plausible values was significant (t-ratio ranged from 2.63 to 2.76 across the five sets of plausible values, $df = 18$, $p < .01$). This indicated that, after controlling for gender, school type, religious background of students and the interaction of these predictors, there was significant between-school variances in student attitude to discipline. The value of the conditional intraclass correlation of 0.0453 on average indicates that, after controlling for all predictors and interactions of these predictors in the model, school accounted for 4.53% of the variability of student attitude to discipline. The proportion of variance was quite small though statistically significant.

To start, an inspection of the significance of the predictors and the interaction of these predictors from the three-level interaction, gender by school type by religious background, found that the three-way interaction effect was not significant. None of the three interactions, gender by school type by religious background (Christian), gender by school type by religious background (religion other than Catholic and Christian) were significant. An inspection of the two-level interaction revealed that: (1) the two-way interaction effect of gender by school type was significant (t-ratio ranging from 2.20 to 2.94 across the five sets of plausible values, $df = 18$, $p < .05$ or $< .01$), which was illustrated by plotting the relationship between school type and student attitude to discipline as a function of gender, as shown in Figure 4.11; (2) the two-way interaction effect of gender by religious background was significant

for the interaction of gender by religious background (no religion) (t-ratio ranging from 2.47 to 3.45 across the five sets of plausible values, $df = 18$, $p < .05$ or $p < .01$) which was illustrated by plotting the relationship between students' religious background, students with Catholic religion and no religion, and student attitude to discipline as a function of gender, as shown in Figure 4.12; however, it was not significant for interactions of gender by religious background (Christian) or gender by religious background (religion other than Catholic and Christian); (3) the two-way interaction effect of school type by all categories of religious background was not significant. Given the significant two-way interaction effects, the main effects of individual predictors was not interpreted.

Based on the results, the best-fitting model for the multilevel analysis of student attitude to discipline was a two-level random intercept model, with students at level 1 nested within schools at level 2 for the gender, school type, religious background and two-way interaction effects, and gender by school type and gender by religious background as factors.

Table 4.17

Summary of the Effects for Two-level Full Model for Student Attitude to Discipline

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.161(0.117)	1.38	0.203(0.119)	1.71	0.129(0.120)	1.08
GD[a]	-0.407(0.157)	-2.59**	-0.494(0.157)	-3.15**	-0.312(0.156)	-2.00*
ST[b]	0.049(0.181)	0.27	0.006(0.184)	0.03	0.065(0.186)	0.35
Religious background[c]						
CH	-0.219(0.148)	-1.48	-0.229(0.147)	-1.56	-0.167(0.147)	-1.14
NON-CH	-0.287(0.177)	-1.62	-0.314(0.177)	-1.77	-0.214(0.176)	-1.22
NO-REL	-0.355(0.101)	-3.51**	-0.402(0.101)	-3.98**	-0.342(0.100)	-3.42**
Interaction effects						
GD*ST	0.664(0.255)	2.60**	0.759(0.258)	2.94**	0.572(0.260)	2.20*
GD*CH	0.283(0.223)	1.27	0.394(0.222)	1.77	0.173(0.222)	0.78
GD*NON-CH	0.200(0.262)	0.76	0.234(0.261)	0.90	0.072(0.260)	0.28
GD*NO-REL	0.489(0.168)	2.91**	0.576(0.167)	3.45**	0.412(0.167)	2.47*
ST*CH	-0.103(0.204)	-0.50	-0.068(0.203)	-0.33	-0.113(0.202)	-0.56
ST*NON-CH	-0.260(0.261)	-1.00	-0.171(0.260)	-0.66	-0.246(0.260)	-0.95
ST*NO-REL	0.236(0.147)	1.61	0.279(0.146)	1.91	0.236(0.146)	1.62
GD*ST*CH	0.000(0.308)	0.00	-0.100(0.306)	-0.33	0.080(0.306)	0.26
GD*ST*NON-CH	0.275(0.411)	0.67	0.239(0.409)	0.58	0.444(0.408)	1.09
GD*ST*NO-REL	-0.356(0.227)	-1.57	-0.421(0.226)	-1.86	-0.273(0.226)	-1.21
Random effects						
σ_{0j}^2	0.046(0.017)	2.71**	0.049(0.018)	2.72**	0.052(0.019)	2.74**
σ_e^2	1.041(0.025)	41.64**	1.032(0.025)	41.28**	1.027(0.025)	41.08**
ICC[d]	0.0423		0.0453		0.0482	
Deviance [e]	9800.117		9771.314		9754.973	
Parameters	18		18		18	
Deviance_UN	10213.528		10192.855		10180.150	
χ^{2} [f]	413.41**		421.54**		425.18**	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Fixed effects						
Intercept	0.137(0.119)	1.15	0.159(0.117)	1.36	0.158(0.118)	1.33
GD[a]	-0.396(0.157)	-2.52*	-0.417(0.155)	-2.69**	-0.405(0.156)	-2.59**
ST[b]	0.059(0.185)	0.32	0.038(0.181)	0.21	0.043(0.183)	0.24
Religious background[c]						
CH	-0.183(0.148)	-1.24	-0.226(0.146)	-1.55	-0.205(0.147)	-1.39
NON-CH	-0.191(0.177)	-1.08	-0.208(0.175)	-1.19	-0.243(0.176)	-1.38
NO-REL	-0.345(0.101)	-3.42**	-0.373(0.100)	-3.73**	-0.363(0.101)	-3.61**
Interaction effects						
GD*ST	0.705(0.258)	2.73**	0.705(0.254)	2.78**	0.681(0.257)	2.65**
GD*CH	0.312(0.223)	1.40	0.316(0.220)	1.44	0.296(0.222)	1.33
GD*NON-CH	0.174(0.261)	0.67	0.171(0.258)	0.66	0.170(0.260)	0.65
GD*NO-REL	0.467(0.167)	2.80**	0.526(0.165)	3.19**	0.494(0.167)	2.96**
ST*CH	-0.026(0.203)	-0.13	-0.089(0.200)	-0.45	-0.080(0.202)	-0.39
ST*NON-CH	-0.287(0.261)	-1.10	-0.303(0.257)	-1.18	-0.253(0.260)	-0.98
ST*NO-REL	0.228(0.147)	1.55	0.279(0.145)	1.92	0.252(0.146)	1.72
GD*ST*CH	-0.174(0.307)	-0.57	0.017(0.303)	0.06	-0.035(0.306)	-0.12
GD*ST*NON-CH	0.277(0.410)	0.68	0.224(0.405)	0.55	0.292(0.409)	0.71
GD*ST*NO-REL	-0.354(0.227)	-1.56	-0.461(0.224)	-2.06*	-0.373(0.226)	-1.65
Random effects						
σ_{0j}^2	0.050(0.019)	2.63**	0.047(0.017)	2.76**	0.049(0.018)	2.71**
σ_e^2	1.035(0.025)	41.40**	1.010(0.025)	40.40**	1.029(0.025)	41.16**
ICC[d]	0.0461		0.0445		0.0453	
Deviance [e]	9781.438		9699.033		9761.375	
Parameters	18		18		18	
Deviance_UN	10210.198		10131.483		10185.643	
$\chi^{2\ f}$	428.76**		432.45**		424.27**	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. GD = gender; ST = school type; CH = Christian; NON-CH = religion other than Catholic and Christian; NO-REL = no religion; Deviance_UN = deviance of unconditional model. [a] Reference category of gender: male; [b] Reference category of school type: co-educational Catholic secondary school; [c] Reference category of religious background: Catholic; [d] ICC (intraclass correlation coefficient) = $\sigma_{0j}^2 / (\sigma_{0j}^2 + \sigma_e^2)$; [e] Deviance (-2LL) = negative log likelihood; [f] χ^2 = Deviance_UN - Deviance. *p<.05 **p<.01.

Figure 4.11 Relationship between school type and student attitude to
discipline as a function of gender

Figure 4.12 Relationship between students' religious background, students with Catholic religion and no religion, and student attitude to discipline as a function of gender

The results in Table 4.18 show that the interaction term between gender and school type was statistically significant (*t*-ratio ranging from 2.31 to 2.68 across the five sets of plausible values, *df* = 10, *p* < .05 or <.01). This interaction, as depicted in Figure 4.11, shows that gender moderated the relationship between school type and student attitude to discipline, such that the relationship was weaker for male students than for female students. Compared to female students, the difference in attitude to discipline between male students from coeducational and single-sex schools was smaller. Moreover, the difference in attitude to discipline between female and male students in single-sex schools was larger, compared to coeducational schools. The attitude of female students of single-sex schools to discipline was relatively the most positive.

Table 4.18

Summary of the Effects for the Best-fitting Two-level Model with predictors for Student Attitude to Discipline

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.092(0.102)	0.90	0.116(0.104)	1.12	0.060(0.105)	0.57
GD[a]	-0.277(0.112)	-2.47*	-0.333(0.112)	-2.97**	-0.228(0.111)	-2.05*
ST[b]	0.200(0.131)	1.53	0.183(0.135)	1.36	0.215(0.137)	1.57
Religious background[c]						
CH	-0.298(0.101)	-2.95**	-0.292(0.101)	-2.89**	-0.252(0.101)	-2.50*
NON-CH	-0.406(0.130)	-3.12**	-0.391(0.130)	-3.01**	-0.326(0.130)	-2.51*
NO-REL	-0.241(0.074)	-3.26**	-0.267(0.073)	-3.66**	-0.228(0.073)	-3.12**
Interaction effects						
GD*ST	0.415(0.163)	2.55*	0.450(0.168)	2.68**	0.399(0.171)	2.33*
GD*CH	0.299(0.153)	1.95	0.361(0.152)	2.38*	0.239(0.152)	1.57
GD*NON-CH	0.290(0.197)	1.47	0.291(0.196)	1.48	0.232(0.196)	1.18
GD*NO-REL	0.304(0.112)	2.71**	0.357(0.112)	3.19**	0.277(0.112)	2.47*
Random effects						
σ_{0j}^2	0.047(0.018)	2.61**	0.051(0.019)	2.68**	0.053(0.020)	2.65**
σ_e^2	1.044(0.025)	41.76**	1.035(0.025)	41.40**	1.030(0.025)	41.20**
ICC[d]	0.0431		0.0470		0.0489	
Deviance [e]	9810.617		9782.720		9765.675	
Parameters	10		10		10	
Deviance_FU	9800.117		9771.314		9754.973	
χ^2 [f]	10.50		11.41		10.70	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Fixed effects						
Intercept	0.068(0.104)	0.65	0.076(0.102)	0.75	0.082(0.103)	0.80
GD[a]	-0.257(0.112)	-2.29*	-0.244(0.111)	-2.20*	-0.268(0.112)	-2.40*
ST[b]	0.210(0.135)	1.56	0.219(0.132)	1.66	0.205(0.134)	1.53
Religious background[c]						
CH	-0.217(0.101)	-2.15*	-0.301(0.100)	-3.01**	-0.272(0.101)	-2.70**
NON-CH	-0.321(0.130)	-2.47*	-0.346(0.129)	-2.68**	-0.358(0.130)	-2.76**
NO-REL	-0.235(0.073)	-3.22**	-0.238(0.072)	-3.31**	-0.242(0.073)	-3.31**
Interaction effects						
GD*ST	0.440(0.169)	2.60**	0.379(0.164)	2.31*	0.417(0.167)	2.49*
GD*CH	0.238(0.152)	1.57	0.334(0.150)	2.23*	0.294(0.152)	1.94
GD*NON-CH	0.263(0.197)	1.34	0.237(0.194)	1.22	0.263(0.196)	1.34
GD*NO-REL	0.282(0.112)	2.52*	0.283(0.111)	2.55*	0.301(0.112)	2.69**
Random effects						
σ^2_{0j}	0.052(0.019)	2.74**	0.049(0.018)	2.72**	0.050(0.019)	2.68**
σ^2_e	1.038(0.025)	41.52**	1.015(0.025)	40.60**	1.032(0.025)	41.30**
ICC[d]	0.0477		0.0461		0.0465	
Deviance [e]	9790.811		9713.697		9772.704	
Parameters	10		10		10	
Deviance_FU	9781.438		9699.033		9761.375	
χ^2 [f]	9.37		14.66		11.33	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. GD = gender; ST = school type; CH = Christian; NON-CH = religion other than Catholic and Christian; NO-REL = no religion; Deviance_FU = deviance of the full model. [a] Reference category of gender: male; [b] Reference category of school type: co-educational Catholic secondary school; [c] Reference category of religious background: Catholic; [d] ICC (intraclass correlation coefficient) = $\sigma^2_{0j} / (\sigma^2_{0j} + \sigma^2_e)$; [e] Deviance (-2LL) = negative log likelihood; [f] χ^2 = Deviance - Deviance_FU. *$p<.05$ **$p<.01$.
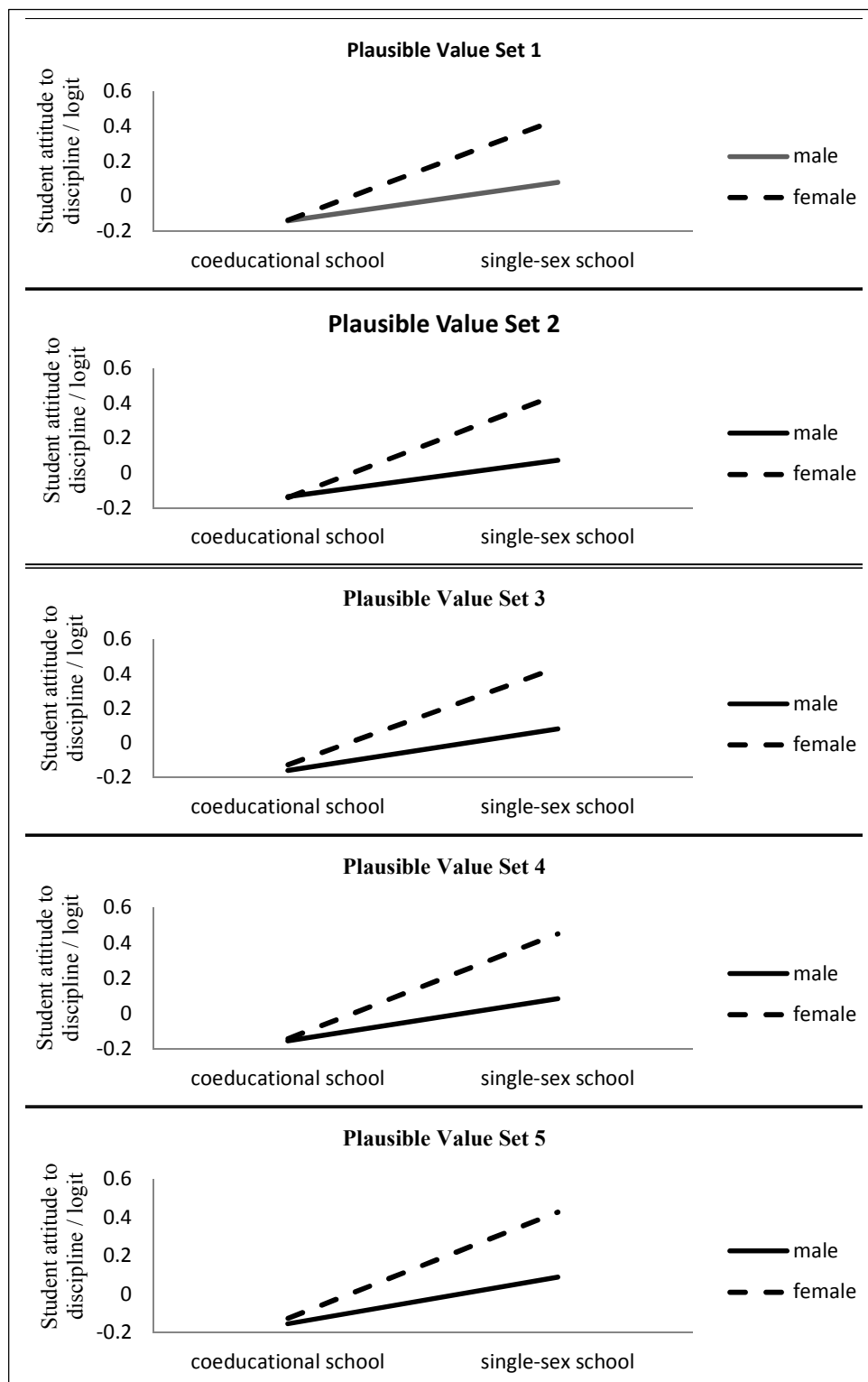
The results in Table 4.18 show that the interaction term between gender and religious background, students with Catholic religion and no religion, was significant (*t*-ratio ranging from 2.47 to 3.19 across the five sets of plausible values, *df* = 10, *p* < .05 or < 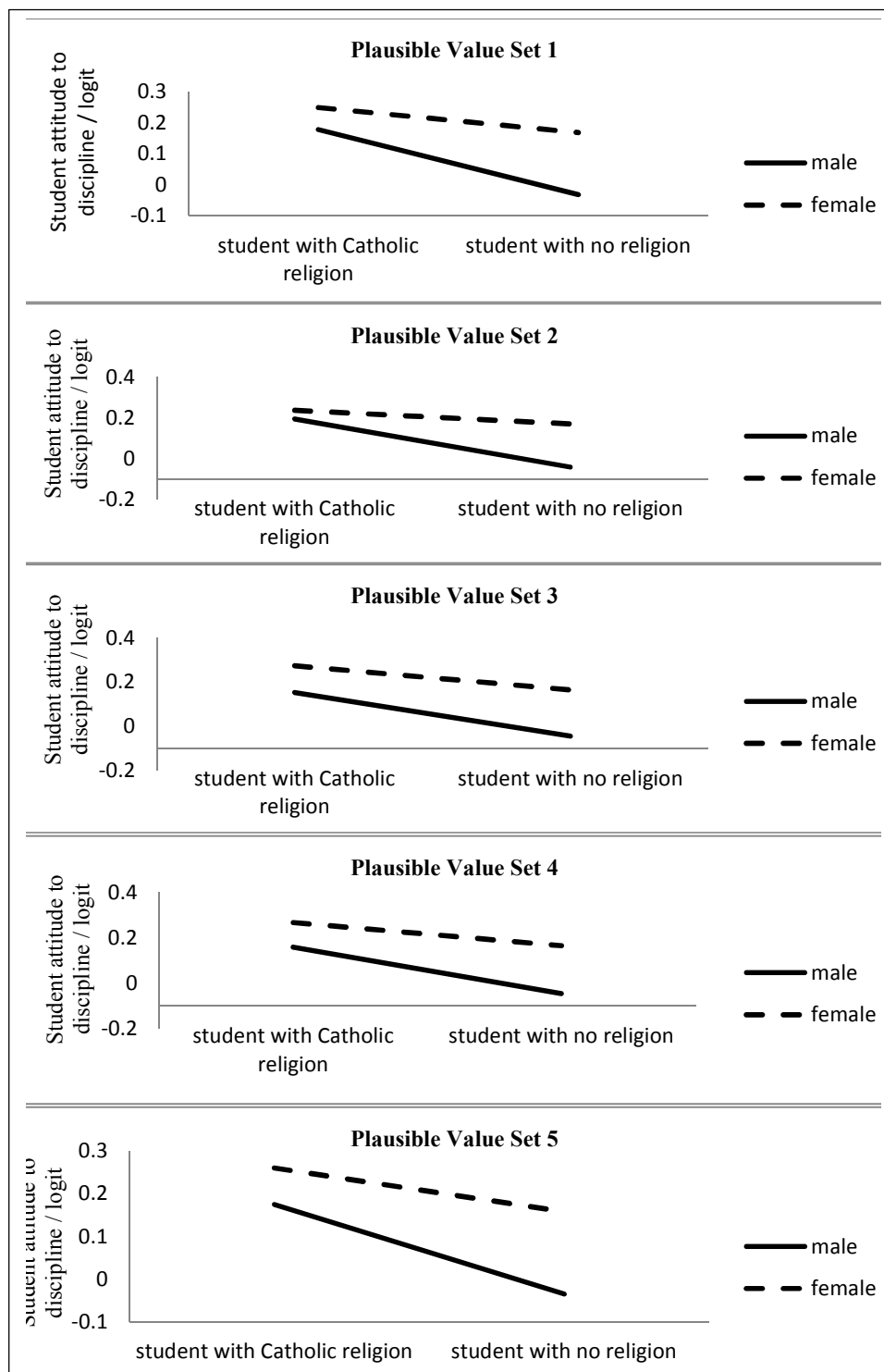.01). This interaction, as depicted in Figure 4.12, shows that gender moderated the relationship between religious background, students with Catholic religion and no religion, and student attitude to discipline, such that the relationship was weaker for female students than for male students. Compared to male students, the difference in attitude to discipline between female students with Catholic religion and no religion was smaller. Moreover, the difference in attitude to discipline between male and female students with

no religion was larger, compared to those with Catholic religion. The interaction between gender and religious background (students with Catholic religion and Christian religion) or religious background (students with Catholic religion and religion other than Catholic and Christian) were not significant. This shows that there was no significant difference on the attitude to discipline between female and male students with Catholic, Christian or other religion respectively. Among the students with Catholic and no religion, the attitude of female students with Catholic religion to school discipline was relatively the most positive, and the attitude of male students with no religion to school discipline was relatively the least positive.

4.6 Student attitude to religion

A valid and reliable scale could not be established based on the set of items in the questionnaire, as discussed in Section 3.5.5, to measure the variable, "student attitude to religion". However, it was impossible to put in extra resources or to re-conduct the survey to modify the scale. In this regard, a comprehensive inquiry about the student attitude to religion in Hong Kong's secondary schools could not be accomplished. The descriptive statistics of these items were discussed to unveil certain aspects of the attitude of the students toward their school.

4.6.1 Descriptive statistics of the items

Students indicated their attitudes by choosing one of five options (strongly disagree, disagree, neutral, agree and strongly agree). Table 4.19 presents the students' responses to the 3 items. The items are arranged in descending order of endorsement by students. That is, the more positive attitudes are arranged at the top of the table.

Table 4.19

Descriptive Statistics on the Three Items Related to Student Attitude to Religion (n = 3448)

Items	% SD	% D	% N	% A	% SA	mean[a]
45. Catholic teachers here set an example of what it means to be a practising Catholic	5%	8%	54%	26%	7%	3.21
32. This school places too much emphasis on external conformity to rules and regulations	3%	10%	60%	20%	7%	3.17
21. Senior students understand and accept the religious goals of the school	4%	9%	65%	20%	3%	3.09

Note. SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.
[a] mean value obtained by averaging the responses of all the participants (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

As shown in Table 4.19, students generally believed that Catholic teachers have set an example of what it means to be a practicing Catholic (33% agree/strongly agree), and they generally felt that the senior students understood and accepted the religious goals of the school (23% agree/strongly agree). However, the students generally believed that the school placed too much emphasis on the external conformity to rules and regulations (23% agree/strongly agree).

4.7 Student attitude to religious education

This section aims to answer research question 6, which inquired about student attitude to religious education in Hong Kong's Catholic secondary schools.

4.7.1 Descriptive statistics on student attitude to religious education

Twelve items were constructed to measure student attitude to religious education in the Catholic secondary schools of Hong Kong. Students indicated their attitudes by choosing one of five options (strongly disagree, disagree, neutral, agree and strongly agree). Table 4.20 presents the students' responses to the 12 items. The items are arranged in descending order of endorsement by students. That is, the more positive attitudes are arranged at the top of the table.

Table 4.20

Descriptive Statistics on the 'Student Attitude to Religious Education' Scale (n = 3334)

Items	% SD	% D	% N	% A	% SA	mean[a]
64. R.E. classes are well prepared and taught	5%	6%	51%	29%	9%	3.31
52. I have enjoyed R.E. classes this year	7%	12%	45%	26%	10%	3.19
63. R.E. teachers allow sufficient time for discussion	6%	9%	52%	27%	6%	3.17
55. R.E. classes are related to real life and to my needs	8%	12%	46%	27%	7%	3.14
66. I have enjoyed studies of religion courses in R.E.	10%	11%	46%	24%	9%	3.11
54. R.E. classes have been interesting	9%	14%	43%	27%	8%	3.11
58. This school has a good programme in my form	6%	11%	54%	23%	5%	3.10
59. More emphasis should be placed on knowledge and content in R.E.	6%	11%	58%	21%	5%	3.07
65. R.E. subject is taught at a level comparable with that of other subjects	8%	12%	55%	20%	5%	3.02
53. The study of other religions has helped me to appreciate my own religion	8%	12%	57%	18%	5%	2.98
60. R.E. classes are taken seriously by students	10%	16%	53%	17%	4%	2.89
57. If R.E. classes were voluntary, I would still attend them	12%	19%	49%	16%	5%	2.84
Average Response	8%	12%	51%	23%	6%	3.08

Note. SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.
[a] mean value obtained by averaging the responses of all the participants (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

As shown in Table 4.20, for all 12 items, only a small percentage were allocated to the options of strongly disagree (ranging from 5%–12%, with an average of 8% across the 12 items) and disagree (ranging from 6%–19%, with an average of 12% across the 12 items). The strongly agree option also attracted endorsement from only a small percentage of students (ranging from 4%–10%, with an average of 6% across the 12 items). In comparison, quite a high percentage of students opted for agree (ranging from 16%–29%, with an average of 23% across the 12 items), and neutral (ranging from 43%–58%, with

an average of 51% across the 12 items). These results indicate that the students' attitude to religious education was, in general, not negative, and in fact between 25% (item 65) and 38% (item 64) showed positive responses to the religious education in their schools. A rather large proportion of students (ranging from 37%–48%, with an average of 43% across the 12 items) indicated that they were neutral, reflecting that a relatively large proportion of students either did not have sufficient experience to form an opinion, did not have strong feelings on the religious education of the school or were loath to give their opinion. The slight inclination toward positive attitudes regarding religious education of the school is further illustrated by the item mean raw scores on the right-most column of Table 4.20. On a scale of 1 to 5, the item means ranged from 2.84 (item 57) to 3.31 (item 64) across the 12 items.

As shown in Table 4.20, students considered that religious education classes were well prepared and taught (38% agree/strongly agree) and they have enjoyed religious education classes (36% agree/strongly agree). The students were less convinced that, if religious education classes were voluntary, they would still attend them (21% agree/strongly agree, 31% disagree/strongly disagree), and that religious education classes were taken seriously by students (21% agree/strongly agree, 26% disagree/strongly disagree).

4.7.2 The Wright map of the 'student attitude to religious education' scale

The distribution of Rasch person measure against the Rasch item measure, or the Wright map (Linacre, 2013) is presented in Figure 4.13. An inspection of the Wright map in Figure 4.13 shows that both the scoring of the items and the persons were widely spread and evenly clustered around the mean, suggesting an effective targeting within the student attitude to religious education scale. The relative positions of the person mean and item mean show a good alignment between person and item. The person mean has the same positioning with the item mean, indicating the participants' neutral attitude to religious education of the school on average.

```
INPUT: 3523 PERSON  12 ITEM  REPORTED: 3505 PERSON  12 ITEM  5 CATS WINSTEPS 3.72.3
--------------------------------------------------------------------------------
          PERSON - MAP - ITEM - Expected score zones (Rasch-half-point thresholds)
                  <more>|
      6         .  +
                .  |
                   |
                   |
      5         .  +
                   |
                .  |
                .  |
                .  |                                               Q57 .45
      4            +                                               Q60 .45
                .  |                                      Q53 .45 Q65 .45
                .  |                    Q54 .45 Q58 .45 Q59 .45 Q66 .45
                .  |                            Q52 .45 Q55 .45 Q63 .45
                .  T|
      3         .  +                                               Q64 .45
                .  |
                .  |
               .## |
               .#  |
      2         .# +
               .#  |                                      Q57 .35
              .## S|                                      Q60 .35
              .##  |                             Q53 .35 Q65 .35
              .##  |                             Q58 .35 Q59 .35
      1       .##  +              Q54 .35 Q55 .35 Q63 .35 Q66 .35
               .   |                                      Q52 .35
              .##  |T                                     Q64 .35
              .##  |S
              .#   |
      0      .### M+M
        .###########  |
               .  |S
              .## |T
              .## |
     -1       .## +                             Q57 .25 Q60 .25
               .# |                                      Q53 .25
               .# |                             Q59 .25 Q65 .25
              .## S|             Q54 .25 Q55 .25 Q58 .25 Q66 .25
               .# |                             Q52 .25 Q63 .25
     -2        .# +
               .  |                                      Q64 .25
              .#  |
               .  |                             Q57 .15
               .  |                             Q60 .15
     -3       .  T+                    Q53 .15 Q65 .15
               .  |                             Q59 .15
               .  | Q54 .15 Q55 .15 Q58 .15 Q63 .15 Q66 .15
               .  |                             Q52 .15
               .  |                             Q64 .15
     -4        .  +
                  |
               .  |
                  |
                  |
     -5           +
               .  |
                  |
                  |
                  |
     -6        .# +
                  <less>|
EACH "#" IS 51. EACH "." IS 1 TO 50
    Scale (modified): student attitude to religious education
```

Figure 4.13 Wright map of the 'student attitude to religious education'
            scale

4.7.3 Effects of gender, school type, and religious background on student attitude to religious education

Before the discussion of the multilevel analysis, the multicollinearity assessment is reported. The multicollinearity assessment using SPSS (version 21) indicates that the variance inflation factors for the three independent variables, gender, school type and religious background of approximately 1.00 are well below the cut-off value of 10.00 (Stern, 2010). This shows that, upon performing linear regression using student attitude to religious education as a dependent variable, there was no correlation between the three independent variables.

4.7.3.1 Building a hierarchical structure for the multilevel analysis of student attitude to religious education

Table 4.21 shows the results of the unconditional model of each of the five sets of plausible values and the average across the five sets including coefficients for each parameter, the variance of each level, their standard errors, the intraclass correlation coefficient, the design effect, the deviance (-2 log-likelihood), and the number of significant parameters (fixed and random).

Table 4.21

Summary of Unconditional Model for Student Attitude to Religious Education

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.108 (0.128)	0.84	0.112 (0.130)	0.86	0.122 (0.131)	0.93
Random effects						
σ_{0j}^2	0.283 (0.098)	2.89**	0.293 (0.101)	2.90**	0.300 (0.103)	2.91**
σ_e^2	2.017 (0.048)	42.02**	2.001 (0.048)	41.69**	1.992 (0.048)	41.50**
ICC[a]	0.1230		0.1277		0.1309	
Deviance[b]	12530.639		12502.260		12486.171	
Deff[c]	24.96		25.87		26.49	
Parameters	3		3		3	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.111 (0.130)	0.85	0.121 (0.127)	0.95	0.115(0.129)	0.89
Random effects						
σ_{0j}^2	0.293 (0.101)	2.90**	0.279 (0.096)	2.91**	0.290(0.100)	2.90**
σ_e^2	2.014 (0.048)	41.96**	1.978 (0.047)	42.09**	2.000(0.048)	41.85**
ICC[a]	0.1270		0.1236		0.1264	
Deviance[b]	12524.402		12461.304		12500.955	
Deff[c]	25.73		25.07		25.62	
Parameters	3		3		3	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. [a] ICC (intraclass correlation coefficient) = σ_{0j}^2 / ($\sigma_{0j}^2 + \sigma_e^2$); [b] Deviance (-2LL) = negative log likelihood; [c] Deff (design effect) = 1 + (195.7 – 1) * ICC. *p<.05 **p<.01.

As shown in Table 4.21, the results of the five sets of plausible values were very similar. The random effects at both the between-school (σ^2_{0j}) and within-school (σ^2_{ej}) levels were statistically significant. The average between-school variance was estimated as 0.290, and the five sets of *t*-ratio of school-level variance, σ_{0j}^2, show that the school-level was significant (*t*-ratio ranging from 2.89 to 2.91 across the five sets of plausible values, *df* = 3, *p* < .01). The average variance between-students within schools was estimated as 2.00, and the five sets of *t*-ratio of student-level variance, σ_e^2, show that the student-level was significant (*t*-ratio ranging from 41.50 to 42.09 across the five sets of plausible values, *df* = 3, *p* < .01). The intraclass correlation coefficient values,

ranging from 0.1230 to 0.1309 across the five sets of plausible values, were larger than the cut-off value of 0.05 (Escobar et al., 2013). This indicates that schools accounted for an average of about 12.64% of the variability of student attitude to religious education. The intraclass correlation coefficient values of larger than 12% show that between-school variation was large in comparison to the total variation. The design effect values, ranging from 24.96 to 26.49 across the five sets of plausible values, were greater than the cut-off value of 2.00 (Muthen & Satorra, 1995).

To conclude, the significance of the *t*-ratio for school variance, intraclass correlation coefficient value and the design effect value clearly indicate that variation in student attitude to religious education existed between schools, and a two-level model, with students at level 1 nested within schools at level 2 was needed for analysis of student attitude to religious education.

4.7.3.2 Development of a full model with predictors fitted for the multilevel analysis of student attitude to religious education

Using student attitude to religious education as a dependent variable, all predictors, gender, school type, religious background and all possible interactions of these predictors, were introduced into the unconditional model to form the full model. Table 4.22 shows that the inclusion of all the predictors caused a reduction in deviance in the five plausible value sets that were all significant (χ^2 ranging from 610.436 to 650.857 across the five sets of plausible

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values, $df = 15$, $p < .01$). This indicates that, after controlling for school effect, at least one of the predictors was highly significant to explain student attitude to religious education. The t-ratio of school-level variance, σ_{0j}^2, shows that the school-level for the full model of each set of plausible values was significant (t-ratio ranging from 2.77 to 2.83 across the five sets of plausible values, $df = 18$, $p < .01$). This indicates that, after controlling for gender, school type and religious background of students and the interaction of these predictors, there was significant between-school variances in student attitude to religious education. The value of the conditional intraclass correlation of 0.0698 on average indicates that, after controlling for all predictors and the interactions of these predictors in the model, school accounted for 6.98% of the variability of student attitude to religious education. The proportion of variance was quite small though statistically significant.

To start, an inspection of the significance of the predictors and the interaction of these predictors from the three-level interaction, gender by school type by religious background, found that the three-way interaction effect was not significant. None of the three interactions, gender by school type by religious background (Christian), gender by school type by religious background (religion other than Catholic and Christian) and gender by school type by religious background (no religion), were significant. Inspection of the two-level of interaction revealed that: (1) the two-way interaction effect of gender by school type was significant (t-ratio ranging from 2.62 to 3.15 across the five sets of plausible values, $df = 18$, $p < .01$), which was illustrated by plotting the relationship between school type and student attitude to religious

education as a function of gender, as shown in Figure 4.14; (2) the two-way interaction effect of gender by religious background was significant for the interaction of gender by religious background (no religion) (*t*-ratio ranging from 2.50 to 3.25 across the five sets of plausible values, $df = 18$, $p < .05$ or $p < .01$), which was illustrated by plotting the relationship between students' religious background, students with Catholic religion and no religion, and student attitude to religious education as a function of gender, as shown in Figure 4.15; however, it was not significant for interactions of gender by religious background (Christian) or gender by religious background (religion other than Catholic and Christian); (3) the two-way interaction effect of school type by all of the categories of religious background was not significant. Given the significant two-way interaction effects, the main effects of individual predictors was not interpreted.

Based on the results, the best-fitting model for the multilevel analysis of student attitude to religious education was a two-level random intercept model, with students at level 1 nested within schools at level 2 for the gender, school type, religious background and two-way interaction effects, and gender by school type and gender by religious background as factors.

Table 4.22

Summary of the Effects for Two-level Full Model for Student Attitude to Religious Education

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.692(0.180)	3.84**	0.635(0.180)	3.53**	0.623(0.179)	3.48**
GD[a]	-0.665(0.215)	-3.09**	-0.536(0.213)	-2.52*	-0.544(0.213)	-2.55*
ST[b]	-0.041(0.282)	-0.15	0.083(0.284)	0.29	0.047(0.282)	0.17
Religious background[c]						
CH	-0.477(0.202)	-2.36*	-0.448(0.201)	-2.23*	-0.442(0.201)	-2.20*
NON-CH	-0.693(0.242)	-2.86**	-0.719(0.240)	-3.00**	-0.496(0.241)	-2.06*
NO-REL	-0.998(0.138)	-7.23**	-0.982(0.137)	-7.17**	-0.930(0.137)	-6.79**
Interaction effects						
GD*ST	1.191(0.385)	3.09**	1.013(0.386)	2.62**	1.106(0.384)	2.88**
GD*CH	0.553(0.305)	1.81	0.453(0.303)	1.50	0.526(0.303)	1.74
GD*NON-CH	0.453(0.358)	1.27	0.327(0.355)	0.92	0.070(0.355)	0.20
GD*NO-REL	0.683(0.229)	2.98**	0.617(0.227)	2.72**	0.567(0.227)	2.50*
ST*CH	0.073(0.278)	0.26	0.080(0.276)	0.29	0.035(0.276)	0.13
ST*NON-CH	-0.461(0.357)	-1.29	-0.639(0.354)	-1.81	-0.707(0.354)	-2.00*
ST*NO-REL	0.303(0.201)	1.51	0.247(0.199)	1.24	0.228(0.199)	1.15
GD*ST*CH	-0.290(0.420)	-0.69	-0.214(0.417)	-0.51	-0.290(0.417)	-0.70
GD*ST*NON-CH	0.045(0.561)	0.08	0.407(0.557)	0.73	0.631(0.557)	1.13
GD*ST*NO-REL	-0.505(0.310)	-1.63	-0.408(0.308)	-1.32	-0.382(0.308)	-1.24
Random effects						
σ^2_{0j}	0.145(0.052)	2.79**	0.150(0.053)	2.83**	0.146(0.052)	2.81**
σ^2_e	1.941(0.047)	41.30**	1.909(0.046)	41.50**	1.912(0.047)	40.68**
ICC[d]	0.0695		0.0729		0.0709	
Deviance [e]	11920.203		11865.611		11869.631	
Parameters	18		18		18	
Deviance_UN	12530.639		12502.260		12486.171	
χ^2 [f]	610.44**		636.65**		616.54**	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Fixed effects						
Intercept	0.734(0.179)	4.10**	0.703(0.175)	4.02**	0.677(0.179)	3.79**
GD[a]	-0.569(0.214)	-2.66**	-0.656(0.212)	-3.09**	-0.594(0.213)	-2.78**
ST[b]	0.028(0.281)	0.10	0.014(0.274)	0.05	0.026(0.281)	0.09
Religious background[c]						
CH	-0.558(0.201)	-2.78**	-0.482(0.200)	-2.41*	-0.481(0.201)	-2.40*
NON-CH	-0.809(0.241)	-3.36**	-0.620(0.239)	-2.59**	-0.667(0.241)	-2.77**
NO-REL	-1.068(0.137)	-7.80**	-1.034(0.136)	-7.60**	-1.002(0.137)	-7.32**
Interaction effects						
GD*ST	1.064(0.383)	2.78**	1.180(0.375)	3.15**	1.111(0.383)	2.90**
GD*CH	0.410(0.303)	1.35	0.579(0.301)	1.92	0.504(0.303)	1.66
GD*NON-CH	0.385(0.356)	1.08	0.293(0.353)	0.83	0.306(0.355)	0.86
GD*NO-REL	0.598(0.228)	2.62**	0.734(0.226)	3.25**	0.640(0.227)	2.81**
ST*CH	0.077(0.276)	0.28	0.025(0.274)	0.09	0.058(0.276)	0.21
ST*NON-CH	-0.472(0.354)	-1.33	-0.822(0.352)	-2.34*	-0.620(0.354)	-1.75
ST*NO-REL	0.276(0.199)	1.39	0.295(0.198)	1.49	0.270(0.199)	1.35
GD*ST*CH	-0.132(0.417)	-0.32	-0.312(0.415)	-0.75	-0.248(0.417)	-0.59
GD*ST*NON-CH	0.251(0.557)	0.45	0.630(0.554)	1.14	0.393(0.557)	0.71
GD*ST*NO-REL	-0.383(0.308)	-1.24	-0.553(0.306)	-1.81	-0.446(0.308)	-1.45
Random effects						
σ_{0j}^2	0.144(0.051)	2.82**	0.133(0.048)	2.77**	0.144(0.051)	2.80**
σ_e^2	1.914(0.047)	40.72**	1.891(0.046)	41.11**	1.913(0.047)	41.06**
ICC[d]	0.0700		0.0657		0.0698	
Deviance [e]	11873.545		11831.070		11872.012	
Parameters	18		18		18	
Deviance_UN	12524.402		12461.304		12500.955	
χ^{2} [f]	650.86**		630.23**		628.94**	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. GD = gender; ST = school type; CH = Christian; NON-CH = religion other than Catholic and Christian; NO-REL = no religion; Deviance_UN = deviance of unconditional model. [a] Reference category of gender: male; [b] Reference category of school type: co-educational Catholic secondary school; [c] Reference category of religious background: Catholic; [d] ICC (intraclass correlation coefficient) = $\sigma_{0j}^2 / (\sigma_{0j}^2 + \sigma_e^2)$; [e] Deviance (-2LL) = negative log likelihood; [f] χ^2 = Deviance_UN - Deviance. *p<.05 **p<.01.
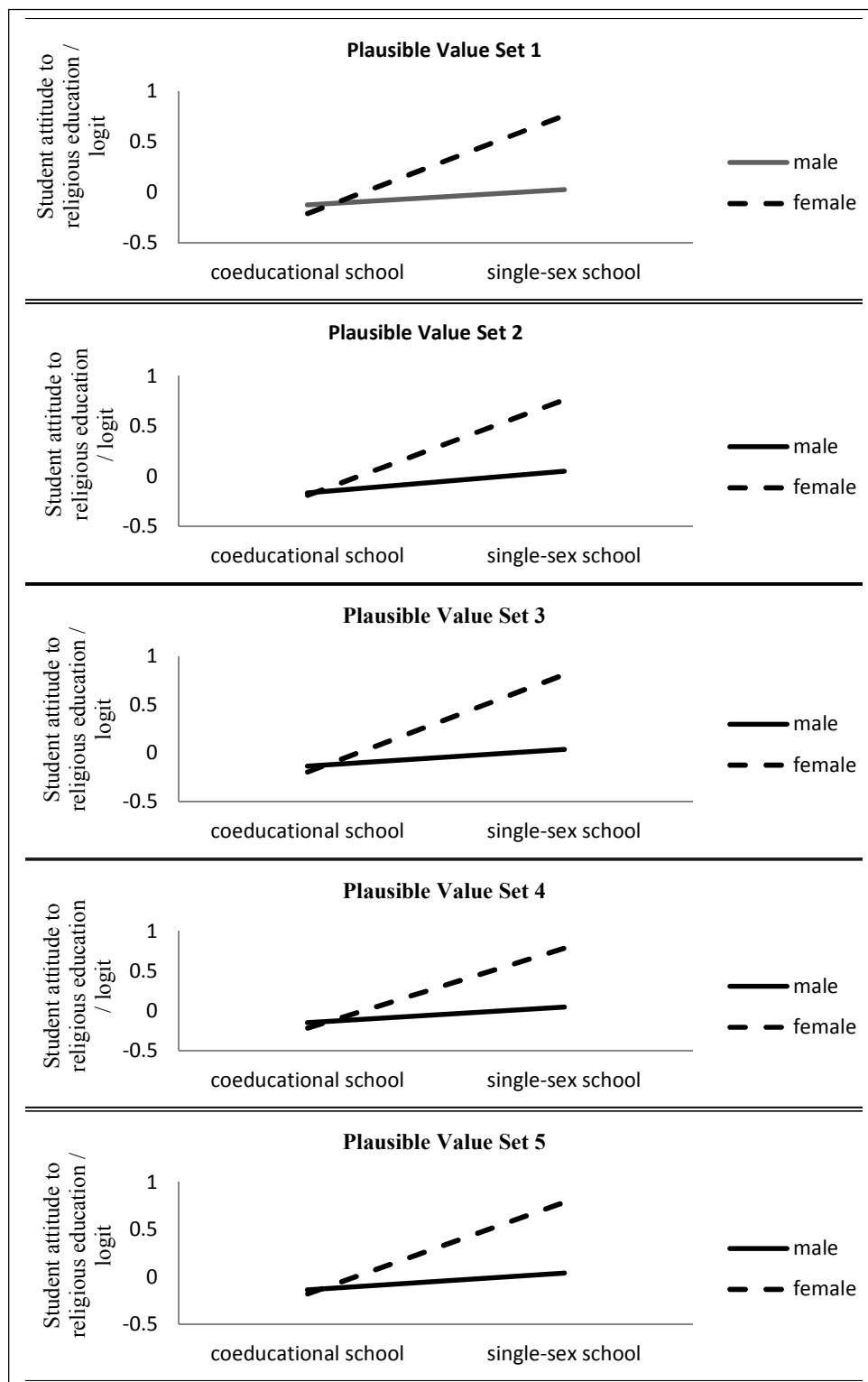
Figure 4.14 Relationship between school type and student attitude to
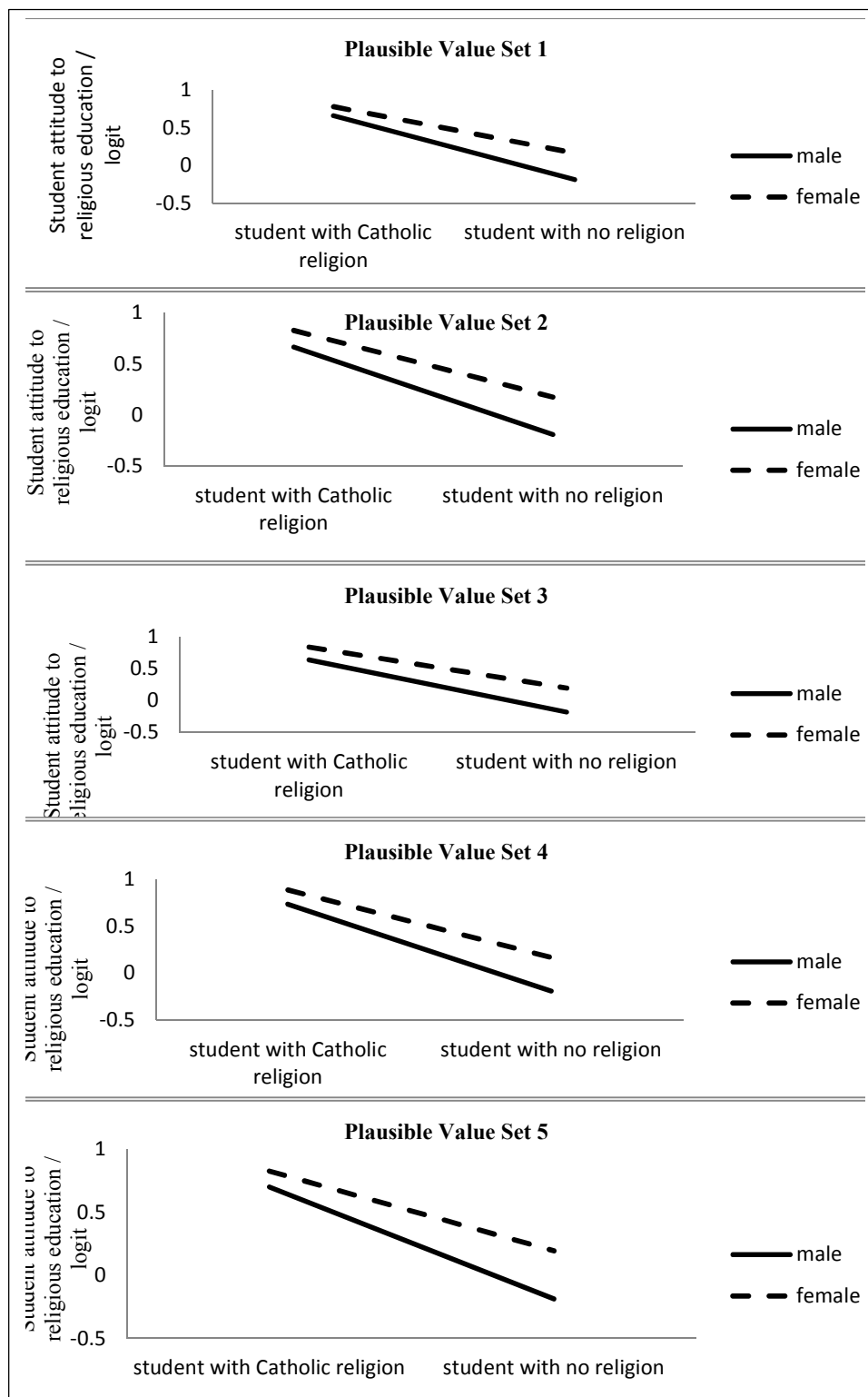religious education as a function of gender

Figure 4.15 Relationship between students' religious background, students with Catholic religion and no religion, and student attitude to religious education as a function of gender

The results of Table 4.23 show that the interaction term between gender and school type was statistically significant (*t*-ratio ranging from 2.55 to 2.99 across the five sets of plausible values, *df* = 10, *p* < .05 or <.01). This interaction, as depicted in Figure 4.14, shows that gender moderated the relationship between school type and student attitude to religious education, such that the relationship was weaker for male students than for female students. Compared to female students, the difference in attitude to religious education between male students from coeducational and single-sex schools was smaller. Moreover, the difference in attitude to religious education between female and male students in single-sex schools was larger, compared to coeducational schools. The attitude of female students of single-sex schools to religious education was relatively the most positive.

Table 4.23

Summary of the Effects for the Best-fitting Two-level Model with predictors for Student Attitude to Religious Education

Effects	Plausible Value Set 1		Plausible Value Set 2		Plausible Value Set 3	
	Coefficient	*t*-ratio	Coefficient	*t*-ratio	Coefficient	*t*-ratio
Fixed effects						
Intercept	0.596(0.161)	3.70**	0.562(0.162)	3.47**	0.560(0.161)	3.48**
GD[a]	-0.454(0.153)	-2.97**	-0.376(0.152)	-2.47*	-0.393(0.152)	-2.59**
ST[b]	0.167(0.224)	0.75	0.242(0.227)	1.07	0.184(0.224)	0.82
Religious background[c]						
CH	-0.461(0.138)	-3.34**	-0.423(0.137)	-3.09**	-0.440(0.137)	-3.21**
NON-CH	-0.903(0.178)	-5.07**	-1.011(0.177)	-5.71**	-0.818(0.177)	-4.62**
NO-REL	-0.852(0.100)	-8.52**	-0.864(0.100)	-8.64**	-0.820(0.100)	-8.20**
Interaction effects						
GD*ST	0.796(0.276)	2.88**	0.712(0.279)	2.55*	0.826(0.276)	2.99**
GD*CH	0.409(0.208)	1.97*	0.344(0.207)	1.66	0.387(0.207)	1.87
GD*NON-CH	0.481(0.269)	1.79	0.504(0.267)	1.89	0.323(0.267)	1.21
GD*NO-REL	0.416(0.154)	2.70**	0.402(0.152)	2.64**	0.364(0.152)	2.39*
Random effects						
σ_{0j}^2	0.147(0.053)	2.77**	0.152(0.054)	2.81**	0.148(0.053)	2.79**
σ_e^2	1.946(0.047)	41.40**	1.915(0.047)	40.74**	1.918(0.047)	40.81**
ICC[d]	0.0702		0.0735		0.0716	
Deviance [e]	11929.378		11875.316		11880.375	
Parameters	10		10		10	
Deviance_FU	11920.203		11865.611		11869.631	
χ^2 [f]	9.18		9.71		10.74	

Effects	Plausible Value Set 4		Plausible Value Set 5		Average Plausible Value	
	Coefficient	t-ratio	Coefficient	t-ratio	Coefficient	t-ratio
Fixed effects						
Intercept	0.647(0.160)	4.04**	0.620(0.156)	3.97**	0.597(0.160)	3.73**
GD[a]	-0.425(0.152)	-2.80**	-0.433(0.151)	-2.87**	-0.416(0.152)	-2.74**
ST[b]	0.216(0.222)	0.97	0.194(0.215)	0.90	0.201(0.222)	0.90
Religious background[c]						
CH	-0.537(0.137)	-3.92**	-0.492(0.137)	-3.59**	-0.471(0.137)	-3.43**
NON-CH	-1.024(0.177)	-5.79**	-0.995(0.176)	-5.65**	-0.950(0.177)	-5.37**
NO-REL	-0.935(0.100)	-9.35**	-0.892(0.099)	-9.01**	-0.873(0.100)	-8.74**
Interaction effects						
GD*ST	0.783(0.274)	2.86**	0.772(0.266)	2.90**	0.778(0.274)	2.84**
GD*CH	0.350(0.207)	1.69	0.423(0.206)	2.05*	0.383(0.207)	1.85
GD*NON-CH	0.504(0.267)	1.89	0.537(0.266)	2.02*	0.470(0.267)	1.76
GD*NO-REL	0.402(0.152)	2.64**	0.437(0.152)	2.88**	0.404(0.152)	2.65**
Random effects						
σ_{0j}^2	0.145(0.052)	2.79**	0.135(0.049)	2.76**	0.145(0.052)	2.78**
σ_e^2	1.918(0.047)	40.81**	1.900(0.046)	41.30**	1.919(0.047)	41.01**
ICC[d]	0.0703		0.0663		0.0704	
Deviance [e]	11881.326		11847.317		11882.742	
Parameters	10		10		10	
Deviance_FU	11873.545		11831.070		11872.012	
χ^2 [f]	7.78		16.25		10.73	

Note. All the estimates were using plausible values produced by ConQuest V.2.0. Estimated standard error of the parameter in brackets. GD = gender; ST = school type; CH = Christian; NON-CH = religion other than Catholic and Christian; NO-REL = no religion; Deviance_FU = deviance of the full model. [a] Reference category of gender: male; [b] Reference category of school type: co-educational Catholic secondary school; [c] Reference category of religious background: Catholic; [d] ICC (intraclass correlation coefficient) = $\sigma_{0j}^2 / (\sigma_{0j}^2 + \sigma_e^2)$; [e] Deviance (-2LL) = negative log likelihood; [f] χ^2 = Deviance - Deviance_FU. *p<.05 **p<.01.

The results in Table 4.23 show that the interaction term between gender and religious background, students with Catholic religion and no religion, was significant (t-ratio ranging from 2.39 to 2.88 across the five sets of plausible values, df = 10, p < .05 or < .01). This interaction, as depicted in Figure 4.15, shows that gender moderated the relationship between religious background, students with Catholic religion and no religion, and student attitude to religious education, such that the relationship was weaker for female students than for male students. Compared to male students, the difference in attitude to religious education between female students with Catholic religion and no religion was smaller. Moreover, the difference in attitude to religious education between male and female students with no religion was larger, compared to those with

Catholic religion. The interaction between gender and religious background (students with Catholic religion and Christian religion) or religious background (students with Catholic religion and religion other than Catholic and Christian) were not significant. This shows that there was no significant difference on the attitude to religious education between female and male students with Catholic, Christian or other religion respectively. Among the students with Catholic and no religion, the attitude of female students with Catholic religion to religious education was relatively the most positive, and the attitude of male students with no religion to religious education was relatively the least positive.

4.8 An overview of the culture of Catholic secondary schools in Hong Kong

Based on the survey results of students' attitudes towards their schools, as summarized in Tables 4.24a, 4.24b and 4.24c, this section gives an overview of the culture of Catholic secondary schools in Hong Kong from the perspective of the four dimensions, as stated in Flynn's circular interaction model (1993). By examining the features of the components of these four dimensions answers, in turn, the overarching research question of the present study, the characteristics of the culture of Catholic secondary schools in Hong Kong. An overview of the culture of Catholic secondary schools in Hong Kong is given from three perspectives: sense of community (Section 4.8.1), religious education (Section 4.8.2), and students' patterns of behaviour (Section 4.8.3).

Table 4.24a

Summary of the Findings on the Attitudes of Students Towards Their School

Scale	Findings on the Attitudes of Students Towards Their School
Student relationship with teachers	Research Question 1: What is student relationship with teachers in Hong Kong's Catholic secondary schools? • Students' attitude towards teacher-student relations was in general positive; • Students generally praised the teachers' caring attitudes and their willingness to assist students when help is needed; • Students generally showed higher appreciation on teachers' professionalism in teaching and their willingness to give up time for students' learning; • The relatively high percentage of students' neutral response regarding their relationship with teachers, 44% students on average, reflected that a rather large proportion of students did not have sufficient experience to form an opinion, did not have strong feelings regarding student relationship with teachers at Catholic secondary schools or were loath to give their opinion.
Student morale	Research Question 2: What is the student morale in Hong Kong's Catholic secondary schools? • The level of morale of the students was in general positive; • Students generally felt that they were happy and there was happy atmosphere in Catholic secondary school; • The relatively high percentage of students' neutral response regarding their morale to the school, 45% students on average, reflected that a rather large proportion of students did not have sufficient experience to form an opinion, did not have strong feelings regarding student morale at Catholic secondary schools or were loath to give their opinion.
Student perception of the principal	Research Question 3: What is the students' perception of the principal in Hong Kong's Catholic secondary schools? • The response of students regarding their perception of the principal was in general positive; • Students generally acknowledged that their principals put more emphasis on the provision of a good education to students; • Students, in general, were of the knowledge that principal was not the person who could approach for assistance or help. In general, students perceived principal to be the authoritative figure denoted as unreachable; • The relatively high percentage of students' neutral response regarding their perception of the principal, 50% students on average, indicated that a rather large proportion of students did not have sufficient experience to form an opinion, did not have

strong feelings regarding student perception of the principal at Catholic secondary schools or were loath to give their opinion.

Student attitude to discipline	**Research Question 4:** What is the students' attitude to discipline in Hong Kong's Catholic secondary schools?

- Students' attitude to discipline were in general neutral;
- Although significant percentage of students spelt out that discipline showed real problem, higher percentage of students agreed that school rules could encourage self-discipline and responsibility;
- School discipline, in general, was not perceived as authoritarian but emphasized conformity and the cultivation of an orderly school atmosphere;
- Students generally did not think that there were ways for them to have the school rules changed even if they disagreed with them and were less confident that teachers would treat them more important than rules;
- The relatively high percentage of students' neutral response regarding their attitude to discipline, 43% students on average, indicated that a rather large proportion of students did not have sufficient experience to form an opinion, did not have strong feelings regarding student attitude to discipline at Catholic secondary schools or were loath to give their opinion.

Student attitude to religion	**Research Question 5:** What is the students' attitude to religion in Hong Kong's Catholic secondary schools?

- A scale could not be established to measure the variable 'student attitude to religion' and a comprehensive inquiry about the student attitude to religion could not be accomplished;
- Students generally considered that Catholic teachers had set an example of what it means to be a practising Catholic;
- Students generally felt that senior students understood and accepted the religious goals of the school;
- Students generally considered that the school placed too much emphasis on external conformity to rules and regulations.

Student attitude to religious education	**Research Question 6:** What is the students' attitude to religious education in Hong Kong's Catholic secondary schools?

- Students' attitude to religious education were in general neutral;
- Students generally agreed that religious education classes were well prepared and taught;
- Students generally felt interest and enjoyed the religious classes;
- Students generally inclined not to take the religious classes seriously and preferred to drop the religious classes if the classes were voluntary;

- The relatively high percentage of students' neutral response regarding their attitude to religious education, 51% students on average, indicated that a rather large proportion of students did not have sufficient experience to form an opinion, did not have strong feelings regarding student attitude to religious education at Catholic secondary schools or were loath to give their opinion.

Table 4.24b

Summary of the Effects of Gender by School Type Interaction on the Attitudes of Students Towards Their School

Attitude of Students	Gender by School Type Interaction		The attitude of female students of single-sex schools was relatively the most positive
	Compared to female students, the difference in attitude between male students from coeducational and single-sex schools was smaller	Compared to coeducational schools, the difference in attitude between female and male students was larger in single-sex schools	
Student relationship with teachers	✓	✓	✓
Student morale	✓	✓	✓
Student perception of the principal	✓	✓	✓
Student attitude to discipline	✓	✓	✓
Student attitude to religious education	✓	✓	✓

Note. ✓ indicated positive response by the students to the attitudinal description.

Table 4.24c

Summary of the Effects of Gender by Religious Background (Student with Catholic Religion and Student with No Religion) Interaction on the Attitudes of Students Towards Their School

Attitude of Students	Gender by Religious Background (Student with Catholic Religion and Student with No Religion) Interaction		The attitude of female students with Catholic religion was relatively the most positive	The attitude of male students with no religion was relatively the least positive
	Compared to male students, the difference in attitude between female students with Catholic religion and no religion was smaller	Compared to students with Catholic religion, the difference in attitude between male and female students was larger for students with no religion		
Student relationship with teachers	✓	✓		✓
Student morale	✓	✓	✓	✓
Student perception of the principal	✓	✓	✓	✓
Student attitude to discipline	✓	✓	✓	✓
Student attitude to religious education	✓	✓	✓	✓

Note. ✓ indicated positive response by the students to the attitudinal description.

4.8.1 Sense of community

The sense of community among students in Hong Kong's Catholic secondary schools, which is a major affective expression, can be described as positive. The achievements of teachers in teaching, together with their caring attitudes and willingness to assist students, contribute to a satisfactory affective culture and sense of community. Moreover, student morale is another aspect that contributes to the affective culture and sense of community of the Catholic secondary schools in Hong Kong. The happy atmosphere felt by the students

indicates their positive sense of belonging to school, which was a good sign of an affective expression of school culture. However the relatively high percentage of students' neutral response on their morale to the school and relationship with teachers reflects that a rather large proportion of students did not have sufficient experience to form an opinion, did not have strong feelings regarding student morale and student relationship with teachers at Catholic secondary schools or were loath to give their opinion.

Significant effects of the interactions between gender, school type and religious background to the relationship with teachers and student morale have marked differences in the students' sense of community under different student backgrounds and school milieu. Students from all-girls' schools are most satisfied with the school environment and have the best relationship with their teachers. In this sense, students from all-girls' Catholic secondary schools would have the best sense of community. Among the students with Catholic and no religions, the highest morale was among the female students with Catholic religion, indicating that these students possess the best sense of community. In contrast, male students with no religion show the least sense of community among the students with Catholic and no religions. In co-educational schools, differences in the relationship with teachers and morale for male and female students are small, compared to those in single-sex schools. This shows a lower chance of a difference in the sense of community between male and female students in co-educational Catholic secondary schools. Moreover, the difference in the sense of community between female and male students with Catholic religion is smaller than those with no religion.

4.8.2 Religious education

The students' comment on teachers' professionalism in teaching and their willingness to give up time for students' learning, and the principal's emphasis on the provision of a good education reflected the inclination of teachers, and even the schools, on subject-teaching related duties. However, students gave less favourable comments on religious education in Catholic secondary schools in Hong Kong. Further investigation into the students' attitude to religious education revealed that they were not interested in religious classes. They were inclined not to take religious classes seriously and preferred to drop the classes if they were voluntary. This reflects that both the students and the Catholic secondary schools in Hong Kong weigh the inculcation of subject knowledge more heavily, but show less of a tendency to preserve the faith and to use the Gospel as their moral guide through religious education. However, the teachers' professionalism and devotion to their teaching earned favourable remarks to the religious education in the schools. The relatively high percentage of students' neutral response on schools' religious education reflects that a rather large proportion of students did not have sufficient experience to form an opinion, did not have strong feelings regarding religious education at Catholic secondary schools or were loath to give their opinion.

The significant effects of the interactions between gender, school type and religious background mark differences in the students' attitudes to religious education under different student backgrounds and school milieu. Students of all-girls' schools have the most positive attitude to religious education in the

school. Among the students with Catholic and no religions, female students with Catholic religion have the most positive attitude to religious education. In contrast, male students with no religion show the least positive attitude to religious education among the students with Catholic and no religions. In co-educational schools, the differences in attitude to religious education for male and female students are small, compared to those in single-sex schools. Moreover, the difference in attitude to religious education in the school between female and male students with Catholic religion is smaller, compared to those with no religion.

4.8.3 Students' patterns of behaviour

A student's attitude to discipline is manifested in his or her pattern of behaviour in school. Although students were not at ease with their teachers, schools did not use authoritarian tactics to address issues of student discipline. On one hand, the students complained that disciplinary actions showed some real problems; on the other hand, the students agreed that school rules could encourage self-discipline and responsibility. Moreover, students did not think that there were ways for them to have the school rules changed even if they disagreed with them. Teachers handled students' problems according to school rules and were less likely to treat students more importantly than rules. Students also considered that the school placed too much emphasis on external conformity to rules and regulations. All of this suggests that Catholic secondary schools in Hong Kong emphasize conformity and the cultivation of an orderly school atmosphere. However, the positive student relationship with teachers

constructively influences the students' patterns of behaviour and cultivates a respectful atmosphere in the school. The relatively high percentage of students' neutral response on schools' discipline reflects that a rather large proportion of students did not have sufficient experience to form an opinion, did not have strong feelings regarding discipline at Catholic secondary schools or were loath to give their opinion.

The significant effects of the interactions between gender, school type and religious background mark differences in students' attitudes to school discipline under different student backgrounds and school milieu. Students from all-girls' schools have the most positive attitude to school discipline in the school. Among the students with Catholic and no religion, female students with Catholic religion have the most positive attitude to school discipline. In contrast, male students with no religion show the least positive attitude to school discipline among the students with Catholic and no religion. In co-educational schools, the difference in attitude to school discipline for male and female students is small, compared with those in single-sex schools. Moreover, the difference in attitude to school discipline between female and male students with Catholic religion is smaller, compared to those with no religion.

CHAPTER 5

CONCLUSIONS

This research had one overarching objective and six specific objectives. The overarching objective was to explore the characteristics of the culture of Catholic secondary schools in Hong Kong. The six specific objectives were to determine aspects of six attitudes that students have towards their school, including the student's relationship with teachers, student morale, the student's perception of the principal, the student's attitude to discipline, the student's attitude to religion and the student's attitude to religious education, and then to explore the effects of gender, school type, religious background, as well as the interaction of these factors, on them. However the scale 'student attitude to religion' could not be established, due to its limited number of items, poor quality and low reliability, and the inquiry of the student attitude to religion could not be achieved in the present study.

The discussion in this chapter falls into six major sections: summary of the study (Section 5.1), contributions (Section 5.2), implications and recommendations (Section 5.3), limitations and suggestions for improvement (Section 5.4), suggestions for future research (Section 5.5) and, finally, the conclusion (Section 5.6).

5.1 Summary of the study

Four major areas were summarised from the present study: attitudes of students towards their school (Section 5.1.1); the effects of gender, school type, religious background and the interaction of these factors on the students' attitudes towards their school (Section 5.1.2); the characteristics of the culture of Catholic secondary schools in Hong Kong (Section 5.1.3); and the applicability of the Attitudes of Students towards Their School (ASTS) instrument (Section 5.1.4).

5.1.1 Attitudes of students towards their school

This study has provided a clear portrait of five important aspects of students' attitudes toward their schools – Catholic secondary schools in Hong Kong. To the best of the author's knowledge, the new knowledge discovered through this study is the first of its kind in Hong Kong for Hong Kong Catholic secondary schools. Overall, the attitudes of the students towards their schools were generally positive. From the students' responses to ASTS, a large proportion of students agreed that the teachers' possess caring attitudes and a willingness to assist students. The students' feeling of being happy in school and the happy atmosphere in the school contributed to their positive sense of belonging. Concerning the handling of discipline problems, Catholic schools emphasized conformity and the cultivation of an orderly school atmosphere, but not authoritarian tactics. Students did not think that there were ways for them to have the school rules changed even if they disagreed with them. They also

considered that the school placed too much emphasis on external conformity to rules and regulations. The responses of students regarding the leadership of their school principals tended to be positive. Students generally acknowledged that their principals emphasised the provision of good education to students and opined that the school principal was not the person who could be approached for help. They perceived the school principal as an authoritative figure denoted as "unreachable". The students' attitude to religious education received the least positive responses among the five attitudinal aspects of students towards their school. Students did not feel interested in or enjoy religious education either. They were inclined not to take religious classes seriously and preferred to drop the classes if they were voluntary. On the other hand, the relatively high percentage of students' neutral response on all the five aspects, i.e. their relationship with teachers, their morale, their perception of the principal, their attitude to discipline and their attitude to religious education, which reflected the lack of strong feelings of the students to their school, is worthy of attention.

5.1.2 The effects of gender, school type, religious background and the interaction of these predictors on attitudes of students towards their school

The results of the present study indicated that the attitudes of students towards their school are influenced by interactions of gender by school type and gender by students' religious background, respectively. The attitudes of students of all-girls' Catholic secondary schools in Hong Kong towards the

schools, in general, were relatively the most positive. Among the students with Catholic and no religion, the attitudes of female students with Catholic religion towards the schools were relatively the most positive. The results agreed with previous studies that found that female students showed more positive attitudes towards their school (Brophy & Evertson, 1981; Rovai & Baker, 2005; Slavin, 2012), and students with the same religious affiliation as their school showed more positive attitudes towards their school (Jeynes, 2003; Wighting & Liu, 2009). The results of the present study also revealed that, among the students with Catholic and no religion, the attitude of male students with no religion towards their school was relatively the least positive.

Concerning the effects of the interaction of gender by school type, the results indicated that there was a smaller difference in attitudes towards their schools between male students of all-boys' and those in coeducational Catholic secondary schools, compared to female students from all-girls' and coeducational Catholic secondary schools. Moreover, compared to female and male students from coeducational Catholic secondary schools, there was a larger difference in attitudes towards their schools between students from all-girls' and all-boys' Catholic secondary schools.

Concerning the effects of the interaction of gender by students' religious background, compared to male students, there was a smaller difference in attitudes towards their schools between female students with Catholic religion and no religion. However, compared to students with Catholic religion, there was a larger difference in attitudes towards their schools between male and female students with no religion.

5.1.3 The characteristics of the culture of Catholic secondary schools in Hong Kong

The professionalism of the teachers and their caring attitudes, together with the satisfactory sense of belonging of the students, contribute to the positive sense of community among students in the schools. This positive sense of community is not only a positive component of the school culture, but also lays a solid foundation for the transmission of the school's core beliefs and values to the students. The positive sense of community among students, whereby students are more open-minded to the schools' teachings and are more receptive to the advice from teachers and school authorities, may also be constructive to the development of other components, such as the delivery of religious education and the development of desirable patterns of students' behaviour in the school.

Catholic secondary schools in Hong Kong are less likely to highlight religious education and pastoral care than subject teaching and academic achievements. The reasons for the schools' preference are manifold. The impact from the broader societal culture of placing importance on academic achievement largely determined the emphasis of Catholic secondary schools in subject teaching and students' academic performance. These phenomena further influence the preference of the principals and teachers to be academic and examination oriented. Without excellent or good results in public examinations, schools are less likely to be considered a "good school" in the minds of students,

parents and the community as a whole. Almost all of Hong Kong's teachers are subject-trained when they graduate from their universities. Most of the teachers, and even principals, showed a preference for subject teaching and tended to undervalue the character and value formation of students, relationship building of the students between Gospel and culture, and the teaching of knowledge with the light of faith in Catholic secondary schools in Hong Kong. All these suppress the development of religious education in the schools. The inadequacies in religious education not only seriously affect the formation of the concept of discipline as discipleship, but also hinder the transmission of the schools' core beliefs and values to the students. Worse still, failure of these components to gain achievements may reversibly affect further development of the students' sense of community.

Conformity and an orderly school atmosphere can best be used to describe the students' patterns of behaviour in Catholic secondary schools in Hong Kong. Teachers handled the students' behaviour and problems according to the school's rules and the concept of discipline as discipleship could only be achieved to a small extent in Catholic secondary schools in Hong Kong. This pattern of students' behaviour is typical in the secondary schools in Hong Kong. Chinese people prefer rule-abiding, respect towards teachers and an orderly pattern of student behaviour (Hue, 2010). On the other hand, schools preferred an orderly pattern of student behaviour due to the advantageous environment it creates for effective educational and learning events (Van der Westhuizen et al., 2008).

Among the students with Catholic and no religion, the influence of school culture is most positive for female students with Catholic religion, but least positive for male students with no religion. In this regard, female students with Catholic religion have a higher sense of community. They are more receptive to the religious education provided by the school and present a more desirable pattern of behaviour. Thus, the core beliefs and values of the school can be better transmitted to these students. On the contrary, the core beliefs and values of the school are less likely to be transmitted effectively to students with no religion. Compared to girls, the extent of the influence of school culture on boys with Catholic religion and no religion was more comparable. Moreover, the extent of the influence of school culture on boys and girls with Catholic religion was more comparable, compared to those with no religion.

From the above discussions, a clearer picture on the culture of the Catholic secondary schools in Hong Kong can be drawn. A positive sense of community, as one of the important components of the 'expressive symbol' dimension in Flynn's circular interaction model, with satisfactory student relationship with teachers and student morale can lay a solid foundation for the Catholic secondary schools in Hong Kong to accomplish its educational aims of nurturing the children and young people with moral values, and cultivating a personal faithfulness with a better knowledge and love of God, as discussed in Section 2.6. However the components of the other two dimensions, i.e. curriculum and religious education of the 'tradition' dimension and school discipline of the 'patterns of behaviour' dimension, seem not competent enough to help creating a distinctive Catholic secondary school culture in Hong Kong.

The emphasis of principals and teachers on the provision of examination-driven and achievement-oriented education, but not balanced curricula highlighting subject knowledge, religious education and pastoral care system, probably undermines the Catholic school's functions of evangelization and the formation of faith among students. The conformed and orderly school atmosphere can really create effective educational events. However the dearth of an orderly and respectful discipline demonstrating the concept of discipleship hinders the Catholic school from achieving its goal of helping youth to build their personal lives according to the new man created in righteousness and true holiness. As discussed in Section 2.5, the fostering of a distinctive Catholic school culture not only involves the lofty, noble and saintly school beliefs and values, but also relies heavily on the effective functioning and interaction of the components of the other three dimensions, i.e. the expressive symbols, the traditions and patterns of behaviour. The Catholic secondary schools' seemingly inadequacy in emphasizing the apostolic cultivation, i.e. the formation of whole person and the building of a school community with religious atmosphere that can help youth building their personal lives according to the new man created in righteousness and true holiness, frustrate them from achieving positive culture.

5.1.4 Applicability of the ASTS instrument

The properties of the ASTS instrument were validated, albeit the scale 'student attitude to religion' could not be established due to its limited number of items, poor quality and low reliability, and shown to be applicable to students of Catholic secondary schools in Hong Kong. One contribution of this

study is the development and validation of the ASTS survey instrument which can be applied in future studies on the culture of religious schools. ASTS can be easily administered by teachers during class and requires 20 minutes. The semantics of the items in this study were found to be simple and straightforward for interpretation by secondary students.

5.2 Contributions

The value of this research is that it is the first survey research study measuring the attitudes of students towards their school to examine the characteristics of the culture of Catholic secondary schools in Hong Kong. This research not only contributes to the study of the attitudes of students towards their school and the characteristics of the culture of Catholic secondary schools in Hong Kong, but also provides empirical evidence to support the existence of the effects of gender, school type, students' religious background and the interactions of these predictors on the attitudes of students towards their school, which, in turn, affect the culture of Catholic secondary schools in Hong Kong. In examining the contributions of this research, two aspects are discussed: the research design (Section 5.2.1) and the attitudes of students towards their school and the characteristics of the culture of Catholic secondary schools in Hong Kong (Section 5.2.2).

5.2.1 Research design

This was a study with a rigorous research design that made three contributions. First, the survey research method selected in the present study provided numeric descriptions of the attitudes and opinions of a population sample (Creswell, 2003), which could be manipulated and analysed objectively using statistical methods. Second, the design of the present study included the development of a Chinese version of the ASTS instrument, with validity and reliability, for the measurement of the attitudes of students towards their school from five aspects: student relationship with teachers, student morale, student perception of the principal, student attitude to discipline and student attitude to religious education. The validated ASTS instrument was shown to be a useful tool for measuring the attitudes of the students towards their school. It is noteworthy to mention that the cultural and linguistic aspects should be considered when making use of this ASTS instrument. Third, quantitative results on the attitudes of students towards their school could provide useful information for the analysis of the characteristics of the culture of Catholic secondary schools in Hong Kong.

5.2.2 Attitudes of students towards their school and characteristics of the culture of Catholic secondary schools in Hong Kong

The school culture literature showed that little was known about the characteristics of the culture of Catholic secondary schools in Hong Kong. This

study contributed to this gap in the knowledge through quantitative components of the attitudes of students towards their school. The results of the present study contribute to six major areas. First, knowledge from the present study can be one of the useful references for principals and teachers to assess whether the students have positive attitudes towards the culture of their schools. Second, the present study identified important features, with quantitative evidence, on five aspects of the students' attitudes towards their school and the effects of gender, school type and religious background and the interactions of these predictors on them. The knowledge is useful to educators, school leaders, teachers and policymakers alike, for their evaluation of the school's performance, from the perspective of students' attitudes towards their school, and for the formulation of plans to enhance the students' attitudes to their school. Third, the present study pioneered the examination of the characteristics of the culture of Catholic secondary schools in Hong Kong by using Flynn's circular interaction model (Flynn, 1993), and exploring the features of some components of the four dimensions, its core beliefs and values, its sense of community, its religious education, and its patterns of behaviour. Fourth, an analysis of the students' attitudes towards their school, as well as the effects of the students' gender, school type and religious background and the interactions of these predictors on them, can help with understanding the features of the components of the four dimensions, and, in turn, the characteristics of the culture of Catholic secondary schools in Hong Kong. Fifth, the present study unveils the effects of students' gender, school type and religious background and the interactions of these predictors on the culture of Catholic secondary schools in Hong Kong, which

are important and valuable characteristics of the Catholic secondary school culture in Hong Kong. Sixth, creating a positive Catholic secondary school culture not only involves identifying and maintaining the functional components and eliminating the non-functional components of the existing culture, but also requires the weights of the components to be adjusted so that a positive culture can be attained through the interactions between these similarly weighted components. The results of the present study on the characteristics of the culture of Catholic secondary schools in Hong Kong will not only help the leaders and teachers concerned to identify the unique features of the components of the four dimensions, but will also provide information to scrutinize the efficacy of the efforts the schools have made. Improvement plans can then be developed to shape a positive school culture and the objective of restoring quality Catholic secondary education in Hong Kong can finally be attained.

5.3 Implications and recommendations

From the present research, there are nine implications and recommendations. First, from the measurement perspective, this was a preliminary study, and the Chinese version of the ASTS instrument was designed and used. This instrument has proved to be a reliable and valid inventory for measuring the attitudes of students towards their school and analysing the characteristics of the culture of the Catholic secondary schools in Hong Kong. The value of the inventory will be a useful tool for leaders and

teachers about whether students have a positive attitude towards the culture of their schools.

Second, due to the heavy workload, pressure from the principal, students and parents, and the teacher redundancy issue, teachers are less likely to have the initiative or motivation to expend energy on the character and value formation of their students, relationship building of the students between Gospel and culture, and the teaching of knowledge with the light of faith. Suggestions, that help strengthening the initiative and motivation of the teachers to pursue the whole-person development curriculum of the schools, are given to for school administrators' reference. First, in order to relieve the workload and time pressure of teachers, the school should set priorities and remove some relatively "unimportant" programs and activities in the school. Second, reward and recognition scheme, which can help elevating the teachers' sense of meaning, competence and impact (Lee & Nie, 2013), should be developed to recognise teachers' effort and good performance. Third, the principal should strengthen professional staff development programs to enhance team spirit among staff and their recognition of the school's core beliefs and values and the realignment of teachers' personal values with their school's goals (Chan et al., 2008). Fourth, learning partnerships can strengthen the bonding between the school and the staff (Henderson & Berla, 1995). Professional development provides opportunities for teachers and communities to learn together for the best teaching methods (DuFour, Eaker, & DuFour, 2005) and support from school authorities encourages teachers to share their personal professional development experiences (Brosnan, 2003). Fifth, to give

greater emphasis on the importance of teachers' psychological empowerment, Education Bureau of Hong Kong and major school sponsoring bodies in Hong Kong should provide development programmes to school leadership on school leaders' empowering behaviours (Lee & Nie, 2014). Sixth, strengthening the principals' pastoral care leadership role will not only enhance the sense of community among the students, but will also help to promote the core beliefs and values of the school (Flynn, 1993). As stated in Section 2.8, the Catholic Education Office pushed forward support for school pastoral care work. On a whole, this policy is beneficial to the development of the sense of community in the school. Regular inspections and reviews should be conducted to ensure the quality and effectiveness of the policy. Seventh, the school sponsoring bodies of Catholic secondary schools should formulate policies to help maintain a higher level of job security for the teachers.

Third, Catholic secondary schools in Hong Kong generally emphasize subject teaching and diminish the religious education in the school. Without the inclusion and effective implementation of a balanced and desirable religious curriculum, the core beliefs and values of Catholic education cannot be transmitted effectively, and the educational aim of Catholic secondary schools at forming the whole man can hardly be achieved. One of the highlights of the reforms made by the Catholic Diocese of Hong Kong, as stated in Section 2.8, is to strengthen religious and moral education through the introduction of a Religious & Moral Education Curriculum, implementation of which began in Catholic primary and secondary schools in the 2011–2012 academic year. In order to ensure the success of the reforms, bureaucratic support is decisive

(Rymarz, 2013). the Catholic Diocese of Hong Kong should also consider devising principles, approaches and guidelines for all of Hong Kong's Catholic secondary schools to follow with a view to integrating faith and life within the daily activities of the school through the provision of religious education. This would be instilled through a prestigious academic and general education, which would include both formal and informal approaches of nurturing the students with moral values, and cultivating them with a personal faithfulness, together with a better knowledge and love of God. A detailed implementation plan to achieve the above objective should be submitted by the individual schools, and regular inspections and reviews should be made to ensure the plan is being implemented in a serious and constructive manner. Development programmes should be given by the sponsoring body to principals to emphasize their mission and role in the transmission of the Catholic schools' core beliefs and values to the students. On the school level, staff development programmes should also be devised to internalize the Catholic schools' core beliefs and values among teachers. The achievements of a school arising from excellent curriculum content or sophisticated pedagogic skills could never supersede the positive impact from a teacher's caring and loving attitude towards students and their internalization of the Catholic school's core beliefs and values. One more point worthy of consideration to help strengthening religious education is to free the Catholic secondary schools from the unduly influence of the broader society culture. The major expectation of broader society and parents in Hong Kong on academic achievement, as discussed in Section 2.7.1, is a structural issue affecting the prominence of religious education in Catholic schools (Rymarz,

2013). Policies and programmes should be formulated both at the level of Catholic Diocese of Hong Kong and school level, to change the major purpose of parents who send their children to Catholic schools to be religion in vicarious terms (Rymarz, 2013).

Fourth, to cultivate a desirable pattern of students' behaviour, the concept of discipleship should be demonstrated in the schools (Flynn, 1993). Discipline, whether it is rooted in responsibility or obedience, requires relationship (Coelho, 2006; Hudson, 2006; Mullaly, 2010; van der Westhuizen et al., 2008). Discipline is not punishment and should not be aimed only at past behaviour, but should be created with those students who need it foremost in mind (Coelho, 2006; Hudson, 2006; Salesians of Don Bosco, n.d.). For discipline to be truly effective, for it to be life-changing and rooted in Christ, it must be based on a relationship between a student and an adult (Hudson, 2006; Mullaly, 2010). Teachers must know their students by more than their names; they must know them as disciples. Teachers must understand that they are role models in the classroom, but also outside the classroom — in the halls, on the athletic fields, in the stands, and in the band and choir rooms. Discipline that changes a student's life is discipline administered in a loving and fair way by a teacher who knows their students in ways that go deeper than mere names (Flynn, 1993; Hudson, 2006; Mullaly, 2010; Salesians of Don Bosco, n.d.; van der Westhuizen et al., 2008).

Fifth, in devising plans to restore quality Catholic secondary education, as voiced by the Catholic Diocese of Hong Kong, leaders of the schools should be aware of the holistic nature of school culture (Flynn & Mok, 2002). They must

not only take into account the conditions of individual components, but also the interactions between them.

Sixth, the influences of school culture are the most positive to students of all-girls' Catholic secondary schools. In contrast, girls in co-educational Catholic secondary schools do not show these positive influences. This implies that, other than the gender effect, there are some distinctive features of the culture of all-girls' Catholic secondary schools contributing to the positive effects. Further research can be performed to look into this aspect.

Seventh, among the students with Catholic and no religion, the influence of school culture is most positive to female students with Catholic religion, but least positive to male students with no religion. Female students with Catholic religion tended to have a higher sense of community, were more receptive to the religious education provided by the school, and presented a more desirable pattern of behaviour. Moreover, the extent of the influence of school culture on boys and girls with Catholic religion was more comparable, compared to those with no religion. This implies that the extent of the influence of the Catholic secondary school culture was higher for Catholic students and the core beliefs and values of the school could be better transmitted to them. In this regard, the Catholic secondary schools in Hong Kong should try their best to recruit more Catholic students. However, the percentage of Catholic students in the Catholic secondary schools in Hong Kong was as low as 9.71% in 2013. These figures indicate that there is a great deal of room to increase the number of Catholic students in the schools. To increase the number of Catholic students, the schools should not only admit more Catholic students, but also implement plans,

especially the introduction of serious religious education curriculum as suggested in the third paragraph of this section, to cultivate an intense religious atmosphere in the school. The cultivation of an intense religious atmosphere in the school, together with the efforts made to help students with their religious formation, is beneficial for the development of a student into a complete Catholic.

Eighth, it is expected that teachers with the same religious affiliation as the serving school is greatly advantageous to the cultivation of a positive culture in the schools. In this regard, the recruitment of more Catholic teachers in Catholic secondary schools in Hong Kong is recommended.

Ninth, in view of the shortcomings in different components of the four dimensions, the implementation of a preventive system of education, as advocated by Don Bosco, is recommended in the Catholic secondary schools of Hong Kong. The main objective of a preventive system of education, as advocated by Don Bosco, is to remove the students' negative experiences which could seriously harm their growth and to equip them with the means to independently encounter what life offers (Mullaly, 2010; Salesians of Don Bosco, n.d.). The preventive system of education can be perceived as an educational and pedagogical method that appeals to the resources of intelligence, love and the desire for God, which everyone has in the depths of their being (Mullaly, 2010). It brings together educators and youngsters in a family experience of trust and dialogue. Imitating God's patience, educators should accompany the students, so that they may develop solid convictions and gradually assume responsibility for the delicate process of their growth as

human beings and as people of faith (Catholic Diocese of Hong Kong, 2002). The practice of the preventive system demands an empathy with the students and a willingness to be with them. Educators are actively present among students in brotherly friendship, helping them in their efforts to grow in what is good, and encouraging them to reject every form of injustice, so that their weakness may not be overcome by evil (Coelho, 2006); Mullaly, 2010; Salesians of Don Bosco, n.d.). This educational method is based entirely on reason, religion and loving kindness. The originality of the system lies in the element of loving kindness, and its basis is provided by religion (Mullaly, 2010).

Reason comes in as mediating and moderating both loving kindness and religion (Coelho, 2006). Religion is perceived as the development of the sense of God present in every person and the power of Christian evangelization (Catholic Diocese of Hong Kong, 2002; Congregation for Catholic Education, 2009). Don Bosco based his educational method on the Catholic faith tradition and believed that faith in Jesus Christ and commitment to the Church were needed not only for spiritual growth but also for one's human, psychological and intellectual growth (Mullaly, 2010). He also placed lot of importance on religious practices.

This preventive system of education originates from the way the educator handles the element of loving kindness. Loving kindness, which is based on the charity of the Good Shepherd, is a special quality of friendliness of the educator that inspires cooperation and confidence in the students (Congregation for Catholic Education, 2013, para 39). It is the key that gives access to the heart of every young person. Educators insist to not only love the students, but also to

let the students know they are loved (Catholic Diocese of Hong Kong, 2002). In this environment, there are very few people who rebel in the face of genuine goodness. One is disciplined with a blend of kindness and firmness, and never by asking what is above the strength of the child. Loving kindness, in order to have a true educational value, must be based on a healthy equilibrium, which, while surrounding the child with a genuine and heartfelt love, avoids every form of false affection, and renders the teacher-student relationship a shared search for true values (Coelho, 2006; Mullaly, 2010; Salesians of Don Bosco, n.d.).

Reason signifies the reasonableness of requests and rules, and the flexibility and persuasiveness in proposals. The rules of good behaviour to be inculcated must be reasonable and essential. They must be clearly expressed, and their necessity and value must be patiently explained and brought home to the young (Coelho, 2006; Mullaly, 2010; Salesians of Don Bosco, n.d.). The above discussion illuminates that the implementation of the preventive system of education not only enhances the students' sense of community and demonstrates the concept of discipleship in school discipline, but can also facilitate the effective implementation of religious education in the school.

Above all, the system has the strength to foster a similarly weighted milieu in the components of the four dimensions, as stated by Flynn's (1993) model, and it is these similarly weighted dimensions, holding the apostolic purpose, that interweave to create the distinctive Catholic secondary school culture.

5.4 Limitations and suggestions for improvement

Despite the contributions, there are some limitations related to the samples for this research. First, the data was based on participants' self-reporting and may contain potential weaknesses.

Second, the data were only collected from S1 to S3 Chinese students of aided Catholic secondary schools in Hong Kong, receiving subsidies from the Hong Kong Government. The results might not apply equally to the private and independent Catholic secondary schools or non-Catholic secondary schools in Hong Kong. Thus, generalization to a Chinese population or Catholic secondary schools outside the Hong Kong region may not be possible.

Third, the present study only involved students as the participants; other kinds of participants, such as principals, teachers and parents, were not included. In this regard, the results might not give a complete picture on the characteristics of the culture of Catholic secondary schools in Hong Kong.

Fourth, in the present study, five aspects of the attitude of students towards their school were used to examine the Catholic school culture. Other dimensions of students' attitudes towards their school, such as students' expectations of the school, students' life goals and values, were not considered.

Fifth, in the present study, the characteristics of the Catholic secondary schools are manifested through the attitudes of students towards their school. Other domains, such as an investigation of the schools' formal and informal curricula, and examination of the religious-related activities and programmes in the schools, were not included.

Sixth, the present study relied on survey research. A qualitative method of inquiry that may yield a better in-depth understanding of participants' attitudes towards their school was not included.

Seventh, in the present study, the effects of the three predictors, gender, school type and religious background, on school culture were assumed to be homogeneous across the school level.

Eighth, the present study only examined the effects of gender, school type and religious background and the interactions of these predictors on Catholic secondary school culture in Hong Kong. Other factors, such as the students' socio-economic status and the educational level of students' parents, were not included.

Ninth, in the present study, the scale 'student attitude to religion' of the ASTS instrument could not be established due to its limited number of items, poor quality and low reliability, and the inquiry of the student attitude to religion; that is, research question 5, could not be answered. This shortcoming limits the comprehensive investigation of the school culture. Modifications, such as the addition of related items, could be made so that a valid and reliable scale of the "student attitude to religion" can be constructed.

5.5 Suggestions for future research

Given the preliminary nature of this research, future research can build on the initial findings from this work and try to overcome its limitations, as well as

expand on its scope and research context. Eight possible research directions for future studies are discussed.

First, with respect to the sample, the present study invites S1 to S3 Chinese students of aided Catholic secondary schools in Hong Kong for the research. Further research may also include students from other year levels and different types of schools. Second, the present study only involves students as the participants. Further research including different kinds of participants, such as principals, teachers and parents, is recommended. Third, the present study only makes use of five aspects of the attitudes of students towards their school to assess the Catholic school culture. Additional dimensions of students' attitudes towards their school, such as students' expectations of the school, students' life goals and values, are recommended in future research. Fourth, other approaches, such as an investigation of the schools' formal and informal curricula, and an examination of the religious-related activities and programmes in the school, should also be included in future research to obtain a more complete picture of the characteristics of the school culture. Fifth, the influences of culture are more positive to students of all-girls' Catholic secondary schools. However, girls in co-educational Catholic secondary schools do not show these positive influences. This implies that, other than the gender effect, there are some distinctive features of the culture of all-girls' Catholic secondary schools that contribute to the positive effects. Further research can be performed to look into this area. Sixth, the present study used a survey research approach. A qualitative approach of inquiry could be used to provide additional strength and yield a better in-depth understanding of participants' perception, which is helpful to the

building of a rich and detailed picture about the attitudes of the students towards their schools. A better understanding of the characteristics of the culture of Catholic secondary schools in Hong Kong can then be achieved. Seventh, in examining the effects of participants' backgrounds on Catholic secondary school culture, additional factors, such as the students' socio-economic status and the educational level of students' parents, can be considered in future research. Eighth, a longitudinal research that examines the changes in the characteristics of Catholic school culture is also an important direction for future research.

This section has only mentioned research that can be further developed from the present research. The list is not exhaustive, and other research directions also deserve investigation in the future.

5.6 Conclusion

The present study offered some insights into the characteristics of the culture of Catholic secondary schools in Hong Kong. The results demonstrated the features of the components of the four dimensions, as stated in Flynn's (1993) model, that influence the Catholic secondary schools in Hong Kong to achieve a positive culture. Seemingly, improvement measures should be taken before the high quality of Catholic secondary education can be restored in Hong Kong. The students' sense of community appears to be a strong and functional component constituting the positive culture of the school. However, some progress should be made in the area of the teachers' sense of community. The

concept of discipline as discipleship can only be achieved to a small extent in the schools and improvement measures should be made to develop this. The curriculum and religious education should be areas of special attention in Hong Kong's Catholic secondary schools. Assessing the characteristics of the culture that exist in the Catholic secondary schools provides valuable insight for leaders who are looking to improve their school. Not only paying attention to the features of the components of the four dimensions of the existing Catholic secondary school culture in Hong Kong, school leaders and teachers should also make full use of the results of the present study to scrutinize to ensure that some of the school work would not be undervalued. Moreover, the school leadership should also make full use of the chance to reveal the school's commitment to apostolic cultivation, i.e. the formation of whole person and the building of a school community with religious atmosphere that can help youth building their personal lives according to the new man created in righteousness and true holiness. It is expected that insights acquired from the findings of the present study will be valuable as the Catholic secondary school principals and teachers conduct interim reviews during the reform period, to scrutinize the efficacy of the efforts the schools have made and formulate improvement plans. Last but not least, the preventive system of education is a worthy educational method which can help foster a distinctive culture in the Catholic schools. It is recommended that the leadership further explore and consider introducing this system of education to the Catholic secondary schools in Hong Kong.

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Appendix A
The Initial Draft of ASTS instrument for the Pilot Test

學生問卷
第一部份　　　背景資料
1.　　　性別：
　　　A. 男
　　　B. 女

2.　　　你的宗教信仰是甚麼？
　　　A. 天主教
　　　B. 基督教
　　　C. 基督宗教以外的信仰
　　　D. 沒有任何宗教信仰

3.　　　你在哪裡出生？
　　　A. 香港
　　　B. 中國大陸
　　　C. 澳門
　　　D. 在亞洲中的其中一個國家
　　　E. 其他

4.　　　你的父親在哪裡出生？
　　　A. 香港
　　　B. 中國大陸
　　　C. 澳門
　　　D. 在亞洲中的其中一個國家
　　　E. 其他

5.　　　你母親的宗教信仰是甚麼？
　　　A. 天主教
　　　B. 基督教
　　　C. 基督宗教以外的信仰
　　　D. 沒有任何宗教信仰

6.　　　你父親的宗教信仰是甚麼？
　　　A. 天主教
　　　B. 基督教
　　　C. 基督宗教以外的信仰
　　　D. 沒有任何宗教信仰

7. 你父親擁有的最高學歷是甚麼？
   A. 沒有接受任何正規教育
   B. 小學程度
   C. 初中程度
   D. 高中程度
   E. 大專或以上程度

8. 你母親擁有的最高學歷是甚麼？
   A. 沒有接受任何正規教育
   B. 小學程度
   C. 初中程度
   D. 高中程度
   E. 大專或以上程度

9. 以下哪一項可正確描述你父母現在的情況？
   A. 父母均健在
   B. 其中一方經已過身
   C. 父母經已過身
   D. 已經離婚
   E. 已經分居

10. 家中有沒有放置與宗教有關的圖片或物品？〔例如十字架、聖相或書籍〕
    A. 有
    B. 沒有

11. 你認為宗教在你生命中有何重要？
    A. 沒有任何重要性可言
    B. 不是十分重要
    C. 有一點重要
    D. 頗重要
    E. 十分重要

第二部份　　學校文化

此部份包含一些與你今年就讀的天主教學校有關的內容。
請表明你對以下題目同意或不同意的程度，每一題的答案如下：

A. 非常不同意
B. 不同意
C. 無意見
D. 同意

E. 非常同意
12. 學生能為學校設想。
13. 老師勝任教學工作且具備良好教學技巧。
14. 學生清楚了解學校對他們品格方面的期望。
15. 本校老師能充份表現學校精神。
16. 學生在校內獲得足夠的自由
17. 老師視每一個學生為獨立的個體。
18. 學校在社區內具備良好的學術名聲。
19. 當我需要建議或協助時，我能夠向校長求助。
20. 高年班學生明白及接受學校的宗教目標。
21. 老師表現得他們很想成為學校的一份子。
22. 老師具備教學的專業態度。
23. 老師工作時充滿活力，而且充滿樂趣。
24. 學校並無學生紀律問題。
25. 學生獲得足夠的輔導。
26. 每一個人都在學校中獲得很多樂趣。
27. 在我所就讀的級別中，同學都擁有良好的歸屬感。
28. 校長確保學校為學生提供良好教育。
29. 教師關心我。
30. 我在學校感到快樂。
31. 學校過份重視與外界的規則保持一致。
32. 我會安排孩子入讀天主教學校。
33. 學生不介意穿著校服。
34. 假如重新再選擇，我也會入讀天主教學校。
35. 學校老師永遠不會向你解釋他們對你的要求。
36. 每一個人均嘗試讓你在學校也獲得像在家一樣的感覺。
37. 大部份老師給予學生足夠的鼓勵。
38. 校長促進校內的團隊精神和歸屬感。
39. 如有學生不同意校規，校內有渠道修改校規。
40. 如學生在功課上有困難，老師願意犧牲私人時間。
41. 學校有太多限制學生自由的校規。
42. 老師認為人比規矩更重要。
43. 我在這間學校曾有愉快的經驗。
44. 學校的天主教老師能建立天主教徒的榜樣。
45. 校長重視學校作為天主教中學的宗教特質。
46. 學校老師關心學生，當學生有需要時，老師樂意給予協助。
47. 能成為這間學校的學生我感到十分快樂。
48. 校規提倡學生自律及負責任。
49. 學校氣氛愉快。
50. 校長在學校團隊中發揮領導才能。

第三部份　　宗教教育

此部份與你的宗教課堂經驗有關
請表明你對以下題目同意或不同意的程度，每一題的答案如下：

A. 非常不同意
B. 不同意
C. 無意見
D. 同意
E. 非常同意

51. 我享受今年的宗教及德育課。
52. 學習其他宗教讓我更欣賞自己的宗教。
53. 宗教及德育課很有趣。
54. 宗教及德育課與日常生活及我的需要息息相關。
55. 宗教及德育課未能提起學生的興趣。
56. 如果宗教及德育課屬自願性質，我仍然會參加。
57. 我覺得學校有效地於我就讀的年級推行宗教科。
58. 宗教及德育課須更加重視知識及內容。
59. 學生重視宗教及德育課。
60. 我所就讀級別的宗教及德育課花費太多時間。
61. 家課或考試的評估方式應作為宗教及德育課的一部份。
62. 宗教及德育課老師給予學生足夠的討論時間。
63. 宗教及德育課老師備課充足及教得很好。
64. 宗教及德育課的深淺程度與其他科目相若。
65. 我享受上宗教及德育課。
66. 家課及評估在宗教及德育課是有需要的。
67. 宗教及德育課的書面功課讓我對宗教更了解。

問卷調查完畢，多謝！

Appendix B

The Scales of the ASTS Instrument Before Modification

Scale	Statements
student relationship with teachers	Q14 Teachers are well qualified and have good teaching skills
	Q16 Teachers in this school show a good deal of school spirit
	Q18 Teachers know students as individuals at this school
	Q22 Teachers give the impression they want to be part of the school community
	Q23 Teachers have a professional attitude towards their teaching
	Q24 Teachers carry out their work with energy and pleasure
	Q30 Teachers take a personal interest in me
	Q38 Most teachers give students sufficient encouragement
	Q41 If students have difficulty with their school work, teachers give up their time
	Q43 Teachers show that people are more important than rules
	Q47 Teachers here are caring and willing to assist students who need help
student morale	Q13 Students here think a lot of their school
	Q19 This school has a good academic name in the local community
	Q26 Adequate counselling help is available to students
	Q27 Everyone has a lot of fun at this school
	Q28 A good spirit of community exists amongst students of your form
	Q31 I have been happy at school
	Q33 I would send my children to a Catholic school
	Q34 Students at this school do not mind wearing the school uniform
	Q35 If I had to do it all over again, I would attend a Catholic school
	Q37 Everyone tries to make you feel at home at this school
	Q44 My experience of this school has been a happy one
	Q48 I am happy to be a student at this school
	Q50 There is happy atmosphere in this school
student perception of the principal	Q20 I can approach the Principal for advice and help
	Q29 The Principal ensures that the school provides a good education to students
	Q39 The Principal encourages a sense of community and belonging in the school
	Q46 The Principal places importance on the religious nature of the Catholic school
	Q51 The Principal provides good leadership of the school community
student attitude to discipline	Q15 Students here know the standard of conduct expected of them
	Q17 Students are given sufficient freedom here
	Q25 Discipline presents no real problems in this school
	Q36 Teachers here never explain why they ask you to do things
	Q40 There are ways to have school rules changed if most students disagree with them
	Q42 There are too many rules which restrict students' freedom
	Q49 School rules here encourage self-discipline and responsibility
student attitude to religion	Q21 Senior students understand and accept the religious goals of the school
	Q32 This school places too much emphasis on external conformity to rules and regulations
	Q45 Catholic teachers here set an example of what it means to be a practising Catholic

student attitude to religious education	Q52	I have enjoyed R.E. classes this year
	Q53	The study of other religions has helped me to appreciate my own religion
	Q54	R.E. classes have been interesting
	Q55	R.E. classes are related to real life and to my needs
	Q56	R.E. classes do not arouse much interest on the part of student
	Q57	If R.E. classes were voluntary, I would still attend them
	Q58	This school has a good programme in my form
	Q59	More emphasis should be placed on knowledge and content in R.E.
	Q60	R.E. classes are taken seriously by students
	Q61	R.E. classes in my form take up too much time
	Q62	Assessment through assignment or examination should form part of the R.E. courses
	Q63	R.E. teachers allow sufficient time for discussion
	Q64	R.E. classes are well prepared and taught
	Q65	R.E. subject is taught at a level comparable with that of other subjects
	Q66	I have enjoyed studies of religion courses in R.E.
	Q67	Assignments and assessment in R.E. are necessary
	Q68	Written work in R.E. helps me to understand religion

Appendix C
Questionnaire: The Attitudes of Students Towards
Their School (ASTS)[1]

Chinese version:

「香港天主教中學學校文化」研究調查問卷

本人胡錦遠是香港教育學院研究生院博士研究生，現正進行一項由莫慕貞教授及汪雅量教授負責監督的研究計劃。這項研究名為「香港天主教中學學校文化」，主要考察對象為天主教中學初中學生，旨在研究香港天主教中學學校文化的特色及其對同學的學業成就和價值觀、信念及行為表現的發展的關係。

指示
1. 須用HB鉛筆填寫。
2. 填滿整個適用的橢圓圈。
3. 錯填答案用潔淨膠擦將筆痕徹底擦去。
例子： 對 ● 不對 ⊘⊗⊖

學生問卷
第一部份 背景資料

1. 性別
   Ⓐ 男　　Ⓑ 女

2. 你的宗教信仰是甚麼？
   Ⓐ 天主教　　Ⓑ 基督教　　Ⓒ 基督教/天主教以外的信仰　　Ⓓ 沒有任何宗教信仰

3. 你就讀的年級？
   Ⓐ 中一　　Ⓑ 中二　　Ⓒ 中三

4. 你在那裡出生？
   Ⓐ 香港　　Ⓑ 中國大陸　　Ⓒ 澳門　　Ⓓ 在亞洲中的其中一個國家　　Ⓔ 其他

5. 你的父親在哪裡出生？
   Ⓐ 香港　　Ⓑ 中國大陸　　Ⓒ 澳門　　Ⓓ 在亞洲中的其中一個國家　　Ⓔ 其他

6. 你母親的宗教信仰是甚麼？
   Ⓐ 天主教　　Ⓑ 基督教　　Ⓒ 基督教/天主教以外的信仰　　Ⓓ 沒有任何宗教信仰

7. 你父親的宗教信仰是甚麼？
   Ⓐ 天主教　　Ⓑ 基督教　　Ⓒ 基督教/天主教以外的信仰　　Ⓓ 沒有任何宗教信仰

8. 你父親擁有的最高學歷是甚麼？
   Ⓐ 沒有接受任何正規教育　　Ⓑ 小學程度　　Ⓒ 初中程度　　Ⓓ 高中程度　　Ⓔ 大專或以上程度

9. 你母親擁有的最高學歷是甚麼？
   Ⓐ 沒有接受任何正規教育　　Ⓑ 小學程度　　Ⓒ 初中程度　　Ⓓ 高中程度　　Ⓔ 大專或以上程度

10. 以下哪一項可正確描述你父母現在的情況？
    Ⓐ 父母均健在　　Ⓑ 其中一方經已過身　　Ⓒ 父母經已過身　　Ⓓ 已經離婚　　Ⓔ 已經分居

11. 家中有沒有放置與宗教有關的圖片或物品？（例如十字架、聖相或書籍）
    Ⓐ 有　　Ⓑ 沒有

12. 你認為宗教在你生命中有何重要？
    Ⓐ 毫不重要　　Ⓑ 不十分重要　　Ⓒ 有一點重要　　Ⓓ 頗重要　　Ⓔ 十分重要

第一頁

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[1] Only Sections 1 to 3 of the questionnaire formed the instrument ASTS. Section 4 of the questionnaire was another instrument, which is not part of this study, on Personal Best.

第二部份　學校文化

此部份包含一些與你今年就讀的天主教學校有關的內容。請表明你對以下題目同意或不同意的程度。

	非常 不同意	不同意	中立	同意	非常 同意
13. 學生能為學校設想。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
14. 老師勝任教學工作且具備良好教學技巧。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
15. 學生清楚了解學校對他們品格方面的期望。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
16. 本校老師能充份表現學校精神。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
17. 學生在校內獲得足夠的自由。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
18. 老師視每一個學生為獨立的個體。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
19. 學校在社區內具備良好的學術名聲。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
20. 當我需要建議或協助時，我能夠向校長求助。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
21. 高年班學生明白及接受學校的宗教目標。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
22. 老師表現得他們很想成為學校的一份子。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
23. 老師具備教學的專業態度。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
24. 老師工作時充滿活力，而且充滿樂趣。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
25. 學校並無學生紀律問題。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
26. 學生獲得足夠的輔導。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
27. 每一個人都在學校中獲得很多樂趣。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
28. 在我所就讀的級別中，同學都擁有良好的歸屬感。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
29. 校長確保學校為學生提供良好教育。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
30. 教師關心我。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
31. 我在學校感到快樂。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
32. 學校過份重視與外界的規則保持一致。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
33. 我將來會安排孩子入讀天主教學校。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
34. 學生不介意穿著校服。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
35. 假如重新再選擇，我也會入讀天主教學校。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
36. 學校老師永遠不會向你解釋他們對你的要求。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
37. 每一個人均嘗試讓你在學校也獲得像在家一樣的感覺。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
38. 大部份老師給予學生足夠的鼓勵。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
39. 校長促進校內老師和同學的團隊精神和歸屬感。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
40. 如有學生不同意校規，校內有渠道修改校規。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
41. 如學生在功課上有困難，老師願意犧牲私人時間。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
42. 學校有太多限制學生自由的校規。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
43. 老師認為人比規矩更重要。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
44. 我在這間學校曾有愉快的經驗。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
45. 學校的天主教老師能建立天主教徒的榜樣。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
46. 校長重視學校作為天主教中學的宗教特質。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
47. 學校老師關心學生，當學生有需要時，老師樂意給予協助。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

	非常 不同意	不同意	中立	同意	非常 同意
48. 能成為這間學校的學生我感到十分快樂。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
49. 校規提倡學生自律及負責任。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
50. 學校氣氛愉快。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
51. 校長在學校團隊中發揮領導才能。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

第三部份　宗教教育

此部份與你的宗教課堂經驗有關。請表明你對以下題目同意或不同意的程度。

	非常 不同意	不同意	中立	同意	非常 同意
52. 我享受今年的宗教及德育課。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
53. 學習其他宗教讓我更欣賞自己的宗教。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
54. 宗教及德育課很有趣。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
55. 宗教及德育課與日常生活及我的需要息息相關。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
56. 宗教及德育課未能提起學生的興趣。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
57. 如果宗教及德育課屬自願性質，我仍然會參加。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
58. 我覺得學校有效地於我就讀的年級推行宗教科。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
59. 宗教及德育課須更加重視知識及內容。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
60. 學生重視宗教及德育課。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
61. 我所就讀級別的宗教及德育課花費太多時間。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
62. 家課或考試的評估方式應作為宗教及德育課的一部份。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
63. 宗教及德育課老師給予學生足夠的討論時間。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
64. 宗教及德育課老師備課充足及教得很好。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
65. 宗教及德育課的深淺程度與其他科目相若。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
66. 我享受上宗教及德育課。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
67. 家課及評估在宗教及德育課是有需要的。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
68. 宗教及德育課的書面功課讓我對宗教更了解。	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ

第四部份　學習傾向

此部份與你的學習傾向有關。請表明你對以下題目同意或不同意的程度。

	非常 不同意	不同意	同意	非常 同意
69. 我會加倍努力改善成績。	Ⓐ	Ⓑ	Ⓒ	Ⓓ
70. 我會盡力把習作做得更好。	Ⓐ	Ⓑ	Ⓒ	Ⓓ
71. 我以超越自己為目標。	Ⓐ	Ⓑ	Ⓒ	Ⓓ
72. 我不斷尋求學習上的突破。	Ⓐ	Ⓑ	Ⓒ	Ⓓ
73. 我不和別人比較，只求發揮自己所長。	Ⓐ	Ⓑ	Ⓒ	Ⓓ
74. 我從各方面發掘自我潛能。	Ⓐ	Ⓑ	Ⓒ	Ⓓ

問卷調查完畢，多謝！

English version:

Section 1   Background

Q1. Please indicate your sex:
   A.   Male
   B.   Female

Q2. What is your religion?
   A.   Catholic
   B.   Christian
   C.   Non-Christian religion
   D.   No religion

Q3. Which form you are now attending?
   A.   S1
   B.   S2
   C.   S3

Q4. Where were you born?
   A.   In Hong Kong
   B.   In Mainland China
   C.   In Macau
   D.   In an Asian country
   E.   Others

Q5. Where was your father born?
   A.   In Hong Kong
   B.   In Mainland China
   C.   In Macau
   D.   In an Asian country
   E.   Others

Q6. What is your mother's religion?
   A.   Catholic
   B.   Christian
   C.   Non-Christian religion
   D.   No religion

Q7. What is your father's religion?
   A.   Catholic
   B.   Christian
   C.   Non-Christian religion
   D.   No religion

Q8. What was the final level of your father's formal education?
   A.   Does not receive formal education
   B.   Primary level
   C.   Junior Secondary level
   D.   Senior Secondary level
   E.   Tertiary level or above

Q9. What was the final level of your mother's formal education?
   A.   Does not receive formal education
   B.   Primary level
   C.   Junior Secondary level

D. Senior Secondary level
E. Tertiary level or above

Q10. With regard to your parents:
   F. Both my parents are living at home
   G. One of my parents has died
   H. Both my parents have died
   I. My parents are divorced
   J. My parents are separated

Q11. Are there any religious pictures or objects (e.g. Cross, holy pictures, books, etc.) displayed at home?
   C. Yes
   D. No

Q12. How important would you say religion is in your life?
   F. Of no importance at all
   G. Not very important
   H. Of some importance
   I. Fairly important
   J. Very important

Section 2   School Culture

THIS SECTION CONTAINS STATEMENTS ABOUT ASPECTS OF THE CATHOLIC SCHOOL YOU ARE ATTENDING THIS YEAR

Please indicate the extent to which you agree, or disagree, with each statement as follows:

   F. Strongly Disagree
   G. Disagree
   H. Neutral
   I. Agree
   J. Strongly Agree

Q13. Students here think a lot of their school
Q14. Teachers are well qualified and have good teaching skills
Q15. Students here know the standard of conduct expected of them
Q16. Teachers in this school show a good deal of school spirit
Q17. Students are given sufficient freedom here
Q18. Teachers know students as individuals at this school
Q19. This school has a good academic name in the local community
Q20. I can approach the Principal for advice and help
Q21. Senior students understand and accept the religious goals of the school
Q22. Teachers give the impression they want to be part of the school community
Q23. Teachers have a professional attitude towards their teaching
Q24. Teachers carry out their work with energy and pleasure
Q25. Discipline presents no real problems in this school
Q26. Adequate counselling help is available to students
Q27. Everyone has a lot of fun at this school
Q28. A good spirit of community exists amongst students of your form
Q29. The Principal ensures that the school provides a good education to students
Q30. Teachers take a personal interest in me
Q31. I have been happy at school
Q32. This school places too much emphasis on external conformity to rules and regulations

Q33. I would send my children to a Catholic school
Q34. Students at this school do not mind wearing the school uniform
Q35. If I had to do it all over again, I would attend a Catholic school
Q36. Teachers here never explain why they ask you to do things
Q37. Everyone tries to make you feel at home at this school
Q38. Most teachers give students sufficient encouragement
Q39. The Principal encourages a sense of community and belonging in the school
Q40. There are ways to have school rules changed if most students disagree with them
Q41. If students have difficulty with their school work, teachers give up their time
Q42. There are too many rules which restrict students' freedom
Q43. Teachers show that people are more important than rules
Q44. My experience of this school has been a happy one
Q45. Catholic teachers here set an example of what it means to be a practising Catholic
Q46. The Principal places importance on the religious nature of the Catholic school
Q47. Teachers here are caring and willing to assist students who need help
Q48. I am happy to be a student at this school
Q49. School rules here encourage self-discipline and responsibility
Q50. There is happy atmosphere in this school
Q51. The Principal provides good leadership of the school community

Section 3   Religious Education

THIS SECTION REFERS TO YOUR EXPERIENCE OF RELIGIOUS EDUCATION CLASSES

For each statement please indicate how strongly you agree, or disagree, as follows:

A. Strongly Disagree
B. Disagree
C. Neutral
D. Agree
E. Strongly Agree

Q52. I have enjoyed R.E. classes this year
Q53. The study of other religions has helped me to appreciate my own religion
Q54. R.E. classes have been interesting
Q55. R.E. classes are related to real life and to my needs
Q56. R.E. classes do not arouse much interest on the part of student
Q57. If R.E. classes were voluntary, I would still attend them
Q58. This school has a good programme in my form
Q59. More emphasis should be placed on knowledge and content in R.E.
Q60. R.E. classes are taken seriously by students
Q61. R.E. classes in my form take up too much time
Q62. Assessment through assignment or examination should form part of the R.E. courses
Q63. R.E. teachers allow sufficient time for discussion
Q64. R.E. classes are well prepared and taught
Q65. R.E. subject is taught at a level comparable with that of other subjects
Q66. I have enjoyed studies of religion courses in R.E.
Q67. Assignments and assessment in R.E. are necessary
Q68. Written work in R.E. helps me to understand religion

Appendix D
Letter of Approval for Ethical Review from HKIED

The Hong Kong
Institute of Education
香 港 教 育 學 院

Powering
Education
點亮教育原動力

28 October 2013

Mr WU Kam Yuen
Doctor of Education Programme
Graduate School

Dear Mr Wu,

Application for Ethical Review <Ref. no. 2013-2014-0014>

I am pleased to inform you that approval has been given by the Human Research Ethics Committee (HREC) with regard to your application for ethical review related to the following research project for a period from 1 September 2012 to 31 March 2014:

Project title: The Culture of Catholic Secondary Schools in Hong Kong

Please note that you are responsible for informing the HREC in advance of any changes in the research proposal or procedures which may affect the validity of this ethical approval. You will receive separate notification should a fresh approval be required.

Thank you for your kind attention.

Yours sincerely,

Cherry Ng (Ms)
Secretary
Human Research Ethics Committee

c.c. Prof Dennis McInerney, Chairperson, Human Research Ethics Committee
Prof Magdalena Mok Mo Ching, Principal Supervisor of the Applicant

Appendix E
Letter of Invitation to School Principals

尊敬的校長：

<u>「香港天主教中學學校文化」研究</u>

本人胡錦遠是香港教育學院研究生院博士研究生，現正進行一項由莫慕貞教授負責監督的研究計劃。這項研究名為「香港天主教中學學校文化」，主要考察對象為天主教中學初中學生，旨在研究香港天主教中學學校文化的特色及其對同學的學業成就和價值觀、信念及行為表現的發展的關係。

本研究以問卷調查方式進行，現特函懇請 貴校支持及協助，安排中一至中三級同學〔各級兩班〕填寫問卷。若蒙 貴校參與，本人將有以下安排：
1. 調查將在2013年4月至5月期間，於 貴校提供之時段中進行，中一至中三級（每級兩班）同學將獲邀填寫問卷。
2. 本人將會安排專人運送問卷到 貴校。
3. 教師將協助派發及收回已填妥的問卷，學生可於半小時內完成問卷。
4. 本人將會安排專人收回填妥的問卷。

註：本人會主動聯絡 貴校的聯絡人商議有關安排。

本人誠意邀請 貴校參加是次調查，如蒙 貴校參與此項研究項目，不勝感激。一切 貴校所提供的數據將僅作研究之用，並會嚴格保密。現隨函附上確認通知書，如 貴校答應參與是次研究，請於2013年4月10日或之前填妥確認通知書，並傳真至 　　　　。為答謝 貴校的支持，本人會為每所參與學校提供一份有關該校整體調查結果之機要報告。

貴校如有任何疑問，請致電 　　　或電郵 　　　　　　聯絡本人。本人誠摯地期待 貴校的正面答覆。

此致

_____

胡錦遠
香港教育學院研究生院博士研究生

2013年3月20日

「香港天主教中學學校文化」研究

回條

學校：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

致　　香港教育學院研究生院博士研究生胡錦遠先生

請在合適的 □ 內填上 ”✓”：

□　　同意本校學生參與是次研究項目。各班級參與的學生人數如下：

年級	班級	人數	班級	人數
中一	A	35	B	33
中一				
中二				
中三				

（填寫例子）

聯絡人姓名：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

　電話：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

　傳真：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

□　　不同意本校學生參與是次研究項目。

校長姓名：＿＿＿＿＿＿＿＿＿＿＿

校長簽署：＿＿＿＿＿＿＿＿＿＿＿

日期：二零一三年＿＿＿＿月＿＿＿＿日

Appendix F
The Information Sheet

「香港天主教中學學校文化」有關資料

誠邀閣下參加莫慕貞教授負責監督，胡錦遠先生負責執行的研究計劃。胡錦遠先生是香港教育學院研究生院的博士生。

這項研究名為「香港天主教中學學校文化」，旨在研究香港天主教中學學校文化的特色及其對同學的學業成就和價值觀、信念及行為表現的發展的關係。是次研究是以問卷調查方式進行。

閣下享有充分的權利在研究開始前或後決定退出這項研究，而不會受到任何對閣下不正常的待遇或被追究責任。凡有關閣下的資料將會保密，一切資料的編碼只有研究人員得悉。

如閣下對這項研究有任何不滿，可隨時與香港教育學院人類實驗對象操守委員會秘書吳惠霞女士聯絡（地址：香港教育學院研究與發展事務處 D4-1/F-21 室轉交）。

如閣下想獲得更多有關這項研究的資料，請與胡錦遠先生聯絡，電話

或聯絡她/他們的導師莫慕貞教授，電話 29487704。

謝謝閣下有興趣參與這項研究。

胡錦遠

首席研究員

INFORMATION SHEET
The Culture of Catholic Secondary Schools in Hong Kong

You are invited to participate in a project supervised by Professor Magdalena Mok and conducted by Mr. Wu Kam Yuen, who is student of the Graduate School in the Hong Kong Institute of Education.

The research project, titled "The Culture of Catholic Secondary Schools in Hong Kong", aims to explore the characteristics of the Catholic secondary school culture in Hong Kong and its effects on students' academic achievement and on the development of students' values, beliefs and behaviors. It involves data collection in the form of a questionnaire (attached) pertaining to the topic.

You have every right to withdraw from the study before or during the measurement without penalty of any kind. All information related to you will remain confidential, and will be identifiable by codes known to the researcher.

If you have any complaints about the conduct of this research study, please do not hesitate to contact Ms. Cherry Ng, Secretary of Human Research Ethics Committee of the Hong Kong Institute of Education in person or in writing (c/o Research and Development Office in room D4-1/F-21 of the Institute.

If you would like to obtain more information about this study, please contact Mr. Wu Kam Yuen at telephone number   or his supervisor Professor Magdalena Mok at telephone number 29487704.

Thank you for your interest in participating in this study.

Wu Kam Yuen

Principal Investigator

Appendix G
Letter to Schools for Delivery and Collection of Questionnaires

「香港天主教中學學校文化」研究

問卷送遞及收回安排

致： «Contact_Person»

　　«Name_in_Chinese»

　　（傳真：«Fax»）

多謝　貴校答應參與是次研究，問卷送遞及收回的安排如下：

問卷送遞到校日期：二零一三年四月二十二日上午

問卷收回日期：二零一三年四月二十九日上午

注意事項：
1. 本人將會安排專人於上述日期運送問卷到　貴校。
2. 問卷將會以　貴校所給予的班級資料分放於公文袋內；每班一個公文袋。
3. 問卷需時約二十分鐘完成。
4. 教師將協助派發問卷和有關資料及收回已填妥問卷，學生可於半小時內完成問卷。
5. 本人將會安排專人於上述日期收回填妥的問卷。

　　貴校如有任何疑問，請致電　　　　　、傳真　　　　　或電郵
聯絡本人。

_____
胡錦遠
香港教育學院研究生院博士研究生

2013年4月18日

Appendix H
Letter of Invitation to Students and Parents

THE HONG KONG INSTITUTE OF EDUCATION

GRADUATE SCHOOL

CONSENT TO PARTICIPATE IN RESEARCH

Project Title: The Culture of Catholic Secondary Schools in Hong Kong

I _____ hereby consent to participate in the captioned research supervised by Professor Magdalena Mok and conducted by Mr. Wu Kam Yuen.

I understand that information obtained from this research may be used in future research and may be published. However, my right to privacy will be retained, i.e., my personal details will not be revealed.

The procedure as set out in the **attached** information sheet has been fully explained. I understand the benefits and risked involved. My participation in the project is voluntary.

I acknowledge that I have the right to question any part of the procedure and can withdraw at any time without penalty of any kind.

Name of participant   _____

Signature of participant   _____

Name of Parent or Guardian (if applicable)   _____

Signature of Parent or Guardian (if applicable)   _____

Name of Researcher   _____

Signature of Researcher   _____

Date   _____

香港教育學院

研究生院

參與研究同意書

香港天主教中學學校文化

本人 ＿＿＿＿＿＿＿同意參加由莫慕貞教授負責監督，胡錦遠先生執行的研究項目。

我理解此研究所獲得的資料可用於未來的研究和學術發表。然而我有權保護自己的隱私，我的個人資料將不能洩漏。

我對所附資料的有關步驟已經得到充分的解釋。我理解可能會出現的風險。我是自願參與這項研究。

我理解我有權在研究過程中提出問題，並在任何時候決定退出研究而不會受到任何不正常的待遇或被追究責任。

參加者姓名：　　　　　　　　　　＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

參加者簽名：　　　　　　　　　　＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

父母姓名或監護人姓名：(如適用)　＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

父母姓名或監護人簽名：(如適用)　＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

研究員姓名：　　　　　　　　　　＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

研究員簽名：　　　　　　　　　　＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

日期：　　　　　　　　　　　　　＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿