

**THE IMPACT OF CO-CURRICULAR ACTIVITIES
ON YOUTH DEVELOPMENT:
A SELF-DETERMINATION THEORY PERSPECTIVE**

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**NATIONAL INSTITUTE OF EDUCATION
NANYANG TECHNOLOGICAL UNIVERSITY**

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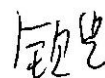
Guo Qinxian

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National Institute of Education,
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Doctor of Philosophy

2020

Statement of Originality

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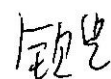


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Authorship Attribution Statement

This thesis **does not** contain any materials from papers published in peer-reviewed journals or from papers accepted at conferences in which I am listed as an author.



July 23rd, 2020

Guo Qinxian

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ABSTRACT

Participation in Co-Curricular Activities (CCAs) has been recognised as a vital avenue for students' holistic developments and acquisition of 21st century competencies. However, there is a lack of research in Singapore and Southeast Asia region that comprehensively and systematically assessed the effect of CCA participation on students' development. To address these limitations, this research involved a large-scale survey that garnered students' responses in 14 schools at various secondary school levels across two time points (i.e., with an interval of 9 months). The study examined the relationship between secondary school students' CCA participation and desired CCA academic and non-academic outcomes based on a self-determination theory (SDT) perspective. Drawing on SDT and also CCA-related conceptual frameworks like youth development and ecological system, the study was based on a substantive-methodological synergy that harnessed the robustness of structural equation modelling (i.e., path analysis) in accounting for variance of covariates and multiple factors across time points to determine the effect of respective CCA participation factors on a range of academic and non-academic outcomes. This research assessed students' development in CCA setting in the contexts of their interaction with parents, CCA-instructors, and CCA peers. Specifically, it adopted a nuanced approach in assessing the effect of: (1) type and quantitative indicators of CCA participation, (2) quality of CCA participation (student' motivational orientations), (3) interpersonal context of CCA participation. Of interest, it examined the role of students' motivational orientations in mediating the relationships between students' CCA participation and academic and non-academic outcomes. Parallel supplementary analyses were done to assess the incremental value of students' motivation over CCA participation factors. Consistent with SDT, the findings established the mediational role of students' CCA motivational orientation (i.e., autonomous motivation). It also highlighted the key role of students' motivation and supportive interpersonal

relationships in fostering students' academic and non-academic development. Thus, it revealed that the quality and interpersonal context of CCA participation had a more crucial role than the CCA type and quantity of CCA participation in promoting students' academic and non-academic development. It also attested to the value of CCA participation as an intervention and a key aspect of school curriculum that could foster students' holistic development. Collectively, this research provides valuable insight for optimising students' development through CCA participation.

CHAPTER 1

INTRODUCTION

1.1 Singapore Education and Its Philosophy and Initiatives

In recent years, the Singapore Ministry of Education (MOE, 2011, para. 16) has emphasised the significance of holistic youth development. This is aligned with the Chinese values of “德智体群美 (de zhi ti qun mei)”, which highlights the dual excellence in academic achievement and character values (MOE, 2011, para. 53). Similarly, the 2012 MOE Work Plan Seminar focused on cognitive skills and characters such as graciousness, responsibility and integrity as necessary for Singaporean children and youth to succeed in the contemporary knowledge economy (MOE, 2012, para. 37). To this end, Singapore government has formulated educational policies and paradigms to develop students to meet challenges in the present-day economy. These paradigms guide schools’ and teachers’ educational practices related to both main curricular and co-curricular activities (i.e., CCAs).

Ability-Driven Education (ADE) is one paradigm that aims to develop students to be innovative and entrepreneurial in the modern economy (MOE, 1999). This paradigm integrated three initiatives. The first is the *Thinking Schools, Learning Nation* (TSLN; Goh, 1997) framework that seeks to promote a culture of learning beyond excellent academic achievement. Second, the Information and Computer Technology (ICT) Master plan (Teo, 1997) executed a series of programmes to enhance the ICT facilities of educational institutions and the ICT competence of teachers and students. Lastly, the National Education (NE) programme (Lee, 1997) was geared toward instilling a sense of belongingness among the young. Collectively, these initiatives develop students’ talents in a diversity of areas and be more all-rounded (MOE, 2004).

At an individual level, Singapore’s education system also incorporated a social and emotional learning (SEL) framework that aims to provide opportunities for students to

develop optimistically and holistically in intellectual, emotional and interpersonal domains (MOE, 1998). This framework centres on core prosocial values (i.e., respect, responsibility, integrity, care, resilience and harmony) that form the basis of the daily application of social-emotional competencies (MOE, 2008, 2012, 2014). These social and emotional competencies are to be demonstrated by specific behaviour repertoires, for instance, having the capacity to regulate cognitions and emotions, managing challenges and making decisions rationally (i.e., self-awareness, self-management and responsible decision-making), being empathetic and sensitive to others' perspectives (i.e., social awareness and harmony) and having psychological robustness in face of difficulties and challenges (i.e., resilience). The MOE further developed the Framework for 21st Century Competencies and Student Outcomes that guides the formulation, application, assessment and enhancement of school programmes, including CCAs in promoting students' social and emotional development as well as 21st century skills and competencies (MOE, 2014). 21st century competencies are skills that enable students be effective in a culturally diverse and fast-paced society. These include *critical and inventive thinking*, or critical-thinking skills and capacity to innovate; *civic literacy, global awareness and cross-cultural skills*, or students' ability to empathise and relate with people across cultures and backgrounds and desire to contribute to society; *communication, collaboration and information skills*, or skills to effectively organise and communicate ideas when collaborating with others (MOE, 2008, 2012, 2014). Together, they promote the Desired Outcomes of Education to develop students to be confident, motivated and civic-minded (MOE, 2012, 2014). Such qualities are imperative in enabling students to strive in a globalised, technologically advanced and culturally diverse society. MOE also recognises the role of supportive environments and adult figures in promoting students' social and emotional competencies (MOE, 2008). Thus, this is in line with the educational goal to develop prosocial, self-directed and confident individuals (MOE, 2014)

1.2 School-Based Co-Curricular Activities in Singapore

The overarching goal of the Framework for 21st Century Competencies and Student Outcomes is congruent with MOE's philosophy of education, and supports MOE's "student-centric, values-driven" vision of Singapore education in which each and every student is valued and entitled to all the support needed for his or her holistic development (MOE, 2011). In order to attain this objective, intermediate outcomes are outlined. One of these involves cultivating an appreciation of the aesthetics through both formal classroom curriculum and co-curricular activities (CCAs) that schools organise. CCA refers to organised and structured activities that involve positive interpersonal relationships and foster positive youth development (Jiang & Peterson, 2012). As an integral part of school curriculum, CCAs provide important out-of-classroom experience that fosters character-building, 21st century skills and competencies, and holistic development (Chong-Mok, 2010; MOE, 2010, 2011; Schwarz & Stolow, 2006).

Although participation in CCAs during primary education is not compulsory, CCAs are emphasised in secondary schools and categorised into Core (or Main) and Merit (or Secondary/Optional) CCAs. Core CCAs are mandatory for all students, whereas Merit CCAs are offered as an option for students with an interest in a particular area. Prior to secondary school admission, Singaporean students typically go through 6 years of elementary education and are at the end of it, are placed into Express, Normal Academic, and Normal Technical (ability) streams based on their Primary School Leaving Examination (PSLE) results. In secondary schools, students are offered choices in subject areas and CCAs. According to the Co-Curricular Activities Branch (CCAB) of Singapore's Ministry of Education (MOE, 2003), school-based CCA is an important platform for students to develop character, team spirit and responsibility. At both primary and secondary levels, the range of CCAs offered is categorised into four major groups: Sports and Games, Uniformed Groups, Visual and Performing Arts, and Clubs and Societies.

Whilst all CCAs serve to develop specific traits and qualities in Singaporean (e.g., confidence, leadership skill, teamwork), CCA participation is also meant to develop specific knowledge, skills and values, based on the student's choice of CCA. It promotes friendships and social integration of students from diverse backgrounds. For instance, physical activities and sports-related CCAs, including track and field, ball games, and gymnastics cultivate ruggedness, team spirit and sportsmanship. Visual and Performing Arts (VPA) encompass bands, dance, choirs and drama clubs. It inculcates a sense of graciousness and an appreciation for arts and culture in a multiracial society. Uniformed Group (UG) activities, for instance, National Cadet Corps (NCC), Red Cross Youth, Boys' and Girls' Brigades, foster self-reliance, discipline, and a spirit of service to others — qualities required to develop Singaporean students as good citizens. Clubs and Societies, for example, chess, robotics and language clubs, provide opportunities for students to explore and further their interest in broad and specific domains in terms of knowledge and skills. Thus, it is the goal of CCA participation that students develop and sharpen their knowledge and technical skills in their CCA areas so that they can develop mastery in those specialised areas (Kalles & Ryan, 2015; Kearney, Perkins, & Maakrun, 2014; Osman, 2011).

Finally, CCAs provide a context for learning core values, social and emotional competencies and the emerging 21st Century Competencies. CCAs are complementary with three other MOE's objectives, namely, Student Leadership Development, Value in Action and Enrichment and Life-skills Programmes, in achieving the targeted outcomes. In many aspects, features of CCAs will align and integrate certain components to reinforce important targeted learning outcomes.

With the increased investment in CCAs in Singapore schools (MOE, 2010, 2011, 2012), it is pertinent to examine the potential impact of CCAs on the holistic development of Singaporean students. This research assessed various dimensions of CCA participation: (a) types of CCA (i.e., Physical Sports, Uniformed Groups, Visual and Performing Arts, and

Clubs and Societies), (b) quantitative indicators of CCA participation (i.e., intensity, breadth and duration), (c) quality of CCA participation (i.e., students' CCA motivational orientation), and (d) the role of CCA-related others (i.e., perceived CCA interpersonal relationships). This study looked into how these dimensions contributed to a range of academic (e.g., educational aspiration, homework completion and classroom engagement) and non-academic (e.g., leadership qualities, teamwork and lifelong learning) outcomes. The study specifically tested a hypothesised model depicting the mediating role of CCA motivational orientations in the relationships between CCA participation predictors, including (a) types of CCA, (b) quantitative indicators of CCA participation, and (c) the role of CCA-related others on the one hand, and CCA outcomes on the other hand. This hypothesised model will be elaborated on below and in Chapter 2.

1.3 Rationale and Context

As explained above, Singapore's education system is geared towards nation-building and individual development of citizens who are expected to flourish in a meritocratic system (Eng, 1995; Kang, 2005; Lee, 2008). To this end, education is tailored towards holistic development, particularly in social and emotional competencies and 21st century skills (MOE, 2014). CCAs have been recognised as an effective avenue for facilitating students' development in these areas (Darling, 2005; Khanlou, 2004).

As will be elaborated in Chapter 2, a systematic review of the relationship between school-based CCA participation and a range of developmental outcomes, including academic achievement, psychological adjustment, and young-adult outcomes revealed there were several methodological limitations to this area of research (Farb & Matjasko, 2012) including, among others, (a) lack of longitudinal studies, (b) failure to control for self-selection biases, (c) lack of adequate or representative samples, (d) lack of conceptual frameworks, and (e) lack of consideration of quality of CCA participation and interpersonal context.

In a special issue of the *Journal of Early Adolescence*, Kuperminc, Smith and Henrich (2013) highlighted the significance of understanding the role of social and motivational processes in contributing to youth engagement and participation in CCAs, which in turn have developmental implications. While many motivational theories have been put forth, self-determination theory (SDT; Ryan & Deci, 2017) was suggested by Kuperminc and colleagues (2013) for its heuristic value in explaining educational and well-being outcomes as a result of differing types of motivational orientations. SDT, therefore, is used to frame this current research. As part of SDT, the study considered the role of significant others, such as parents, CCA instructors, and CCA peers in facilitating (or thwarting) motivation for CCA participation. In this regard, SDT encapsulates social and motivational processes pertaining to youths' motivation in CCA, which formed the central focus of this study.

An important direction of research involved examining the role of students' motivation in mediating the relationship between CCA-participation factors and a range of academic and non-academic outcomes. As depicted in Figure 1, the hypothesised model is one that includes CCA participation factors: (a) CCA types (Physical Sports, Visual and Performing Arts, Uniformed Groups, and Clubs and Societies), (b) quantitative indicators of CCA participation (e.g., intensity, breadth, duration), (c) CCA interpersonal relationship in relation parents, CCA instructors, and CCA peers, (d) quality of CCA participation (i.e., students' CCA autonomous and controlled motivation), and (e) a wide range of academic (e.g., educational aspiration, homework completion, and classroom engagement) and non-academic (e.g., leadership skill, teamwork and lifelong learning)

outcomes.

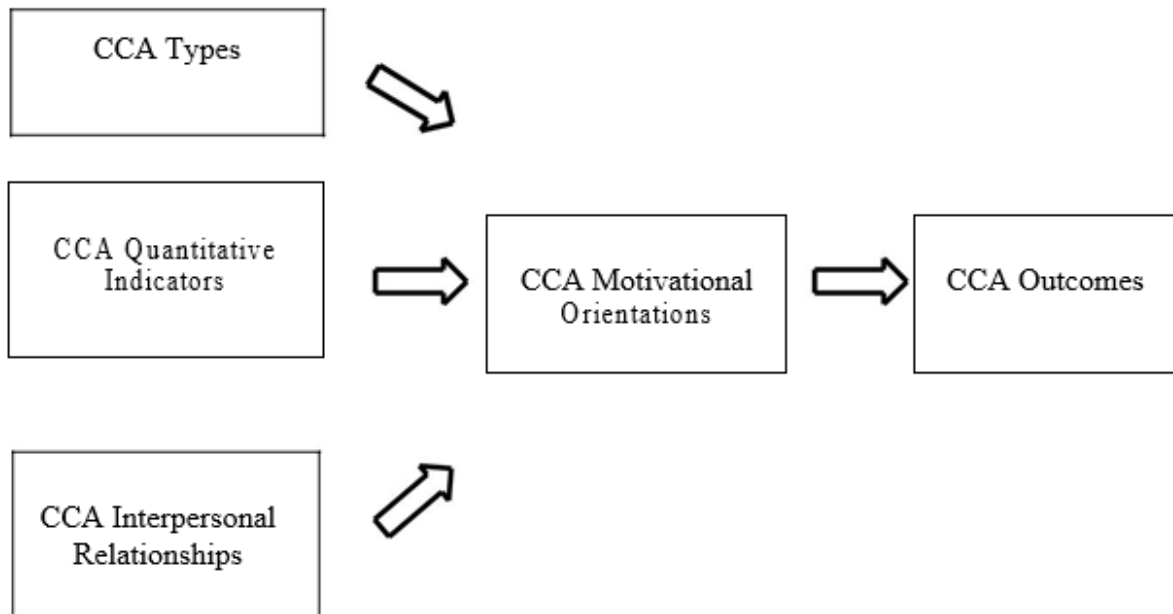


Figure 1. 1: General hypothesised model depicting the mediating role of CCA motivational orientations in the relationships between CCA participation predictors (i.e., CCA types, quantity of CCA participation, CCA interpersonal relationships) and CCA outcomes.

1.4 Foreseen Yields of the Current Study

This research, which incorporates a number of theoretical and methodological development, is expected to advance the field by making a number of contributions: (a) It advances the body of literature by studying school-based CCA participation and its role in student development in Singapore, something which is relatively lacking in the international body of literature; (b) It assesses both the quantity and quality of CCA participation, rather than merely focusing on the amount of activity participation (i.e., frequency, duration), like previous research (see e.g., Bohnert, Fredricks, & Randall, 2010; Fredricks, 2011) by considering the motivational aspects of CCA participation from the SDT perspective; (c) It adopts a longitudinal design (Farb & Matjasko, 2012; Kuperminc et al., 2013) by measuring key factors at two time points across one academic year (i.e., at the beginning and end of CCA participation in a school year), and thus, provides valuable insights on the impact of CCA participation on the developmental trajectories of secondary youth; (d) It examines the

contribution of interpersonal relationships (parental autonomy support, CCA instructor autonomy support and CCA peer autonomy support) in relation to CCA participation and adolescents' development; (e) It examines a wide range of academic (i.e., academic buoyancy, homework completion, school belongingness, education aspiration and classroom engagement) and non-academic (i.e., leadership skill, communication skill, teamwork, society-oriented future goals and lifelong learning) outcomes relevant to Singapore's educational objectives; (f) It used an application of structural equation modelling, which integrates the advantages of advanced quantitative techniques. These involved path analysis targeting multiple dependent measures and accounting for their shared variance. It assessed the significance and magnitude of hypothesised relationships among various CCA predictors and CCA outcomes; (g) By understanding the underlying mechanism and relationship between CCAs participation and outcomes, the study provides important findings regarding the role of CCAs in promoting youth development. Such findings would be informative to stakeholders, such as parents and CCA instructors, and contribute to educational policy formulation. Thus, this research is instrumental in addressing substantive-methodological gaps identified and provides much needed research on CCAs in Singapore schools. Such research would provide invaluable insights necessary for interventions that can foster important developmental outcomes.

1.5 Chapter Summary

This chapter has introduced the background and underlying motivation for the present study. In doing so, this chapter outlined the recent education trends in Singapore, mainly, the increasing emphasis on holistic development of Singapore's students. Further, it expounded the role of CCAs in fostering students' character-building, 21st century skills and competencies, and holistic development. It also examined the role of motivation and interpersonal context in contributing to students' CCA participation outcomes. Lastly, it

brought up a number of possible yields from this study. The next chapter provides a conceptual and empirical review that set a stage for the present doctoral study.

CHAPTER 2

LITERATURE REVIEW

The chapter reports on reviews of the extant literature pertinent to the current study, and provides theoretical-conceptual frameworks and empirical bases to understand the relationships among CCA participation, motivation, interpersonal factors, and desired outcomes examined in this study. These theoretical-conceptual frameworks include the bioecological model of development (Bronfenbrenner, 1977, 1979, 1994), positive youth development (Lerner, 2002, 2004), models of extracurricular activity participation effects (Marsh & Kleitman, 2002), and self-determination theory (SDT; Ryan & Deci, 2000, 2017) from which key constructs of the study were mainly derived.

2.1 Bioecological Model of Human Development

Bronfenbrenner (1977, 1979) proffered a systemic model of individual development, called the ecological model of human development. In his view, the development of a youth is embedded in multiple contexts. It conceptualises the youths' environment (ecology) as multilayered, overlapping, nested and interrelated environmental systems. These spheres are arranged from those which are most proximal to the youth to those whose influences are important but distal and indirect. These systems are the micro-, meso-, exo-, macro- and chrono-systems. The reciprocal relationship between the individual and these environments forms the focus of this model and of understanding an individual's development (McMahon, 1996; Santrock, 2004). The more recent version of the model takes into account biological elements of individuals in understanding human development, resulting in the revised name of the model, the bioecological model of individual development (Bronfenbrenner, 2005; Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006).

The bioecological model provides one of the key theoretical frameworks in the present study in considering the influence of the various aspects of the youths' ecological systems, especially in relation to their participation in school-based co-curricular activities. Students' intrapsychic characteristics (e.g., students' motivational orientations) and biological dispositions (e.g., age, gender), as well as the relationships between students and their ecological contexts, including their social relationships with CCA peers, CCA instructors, and parents (i.e., the extent to which parents support their CCA participation) are likely to influence students' CCA participation motivation and, in turn, their academic and non-academic development. These factors, hence, need to be taken into account in a study seeking to investigate the role of CCA participation and developmental outcomes. The various systems in the model and their relations to CCA contexts are described below.

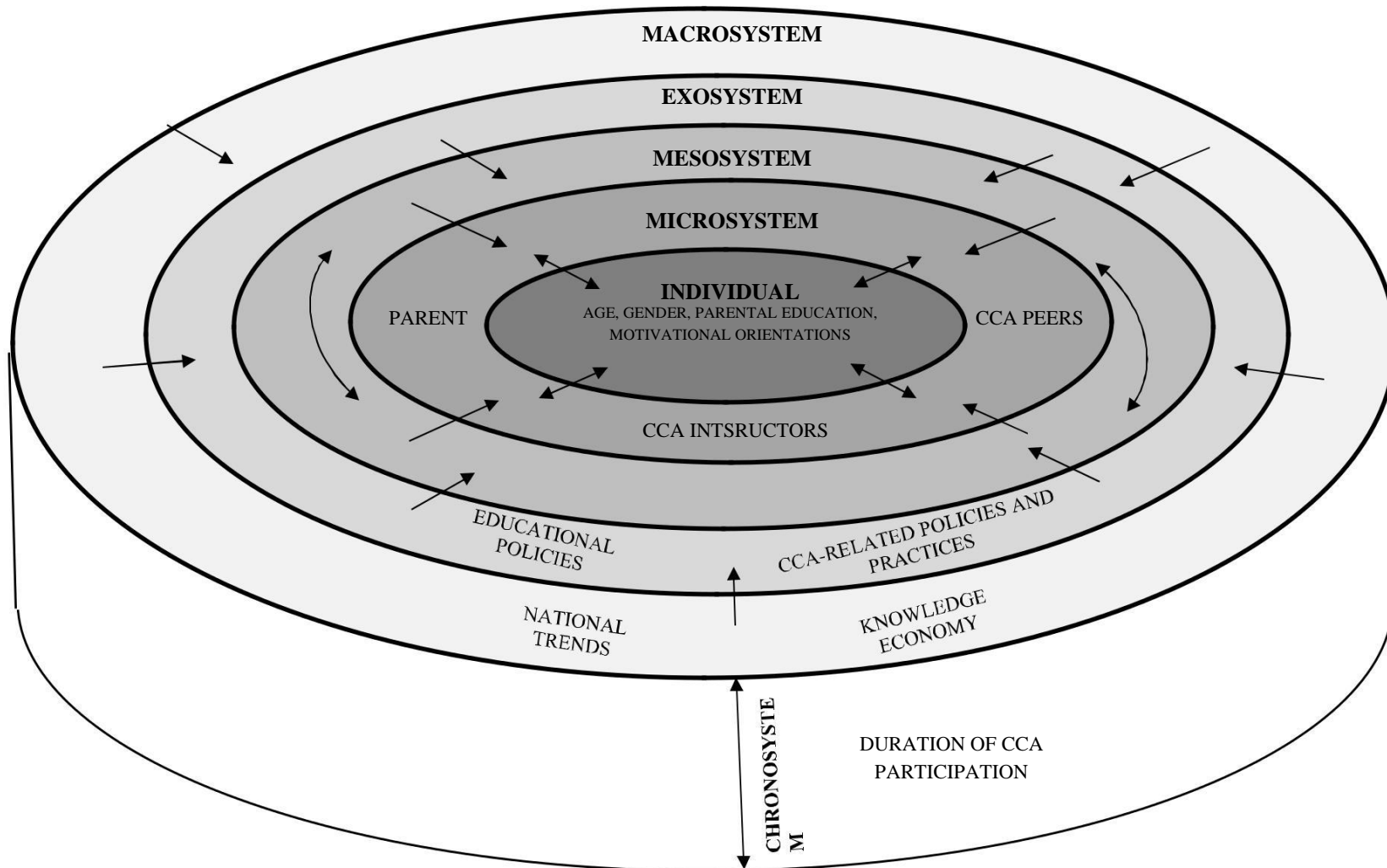


Figure 2.1: Bronfenbrenner's bioecological model as applied in understanding the role of school-based Co-Curricular Activity (CCA) participation in developmental outcomes.

As shown in Figure 2.1, the microsystem, the most proximal environment to the student in the model, refers to direct, immediate social CCA environments (i.e., CCA-related social interactions) which influence students' development through their direct interactions (Bronfenbrenner, 1979). Thus, the microsystem in the present study entails people whom students have direct interactions within the context of their CCA participation. These people include CCA instructors, CCA peers, and parents. In terms of parents, they may not directly be involved in their children's participation in school-based CCAs, however, they may support or impede their children's CCA participation and in turn CCA-related outcomes. Indeed, according to Bronfenbrenner (1994), within the microsystem, proximal processes function to produce and sustain students' development. Supportive relationships in the microsystem may facilitate students' sense of belongingness (Kinney, 1993; Youniss, McLellan, & Mazer, 2001) and promote their strengths and talents through interaction with role models (Hirsch, Mickus, & Boerger, 2002). Thus, school-based CCA constitute a microsystem that may affect the academic and non-academic development of youth. In the present study, the microsystem was represented by key variables including CCA instructor autonomy support, CCA peer autonomy support, and parental autonomy support, each of which is elaborated on below.

The mesosystem, the second layer of the model, refers to the connection and interaction between two or more students' microsystems and this connection would also affect students' development (Bronfenbrenner, 1979). This context includes, for example, the relationship between home and CCA context or between parents and CCA peers. Its optimal influence on a student's development takes place when parents correspond with school and CCA instructors in terms of the values that school-based CCA cultivate in students. The number and quality of connections between the settings can play a role in shaping the development of students (Bronfenbrenner, 2005; Bronfenbrenner & Morris, 2006). Although this system was not specifically included or measured in the present study, it has an important

applied implication particularly in encouraging parents to support their children's school-based CCA participation. This is especially the case in Singapore where parents usually emphasise and put higher importance on their children's curricular, rather than co-curricular activity, performance.

The exosystem is the third layer of the ecological context of individual development in the model (see Figure 2.1). It refers to environmental factors that have an influence on students' development even though these factors do not directly 'interact with' or involve students and that their influence on students' development may not be immediate or direct (Bronfenbrenner, 1979, 2005; Bronfenbrenner & Morris, 2006). An example of the exosystem in the present study is a national educational policy formulated by the MOE that requires all secondary school students in Singapore to take up at least one CCA. This shapes the after-school activity of secondary school students in the nation. By extension, this educational policy and practice affect not only the compulsory school-based CCA participation but also the frequency or intensity (e.g., the number of hours per week), the duration (e.g., the number of years of participation), and the breadth (i.e., the number of CCAs that students partake in) of this school-based CCA participation. These CCA participation factors were included and measured, and their effects on students' CCA motivational orientations and developmental outcomes were evaluated in the present study.

The fourth layer of developmental context is the macrosystem, which encapsulates the characteristics of a general culture, or subculture, in which the individual lives (Bronfenbrenner, 1994). An example of the macrosystem in the present study is the shift in emphasis from academic credentials and certificates to holistic and life-skill development that has taken place in Singapore education and society at large in recent years. Such a trend has motivated schools to tighten their CCA policy and practice with the purpose to develop 21st century competencies as CCA participation outcomes in their students. Whilst (perceptions of) the shift in this societal and educational objective was not directly assessed, the present study

included and measured a wide range of students' academic and non-academic outcomes related to 21st century competencies. The academic outcomes included school belongingness, academic buoyancy, educational aspiration, classroom engagement, whereas the non-academic outcomes were represented by confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal. Their inclusion allowed the present study to examine if school-based CCA participation would bring about positive changes (gains) in this wide range of outcomes.

The fifth and final layer of developmental context in the bioecological model is the chronosystem, entailing the influence of time-related factors in shaping human development. These factors include, for example, past CCA experience (e.g., duration of CCA participation), students' prior academic performance or future goals. These may lead to students responding differently to their environment and how they interact with other systems. In the present study, the chronosystem concerns how CCA participation influences students' development over a period of time. An example of the chronosystem in the CCA participation context is the fact that students' track record of their school-based CCA participation and achievement is taken into consideration when they apply for further studies, scholarships, and jobs. In the present study, the chronosystem was broadly represented by measuring CCA participation and outcome factors at the beginning and end of the school year and analysing the data cross-sectionally and longitudinally.

Taken together, the present research took the bioecological system model into consideration in its design. Specifically, the bioecological model was useful in understanding the potential effects of the various ecological contexts pertinent to CCA on students' academic and non-academic development.

2.2 Stage-Environment Fit Theory

According to the stage-environment perspective, a social environment that adapts and meets students' psychosocial needs is pivotal to students' motivation and optimal

development (Eccles & Midgley, 1989; Eccles et al., 1993). This is pertinent in teenage years when students experience a range of physical and cognitive developments, as well as school transitions and shifts in social roles and relations with peers and families (Eccles et al., 1993; Eccles, Lord, & Roeser, 1996). Depending on the match between the characteristics of youth and their social environment, the psychosocial needs of students are met to a different extent. This will influence their subsequent motivation and developmental needs. Their autonomy-supportive interpersonal relationships with teachers, parents and peers are instrumental in facilitating students' motivation and developments.

Of relevance to the present CCA research, Eccles and colleagues (1993) highlighted how a “fit” between individual characteristics (e.g., age, gender and parental education) and psychological characteristics (e.g., CCA motivational orientations and values) and contextual variables (e.g., schools, families and CCA programmes) contributes to the healthy, positive development of adolescents (e.g., Wigfield & Eccles, 2002). As pointed out by the stage-environment fit theory (Eccles et al., 1993), the match between the needs of developing adolescents and social contexts in which they reside (e.g., home, school) is crucial and related to the psychological changes associated with development. So, the alignment of the strengths of youth with resources present in the key contexts of adolescent development – the home, the school, and the community, translates to enhancements in positive functioning at any one point in time (i.e., well-being; Bornstein, Davidson, Keyes, Moore, & the Center for Child Well-Being, 2003) and, in turn, the systematic promotion of positive development will occur across time (i.e., thriving; e.g., Dowling et al., 2004; Lerner, 2005; Lerner & Steinberg, 2004).

The stage-environment fit theory is aligned with the self-determination perspective, which outlines the importance of involvement in contexts that fulfil their sense of connection, autonomy and engagement in challenging tasks. These enable them to be motivated individuals (Anderson-Butcher, 2005; Lauver & Little, 2005; Weiss, Little, & Bouffard, 2005). In this instance, CCA provides a context that matches students' developmental needs

and facilitates students' desire to promote students' academic and non-academic outcomes (Ryan & Deci, 2000). This perspective recognises that students' motivation depends on the context and emphasises the role of supportive adults and peers in fostering students' autonomous motivation (Assor, Kaplan, & Roth, 2002; Deci & Ryan, 1985; Furrer & Skinner, 2003; Katz, 2003; Reeve & Jang, 2006; Vallerand, Fortier, & Guay, 1997). The SDT and its link to the present study is elaborated below. Thus, the stage-environment theory recognises the role of interpersonal contexts in supporting students' development during adolescence. By aligning CCA contexts (i.e., CCA interpersonal relationships) to fulfil students' psychological needs, students' development in terms of academic and non-academic outcomes can be optimised.

2.3 Traditional Perspectives on Youth Development

Adolescence have traditionally been seen as a turbulent time of “storm and stress” (Hall, 1904) as adolescents experience an array of physiological and psychological changes. At the same time, they need to adapt and respond to demands and challenges of the sociocultural context they live in (Larson & McKinley, 1995). Youth are perceived to be distraught and alienated by parents and other adult figures in the society (Coleman, 1961). Yet, rebellious and erratic behaviours are actually part of the process for youth to develop their identity and formation of personal values and beliefs (Brown, 1990; Damon, 1983). Nevertheless, youth are largely regarded as well-adjusted, thriving individuals who are confident, joyful and self-assured (Offer, Ostrov, & Howard, 1981). Thus, adolescents are perceived to be flawed and problematic, and require the guided management of their maladaptive behaviours (see Benson, Scales, Hamilton, & Sesma, 2006; Roth, Brooks-Gunn, Murray, & Foster, 1998, for an extensive review). Youth development is therefore seen as entailing risk-reduction or deficit-reduction approaches, which involve identifying and mitigating obstacles to positive development (Benson & Saito, 2000).

The development of self and personal identity is a major developmental task that youth are expected to accomplish during adolescence (Erikson, 1968). CCA participation is associated with students' positive self-perception (Harter, 1990) and such identity development is related to positive sense of well-being (Coatsworth, Palen, Sharp, & Ferrer-Wreder, 2006). These experiences provide an avenue for the exploration of their interest and identity, formation of peer relationships and a restructuring of relationships with family members, which forms the basis for the forging of mature and affectionate relationships in adulthood and the defining of an individual's role within society (Brown, 1990; Cotterell, 1996; Laursen & Williams, 1997; Niebrzydowski, 1995). In order to transit smoothly to adulthood, youth have to develop a positive clear sense of identity in their development. Erikson (1963) suggested that individuals would experience identity confusion when they are unable to make commitment in significant areas of life and when they are not sure about who they are in relation to their personal characteristics and others. In response to Erikson's perspective on identity development, Marcia (1993a, 1993b) proposed the four identity-statuses model. These four statuses are: (a) *Diffusion*: Individuals who are not engaged in the identity-exploration process and have yet committed to a certain identity; (b) *Moratorium*: Individuals are involved in personal exploration but have not committed to a certain identity, (c) *Foreclosure*: Individuals have committed to a certain identity but without going through any personal exploration; and (d) *Achievement*: Individuals have committed to a certain identity after undergoing personal exploration. Among these, the least favourable outcome is identity diffusion. The most common and likely optimal progression is for the initial identity status to proceed from foreclosure to moratorium, and finally attaining achievement status.

In the adolescence phase, youth spend less time with family, and other settings such as school becomes more salient and an important context for holistic development (Larson, Hansen, & Moneta, 2006). CCAs therefore present opportunities for them to develop cognitively and socioemotionally. Effective youth programmes require young people to

collaborate with peers, which helps them develop their social skills and fulfil their social needs (Furman, McDunn, & Young, 2008; Larson & Asmussen, 1991). The involvement of supportive adult figures and prosocial organisational culture positively impacts youths' emotional development and growth. For instance, a study by Busseri, Rose-Krasnor, Willoughby, and Chalmers (2006) found a longitudinal association between a range of activity involvement and adjustment, in particular interpersonal functioning, composite indicators of successful development and less tendency to engage in risky behaviour after 20 months.

Previous studies have lent support to the role of CCAs in promoting adolescent development. CCAs provide a context for youth to develop their identity by finding out their own preferences, developing their skills and relating with others in CCAs (Dworkin, Larson, & Hansen, 2003; Fredricks et al., 2002). Through the engagement of these activities, the youth develop self-awareness by understanding (Valentine, Cooper, Bettencourt, & DuBois, 2002). Besides the fulfilment of developmental tasks, youth develop social capital in the form of extended supportive networks of friends and adults (McNeal, 1999; Newmann, Wehlage, & Lamborn, 1992). Youth will then have access to coaching and mentoring relationships, foster reciprocal relationships with peers who have common interests and interactions with supportive adults (Dworkin et al., 2003). In addition, social capital has been noted to promote youths' engagement in school and academic achievement (Lamborn, Brown, Mounts, & Steinberg, 1992).

In summary, adolescence is a transitional period that is marked by shifts and a range of development across cognitive and socioemotional domains. While youth strive to accomplish an array of developmental tasks, it is important for us to consider the relevance of sociocultural contexts in dictating the timing and degree of development. CCA participation presents many opportunities for promoting youths' development, including the consolidation of self-identity, cognitive autonomy and accumulation of social capital. Hence, youth

development forms the backdrop of the research that examined the influence of school-based CCAs in shaping secondary school students' development in terms of academic and non-academic outcomes.

2.4 Positive Youth Development

In recent years, positive youth development (PYD) has gained greater attention in the field (Busseri & Rose-Krasnor, 2009). This perspective is seen as being more positive and optimistic than the traditional perspectives on youth development. It entails an asset-building orientation of development, in which strengths and competencies of youth are emphasised and promoted (Benson, Leffert, Scales, & Blyth, 1998; Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004). In the context of PYD, CCA participation can promote positive development through supportive adult-youth relationships, participation in leadership roles, and skill-building activities (Eccles & Gootman, 2002; Roth & Brooks-Gunn, 2003a, 2003b).

In PYD, developmental assets entail social and ecological resources vital for the personal growth of healthy youth (Benson, 2003), and there is a general agreement on the need for developmental assets to be mobilised in homes and classrooms or schools, or through community-based programmes to foster PYD. Benson and colleagues (1998) suggest the importance of “developmental assets”, which encompasses talents, strengths, energies and constructive interests that young people possess. These specifically include “internal” and “external” assets. Internal assets are personal qualities of young people, particularly positive ones, such as commitment to learning, positive values, social skills, and positive identity. External assets refer to community influences needed for optimal youth development, which includes caring families, neighbourhoods and other community-oriented assets. For many young people, after-school activities provide a context to build these assets. In this context, school-based CCAs are associated with youth programmes, especially those that focus on positive youth development (i.e., programmes that adopt the features associated with the PYD perspective; Roth & Brooks-Gunn, 2003a, 2003b). For example, Scales, Benson,

Leffert, and Blyth (2000) found that participation of three or more hours in sports, clubs, or organisations at school or in the community was the single developmental asset (of the 40 assets they surveyed) that was most linked to thriving outcomes among the adolescents in the Search Institute sample.

Similarly, Lerner (2004) proposed the “Big Three” features of optimal youth development programmes, i.e., positive and sustained (for at least 1 year; Rhodes, 2002) adult-youth relationships; skill-building activities; and opportunities to use these skills by participating in, and leading, community-based activities. In this regard, CCAs provide a platform for adolescents to be immersed in these big three features of optimal development programmes. According to the PYD perspective, CCAs confer developmental supports and opportunities characterised by the following (Eccles & Gootman, 2002): (a) physical and psychological safety, (b) structure, (c) supportive relationships, (d) sense of connection, (e) positive social norms, (f) stronger sense of confidence and significance, (g) skill-building, and (h) collaboration and partnership among family, school and community. Students flourish when their individual aptitudes and talents are aligned with, or supported by, contextual or ecological characteristics as mentioned above (Benson, Scales, & Syvertsen, 2011).

Specifically, PYD programmes are designed with an aim to produce short- and long-term benefits for young people in terms of their 6Cs (Lerner, Theokas, & Jellicic, 2005; Roth & Brooks-Gunn, 2003a, 2003b): (a) connections, providing primary or secondary support system; (b) confidence, helping them develop a positive identity; (c) caring, helping them to develop a sense of belonging; (d) competence, helping them develop skills and resources for choosing healthy options over risky ones; (e) contribution, creating vehicles through which to give back to the community; and (f) character, encouraging a sense of responsibility for oneself and others. Meta-analysis indicated CCA participation led to substantial increases in students’ school belongingness, academic and socioemotional outcomes (Durlak, Weissberg, & Pachan, 2010). Therefore, it is evident that after-school activities supplement positive

development of students at home and at school and empower them to function more optimally in the real world. This present research centred on the role of students' motivation, which often influence the degree to which CCAs conferred psychological benefits to that person. This is one aspect that must be affirmed within the PYD framework as engagement often leads to psychological benefits, including life satisfaction, meaning, and self-actualisation (see also Steger, Oishi, & Kashdan, 2009).

2.5 Co-Curricular Activities

Extracurricular activities, or co-curricular activities (CCAs) as they were called in the present research, refers to activities that do not take place within school academic curriculum or classroom hours (Grove, 2013). Yet, they involve productive use of students' leisure time, and provide opportunities for growth and development (Eccles & Gootman, 2002; Larson, 2000). Well-structured forms of CCAs include community service, music, art, sports and uniformed groups (see e.g., Shulruf & Wang, 2013). These activities require the active participation of individuals and provide a context for the expression of an individual's identity or interest in a particular activity (Marsh & Kleitman, 2002) and for social, emotional and civic development during adolescence (Mahoney, Larson, Eccles, & Lord, 2005). Several characteristics in these contexts are directly associated to positive developmental outcomes, such as regular participation schedules, the support of prosocial adults, focus on skill development, clear feedback, involve sustained attention and allow meaningful participation (Eccles & Gootman, 2002). CCAs are viewed as being important developmental settings for adolescents (Feldman & Matjasko, 2005) and it is apt to understand the relationship between participation and academic and non-academic outcomes.

CCAs provide a context that facilitates youth development and include the following four features. First, structured activities and supportive social network: Positively structured activities introduce youth into productive social networks that are likely to reflect school-and society-based values (Davalos, Chavez, & Guardiola, 1999; Holland & Andre, 1987), which

is especially beneficial for youth at risk of negative outcomes (see Mahoney, 2000). Second, interaction with competent adults: CCAs provide opportunities for students to work with competent non-parental adult figures so as to achieve goals, develop and improve skills, and enhance social opportunities. With ongoing and positive response, there is an internalisation of adult-constructed goals and values (Bronfenbrenner, 1979; Roeser, Midgley, & Urdan, 1996). Further, competent non-parental adult figures may instill knowledge and skills, provide opportunities to develop youth and act as role models (Hirsch et al., 2002). Third, establishing a school identity: Participation in school-based CCAs fosters a sense of meaning based on identification with the school and community (Gerber, 1996; Mahoney, Vandell, Simpkins, & Zarrett, 2009; Marsh, 1992). Fourth, promotion of individual strengths: CCAs participation provides a platform to express personal talents and master challenging skills that are consistent with the larger school value system (Csikszentmihalyi & LeFevre, 1989; Finn, 1989; Maton, 1990). Students generally choose activities of intrinsic interest that fit their personal inclinations (McNeal, 1998) and develop their personal strengths (Camp, 1990; Mahoney & Cairns, 1997).

Thus, CCAs provide a unique and conducive context for values and characters to be nurtured (MOE, 2012; Roth, Malone, & Brooks-Gunn, 2010) and academic performance may be promoted through the more direct impact that CCAs have on students' school identification, self-esteem, and other psychosocial resources (Marsh & Kleitman, 2002; Martin, Nejad, Colmar, & Liem, 2013).

2.5.1 Co-curricular activities: Conceptual models.

In addition to the general features of CCAs reviewed above, it is important to review perspectives on or models of CCAs that can help explain the effects of CCA participation on student development. As proposed by Marsh and Kleitman (2002), these models are: (a) zero-sum model, (b) developmental model, (c) identification/commitment model, (d) threshold model and, and (e) social-inequality model. Each of these models is described below.

2.5.1.1 Zero-sum model of the negative effects of CCA participation.

The zero-sum model states that the “amounts of time devoted to academic, social, or athletic pursuits is in competition with each other” (Marsh & Kleitman, 2002, p. 471). In this model, academic, social and athletic activities have to compete for the limited time that a student has. As many CCAs are within the social and sports domains, participation in these activities can potentially distract youth and take time away from conventional academic subjects. However, empirical evidence is largely absent for this model (Mahoney, 2000). So, the zero-sum model poses a question of whether the academic outcomes of students who take part in CCAs would be compromised. The gain or loss of these outcomes over time could be attributed to the function of school-based CCAs.

2.5.1.2 Developmental model.

Holland and Andre (1987) viewed CCA experiences as serving to further the holistic development of students. This perspective proposes that CCAs facilitate many non-academic outcomes and can possibly facilitate other more narrowly defined academic outcomes. Substantial research showed that the CCA participation during early-to-mid adolescence is related to a range of positive developmental and academic outcomes (Denault & Poulin, 2009; Durlak, Mahoney, Bohnert, & Parente, 2010). Youths develop more positive values towards society, exhibited better academic orientation, and better psychological and behavioural adjustment. As highlighted by Marsh and Kleitman (2002), CCAs provide the avenue for character-building, skill development and for youth to become well-rounded, socially adept, and mature adults. It suggested that the time spent in CCAs function as a proxy for particular socialisation experiences that result in the holistic development of youth.

2.5.1.3 Identification/commitment model.

This model posits that CCAs could enhance school-identification, involvement and commitment such that more narrowly defined academic outcomes (e.g., classroom participation, educational aspiration) and non-academic outcomes (e.g., self-confidence,

teamwork) accentuated in the developmental model are further strengthened (Marsh & Kleitman, 2002). Finn's (1989) participation-identification model focuses on involvement in school and hypothesised that positive outcomes are amplified when students maintain participation in multiple and broadening forms of school-relevant activities. In appropriate situations, participation (i.e., a behavioural element) is likely to be accompanied by identification with school (psychological element). With an increased sense of identification with school, CCAs have the potential of bringing about academic benefits (Barber, Eccles, & Stone, 2001; Eccles & Barber, 1999). Shernoff (2010) supported Finn (1989)'s participation-identification model, and found that increase in engagement in after-school programmes was predictive of positive academic outcomes and social competence. Likewise, students' CCA participation was positively related to the level of school belongingness (Brown & Evans, 2002; Dotterer, McHale, & Crouter, 2007). CCAs form an integral part of education. To date, no systematic research had examined how CCAs influence students' identification and commitment to school. So, it is worthwhile to understand how CCA participation would be associated with school belongingness, and whether there were gains or losses due to CCA participation.

2.5.1.4 Threshold model.

The threshold model (Marsh & Kleitman, 2002) suggests that moderate amount of CCA participation is beneficial, but beyond an optimal point, diminishing returns may start to occur. Cooper, Valentine, Nye, and Lindsay (1999) pointed out that the over-identification with an extracurricular activity could potentially displace students' identification with the school. Excessive CCA participation could potentially impair students' academic pursuit and development as it reduces their discretionary time for rest, leisure and family (Melman, Little, & Akin-Little, 2007; Shaw, Caldwell, Kleiber, & Douglas, 1996). Students' multiple and competing commitments in CCAs, school and other areas could adversely affect students' development and family functioning. Such over-involvement in CCAs could hinder students'

academic activities (Coleman, 1961; Marsh, 1992; Marsh & Kleitman, 2002). Relatedly, the overscheduling hypothesis (OSH) indicated that over-involvement in organised activity participation leads to poor developmental outcomes (Mahoney & Vest, 2012). However, such an effect is not apparent. In many instance, CCA participation is regarded as an avenue to build up students' resumes and accumulate merits and awards for further study and job applications (Luthar & Sexton, 2004). In addition, CCA participation rarely dominates students' discretionary time (Mahoney, Harris, & Eccles, 2006). Finally, there was consistent and strong evidence of a positive association between the amount of time spent in participating in organised activities and indicators of PYD.

2.5.1.5 Social inequality gap reduction model.

The social inequality gap reduction model (Marsh & Kleitman, 2002) maintains that CCAs confer more positive benefits for socioeconomically disadvantaged students by reducing the size of the academic achievement gap. Though CCAs are likely to enhance school identification or commitment for all students, these effects can be larger for disadvantaged students than the more advantaged students who tend to already have higher levels of school identification or commitment (Marsh & Kleitman, 2002). Mahoney, Lord and Carryl (2005) observed that disadvantaged children's participation in after-school programmes was linked to significantly better academic performance and the students were rated to hold greater expectancies of success. CCAs are effective in promoting students' social support and social skills (Anderson, Scrimshaw, Fullilove, Fielding, & Task Force on Community Preventive Services, 2003), which, in turn, are helpful at keeping at-risk students away from deviant behaviours, including delinquency and alcohol consumption (Durlak et al., 2010; Farb & Matjasko, 2012; Shernoff & Vandell, 2007). While it was theorised that students' socioeconomic status might lead to varying students' CCA outcomes, this was accounted for as covariates in the present study, in order to assess a 'purer' effect of CCA participation on students' academic and non-academic outcomes.

In sum, based on these different but related CCA models, some general observations can be made. There is reason to believe that CCA participation has a positive impact on the academic and non-academic outcomes (i.e., developmental and identification/commitment models) rather than on either academic or non-academic outcomes. However, based on the zero-sum model, time spent on CCA participation may interfere and affect academic performance adversely. CCA participation fosters PYD, particularly for social disadvantaged youth (i.e., social inequality gap reduction model). Participation in CCAs promotes social cohesion and connectedness with school (i.e., identification/commitment models). Although these models were not directly tested in the present study, they were helpful in guiding the current research and interpretation of findings. Having considered the various models explaining the role of CCA participation in facilitating developmental outcomes, the next section will review specific dimensions of CCA participation, including types, intensity, breadth, and duration of CCA participation.

2.5.2 Dimensions of CCA participation: Types, intensity, breadth, and duration.

Different dimensions have been used to characterise CCA participation or involvement (Bohnert et al., 2010). These dimensions, which include types of CCA and quantitative indicators of CCA participation (e.g., intensity, breadth and duration of CCA participation), have been found to be related to differential developmental outcomes (Denault & Poulin, 2009; Rose-Krasnor, Busseri, Willoughby, & Chalmers, 2006). In the present study, types refer to major categories of school-based CCAs which, as reviewed in Chapter 1, include Uniformed Groups, Physical Sports, Visual and Performing Arts, and Clubs and Societies. CCA intensity or frequency refers to the number of weekly hours of CCA participation. CCA breadth refers to the range or number of CCAs students participate in. CCA duration refers to the period of time that students have been participating in a CCA. Rather than merely relying on a single dimension and limited number of dimensions, the inclusion of all these dimensions represents a richer and more comprehensive understanding

of students' CCA experience and, as such, they should be examined together in one study (Blumenfeld et al., 2005). This section provides a review of prior studies that looked into each of these CCA dimensions.

2.5.2.1 Types of CCA.

This dimension refers to CCA types or categories (i.e., Uniformed Groups, Physical Sports, Visual and Performing Arts, and Clubs and Societies). Different CCAs provide different patterns of learning experiences for students, and consequently differential developmental outcomes. In other words, participation in each CCA could contribute uniquely to students' development. Indeed, the literature demonstrates that this is the case.

Youths' involvement with school and community-based civic activities is linked to a higher level of academic engagement and more positive perceptions of parents and peers as compared to youth who did not participate (Ludden, 2011). Participation in the arts is found to be linked to higher level of academic engagement (Shernoff & Vandell, 2007).

Participation in school clubs was associated with school belongingness and higher school grades, whereas prosocial activities were linked to higher educational aspiration (Fredricks & Eccles, 2006b). A longitudinal analysis by Barnett (2007) revealed that participation in sport activities had a protective function in decreasing the propensity of cigarette-smoking and illicit drug use. Further, students' participation in sports has been related to increased school engagement and lower levels of depression (Eccles & Barber, 1999; Fredricks & Eccles, 2005), students' participation in performing arts has been associated with lower alcohol use (Fredricks & Eccles, 2005), and students' participation in school clubs was found to be a predictor of later civic engagement (Fredricks & Eccles, 2006b).

In terms of educational outcomes, Fredricks and Eccles (2006b)'s study indicated that participation in club and sports activities were connected to both grades and educational expectations in the 11th grade, while prosocial activity participation was associated with higher educational aspiration. Another study revealed that participation in school clubs had a

positive relation with better grades and school engagement but sports participation was related to less school engagement (Fredricks & Eccles, 2008). In other studies, participation in highly structured arts activities, such as band, chorus, plays and orchestra, is related to lower levels of delinquency (Mahoney, 2000; Mahoney & Stattin, 2000; Zill, Nord, & Loomis, 1995). Taken together, these prior studies attested to the role of CCA participation in facilitating students' positive personal attributes. While each CCA type is believed to have the capacity to foster certain developmental outcomes, in view of the more physical nature of Physical Sports compared with the other three CCAs, the present study aimed to explore the extent to which students who were in Physical Sports differed from their peers who were in Clubs and Societies, Uniformed Groups, and Visual and Performing Arts in terms of academic and non-academic outcomes.

2.5.2.2 Intensity.

Intensity of CCA participation refers to the frequency of students' CCA participation in a week during an academic term (Rose-Krasnor et al., 2006). By spending a greater amount of time in their CCAs, youth have more opportunities to build their skills and knowledge, and to form meaningful relationships with peers and supportive adults (Busseri et al., 2006; Larson & Verma, 1999). CCA intensity was predictive of greater civic engagement in late adolescence, after controlling for family income and prior levels of outcome variables (Denault & Poulin, 2009). In addition, the more time youth are involved in a CCA, the less time they have to take part in deviant, risky behaviours after school hours (Fredricks & Eccles, 2006a; Mahoney & Stattin, 2000; Osgood, Wilson, O'Malley, Bachman, & Johnston, 1996). Research has also documented positive relationships between CCA-participation intensity and civic engagement (Darling, 2005; Denault & Poulin, 2009) and friendship quality (Bohnert, Aikins, & Edidin, 2007). These studies attested to the links between CCA intensity and non-academic outcomes.

In terms of academic outcomes, cross-sectional studies showed that more intense participation in CCAs has been associated with higher grades, better planning skills, better achievement test scores, and higher reading achievement (Cooper et al., 1999; Darling, 2005; Dotterer et al., 2007; Mahoney et al., 2006; Rose-Krasnor et al., 2006). Similarly, a longitudinal study by Marsh and Kleitman (2002) revealed that the intensity of participation in school-organised activities was linked to higher grades and educational aspirations during mid- to late adolescence. Greater intensity in sports activities has been linked to higher levels of school connection and more positive feelings toward school (Brown & Evans, 2002; Fredricks & Eccles, 2005). Taken together, empirical evidence supported the relationship between CCA intensity and academic and non-academic outcomes. It is therefore important for the present study to examine the relationships between the frequency or intensity of students' CCA participation and academic and non-academic outcomes.

2.5.2.3 Breadth.

Breadth refers to the range or number of CCAs that students participate in (Eccles & Barber, 1999). Unlike intensity, which focuses on specialisation and building specific skills, activity breadth provides an opportunity for students to participate in a diverse range of learning activities and to develop a spectrum of competencies and interests (Fredricks & Eccles, 2006a, 2006b; Larson et al., 2006; Rose-Krasnor et al., 2006). As reviewed earlier, Marcia (1993a)'s identity status theory provides theoretical perspective for the significance of assessing breadth of CCA participation. This theory suggests that the exploration of different roles and activities is a beneficial process for youth to undertake before they commit to a certain path and activity. Second, the capital theory states that activity breadth provides greater opportunities for youth to build human and social capital (Coleman, 1988). As youths gain exposure to a range of activity experiences, they accumulate a variety of human capital through interaction with a variety of adults and peers.

Breadth of CCA involvement was found to be positively associated with school belongingness, higher grades, and positive perception of peer relations (Fredricks & Eccles, 2006a). Regular youth participation in a variety of activities has been found to predict a number of developmental outcomes, including school achievement (Cooper et al., 1999), personal adjustment (McHale, Crouter, & Tucker, 2001), identity development (Youniss, McLellan, Su, & Yates, 1999), self-esteem and perceived competence (Bowker, Gadbois, & Cornock, 2003), and antisocial behaviour (Mahoney, Stattin, & Lord, 2004). Denault and Poulin (2009) also found that higher levels of breadth were predictive of higher levels of academic orientation and civic engagement in youth. In view of its significance in youth development, it is pertinent to examine the association between the breadth of CCA participation and desired CCA outcomes.

2.5.2.4 Duration.

Duration refers to the length or period of time of students' CCA participation and concerns about the consistency of participation over time (Farb, & Matjasko, 2012). It is noteworthy to consider CCA duration because the development of skills and expertise in specific CCAs requires time (Csikszentmihalyi, Rathunde, & Whalen, 1993; Ericsson, 1996). Furthermore, continuous participation enables students to form supportive relationships with significant others (i.e., peers and teachers) (Broh, 2002). Longitudinal analyses showed that longer durations of CCA participation was related to better academic grades, more positive perception towards school, higher educational aspiration and better educational achievement (Darling, 2005; Gardner, Roth, & Brooks-Gunn, 2008). In view of these developmental implications, it is important to consider the role of CCA duration in contributing to CCA academic and non-academic outcomes.

Taken together, past studies have yielded support for the different benefits of (the quantity of) CCA participation. Although some studies reported negative or non-significant results, these could be, as Feldman and Matjasko (2005) noted, due to the differences in the

measurement of CCA-participation dimensions. These studies mostly operationalised participation as a dichotomous “all-or-nothing” variable and as a comparison between activity participants and non-participants on developmental indicators. Other than considering the type of activities, the present research adopts Fredricks and Eccles’ (2006a) recommendation which takes into consideration of the nuanced differences in activity participation by assessing the distinct quantitative dimensions of the participation, including (a) the *breadth* or the number of different activities enrolled in, (b) the *intensity* or the frequency (number of days, hours/week) of participation in an activity, (c) the duration or the length of CCA participation, and (d) the *type* of CCA that students participate in. The various activity dimensions tend to be assessed individually but they are interrelated and should be considered together. By doing so, the present study was in a better position to consider their unique contributions in predicting outcomes. Thus far, this chapter has reviewed the literature on categorical and quantitative indicators of CCA participants. Using self-determination theory, the next section will focus on what is regarded as qualitative indicators of CCA participation by considering the role of students’ CCA motivational orientations and perceptions of key people related to their CCA involvement or participation (i.e., CCA instructors, CCA peers, and parents) in facilitating developmental outcomes.

2.6 Self-Determination Theory

Self-determination theory or SDT (Deci & Ryan, 2000; Ryan & Deci, 2017) is a theory of motivation that concerns human’s inherent nature to perform in effective and healthy ways. This meta-theory consists of sub-theories: cognitive evaluation theory, causality orientations theory, basic psychological needs theory, organismic integration theory, goal-content theory, and relationship motivation theory. Basic needs theory proposes that the fulfilment of psychological needs of autonomy, competence and relatedness as source of students’ psychological positive functioning and optimal functioning (Ryan & Deci, 2000).

Goal content theory proposed how different goals vary in fostering students' motivation as well as their well-being. Hence, the pursuit of intrinsic goals is more likely to promote students' motivation and well-being than extrinsic goals (Vansteenkiste, Niemiec, & Soenens, 2010). Causality orientations theory suggested that the individual difference in how people respond to situations and regulate their behaviors according to their orientations. Depending on the extent that students endorse and identify with the task, students demonstrate either an autonomous or controlled source of motivation (Ryan & Deci, 2000). Cognitive evaluation theory considers the influence of social and environmental conditions that facilitate or hinder students' motivation (Ryan & Deci, 2000). This theory highlighted the significance of competence and autonomy support in promoting motivation.

The organismic integration theory (OIT) is one of the sub-theories of SDT that explains the process through which extrinsically motivated behaviours can be transformed into more intrinsically regulated behaviours (Ryan & Deci, 2017). Organismic integration theory is concerned with how social and environmental conditions can facilitate the degree of internalisation of a value of a task (Ryan & Deci, 2000). SDT theorises that two main kinds of motivations regulate students' behaviour, namely, (a) intrinsic motivation which occurs when students engage in activities out of inherent interest, and (b) extrinsic motivation which occurs when students are influenced by external consequences, typically in the forms of reward (e.g., students participate in CCAs because of their desire to gain their parents' praise) or to avoid negative external consequences typically in the forms of punishment (e.g., students participate in CCAs because of their desire to avoid the teacher's or the school's punishment) (Deci & Ryan, 2000). Within OIT, motivation is distributed along a self-determination continuum in which each kind of motivation or regulation is classified according to the amount of autonomy or control regulating the motive (Deci & Ryan, 2000; Ryan & Deci, 2000). Accordingly, motivation is postulated to fall on a continuum between autonomous motivation (i.e., when students participate in activities because of self-initiative

and their own choice) and controlled motivation (i.e., when students perform a task due to external imposition such as compliments or punishments). SDT makes a distinction of four levels of internalization: (a) external regulation, when students' participation and performance are directly influenced by external rewards and punishments; (b) introjection, when students respond to external imposition without fully accepting them as their own, usually to avoid a sense of shame or to gain others' approval (e.g., students participate and strive to excel in CCA for parents' and teachers' endorsement); (c) identification, when students consciously value activities or goals (e.g., students participate in CCA because they believe that CCA achievements are beneficial to their educational advancement and because CCA involvement will give them brownie points that are useful for admission in further education); and (d) integration, when people further align identified regulations with their personal values and needs (e.g., students participate in CCA as it relates to their personal need for growth and character-building and because the CCA is aligned with their interest, values, and preferences, and even perceived strengths).

Lastly, relationship motivation theory is concerned with the dynamics in students' relationship with significant others, such parents, teachers and peers, that would affect the satisfaction (or the lack thereof) students' psychological needs and motivation (Deci & Ryan, 2014). This highlights how quality relationships contribute to psychological fulfilment and optimal functioning (Deci & Ryan, 2008).

In the present research, SDT forms the fundamental basis for conceptualising the various reasons for students to participate in CCAs. It is also related to the degree that values of the activities are internalised by students during CCA participation (Ryan, Williams, Patrick, & Deci, 2009). Self-determined motivation towards school has been found to be related to key educational and non-educational outcomes (see Deci, Vallerand, Pelletier, & Ryan, 1991; Reeve, 2002, for reviews), including students' level of achievements (e.g., Burton, Lydon, D'Alessandro, & Koestner, 2006; Miserandino, 1996) and well-being

(Levesque, Zuehlke, Stanek, & Ryan, 2004). In this context, motivational orientations refer to students' intrinsic or extrinsic motivation inclinations, which develop over time as students engage in CCA (Barnett, 2006; Lavigne et al., 2009; Levesque, Copeland, & Sutcliffe, 2008). This model acknowledges temporal and context specific nature of students' motivation to participate in CCAs would influence students' holistic and long-term motivation (Lavigne et al., 2009). It aims to consider the socio-psychological factors associated with students' motivation that may account for students' academic and non-academic development.

The SDT research has established that autonomous motivation is related to better social and emotional well-being (Núñez, Fernández, León, & Grijalvo, 2015) and performance (Kusurkar, Ten Cate, Vos, Westers, & Croiset, 2013). This perspective also shows that autonomous motivational orientation is associated with better academic and non-academic outcomes (Ratelle, Guay, Vallerand, Larose, & Senécal, 2007). According to SDT, autonomous motivation is facilitated by the fulfilment of three basic psychological needs including needs for autonomy, competence, and relatedness (Grolnick, 2003; Ryan & Deci, 2017; Ryan, Deci, Grolnick, & La Guardia, 2006). Needs for autonomy represent individuals' desire to act or perform an activity out of his or her volition and freewill rather than being coerced by some external drivers of behaviours (e.g., rewards and/or punishments). Needs for competence represent individuals' desire to feel capable of doing or accomplishing a task well. Lastly, needs for relatedness represent individuals' desire to have a sense of warm and genuine connection with others. While the current research did not directly measure need satisfaction, it made the theoretical assumption that fulfillment of psychological needs (i.e., competence, autonomy and relatedness) translates or equates to autonomous motivation. That was assessed in relation to academic and non-academic outcomes.

In SDT, environmental support depends on social agents' motivating style (Deci, Schwartz, Sheinman, & Ryan, 1981; Reeve, 2009). While motivating style fulfills students' psychological needs for autonomy, competence, and related, respectively (Ntoumanis &

Standage, 2009; Taylor & Ntoumanis, 2007), this research adopted Deci and Ryan's original theoretical framework (Deci et al., 1981) which involved a narrow conceptualization of motivating style that focused only on autonomy support. This is because the provision of autonomy support has been found to be sufficient in nurturing all three psychological needs (Standage, Duda, & Ntoumanis, 2006). In terms of practice, it directs stakeholders' attention to focus on training that emphasizes on autonomy.

While other sub-theories of SDT are mostly concerned about individual's motivation profiles and psychological needs, the present research considers the environmental condition (i.e., CCA interpersonal contexts) in facilitating students' motivation. Indeed, past research had accentuated the significance of contextual and personal factors in promoting students' learning and psychological functioning. Likewise, this forms the key thrust of the present research. Drawing from SDT, this research examined the impact of environmental factors (i.e., CCA interpersonal relationships) and individual factor (i.e., motivation orientation) on students' academic and non-academic outcomes. Beyond furthering the understanding of motivation in CCA participation, it has practical utility and form a viable target for intervention (Pintrich, 2003).

Research had shown that an autonomy-supportive context could facilitate autonomous motivation and the process of internalisation of the value of a task, and promote positive developmental and socioemotional outcomes more generally (see Deci & Ryan, 2000, 2008; Ryan & Deci, 2017, for reviews). Conversely, a controlling motivational style could lead to disengagement and would adversely affect students' positive functioning (Reeve & Tseng, 2011). Taken together, SDT is a theoretical perspective that highlights the role of interpersonal relationships in promoting students' motivation and development (Deci & Ryan, 2000). As raised earlier, social and motivational processes underlie students' CCA participation (Kuperminc et al., 2013). Thus, it is important to consider characteristics within

a social context that facilitate students' meaningful involvement in activities, and other positive experiences and outcomes.

Student differences in CCA motivational orientations might be related to students' outcomes. The processes of how students internalised the meaning or value of their CCA participation and become more autonomously motivated in their CCA are important. This influences not only CCA retention but also the likelihood of students attaining the benefits that such activities can offer. It is believed that identification with the mission and value of CCAs would increase students' autonomous motivation. Indeed, autonomy-supportive relationships with adults played a role in adolescents' motivational changes throughout the programme (Pearce & Larson, 2006). Interpersonal contextual factors are viewed as precursors to the students' motivation orientation. According to SDT, students' level of self-determination is a motivational resource and autonomy supportive style could optimize these motivational resources and in turn promotes students' psychological well-being (Grolnick, Ryan, & Deci, 1991). Hence, students' self-determined motivation is deemed as a motivation mediator of the relations between autonomy-supportive interpersonal environments and CCA outcomes.

The SDT is proposed to be a fitting model to better understand the relationship between students' CCA participation and outcomes and how these relationships may be mediated by the students' CCA motivational orientations as a function of the extent to which they perceive that their key people related to their CCA are autonomy-supportive. These key people include CCA instructors, CCA peers, and their parents.

The SDT points out how CCA interpersonal contexts could affect students' self-determined (intrinsic and identified) motivation, which has been found to be relatively more adaptive for well-being and development than externally derived (introjected and extrinsic) motivation. Intrinsic motivation and internalisation of task values can be facilitated when parents, CCA instructors, and CCA peers are autonomy-supportive, that is, when they are

able to fulfil students' basic psychological needs (Ryan & Deci, 2000, 2017). Indeed, in the academic setting, autonomy-supportive relationships with parents, teachers and peers have been associated with autonomous motivation and engagement in school (e.g., Furrer & Skinner, 2003; Ryan, Stiller, & Lynch, 1994). Autonomy-supportive teaching practices that support students' self-determined or autonomous motivation are, for example, providing choices and opportunities for students to make decision, providing non-controlling competence feedback, providing rationale for tasks, acknowledging students' (negative) feelings and perspectives, and avoiding controlling behaviours with the aim to regulate students' behaviours using rewards and punishments (Amorose & Anderson-Butcher, 2007; Gagné, Ryan, & Bargmann, 2003; Mageau & Vallerand, 2003; Reinboth, Duda, & Ntoumanis, 2004). Students' perceptions of interpersonal contexts, including their interactions with parents, CCA instructors, and CCA peers, would be examined as key predictors of their CCA motivational orientations (autonomous and controlled) and CCA outcomes. Extensive research established the significance of social support for education from teachers, parents and peers on students' academic success and motivation (Furrer & Skinner, 2003). These research supported the positive impact of perceived autonomy support from parents, teachers and peers on self-determined forms of motivation (Fortier, 2000; Pelletier, Fortier, Vallerand, & Brière, 2001). Research pertinent to each of these key social agents examined in this study is reviewed below.

2.6.1 CCA instructor autonomy support.

Teachers, instructors, or coaches have a role in facilitating students' motivation and socioemotional development. Research has established the positive effect of supportive teacher-student relationships on students' motivation in a range of academic settings (Ryan & Deci, 2002; Wentzel, 1998; Wigfield, Byrnes, & Eccles, 2006). Further, studies have shown the importance of positive teacher-student relationships to students' sense of belongingness (Furrer & Skinner, 2003; Wang & Eccles, 2012). Similarly, an autonomy-supportive teaching

approach is found to be closely related to school engagement (Assor et al., 2002), higher grades and better school adjustment (Patrick et al., 1999; Ryan et al., 1994). Autonomy-supportive interpersonal interactions between teacher and students involve nurturing and supportive approaches with an aim to increase students' appreciation of their classroom learning (Reeve & Jang, 2006). It specifically facilitates the internalisation of prosocial values, skill development and social responsibility in students. Such an atmosphere aligns students' learning needs and preferences, which then lead to heightened motivation and engagement (Deci et al., 1991; Reeve, 2002; Ryan & Deci, 2000, 2017). Standage and colleagues (2006) demonstrated that students' perception of teacher's autonomy supportiveness was connected to their degree of self-determination, which in turn predicted students' effort and persistence. Thus, it is relevant to examine the extent to which students perceive their CCA instructors as autonomy-supportive relates to their CCA motivational orientations (especially their autonomous motivation) as well as academic and non-academic outcomes.

2.6.2 Parental autonomy support.

According to SDT, parents can facilitate youths' motivation by adopting parenting practices that fulfil youths' psychological needs for relatedness, competence and autonomy (Guay, Ratelle, & Chanal, 2008; Vallerand et al., 1997). Such parenting behaviours were found to be related to youths' self-determined motivation in schooling, which in turn led to better academic performance (Soenens & Vansteenkiste, 2005). Most research regarding autonomy-supportive parenting practices were typically focused on parents' concerns of their children's academic and sports pursuits, but little has been done in the CCA settings. Whilst research on the role of parents in their children's CCA motivation is relatively scarce, extant evidence showed that parental support and involvement in CCAs is closely related to youths' well-being and academic success (Lagacé-Séguin & Case, 2010). Parental support of their children's CCA is expected to facilitate the children's sense of autonomous motivation in

their CCA and their development more generally. It is therefore meaningful to examine the role of parental autonomy support in their children's CCA participation in predicting students' CCA motivational orientations (especially their autonomous motivation) and CCA desired outcomes.

2.6.3 Peer autonomy support.

Peers provide essential social support and companionship to youth (Berndt, 1979; Steinberg & Silverberg, 1986). Peer support during adolescence can facilitate students' belongingness to school (Eccles & Barber, 1999; Mahoney et al., 2005), positive social functioning and academic outcomes (Fredricks & Eccles, 2005). Studies revealed that peers have a role in influencing youths' decision to initiate or continue participating in a CCA (Fredricks et al., 2002; Huebner & Mancini, 2003; Patrick et al., 1999). Some youth take part in school-based CCAs to be accepted and affirmed by other peers, rather than for mere personal interest (Shaw et al., 1996). Vazou, Ntoumanis, and Duda (2005), for instance, identified peer autonomy support as a key component of positive peer motivational climate in youth sport. Indeed, in addition to the provision of autonomy support by the teacher, which include for example allowing students to make choices, the cultivation of a sense of belongingness and relatedness with peers (i.e., an indicator of peer autonomy support) was markedly associated with autonomous motivation to be engaged in a school activity (Furrer & Skinner, 2003). Given the important role of peers in CCA settings, it is important to consider the degree to which students perceive that their CCA peers as autonomy supportive relates to their CCA motivational orientations (especially autonomous motivation) and academic and non-academic outcomes.

2.7 Academic and Non-Academic Outcomes of CCA Participation

The above reviews of theoretical models and prior empirical findings have supported the connections between CCA participation factors and a range of developmental outcomes,

(b) the relevance of self-determined motivation in CCA settings, and (c) the role of autonomy-supportive social contexts in promoting CCA motivational orientations and outcomes. These reviews provide theoretical and empirical bases for the present study to conceptualise an investigation to look into Singapore secondary students' motivation in school-based CCA participation and its role in facilitating a wide range of academic and non-academic outcomes. The academic outcomes included in this study were: school belongingness, educational aspiration, classroom engagement, and academic buoyancy. Research had identified elements that characterize optimal learning and academic achievement (Cortes, Moussa, & Weinstein, 2012). These outcomes are vital for tracking students' academic progress and form important inputs for teaching and instructional decisions (Safer & Fleischman, 2005). The non-academic outcomes included communication skill, leadership skill, teamwork, lifelong learning and society-oriented future goal. These are in line with nation's educational objectives to foster 21st century competencies (MOE, 2010). Such are qualities necessary for learners to adapt and thrive in 21st century that is marked by technological shifts and volatility. This section focuses on each of the outcomes examined and their relevance to youths' development in general.

2.7.1 Academic outcomes.

2.7.1.1 School belongingness.

School belongingness represents students' sense of connectedness to school (Neel & Fuligni, 2013) and the value and significance they attach to school (Roeser & Eccles, 1998). Research has shown the link between school belongingness and a range of important outcomes, such as school completion, academic motivation and performance, school attendance, prosocial behaviour, school engagement, and a sense of competence (Berndt & Keefe, 1995; Bond et al., 2007; Cauce, 1986; Wentzel, Barry, & Caldwell, 2004). Further, it also has a positive relationship with psychological well-being (Anderman, 1999, 2003; Anderman & Freeman, 2004; Freeman, Anderman, & Jensen, 2007). Theorizing (e.g., Marsh

& Kleitman, 2002) and prior studies (e.g., Fredricks & Eccles, 2005, 2006b) have suggested that CCA participation is instrumental in promoting students' sense of school belongingness. The supportive relationships with CCA instructors and CCA peers experienced by students during their CCA sessions are seen to be responsible for this heightened sense of school belongingness (see e.g., Wentzel, 2012; Wentzel & Wigfield, 2007). Considering the importance of school belongingness for school motivation and well-being, the present study examined the role of CCA participation, CCA interpersonal relationships, and CCA motivational orientations in promoting school belongingness as one of the key academic outcomes.

2.7.1.2 Educational aspiration.

Educational aspiration refers to the highest educational level that students wish to achieve, and it has implications for students' future career (Rojewski, 2005). Socioeconomic status, as often represented by parents' educational levels, appears to be predictive of youths' educational aspirations (Rockwell, 2011). Research suggests that such future-oriented cognition may influence youths' present academic motivation, engagement, and achievement. For instance, youths' educational expectation was found to be predictive of their school achievement (Messersmith & Schulenberg, 2008; Ou & Reynolds, 2008).

CCA participation has been found to have a positive effect on educational aspiration. For instance, Dumais (2009) found that participation in school-organised activities was related to better grades and higher expectations for college entrance. Darling, Caldwell, and Smith (2005) found that CCA participation led to students' higher grades, academic aspirations, and more positive attitudes towards school. Further, a longitudinal study by Mahoney, Cairns, and Farmer (2003) demonstrated the importance of consistent and continuous CCA participation in contributing towards long-term educational success, especially for students with poor social skills.

Studies demonstrated that the supportive relationships students experienced in school and their sense of school belongingness were predictive of positive academic outcomes such as academic motivation and academic self-efficacy (Goodenow, 1993; Osterman, 2000; Roeser et al., 1996). The heightened academic motivation and efficacy, in turn, were found to be positively correlated to educational aspiration (see e.g., Johnson, 2000). Thus, there is reason to believe that students' CCA participation, including their CCA motivational orientations and supportive relationships with CCA instructors, CCA peers, and parents would develop not only their sense of connectedness but also their educational aspiration. In view of the importance of educational aspiration to students' sense of purpose and school motivation, it is meaningful to consider it as another key outcome in the present study too.

2.7.1.3 Academic buoyancy.

Academic buoyancy is defined as “students' capacity to successfully overcome setbacks and challenges that are typical of the ordinary course of everyday academic life (e.g., poor performance, competing deadlines, performance pressure and difficult tasks)” (Martin & Marsh, 2008, 2009). School life may present certain challenges, setbacks and pressures to students (Martin & Marsh, 2008). One of these challenges includes the need to balance schoolwork with CCAs. Therefore, it is necessary for youth to develop this capacity to meet various kinds of academic challenges (Martin et al., 2013). Academic buoyancy is an important factor in students' academic development. It has been found to predict a range of academic and non-academic outcomes, including enjoyment of school, class participation, absenteeism, task completion, positive academic intentions, and general self-esteem (Martin, 2008; Martin & Marsh, 2008). Further, a study by Martin, Colmar, Davey, and Marsh (2010) found that confidence, planning, persistence, lower anxiety and lower uncertain control predicted academic buoyancy. It is interesting to see how CCA participation predicts students' academic buoyancy because although CCA participation presents an additional

challenge for students to deal with, it also provides a platform for them to be more confident, more organised, and more persistent.

2.7.1.4 Classroom engagement.

Classroom engagement concerns a student's active involvement in class learning activities (Christenson, Reschly, & Wylie, 2012). It has typically been conceptualised as comprising four interrelated aspects of behaviour, emotion, cognition and agency (Christenson et al., 2012; Fredricks, Blumenfeld, & Paris, 2004; Reeve, 2013; Reeve & Tseng, 2011; Skinner, Kindermann, Connell, & Wellborn, 2009). Behavioural engagement refers to the amount of effort the students put into learning in terms of attention, effort and persistence (Skinner, Kindermann, & Furrer, 2009). Emotional involvement refers to the positive (such as interest) and negative emotions (such as anxiety) present during task involvement (Skinner, Kindermann, & Furrer, 2009). Cognitive engagement refers to the extent which students adopt strategies in learning. This ranges from sophisticated learning, such as elaboration, to superficial learning strategies, such as memorisation (Walker, Greene, & Mansell, 2006). Agentic engagement is the fourth and latest addition to the construct of students' engagement. This refers to the extent which students take initiative in making constructive contribution to the learning process, such as making clarification, sharing their preferences and informing the teachers about their learning needs (Reeve, 2013).

Classroom engagement functions as a pathway that links students' motivational state with the desired academic outcomes (Skinner, Kindermann, Connell, & Wellborn, 2009; Skinner, Kindermann, & Furrer, 2009) such as quality of learning and extent of achievement (Hughes, Wu, Kwok, Villarreal, & Johnson, 2012; Jang, Kim, & Reeve, 2012; Ladd & Dinella, 2009; Reyes, Brackett, Rivers, White, & Salovey, 2012; Skinner, Zimmer-Gembeck, & Connell, 1998). It is also relevant to school interest and study enjoyment (Schunk, Pintrich, & Meece, 2008). In view of the importance of classroom engagement in students' academic trajectory, the present study also aimed to explore if CCA participation promotes classroom

engagement (i.e., through the heightened sense of school belongingness and fulfilment of needs for relatedness that CCA participation facilitates), or reduces classroom engagement (i.e., due to the time and energy spent for their engagement in CCAs).

2.7.2 Non-academic outcomes.

2.7.2.1 Communication skill.

Communication skill refers to the ability to exchange information in verbal and non-verbal forms that include self-expression, listening, speaking and perceiving non-verbal cues (Wilson-Ahlstrom, Yohalem, DuBois, & Ji, 2011). As part of interpersonal skills, the ability to communicate is important and linked to students' psychological well-being (Segrin & Taylor, 2007). In this instance, CCAs form a structured informal environment for students to socialise (Feldman & Matjasko, 2005) and to hone their social and personal skills (Hansen & Larson, 2007). Interpersonal relationships are crucial in not only promoting students' socioemotional outcomes (Decker, Dona, & Christenson, 2007) but also developing their vocational skills, including communication skills (Kuh & Hu, 2001). Through CCA participation, students' communication skills are expected to improve through their interaction with CCA peers (Balyer & Gunduz, 2012). They gain transferable skills (i.e., communication skills) that benefit their academic and career trajectories (Jones, 2009).

In line with the developmental model theorised by Marsh and Kleitman (2002), communication skill could be one of the key skills students may garner from CCA participation. Indeed, research has pointed to the role of CCA participation, particularly through the enriching and stimulating activities and the supportive relationships with adults and peers, in developing CCA participants' communication skills (Eccles & Templeton, 2002; Mahoney et al., 2003; National Research Council and Institute of Medicine, 2004). Hence, it is of interest to examine the extent to which CCA participation, including CCA interpersonal contexts and CCA motivational orientations, predict students' communication skill as one of the key non-academic outcomes.

2.7.2.2 Confidence.

Confidence refers to a person's belief that he or she can succeed in task (McPheat, 2010). Perceived self-efficacy could influence how students' motivation, cognitive, affective and behaviours (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). As mentioned, features of CCAs are closely aligned with the tenets of self-determination theory including mentoring, mutual learning, feedback and recognition (Deci & Ryan, 2000). Likewise, these are consistent with sources of self-efficacy proposed by Bandura (1997; i.e., mastery experiences, vicarious learning, and social persuasions) incorporated into CCA programmes. In the context of CCA participation, autonomy supportive interpersonal communication could promote students' sense of self-efficacy, which could foster students' sense of intrinsic motivation and in turn promote academic success and psychological well-being (Deci & Ryan, 2000). Research had showed that students' confidence is a predictor of academic success, aspiration and persistence (Long, Monoi, Harper, Knoblauch, & Murphy, 2007). Hence, this study examined the extent CCA participation, CCA motivation orientations, CCA interpersonal relationships contribute toward students' confidence.

2.7.2.3 Leadership skill.

Leadership skill refers to the ability to influence and motivate others in order to achieve a common goal (Northouse, 2010). The values and benefits of leadership training for developing these skills in students have been noted (see e.g., Chapman & Aspin, 2001; Hine, 2012; Myers, 2005). That is, students' leadership capacity can be developed through structured and planned programmes, like CCAs, which aim to promote social responsibility, community leadership, active citizenship, and service leadership (Chapman & Aspin, 2001). Leadership opportunities in CCAs enable students to develop specific leadership skills and the confidence to lead, mentor, and work with peers and younger students, and to provide valuable experiences in organisation, facilitation, and public speaking (Myers, 2005).

Whilst it is believed that formal leadership roles (e.g., the team captain) are not possibly available for all students during CCAs, hence not all CCA participants have a chance to lead formally, interactions between youth and adults during CCAs are important and provide them an opportunity to model how adults lead, facilitate, mentor, and coordinate (Van Linden & Fertman, 1998). Thus, according to the social learning theory (Bandura, 1977), the quality of youths' social relationships and interactions with adults are key in transmitting leadership attitudes and other leadership qualities. That is, adult figures may facilitate youths' development of leadership skills by modelling these skills to the youth (Van Linden & Fertman, 1998). These skills are further facilitated when adults serve as a supportive role model (Benson & Pittman, 2001). Thus, the present study aimed to examine the extent to which CCA participation, CCA interpersonal contexts, and CCA motivational orientations predict leadership skill.

2.7.2.4 Lifelong learning.

Lifelong learning refers to all forms of purposeful learning carried out continuously with the objective of improving knowledge, skills and competence (Nijhof, 2005). More specifically, Hojat et al. (2003) defined lifelong learning as “a concept involving a set of self-initiated activities (behavioural aspect) and information-seeking skills (capabilities) that are activated in individuals with a sustained motivation (predisposition) to learn and the ability to recognise their own learning skills (cognitive aspect)” (p. 434). Lifelong learning is integral to the holistic wellbeing of individuals, thus their readiness to engage in such learning is an important issue (Rubenson, 2001). Nonetheless, lifelong learning extends beyond vocational- or work-related learning, and entails continual learning to expand individuals' competencies in various life domains (Commission of the European Communities, 2000). Indeed, the three major areas of adult life that have been identified as potential triggers for lifelong learning are job and career, home and personal responsibilities, and leisure and interest (Aslanian & Brickell, 1980). The literature further suggests that lifelong learning has two central

psychological components including: (a) enduring motivation and a strong interest in education and learning, and (b) specific competencies that are required to actualise this motivation through explicit, directed learning activities (e.g., Artelt, Baumert, Julius-McElvany, & Peschar, 2003; Pintrich & De Groot, 1990; Schunk, 2005a, 2005b; Weinstein & Hume, 1998).

CCAs have a role in providing recreational and informal education and learning opportunities for youth. Beside, CCAs contribute to the development of desires for lifelong learning (Durlak, Mahoney et al., 2010). Indeed, CCAs can be viewed as part of the lifelong learning system. That is, CCA has an important implication to bring about more positive developmental outcomes in students who feel alienated from the formal education system. Dawes and Larson (2011) asserted the importance of engaging youth in after-school programmes, and by increasing their level of intrinsic motivation and engagement, these programmes may encourage youth to become involved in continuous learning beyond academic learning. In view of its importance, this study examined how CCA participation contributes to the development of students' desire for lifelong learning.

2.7.2.5 Society-oriented future goal.

Society-oriented future goal refers to the goal of contributing to, or to make an impact on, society in the future (e.g., Gilles, 1989; Nurmi, 1991, 2005). Thus, this goal is aligned with civic mindedness emphasised in some CCAs especially those classified into Uniformed Groups. It is natural for students to aspire to attain future goals and to consider schooling as a mean to achieve them. These future goals require youth to see beyond immediate needs and outcomes by assigning significance to the tasks they perform in relation to their future aspirations (Miller & Brickman, 2004). Importantly, students have to adopt a long-term perspective in evaluating actions, and such psychological dynamics are influenced by various sociocultural factors (Nurmi, 1991).

In the context of Singapore, the goals that Singaporean youth set are intricately intertwined with national development. As Singapore lacks natural resources, having an educated citizenry becomes a prominent feature of the national agenda (Wah, 1992). Preparing Singaporeans to meet the challenges of global changes and competitiveness in the 21st century is thus a key priority. This is evident from the “Thinking Schools, Learning Nation” policy (TSLN; Goh, 1997), which aims to develop future generations of thinking, committed and creative citizens who are lifelong learners with the capacity to make good decisions for Singapore’s future success. Prime Minister Lee Hsien Loong introduced the “Teach Less, Learn More” (TLLM) educational policy in 2004 (Tan, Koh, & Hung, 2017), to develop students who are motivated and engaged in learning, and also youth who are more prepared to meet life challenges. Thus, a future-time orientation is an integral element in the various education policies, including TLLM and TSLN.

Students with clear future goals tend to be self-regulated in their learning. They tend to take initiative and try to coordinate their actions, cognitions and feelings, which are targeted at specific goals (Covington, 2000; Schunk et al., 2008). These students also tend to be more motivated to do well in their schoolwork and this in turn leads to the adoption of more effective learning strategies (Phalet, Andriessen, & Lens, 2004). On the contrary, when students perceive school as unimportant, trivial and unrelated to their future goals, they are less likely to be diligent in learning (Miller & Brickman, 2004). Thus, there is reason to believe that students who are able to see the value and relevance of their CCAs to attain their future goals will be more intrinsically motivated in their CCAs. As such, the present study aimed to examine if CCA participation factors, especially CCA autonomous motivation, contributes to the prediction of social-oriented future goal.

2.7.2.6 Teamwork.

Andrew Carnegie once said, “Teamwork is the ability to work together toward a common vision” (Hagopian Institute, 2009, p. 13). Teamwork entails collaborative effort

towards a shared vision. Through teamwork, youth learn to develop empathy and to align their aspirations with the actions of others (Larson, 2007). CCA is a setting where collaboration and teamwork are often emphasised and commonly practiced. CCA instructors foster positive relationships among participants by teaching them how to work together with others. By leading students to transcend their egocentric tendencies and shift towards altruistic group processes, students develop the capacity for teamwork (Larson, 2007). Participation in teamwork activities during CCA enables students to appreciate the benefits of cooperation and mutual feedback (Larson, 2007).

Taken together, the ability to work in a team is an important outcome of positive development, and a key competency in the 21st century. Indeed, collaboration and teamwork are key competencies necessary for youth to develop for adulthood (Parker, Ninomiya, & Cogan, 1999; Partnership for 21st Century Skills, 2007; The Secretary's Commission on Achieving Necessary Skills, 1991). In view of this, the present research assessed the extent to which CCA participation, including CCA interpersonal contexts and CCA motivational orientations, are associated with the capacity to work together with others as a team.

2.8 Role of Covariates

To understand the role of school-based CCA participation in predicting academic and non-academic outcomes, it is important to take students' sociodemographic factors into account as these factors can possibly affect CCA participation patterns and moderate the impacts of such participation on outcomes (Dotterer et al., 2007; Farb & Matjasko, 2012). Therefore, the current study included sociodemographic factors as control variables or covariates in all the analyses, so as to extricate their effects from the effects of CCA participation factors (i.e., CCA types, quantitative indicators of CCA participation, CCA interpersonal contexts, CCA motivational orientations) on outcomes. Age (represented in this study by school level), gender, and parental education, were included as covariates. The rationale for including each of these factors as covariate is discussed below.

2.8.1 Age or school level.

CCA participation – its intensity, breadth, and certainly duration – are closely related to the phase of youth development. This relationship is supported by a number of theoretical models. Marcia (1993a, 1993b), for example, proposed a framework for youths' identity development. As described earlier in this chapter, this developmental progression from identity exploration to identity achievement is related to the shift from breadth to intensity. When they are younger, students are typically engaged in the act of exploring different activities. When they are older, they tend to identify what they like doing and what they are relatively good at. This in turn encourages them to commit to a less number of activities. Similarly, Cote (1999) maintained that the intensity of CCA participation increases with age. At the pre-adolescence, children begin experimenting with their CCA participation by being involved in different activities. As they progress to early adolescence, they develop specialisation and tend to focus on certain activities. As they grow older, youth usually become more prudent in their allocation of time and resources in a few selected activities. Engaging in less activities, but in a more focused manner, may help students reap the benefits of such activities more optimally than engaging in more activities but in a superficial fashion. Thus, school level is one of the covariates included in this study.

2.8.2 Gender.

Previous research has shown gender differences in after-school activities, with males being involved in more sports activities and females spending more after-school time on academic, creative arts, socialising, and outdoor-play activities (Markstrom, Li, Blackshire, & Wilfong, 2005; McHale et al., 2001; Posner & Vandell, 1999). Several early studies indicated gender differences pertaining to parental involvement in children's sports participation. These studies (Lewko & Ewing, 1980; Spreitzer & Snyder, 1976) showed that female students tended to need more parental support and encouragement to be involved in sports-related activities than male students. Likewise, males and females students were found to respond

differently to activity participation. Luthar, Shoum, and Brown (2006), for example, showed that girls with a very high level of intensity (high hours per week) of extracurricular involvement reported higher substance use than girls with medium and low levels of intensity of involvement; this pattern however was not found among boys. In contrast, boys with extremely low levels of activity participation had poorer grades than boys with high and medium levels of activity participation; this pattern was not found among girls.

Further, different CCAs were found to have differential impacts for male and female student participants. Several studies have shown that male students' participation in performing arts and school clubs was associated with fewer risky behaviours and lower levels of substance abuse (e.g., marijuana and alcohol use) (Eccles & Barber, 1999; Fredricks & Eccles, 2006b). Female student participants who were active in sports, however, were found to demonstrate higher academic self-concepts but higher levels of alcohol use (Fredricks & Eccles, 2006b; Simpkins, Ripke, Huston, & Eccles, 2005). In view of these various findings, gender has the potential to moderate the impacts of CCA participation on academic and non-academic outcomes. It is therefore necessary control for the effect of gender in better understanding the impact of school-based CCAs on outcomes.

2.8.3 Parental education.

Parents' educational level is an important predictor of children's CCA participation. More educated parents were found to be more inclined than less educated parents to consider CCA participation as beneficial to their children's socioemotional development (Dunn, Kinney, & Hofferth, 2003; Lareau, 2002, 2003). Socioeconomic status (SES), which is a close correlate of parental education, also has a role in influencing the patterns of children's CCA participation and the impact of such participation on developmental outcomes. This might be the case because socioeconomic resources may influence youths' opportunities for participation.

Empirically, CCA participation has been found to have different impacts on the development of high- and low-income youth (Mahoney, 2000; Marsh, 1992; Marsh & Kleitman, 2002). On the one hand, youth from high-income families were more inclined to participate in CCAs (Huebner & Mancini, 2003; Pedersen & Seidman, 2005) and engage with greater intensity once they are involved (Bartko & Eccles, 2003; Fredricks & Eccles, 2006a; Markstrom et al., 2005). On the other hand, however, low-income and disadvantaged youths are reported to benefit the most from CCA participation even though this was not consistently found across studies (Mahoney, 2000; Mahoney & Cairns, 1997; Marsh, 1992; Marsh & Kleitman, 2002). For example, a longitudinal study by Fredricks and Eccles (2008) showed that, among students who were involved in sports-related CCAs, those who were from lower-income homes experienced lower declines in the proportion of prosocial peers than those from higher-income homes. In contrast, those who were from lower-income families were found to experience smaller decreases in depression than those who were from higher-income families. Given the documented effects of parental education and its proxy (i.e., SES) in affecting CCA participation patterns and moderating the effects of CCA participation in developmental outcomes, parental education is also included as a covariate in this study.

2.9 The Present Investigation: Purpose, Research Questions, and Hypotheses

This chapter has reviewed key theoretical-conceptual models delineating the positive role of school-organised or adult-structured activities for adolescents' development. These models include the bioecological perspective of human development (Bronfenbrenner, 2005), the stage-environment fit perspective (Eccles & Midgley, 1989), and the positive youth development (PYD) perspective (Busseri & Rose-Krasnor, 2009). The chapter has also discussed theoretical models and empirical findings that are more specific to co-curricular activities (CCAs). These mainly include models that posit the different ways in which CCA participation impacts on students' or adolescents' development (e.g., the zero-sum model, the

school identification model; Marsh & Kleitman, 2002). CCA-specific research that are reviewed in the chapter look into categorical and quantitative indicators of CCA participation, with the former primarily comparing developmental outcomes of students who participate in CCAs with those who do not participate in CCAs or between students who participate in different CCA types (see Farb & Matjasko, 2012), whereas the latter focusing on the breadth, duration, and intensity of CCA participation and the impacts of these indicators on developmental outcomes (e.g., Darling, 2005; Gardner et al., 2008).

Moving beyond the categorical and quantitative indicators of CCA participation, scholars (Bohnert et al., 2010; Kuperminc et al., 2013) have now believed that it is important to examine the quality and the social context of CCA participation such that the role of CCA participation in facilitating developmental outcomes can be better understood. To this end, in addition to the categorical and quantitative indicators of CCA participation, the present study used self-determination theory (SDT) to assess the role of students' CCA motivational orientations and perceptions of their CCA instructors, CCA peers, and parents in facilitating developmental outcomes.

As reviewed above, SDT suggested that social-contextual factors as precursors to students' motivational orientation. Many of its studies have posited and demonstrated (a) the presence of two distinct motivational orientations, namely autonomous and controlled motivation, with the former typically found to be more optimal for promoting students' educational and well-being outcomes than the latter, and (b) that autonomy-supportive social environments (teachers, peers, and parents) are important facilitating conditions for the development of students' autonomous motivation and the optimisation of their educational and well-being outcomes, due to the fulfilment of students' basic psychological needs (i.e., needs for relatedness, autonomy, and competence) that these environments facilitate.

In view of these theorising and research findings, the present study aimed to examine the role of CCA autonomous and controlled motivational orientations in mediating the

relationships between CCA participation factors (i.e., CCA types, quantitative indicators of CCA participation, and perceived CCA interpersonal contexts) and academic and non-academic outcomes. CCA interpersonal contexts were specifically represented by assessing students' perceptions of the extent to which their CCA instructors, CCA peers, and parents are autonomy supportive in relation to their CCA participation. The academic outcomes consist of five constructs, including school belongingness, homework completion, educational aspiration, academic buoyancy, and classroom engagement. The non-academic outcomes also consist of five constructs including communication skill, lifelong learning, teamwork, leadership skill, and society-oriented future goal. School level, gender, and parental educational were included as covariates in the analyses.

Drawing from these theoretical perspectives, the study formulated the hypothesised model which depicted the mediation of CCA motivational orientations in understanding the role of CCA participation indicators and CCA-related interpersonal factors in predicting CCA desired outcomes. This model was examined both cross-sectionally and longitudinally, namely at the beginning of the school year (Time 1), at the end of the school year (Time 2), and at the end of the school year when prior variance of the outcome variables are controlled for (i.e., the longitudinal consideration of the hypothesised model).

Figure 2.2 shows the hypothesised model depicting these mediational relationships. As shown in the figure, the direct effects of CCA participation factors on outcomes were also examined. Indeed, not only is this model built based on theorizing (Ryan & Deci, 2017), it has also received empirical support (e.g., Cheon, 2011; Guay, Boggiano, & Vallerand, 2001; Gurland & Grolnick, 2003; Jang, 2008; Jang, Reeve, Ryan, & Kim, 2009; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Reeve, Jang, Hardre, & Omura, 2002; Reeve, Nix, & Hamm, 2003). Thus, SDT is especially instrumental in mapping out the hypothesised process of students' development. The hypothesised model was first assessed via cross-sectional

analyses with Time-1 sample and Time-2 sample, and via a longitudinal analysis with matched Time-1 and Time-2 sample.

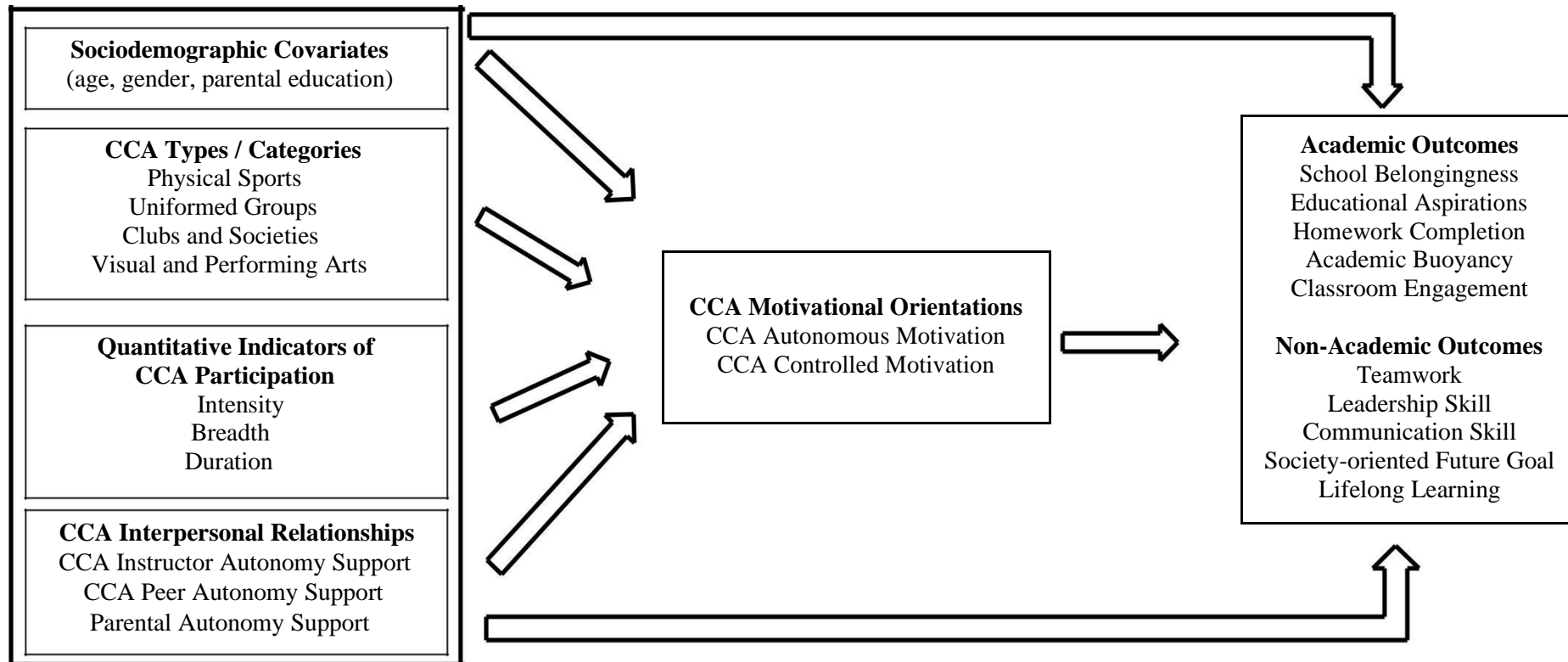


Figure 2. 2: Hypothesised model depicting the mediating role of CCA motivational orientations in the relationships between CCA participation dimensions and developmental (academic and non-academic) outcomes, controlling for sociodemographic covariates.

Although there is reason to believe that school-based CCA participation has a positive role in students or adolescents' development, documented research seems to point to mixed and inconsistent findings. As reviewed earlier, this could have been due to methodological limitations (e.g., small sample sizes, reliance on nominal categories of CCA types). Thus, in light of a lack of CCA research in the Singapore setting and the different classification of CCA types used in Singapore schools and in this research, it is difficult to make any concrete hypotheses about the influence of CCA types and quantitative indicators of CCA participation on outcomes. Instead, this study is exploratory in nature in terms of these specific CCA participation factors. However, a series of research questions, which are pertinent to the cross-sectional and longitudinal analyses, are posed, as follows:

Cross-Sectional Analysis Research Questions:

As reviewed above, various CCAs provide distinct learning experiences for students and could potentially have different developmental implications. It is therefore meaningful to consider the contribution of CCA categories. Thus, the first research question to be addressed is as follows:

- **Research Question 1:** To what extent do students in three different CCA types (i.e., Visual and Performing Arts, Clubs and Societies, Uniformed Groups) differ from those in Physical Sports (i.e., reference group) in terms of their CCA motivational orientations as well as academic and non-academic outcomes?

The quantitative indicators of CCA participation characterise the degree of students' CCA involvement. These indicators include the frequency, the number of CCAs they participate in and the period of sustained participation (i.e., duration). Prior studies have shown that these quantitative indicators of CCA participation had some impact of students' developmental outcomes (Farb & Matjasko, 2012). Therefore, it is important to consider

their relationship to students' outcomes. Hence, the second research question to be addressed is as follows:

- **Research Questions 2:** To what extent do quantitative indicators of students' CCA participation (i.e., the breadth, duration, and intensity of CCA participation) predict their CCA motivational orientations and academic and non-academic outcomes?

Given the importance of interpersonal relationships in predicting students' motivation and developmental outcomes considered in this study as CCA outcomes (Martin, 2014), it is important to examine the extent to which students' perceptions of others (instructor, peers, and parents) related to their CCA involvement affect their CCA motivation and outcomes. In view of these relationships, the third research questions that this study seeks to address is as follows:

- **Research Question 3:** To what extent do students' perceptions of CCA interpersonal contexts (i.e., perceived CCA instructors, CCA peers, and CCA parental autonomy support) predict their CCA motivational orientations and academic and non-academic outcomes?

Self-determination theory proposed motivation mediation model, which was also empirically supported in classroom contexts (Jang et al., 2009). In line with SDT's motivation mediation model, this study examined the mediational role of CCA motivation orientations in the relationship between CCA participation and outcomes. So, the fourth research question aims to examine:

- **Research Question 4:** To what extent do students' CCA motivational orientations mediate the link between the types of CCA that students participate in, the quantitative indicators of their CCA participation, and their perceptions of CCA interpersonal contexts to academic and non-academic outcomes?

Longitudinal Analysis Research Questions:

As reviewed, CCAs provide distinct learning experiences for students and could potentially have different developmental implications. It is therefore meaningful to consider the contribution of CCA categories over two time-points. Thus, the fifth research question to be addressed is as follows:

- **Research Question 5:** To what extent do students in three different CCA types (i.e., Visual and Performing Arts, Clubs and Societies, Uniformed Groups) differ from those in Physical Sports (i.e., reference group) differentially gain or decline in terms of their CCA motivational orientations as well as academic and non-academic outcomes?

As mentioned, prior studies have established that these quantitative indicators of CCA participation had some impact on students' developmental outcomes (Farb & Matjasko, 2012). Therefore, it is important to consider their relationship to students' outcomes over two time-points. Hence, the second research question to be addressed is

- **Research Question 6:** To what extent do quantitative indicators of students' CCA participation (i.e., the breadth, duration, and intensity of CCA participation) predict gains or declines in their CCA motivational orientations and academic and non-academic outcomes?

In view of the importance of interpersonal relationships in predicting students' motivation and developmental outcomes considered in this study as CCA outcomes (Martin, 2014), it is important to examine the extent to which students' perceptions of others (instructor, peers, and parents) related to their CCA involvement affect their CCA motivation and outcomes over two time points.

- **Research Question 7:** To what extent do students' perceptions of CCA interpersonal contexts (i.e., perceived CCA instructors, CCA peers, and CCA parental

autonomy support) predict the gains or declines in their CCA motivational orientations and academic and non-academic outcomes?

As hypothesised by SDT's motivation mediation model, this study examined the mediational role of CCA motivation orientations in the relationship between CCA participation and outcomes over two time points. So, the fourth research question aims to examine:

- **Research Question 8:** To what extent do students' CCA motivational orientations mediate the link between types of CCA that students participate in, the quantitative indicators of their CCA participation, and their perceptions of CCA interpersonal contexts to the gains or declines in their academic and non-academic outcomes?

As mentioned above, the present study is exploratory in nature in terms of the influence of CCA types and quantitative indicators of CCA participation on CCA motivational orientations and academic and non-academic outcomes. In light of theorizing and prior research, however, it is possible to propose hypotheses pertinent to the relationships involving CCA interpersonal contexts, CCA motivational orientations, and academic and non-academic outcomes. These hypotheses are mainly concerned with the key mediational paths in the hypothesised model and are applicable to both the cross-sectional and longitudinal analyses.

Hypothesis 1: Students' perceptions of CCA interpersonal contexts (i.e., perceived CCA instructors, CCA peers, and CCA parental autonomy support) will positively predict CCA autonomous motivational orientation.

Hypothesis 2: Students' CCA autonomous motivational orientation will positively predict academic (school belongingness, educational aspiration, academic

buoyancy, and classroom engagement) and non-academic (communication skill, lifelong learning, teamwork, leadership skill, and society-oriented future goal) outcomes.

Given the possibility that socially-derived motivation may have a double-sword effect on motivation of students in the collectivist Asian cultures (e.g., Jiang, Bong, & Kim, 2015; Liem, Martin, Porter, & Colmar, 2012; Nie & Liem, 2013) and that controlled motivation may not always be detrimental for Asian students (see e.g., Cai & Liem, 2017), it is interesting to see in this study how students' perceptions of their CCA interpersonal contexts will predict their CCA controlled motivation, and how students' CCA controlled motivation will predict academic and non-academic outcomes.

2.10 Chapter Summary

This chapter reviewed the various theoretical-conceptual models and perspectives which set the stage for the study investigating the effects of CCA participation on academic and non-academic outcomes. These models or perspectives include the bioecological system theory, the stage-environment fit theory, the PYD theory, and various models proposed to explain the role of CCA participation in facilitating adolescents' development. The chapter then reviewed main tenets of self-determination theory, which underpinned the present study and was a theoretical basis to include CCA interpersonal contexts and CCA motivational orientations as key constructs in the present study. The chapter proceeded with a review of and discussion on the relevance of a wide range of academic and non-academic outcomes to be assessed in the study. These academic outcomes include school belongingness, academic buoyancy, educational aspiration, and classroom engagement, whereas the non-academic outcomes include lifelong learning, communication skill, leadership skill, teamwork, and society-oriented future goal. The chapter ended by proposing a hypothesised model depicting the mediating role of CCA motivational orientations in linking CCA types, quantitative

indicators of CCA participation, and CCA interpersonal contexts to academic and non-academic outcomes. Research questions and hypotheses are posed and proposed.

CHAPTER 3

METHODOLOGY

This chapter outlines the methodological aspects and procedures pertaining to the study. It presents information on the measuring instruments and participants. It also describes the statistical procedures applied to conduct preliminary data analyses and to address the research questions and hypotheses presented in the earlier chapter.

3.1 Participants

Participants were middle-school students who were in Secondary 1 to 5 (equivalent to Year 7 to Year 11 in the American, Australian or British education system). The sampling aimed to be broadly representative of the proportion of students who participated in various types of CCAs across different grade levels in 14 secondary schools in Singapore.

3.1.1 Time-1 sample.

At Time 1, the sample consisted of 2,242 secondary-school students across 14 schools. Among these participants, 991 (44.20%) were male and 1,251 (55.80%) were female, and they fell between the ages of 10 and 19 ($M = 14.27$, $SD = 1.09$). Of this sample, 659 (29.40%) were in Secondary 1, 703 (31.40%) were in Secondary 2, 637 (28.40%) were in Secondary 3, 217 (9.70%) were in Secondary 4, and 26 (1.20%) were in Secondary 5. In terms of academic stream, 215 (9.60%) were students in the Normal Technical (lower progress) stream, 597 (26.60%) were students in the Normal Academic (middle progress) stream, 1392 (62.10%) were students in the Express (faster progress) stream, and 38 (1.70%) students were in the Special Academic and Gifted Education Programme. Among the 2,242 students in the Time-1 sample, 481 (21.50%) participated in Physical Sports, 767 (34.20%) were involved in Uniformed Groups, 698 (31.10%) engaged in Visual and Performing Arts, and 320 (14.30%) were in Clubs and Societies. With regards to the participants' nationalities,

there were 1,961 (87.50%) Singaporeans, 192 (8.60%) Singapore permanent residents, and 89 (4.00%) non-Singaporeans. For ethnic background distribution, 1,582 (70.60%) of the participants were Chinese, 339 (15.10%) were Malay, 193 (8.60%) were Indian, 13 (0.60%) were Eurasian, and 115 (5.10%) participants were students from other nationalities (e.g., Indonesian, Malaysian, Thai, Vietnamese) who were studying in Singapore, and they were classified as Others.

In terms of parental education, the mothers of 250 (11.20%) participants were reported to have completed primary school education, 893 (39.80%) completed secondary school education, 393 (17.50%) attained a polytechnic diploma certificate, 159 (7.10%) attained a pre-university or junior college A-level certificate, 423 (18.90%) indicated that they were undergraduate degree holders, and 124 (5.50%) were postgraduate degree holders. As for the participants' fathers, 275 (12.30%) were reported to have completed primary school education, 809 (36.10%) completed secondary school education, 418 (18.60%) attained a polytechnic diploma certificate, 137 (6.10%) had a pre-university or junior college A-level certificate, 458 (20.40%) were undergraduate degree holders, and 145 (6.50%) were postgraduate degree holders.

3.1.2 Time-2 sample.

At Time 2, the sample comprised 1,837 students from the same 14 schools. This sample consisted of 815 (44.40%) male and 1,022 (55.60%) female students. Their ages ranged from 12 to 20 years old ($M=14.15$, $SD=1.01$). Among these participants, 575 (31.30%) were in Secondary 1, 615 (33.50%) were in Secondary 2, 549 (29.90%) were in Secondary 3, 89 (4.80%) were in Secondary 4, and 10 (0.50%) were in Secondary 5. In terms of academic stream, 182 (9.90%) of them were in the Normal Technical stream, 470 (25.60%) were in the Normal Academic stream, 1164 (63.30%) were in the Express stream, and 22 (1.20%) were in the Special Academic and Gifted Education programme. Of the 1,838 students in Time-2 sample, 429 (23.30%) were students who participated in Physical Sports,

540 (29.40%) took part in Uniformed Groups, 596 (32.40%) took part in Visual and Performing Arts, and 216 (11.8%) were involved in Clubs and Societies. Within the sample, 1,614 (87.80%) were Singaporeans, 151 (8.20%) were Singapore permanent residents, and 73 (4.00%) were non-Singaporeans. In terms of ethnicity, 1,289 (70.10%) were Chinese, 299 (16.30%) were Malay, 152 (8.30%) were Indian, 14 (0.80%) were Eurasian, and the remaining 84 (4.60%) participants were classified as Others.

In terms of parental education, mothers of 212 (11.50%) participants were reported to have completed primary school education, 735 (40%) have completed secondary school education, 335 (18.20%) attained a polytechnic diploma certificate, 144 (7.80%) attained a pre-university or junior college A-level certificate, 319 (17.40%) were reported to be undergraduate degree holders, and 93 (5.10%) were postgraduate degree holders. As for the participants' fathers, 197 (10.70%) of them were reported to have completed primary school education, 683 (37.20%) completed secondary school education, 356 (19.40%) attained a polytechnic diploma certificate, 125 (6.80%) attained a pre-university or junior college A-level certificate, 355 (19.30%) were undergraduate degree holders, and 122 (6.60%) were postgraduate degree holders.

3.1.3 Matched Time-1 and Time-2 sample.

Participants with matched Time-1 and Time-2 data totalled 1,190, of which 505 (42.40%) were males and 685 (57.60%) were females. Their ages ranged between 12 and 19 years ($M = 14.13$, $SD = 0.99$). Within the sample, there were 373 (31.30%) Secondary 1 students, 413 (34.70%) Secondary 2 students, 346 (29.10%) Secondary 3 students, 52 (4.40%) Secondary 4 students, and 6 (0.50%) Secondary 5 students. Of the total sample, 105 (8.80%) students were in the Normal Technical stream, 291 (24.50%) students were in the Normal Academic stream, 778 (65.40%) students were in the Express stream, and 1 (0.10%) student was in the Special Academic programme, and 15 (1.3%) were in the Gifted Education programme. Of the total matched longitudinal sample, there were 252 (21.20%)

students who participated in Physical Sports, 25 (2.10 %) in Uniformed Groups, 464 (39.00 %) students in Visual and Performing Arts, and 470 (39.50 %) students in Clubs and Societies. In terms of their nationality, 1,037 (87.20%) were Singaporeans, 101 (8.50%) were Singapore permanent residents, and 52 (4.30%) were non-Singaporeans. With regards to ethnicity, 890 (74.80%) students were Chinese, 165 (13.90%) students were Malay, 80 (6.70%) students were Indian, 7 (0.60%) students were Eurasian, and 48 (4.00%) students were classified as Others.

In terms of parental education, mothers of 137 (11.50%) participants were reported to have completed primary school education, 489 (41.10%) secondary school education, 208 (17.50%) attained a polytechnic diploma certificate, 78 (6.60%) attained a pre-university or junior college A-level certificate, 220 (18.50%) were reported to be undergraduate degree holders, and 58 (4.90%) were postgraduate degree holders. Similarly, 142 (11.90%) of the participants' fathers were reported to have completed primary school education, 443 (37.20%) completed secondary school education, 215 (18.10%) attained a polytechnic diploma certificate, 75 (6.30%) attained a pre-university or junior college A-level certificate, 231 (19.40%) were reported to be undergraduate degree holders, and 84 (7.10%) were postgraduate degree holders.

3.2 Procedure and Participation

The data analysed in this dissertation was part of a larger dataset based on a project funded by the Ministry of Education (MOE) through the Office of Education Research (OER), at the National Institute of Education, Singapore. The title of the project is “Participation in School-Based Co-Curricular Activities and Student Development: A Motivation and Engagement Perspective” (Liem, 2013). Ethics approval was first sought and granted by the Nanyang Technological University’s Institution Review Board (IRB), and the permission to conduct the study was sought and given by the Ministry of Education prior to contacting the schools for their participation.

A formal invitation to participate in the research, which outlined the objectives and other important information regarding the research, was sent out to school principals in the selected schools. Fourteen secondary schools positively responded to the invitation and showed their willingness to participate. They recognised that the participation was voluntary and confidentiality of their participation would be ensured. Prior to the administration of the survey to participating students, schools were issued physical copies of the Parent/Guardian research information sheet and consent form for parents to read and complete. This form served to introduce the background and procedure of the study.

At each school, the Head of Department (Co-Curricular Activities, or CCA) facilitated and supervised the administration of data collection, which was conducted during one of the CCA sessions. Students were allocated a specific time slot during their CCA session to complete an online survey. Students were first briefed about the study and then instructed to complete the survey individually. It took between 35 and 40 minutes for the students to complete the survey at each time point.

The study adopted a longitudinal survey-based approach in which students were asked to complete the same online survey at two time points: at the end of Term 1 of the school year (Time 1; February/March 2014) and at the end of Term 4 (Time 2; October/November 2014). Time-1 data collection gathered information related to students' participation in CCAs and provided the baseline information on their academic and non-academic functioning at the initial stage of their CCA participation. Time-2 data collection gathered the same set of information at the end stage of their CCA participation (i.e., 8 to 10 months later) within the same academic year. The second data collection aimed at garnering relevant information to examine the extent to which academic and non-academic outcome factors develop as a result of the students' involvement in a particular CCA type.

3.3 Measures

The measures used in this study included those that purport to measure: (a) the CCA type that students participated in, (b) the amount or quantitative indicators of CCA participation (i.e., the intensity, breadth, and duration), (c) students' CCA motivational orientations (i.e., autonomous and controlled motivation), (d) students' perceptions of the nature of their interpersonal relationships with specific people in the context of their CCA participation (i.e., CCA instructor autonomy support, CCA parental autonomy support and CCA peer autonomy support), (e) factors classified as academic outcomes (i.e., school belongingness, academic buoyancy, classroom engagement, and educational aspiration), and (f) factors classified as non-academic outcomes (i.e., confidence, leadership skill, communication skill, lifelong learning, teamwork and society-oriented future goal). In addition, questions pertaining to relevant sociodemographic information (e.g., age, gender and academic stream) were also included in the survey. Psychometric properties of the measures used in this study were reported in the results chapters. The result of Confirmatory Factor Analysis (CFA) indicated that the measures had good factor structure. The individual items' factor CFA loadings are reported in Appendix E. Each measure is described below.

3.3.1 CCA participation dimensions.

Prior measures of CCA participation (e.g., Denault & Poulin, 2009; Fredricks & Eccles, 2010) were consulted and modified for use in the present study. Information on CCA participation included: (a) CCA categories (and sub-categories) that students participated in, breadth of CCA participation (i.e., "How many CCAs are you involved in? What are they?"), (c) intensity of CCA participation (i.e., "On average, how many hours/weeks do you spend in your main CCA in the past 2 months?"), which ranged from "0 to 2 hours" to "more than 10 hours", (d) duration of CCA participation (i.e., "How long have you been taking part in your main CCA?"), which required a response in terms of the year and number of months. Items b, c, and d were formulated to measure quantitative indicators of CCA participation.

3.3.2 Self-determined motivation measure.

The Self-Regulation Questionnaire (SRQ; Ryan & Connell, 1989) was adapted in the present study to assess students' motivation along the continuum of intrinsic-extrinsic motivation in the context of CCA. The four SRQ subscales included intrinsic motivation (4 items; e.g., "I enjoy doing things in my main CCA."), identified motivation (4 items; e.g., "Doing well in my CCA is important for my further studies."), introjected motivation (4 items; e.g., "I will be ashamed of myself if I do not do it"), and external motivation (4 items; e.g., "CCA is compulsory in the school and I will get punished if I do not have one."). Similar to prior studies (e.g., Sheldon & Elliot, 1998), intrinsic and identified motivation subscales were combined in this study to form autonomous motivation, and introjected and extrinsic motivation subscales were combined to form controlled motivation. The SRQ items in this study were rated on a 7-point Likert scale ranging from 1 ("Disagree Strongly") to 7 ("Agree Strongly").

3.3.3 CCA interpersonal relationships.

These measures include those that measure participants' perceptions towards significant others (i.e., parents, instructors and peers) in the context of CCA. The perception towards parents (i.e., CCA parental autonomy support) was assessed by measures of parental support (Anderson, Funk, Elliott, & Smith, 2003; 3 items; e.g., "My parents support me in the things I do in my main CCA."). CCA peer autonomy support was assessed through measures adapted from the Peer Motivational Climate in Youth Sports Questionnaire (PMCYSQ; Ntoumanis & Vazou, 2005). The PMCYSQ subscale includes relatedness support (3 items; e.g., "Students in my main CCA make their peers feel accepted."). CCA instructor autonomy support was measured by adapting items from the Perceived Motivational Climate (PMC; Black & Deci, 2000; 6 items; e.g., "I feel that my main CCA coach/instructor provides me with choices."). In the present study, the PMC was adapted to examine the extent to which participants or students perceived their CCA instructors were

supportive of their autonomy during CCA sessions. Items in these measures were required to be rated on a 7-point Likert scale ranging from 1 (“Disagree Strongly”) to 7 (“Agree Strongly”).

3.3.4 Academic outcomes.

Academic outcomes included in this study were school belongingness, academic buoyancy, classroom engagement, and educational aspiration. Each item was rated on a 7-point Likert scale, ranging from 1 (“Disagree Strongly”) to 7 (“Agree Strongly”). School belongingness (4 items; e.g., “I enjoy being a student at this school.”) was drawn from the Psychological Sense of School Membership Scale (Goodenow, 1993). It was adapted to measure students’ sense of affiliation to their school. Educational aspiration (4 items; e.g., “I want to complete secondary school.”) assessed students’ future goals in education (Martin & Marsh, 2005, 2006). Academic buoyancy (4 items; e.g., “I think I am good at dealing with schoolwork pressures.”) assessed students’ ability to cope with daily academic setbacks. Classroom engagement (4 items; e.g., “I pay attention well in the class.”) was modified from the School Engagement Scale (Fredricks, Blumenfeld, Friedel, & Paris, 2005) to assess the extent to which students pay attention in their class.

3.3.5 Non-academic outcomes.

In addition to academic outcomes, this study also focused on non-academic outcomes including confidence, leadership skill, communication skill, lifelong learning, teamwork, and society-oriented future goal. These outcomes are pertinent to 21st century competencies that Singapore education aims to nurture in its students through their participation in CCA. Items in each outcome were rated on a 7-point Likert scale ranging from 1 (“Disagree Strongly”) to 7 (“Agree Strongly”). Leadership skill (Chua, 2012; 4 items; “People trust and see me as their leader.”) examined the extent that students demonstrate leadership qualities. Lifelong learning (Chua, 2012; 4 items; “I want to keep learning.”) considered students’ desire to engage in continual learning. Society-oriented future goal (Lee, McInerney, Liem, & Ortiga,

2010; 3 items; “I want to make a contribution to my society.”) measured students’ orientation towards societal contribution. Teamwork (Chua, 2012; 4 items; “I work well in a team.”) assessed students’ perception of their teamwork competence. Communication skill (Chua, 2012; 4 items; “I communicate well with others.”) measured how well students express themselves. Confidence (Chua, 2012; 4 items; “I believe in myself.”) assessed the degree to which students believe in their ability to excel in CCA.

3.4 Data Analyses

Data analyses entailed the assessment of the measurement models and structural aspects of the hypothesised CCA model as well as the assessment of the reliability and validity of instruments. This began by establishing the multi-dimensionality and assessing the underlying factor structure of scales. It aims to provide psychometric properties of the scales. Following this, the internal consistency of the items that belong to a scale was established by examining Cronbach’s alpha reliability of the scale. SPSS (Statistical Package for the Social Sciences) version 24.0 was used in the preliminary analysis to assess the descriptive statistics (M , SD) and the distributional properties (skewness, kurtosis) of the data.

3.4.1 Confirmatory factor analysis

Confirmatory factor analysis (CFA) was performed using Mplus 6.0 (Muthén & Muthén, 1998-2012) to test the multi-dimensionality and provide evidence for the construct validity of the measurement of factors in this study. In CFA, a measurement model specified tests the extent to which a set of a priori hypothesised items (observed variables) load onto only one target latent variable and their loadings onto nontarget latent variables are constrained to be zero (Marsh, Liem, Martin, Morin, & Nagengast, 2011; Muthén & Muthén, 1998-2012). In the present study, CFA was conducted for the three main constructs separately, namely (a) socio-contextual factors comprising three factors (i.e., CCA instructor autonomy support, parental autonomy support, and peer autonomy support), (b) motivational

orientations comprising two factors (i.e., autonomous and controlled motivation), and (c) CCA outcomes comprising 10 factors (i.e., school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal). CFA was conducted on datasets at the two time points, as well as with the longitudinal matched Time-1 and Time-2 dataset. Maximum likelihood estimation was used in this study to mitigate potential threats that undermine normality of data (Schermelleh-Engel, Moosbrugger, & Müller, 2003). As described below, the hypothesised CFA measurement models were evaluated by statistical approaches to assess the adequacy of its goodness-of-fit to the data (Hooper, Coughlan, & Mullen, 2008).

3.4.2 Model fit indices.

Goodness-of-fit indices determine the extent to which the hypothesised model fits the empirical data. The current study consulted four indices: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), and the chi-square value. More than one index was used to assess the model fit so as to consider multiple criteria and to evaluate the model based on several measures concurrently (Schermelleh-Engel et al., 2003). Bentler's (1990) CFI considers the improvement of the fit of the hypothesised model over a restrictive model (or null) model that bears no relationships among the variables. It ranges from 0 to 1.00, with values closer to 1.00 indicating better fit. TLI or Non-Normed Fit Index (NNFI) is an index that favours parsimony models and ranges between 0 to 1.00. Similar to CFI, Hu and Bentler (1999) proposed that TLI values closer to 1.00 indicate better fit. RMSEA is an index of fit that favours parsimony (Steiger, 1990; Steiger & Lind, 1980). Values between 0.08 and 0.10 are deemed to be a mediocre fit and those below 0.08 indicate a good fit (MacCallum, Browne, & Sugawara, 1996).

Chi-square value is a measure that gauges overall model fit, and to test the degree of discrepancy between the sample and the fitted covariance matrices (Hu & Bentler, 1999).

This is also known as an indicator of “badness of fit” (Kline, 2005) and a good model fit would yield a non-significant chi-square result at a $p < .05$ threshold (Barrett, 2007).

However, chi-square statistics has several limitations: (a) It assumes multivariate normality and violation of this assumption would lead to model rejections even though the model is properly specified (McIntosh, 2007); (b) It is sensitive to sample size and hence, there is an increased tendency to reject the model if a large sample size is involved (Bentler & Bonett, 1980; Jöreskog & Sörbom, 1993); And yet, (c) it lacks power with a small sample size which compromises its ability to differentiate between good-fitting and poor-fitting models (Kenny & McCoach, 2003).

3.4.3 Modification indices.

An important aspect of the applications of SEM, including path analysis, relates to model modification involving bolstering the fit between the hypothesised model and empirical data (Kaplan, 1990a, 1990b). In pursuit of better match between data and model, it is of interest to evaluate various alternative models so as to attain the most optimal model, both empirically and theoretically (Byrne, 2012; Kline, 2011; MacCallum & Austin, 2000; Quintana & Maxwell, 1999). Model modification often involves assessing the magnitude of decrease in model chi-square (for one degree of freedom) while expected parameter change estimates the expected size of change in the parameter estimate in light of a certain fixed parameter (Lei & Wu, 2007). Though these indices are instrumental in model re-specification (Olsson, Troye, & Howell, 1999), model adjustments should be done with theoretical and empirical bases (Bollen, 1990; Kaplan, 1989, 1990a, 1990b). Since Time-1 and Time-2 models are “fully forward” models with all parameters from covariates and predictors or independent variables predicting dependent variables are freed or estimated, the modification indices for these two models were not generated because they are saturated models. But modification indices were relevant to the matched or longitudinal dataset analysis because some parameters were freely estimated.

3.4.4 Multigroup tests of invariance.

Multigroup tests of invariance determine if parameters (measurement or structural models) are equivalent across groups (Gregorich, 2006). For the purpose of this study, invariance testing for Time-1 and Time-2 samples was done across age, gender and parental education. It is meaningful to assess for invariance of the various constructs across different sub-groups prior to pooling the data as one (MacCallum & Austin, 2000). For the longitudinal sample, it entailed tests of invariance of the measurements across the two data points. This method (longitudinal invariance) is useful for assessing equivalence of constructs measured at different time points.

The present study adopted multigroup CFA that was extended to test if the factor structure underlying the instrument was invariant across the groups. This was done by comparing a number of estimated models, which had consecutive elements of the factor structure constrained (i.e., factor loadings, factor variances and intercept) (Marsh, Muthén et al., 2009; Marsh, Liem et al., 2011; Marsh, Vallerand et al., 2013). Goodness-of-fit measures across models were then considered and contrasted. Several gradually more restrictive models of Time-1 and Time-2 datasets were tested across age, gender and parental education, whereas the same procedure was done with the matched Time-1 and Time-2 datasets. The first multigroup (or multitime) CFA involves no invariance imposed on the estimated parameters across the sub-groups and this comprises the baseline model. Subsequent models were increasingly more restrictive than the baseline model. These more restrictive models included a second model which constrained factor-loading to be invariant and a third model that constrained both factor loadings and intercepts to be invariant. The baseline model was then compared with the consecutive models to examine if there were any changes in CFI and RMSEA between the less and more restrictive models. The cut-off values for the differences below .01 for CFI (Cheung & Rensvold, 2001, 2002) and .015 for RMSEA (Chen, 2007) were used to determine invariance.

3.4.5 Path analysis.

Path analysis is an application of SEM that examines the relationships among constructs. Each construct was represented by an aggregation of responses to its measuring items. The use of path analysis, rather than the full SEM that examines latent constructs underlying the observed (measured) responses, is preferable in this study because of the number of factors considered in the CCA hypothesised model. Like full SEM analysis, path analysis enables the hypothesised model to be examined within a comprehensive and concurrent analysis of the variables in order to determine the extent to which it matches the data. Depending on the goodness of fit resulted from the analysis (when the model estimated is not a saturated model, see below), the validity of the postulated relations among variables would determine the acceptability or rejection of the model (MacCallum et al., 1996). In the present study, path analysis was used to examine: (a) the Time-1 and Time-2 cross-sectional modelling of the role of CCA motivational orientation in mediating the links between CCA participation and interpersonal factors on the one side of the model and academic and non-academic outcomes on the other side (see results reported in Chapters 4 and 5), and (b) the longitudinal modelling of the Time-2 hypothesised mediation model in predicting outcomes by controlling for the shared variance in each of the Time-2 outcomes (e.g., T2 academic buoyancy, T2 confidence, etc.) with the corresponding Time-1 outcome factors (i.e., T1 academic buoyancy, T1 confidence, etc.) (see also 3.4.6 Longitudinal modelling below). However, Time-1 and Time-2 cross-sectional models reported in Chapters 4 and 5, respectively, were saturated ‘fully-forward’ models, in which all the possible paths from predictors to outcomes were freed or estimated; hence fit indices of these models were as follows: $\chi^2 = 0$, $df = 0$, RMSEA = 0.00, CFI = 1.00, and TLI = 1.00. Fit indices were consulted for the longitudinal model reported in Chapter 6 because in this longitudinal model, Time-1 outcomes were hypothesized to predict only their corresponding Time-2 outcomes (i.e., auto-regressive paths; e.g., T1 school belonging predicting only T2 school belonging

but not other variables in the model such as motivational orientations or other, non-corresponding CCA outcomes); hence the longitudinal model was not a saturated ‘fully-forward’ model.

The current study first adopted a hierarchical or sequential approach to mediational path analysis. In Step 1, covariates (age, gender and parental education) were entered into the model to account for their variance in the CCA hypothesised model. In Step 2, types of CCA (i.e., Uniformed Groups, Visual and Performing Arts, and Clubs and Societies) were included as additional predictors of outcomes. Physical Sports was the CCA category used as a reference group, such that the regression weights associated with each of the three CCA categories entered into the model should be interpreted relative to Physical Sports. In Step 3, the quantitative indicators of CCA participation (breadth, duration and intensity) were entered into the model. In Step 4, CCA interpersonal relationships (i.e., CCA parental autonomy support, CCA instructor autonomy support and CCA peer autonomy support) were included in the model. Finally, in Step 5, CCA motivational orientations (i.e., autonomous and controlled motivation) were added into the model. This sequential approach to the analysis aimed to examine the incremental variance that comes about from the respective factor at each step.

3.4.6 Longitudinal modelling.

In addition to examining the cross-sectional mediation model at Time 1 and Time 2, the current research also aims to investigate the role of CCA participation in fostering academic and non-academic over two time points (i.e., an approximately 9-month period) by accounting for prior variance in outcome measures. The analysis for longitudinal modelling was conducted over several steps. In Step 1, prior variance of Time-1 outcomes was entered in the hypothesised CCA model to take into account their shared variance with the corresponding outcome factors at Time 2. In Step 2, covariates (i.e., age, gender and parental education) were added as subsequent predictors of outcomes. In Step 3, types of CCA were

included in the CCA model. Similar to the cross-sectional analyses, Physical Sports was set as a reference group so that the regressions weights linked to the respective CCA groups were interpreted relative to this CCA group. In Step 4, CCA quantitative indicators were included as predictors in the model. In Step 5, CCA interpersonal relationships were entered. Lastly, in Step 6, CCA motivational orientations were included as predictors in the model. By accounting for the shared variance with prior academic and non-academic outcomes, the modelling enabled the assessment of the unique variance traced to the predictors and the *increase* or *decrease* in scores on CCA outcomes or CCA motivation over Time 1 and Time 2 (see Martin, Mansour, Anderson, Gibson, Liem, & Sudmalis, 2013; Martin, Nejad et al., 2013; Martin, Papworth, Ginns, & Liem, 2014; Reeve & Lee, 2014, for use of this method; see also MacCallum & Austin, 2000; Martin, 2011, for conceptual discussions on this method).

3.4.7 Bootstrapping mediational analysis.

The hypothesised CCA mediation model was also examined via bootstrapping analysis for the indirect effects (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Shrout & Bolger, 2002). It tested if indirect pathways were significantly different from zero. Particularly, it considered the role of CCA motivational orientation in mediating the relationship between CCA participation factors and CCA outcomes. In order to assess the significance of mediated relationships (i.e., indirect effects), 5000 random samples were used to derive 95% bias-corrected bootstrap confidence intervals (CIs) (MacKinnon, Lockwood, & Williams, 2004). Significant mediation effects exist if upper and lower limits of the 95% confidence interval (CI) did not include zero. Building on prior hierarchical mediational analysis, covariates, CCA types and CCA quantitative indicators were also entered into the model, and CCA motivational orientation was factored in as a mediational variable instead of subsequent predictor to assess its incremental value over earlier predictors. These two

approaches were in corroboration and done in parallel to test the role of CCA motivational orientation in mediating the relationship between CCA predictors and outcomes. The hierarchical SEM assessed the incremental variance of CCA motivational orientation over and beyond prior covariates, CCA types and CCA quantity indicators towards CCA outcomes. The bootstrapping mediational analysis tested the significance of indirect effect of CCA motivational orientations in predicting CCA outcomes in the relationship between CCA predictors and CCA outcomes.

3.5 Chapter Summary

This chapter described the methodological aspects adopted in the present study, including the procedure, instrumentation, sample and statistical analyses at Time 1, Time 2 and the longitudinal phase. Students completed a survey consisting of measures of CCA quantitative indicators, CCA motivational orientations, CCA interpersonal relationship factors, as well as academic and non-academic outcomes. Data analyses involved assessing the reliability and validity of instrumentation and the testing of cross-sectional and longitudinal CCA models. The main analyses adopted two approaches to examine the research questions. First, it adopted a sequential approach to examine the incremental variance of consecutive predictors to academic and non-academic outcomes. Second, it examined the mediating role of CCA motivational orientations in the relationship between CCA predictors and interpersonal relationships and CCA outcomes via a bootstrapping approach to mediational analysis.

CHAPTER 4

TIME-1 CROSS-SECTIONAL RESULTS

This and the subsequent two chapters report on the various aspects of the procedures involved in data analysis. Preliminary analyses were first performed to examine the psychometric properties of the respective constructs (i.e., motivation, interpersonal relationships, and academic and non-academic outcome factors). This was done by (a) evaluating construct-validity of the constructs and their multigroup invariance across key subgroups (i.e., age, gender, parental education) via confirmatory factor analysis (CFA); (b) assessing the correlations among key factors under focus, assessing descriptive statistics (i.e., mean and standard deviation), distributional properties (i.e., skewness, kurtosis) and internal consistency (i.e., Cronbach's alpha) of the subscales. Next, main analyses seeking to address the substantive issues of interest were conducted by testing the hypothesised structural relationships among the variables via path analysis. Specifically, the study examined links between co-curricular activity (CCA) participation factors (i.e., type of CCA participation, quantitative indicators of CCA participation, CCA interpersonal relationships) with CCA motivation as mediators, and outcomes, while controlling for age, gender and parental education as covariates. These analyses were conducted with Time-1 data and Time-2 data (reported in Chapters 4 and 5, respectively). Longitudinal analyses were then conducted to test the hypothesised structural relationships at Time 2 by controlling for the effects of auto-regression paths (prior variance) of CCA-related factors and outcomes (reported in Chapter 6).

Table 4.1

Descriptive Statistics, Distributional Properties, Cronbach's Alpha, and Summary of CFA Loadings at Time 1

Variable	Time 1						No. of Items
	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's Alpha	Range (Mean) of CFA Loadings	
CCA Participation							
Breadth	1.06	0.27	5.082	27.335	-	-	1
Duration	20.57	16.22	1.196	2.210	-	-	1
Intensity	2.72	1.21	1.021	0.658	-	-	1
Motivation							
Autonomous Motivation	5.57	2.40	-0.90	1.23	.91	.52-.93 (.80)	8
Controlled Motivation	4.51	2.12	-0.29	0.01	.87	.65-.87 (.80)	8
CCA Interpersonal Relationships							
Instructor Autonomy Support	5.16	2.27	-0.90	1.57	.94	.78-.88 (.85)	6
Parental Autonomy Support	4.59	2.16	-0.50	0.44	.89	.76-.84 (.80)	3
Peer Autonomy Support	5.40	2.36	-1.10	2.10	.97	.89-.93 (.91)	3

Variable	Time 1						No. of Items
	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's Alpha	Range	
						(Mean) of CFA Loadings	
CCA Outcomes							
School Belongingness	5.36	2.38	-1.04	1.44	.93	.83-.91 (.89)	4
Academic Buoyancy	4.96	2.24	-0.67	0.86	.80	.67-.81 (.76)	4
Educational Aspiration	5.96	2.52	-1.78	4.65	.87	.78-.84 (.81)	4
Classroom Engagement	5.27	2.31	-1.03	2.42	.92	.77-.90 (.86)	4
Confidence	5.25	2.31	-1.07	1.57	.92	.85-.91 (.88)	4
Lifelong Learning	5.82	2.45	-1.76	5.52	.92	.86-.90 (.89)	4
Teamwork	5.49	2.38	-1.38	3.33	.91	.84-.90 (.87)	4
Leadership Skill	4.72	2.16	-0.64	0.57	.86	.75-.88 (.83)	4
Communication Skill	5.18	2.31	-0.97	1.80	.92	.84-.89 (.87)	4
Society-oriented Future Goal	5.54	2.38	-1.31	3.02	.94	.91-.93 (.92)	3

Note. The variables of duration, intensity and breadth, were named in such a way that the higher their values, the longer the period of students' participation in their main CCA (in months), the longer the amount of time they participated in their main CCA weekly (in hours), and the more number of CCAs students were involved in (in continuous values of 0, 1, 2, etc.), respectively.

4.1 Construct Validity

To examine the underlying factor structure of Time-1 data, confirmatory factor analysis (CFA) was conducted three times, once for socio-contextual factors (i.e., Time-1 CCA instructor autonomy support, parental autonomy support, and peer autonomy support), once for motivational orientations (i.e., Time-1 autonomous and controlled motivation), and once for CCA outcomes (i.e., Time-1 school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal). Table 4.1 presents a summary of CFA factor loadings of the subscales in terms of their range and mean factor loadings. Goodness-of-fit indices were reviewed to evaluate how closely the data matched the measurement model. CFA results, with the following indices, CCA motivational orientations ($\chi^2 = 1169$, $df = 97$, RMSEA = .07, CFI = .93, TLI = .91), CCA socio-contextual factors ($\chi^2 = 307$, $df = 51$, RMSEA = .05, CFI = .98, TLI = .98) and CCA outcomes ($\chi^2 = 4864$, $df = 657$, RMSEA = .05; CFI = .92, TLI = .91), indicated that each set of constructs was well-defined. These indices showed an acceptable fit between the model and the data. All the factor loadings for Time-1 CFA are significant at $p < .001$ and reported in Appendices E1, E2, and E3.

Multigroup invariance was performed to evaluate the equivalence of measurement parameters across various key subgroups in the study (i.e., gender, age and parental-education levels) by testing three increasingly restrictive models which progressively reflect higher-levels of measurement invariance (Vandenberg & Lance, 2000; Widaman & Reise, 1997). The first model, the configural invariance model, was estimated to assess if the factor structure was equivalent across the subgroups. It provided a baseline model of comparison for the subsequent, more restrictive models. Next, the metric invariance model was estimated to test if factor loadings were invariant across the subgroups, in addition to the configural invariance model. Thirdly, in addition to the invariance of factor structure and factor loadings, the scalar invariance model was estimated to examine the equivalence of item

intercepts across the subgroups. To evaluate the extent to which parameters added into a more restrictive model were invariant, certain fit indices that resulted from the analyses of the less and the more restrictive models were compared. If significant decrement in fit indices arose as a result of such comparison, parameters constrained to be equal in the more restrictive model were not considered to be invariant. To show evidence of the invariance, the difference in CFIs between the less and the more restrictive models should be less than .01 (Cheung & Rensvold, 2001, 2002) and the difference in the RMSEAs between these two models should be less than .015 (Chen, 2007). Based on these criteria, comparisons of CFIs and RMSEAs across CFA models that successively constrained key measurement parameters provided evidence for the configural, metric and scalar invariance across gender, age or educational level groups, and parental education (all Δ CFIs $< .01$ and all Δ RMSEAs $< .015$).

4.2 Time-1 Descriptive Statistics, Distributional Properties and Reliability Analysis

Having established the multidimensionality of the factors focused on in this study by way of CFA as reported above, preliminary examination of the subscales was conducted by assessing the subscales' means and variance, distributional properties, and reliability. Cronbach's alpha is commonly used to assess degree of internal reliability (De Vaus, 2002; Streiner, 2003) and this reliability coefficient falls in the range of between 0 to 1, with $\alpha = .70$ and above commonly considered to be acceptable (Anastasi & Urbina, 1997; Field, 2009; Sattler, 2001). For distributional properties, skewness and kurtosis were used to gauge the normality of score distribution. As a guideline, Curran, West, and Finch (1996; see also Azzalini & Capitanio, 1999) recommended skewness values of less than 2 and kurtosis values of less than 7 as indicators of a normal distribution. Table 4.1 shows descriptive statistics, distributional properties and reliability results. All subscales scores in the study showed acceptable to high levels of reliability, ranging from $\alpha = .80$ for academic buoyancy to $\alpha = .97$ for peer autonomy support. The values of skewness ranged from -1.78 to -0.29,

whereas the values of kurtosis ranged from 0.01 to 5.52. For CCA quantitative indicators, values for skewness were 1.02, 5.08 and 1.19 for intensity, breadth and duration respectively, and values for kurtosis were 0.66, 27.34 and 2.21. In terms of breadth, in secondary schools, students are required to participate in at least one CCA, which resulted in a peak and skewed distribution as most data points point to participating in one CCA. In general, CFA indicated that all items loaded well on the factors. The inspection of multiple indices (Byrne, 2012): the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), with values higher than .90 indicative of an acceptable fit and values higher than .95 suggesting an excellent fit; the Root Mean Square Error of Approximation (RMSEA) with values below .08 indicative of an acceptable fit and values less than .05 representing a good fit.

4.3 Correlations

Correlation analysis provides an overview of the relationships between key factors examined in the study, including CCA predictors, CCA motivational orientations, CCA interpersonal relationships, and academic and non-academic outcomes. In this correlation analysis, the four variables representing CCA types (i.e., Physical Sports, Uniformed Groups, Visual and Performing Arts, and Clubs and Societies) were derived from the following procedure: for the CCA-type variable of Physical Sports, students whose main CCA was classified as Physical Sports were dummy-coded 1 and all other students whose main CCA fell under the other three categories (i.e., Uniformed Groups, Visual and Performing Arts, and Clubs and Societies) were dummy-coded 0. A similar coding procedure was done for the CCA-type variables of Uniformed Groups, Visual and Performing Arts, and Clubs and Societies. Therefore, a positive correlation coefficient between a CCA type dummy-coded as 1 (e.g., Physical Sports) and a given variable (e.g., autonomous motivation) indicated that students whose main CCA was Physical Sports (dummy-coded 1) were higher on autonomous motivation than those whose main CCA was not Physical Sports (dummy-coded 0). In contrast, a negative correlation coefficient between Physical Sports and autonomous

motivation indicated that students whose main CCA was Physical Sports were lower than those whose main CCA was not Physical Sports.

For the quantitative indicators of CCA participation—namely, duration, intensity and breadth—the variables were named in such a way that the higher their values, the longer the students had participated (in months) in their main CCA, the more time (in hours) they spent on weekly participation in their main CCA, and the higher number of CCAs (in continuous values of 0, 1, 2, etc.) that students were involved in respectively. Thus, a positive correlation coefficient between a quantitative indicator of CCA participation, such as CCA duration, and a given psychological or attitudinal factor, such as confidence, would suggest that students with a longer period of participation in their main CCA tend to be more confident. In contrast, a negative correlation coefficient between CCA duration and confidence suggested that students with a longer period of participation in their main CCA tended to be less confident. The correlation coefficients reported in Table 4.2 (as well as Tables 5.2 and 6.2 in Chapters 5 and 6, respectively) are Pearson Product-Moment correlations among key factors examined in the study. Pearson correlations, rather than latent variable correlations, are reported here because the hypothesized model is tested using path analysis which is modeling technique relying on subscale manifest scores rather than latent variables. However, for completeness, latent variable correlations are also reported in Appendix F.

As shown in Table 4.2, Uniformed Groups were positively correlated with controlled motivation ($r = .07, p < .01$), teamwork ($r = .05, p < .01$), leadership skill ($r = .07, p < .01$), communication skill ($r = .05, p < .001$) and society-oriented future goal ($r = .07, p < .01$). This indicates that students in Uniformed Groups had higher levels of controlled motivation, teamwork, leadership skill, communication skill and society-oriented future goal compared to students in non-Uniformed Groups. Visual and Performing Arts were negatively correlated with controlled motivation ($r = -.08, p < .01$), CCA parental autonomy support ($r = -.08, p < .01$), school belongingness ($r = -.12, p < .001$), academic buoyancy ($r = -.11, p$

< .001), classroom engagement ($r = -.07, p < .01$), confidence ($r = -.12, p < .001$) and leadership skill ($r = -.09, p < .01$). Students in Visual and Performing Arts had lower levels of controlled motivation, CCA parental autonomy support, school belongingness, academic buoyancy, classroom engagement, confidence and leadership skill compared to those in non-Visual and Performing Arts. Clubs and Societies were negatively correlated with autonomous motivation ($r = -.14, p < .001$), CCA instructor autonomy support ($r = -.12, p < .001$) and CCA peer autonomy support ($r = -.17, p < .001$). This suggests that students who participated in Clubs and Societies had lower levels of autonomous motivation, perceived CCA instructor autonomy support and perceived CCA peer autonomy compared to students in non-Clubs and Societies. Physical Sports positively correlated with autonomous motivation ($r = .12, p < .001$), CCA instructor autonomy support ($r = .09, p < .001$) and CCA peer autonomy support ($r = .08, p < .01$). This means that students in Physical Sports had higher level of autonomous motivation, perceived CCA instructor autonomy support and perceived CCA peer autonomy support than students in non-Physical Sports.

CCA intensity was positively correlated with CCA peer autonomy ($r = .06, p < .001$) and negatively correlated with academic buoyancy ($r = -.05, p < .01$). CCA breadth was not significantly associated with any of the outcomes or CCA motivational orientations. CCA duration, however, was found to be negatively correlated with school belongingness ($r = -.07, p < .01$), academic buoyancy ($r = -.07, p < .01$), educational aspiration ($r = -.06, p < .01$), and classroom engagement ($r = -.06, p < .01$). This suggests that the higher the frequency of CCA participation, the higher the CCA peer autonomy support but the lower the level of academic buoyancy. Also, the longer the students participated in their main CCA, the lower their school belongingness, academic buoyancy, educational aspiration, and classroom engagement. However, the number of CCAs students were involved in was not associated with any outcomes or CCA motivational orientations.

In terms of the two motivational orientations, autonomous motivation was positively correlated with CCA instructor autonomy support ($r = .64, p < .001$), CCA parental autonomy support ($r = .48, p < .001$), CCA peer autonomy support ($r = .63, p < .001$), school belongingness ($r = .41, p < .001$), academic buoyancy ($r = .31, p < .001$), educational aspiration ($r = .32, p < .001$), classroom engagement ($r = .36, p < .001$), confidence ($r = .42, p < .001$), lifelong learning ($r = .45, p < .001$), teamwork ($r = .44, p < .001$), leadership skill ($r = .38, p < .001$), communication skill ($r = .44, p < .001$), and society-oriented future goal ($r = .45, p < .001$). This shows that the higher the level of students' autonomous motivation, the higher their CCA instructor autonomy support, CCA parental autonomy support, CCA peer autonomy support, school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

Controlled motivation was positively correlated with CCA instructor autonomy support ($r = .21, p < .001$), CCA parental autonomy support ($r = .28, p < .001$), CCA peer autonomy support ($r = .20, p < .001$), school belongingness ($r = .13, p < .001$), academic buoyancy ($r = .16, p < .001$), educational aspiration ($r = .10, p < .001$), classroom engagement ($r = .19, p < .001$), confidence ($r = .17, p < .001$), lifelong learning ($r = .14, p < .001$), teamwork ($r = .16, p < .001$), leadership skill ($r = .15, p < .001$), communication skill ($r = .17, p < .001$), and society-oriented future goal ($r = .17, p < .001$). These findings showed that, although both autonomous and controlled motivation were related to a similar range of academic and non-academic outcomes, the strength of the correlations with autonomous motivation was generally stronger than those with controlled motivation.

In terms of CCA interpersonal relationships, CCA instructor autonomy support was positively correlated with CCA parental autonomy support ($r = .61, p < .001$), CCA peer autonomy support ($r = .82, p < .001$), school belongingness ($r = .54, p < .001$), academic buoyancy ($r = .47, p < .001$), educational aspiration ($r = .45, p < .01$), classroom engagement ($r = .50, p$

< .001), confidence ($r = .53, p < .01$), lifelong learning ($r = .57, p < .001$), teamwork ($r = .59, p < .001$), leadership skill ($r = .51, p < .001$), communication skill ($r = .56, p < .001$), and society-oriented future goal ($r = .57, p < .001$). These correlations showed that the higher the CCA instructors' autonomy support, the higher the CCA parental autonomy support, CCA peer autonomy support, school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

CCA parental autonomy support was positively correlated with CCA peer autonomy support ($r = .59, p < .001$), school belongingness ($r = .47, p < .001$), academic buoyancy ($r = .43, p < .001$), educational aspiration ($r = .36, p < .01$), classroom engagement ($r = .46, p < .001$), confidence ($r = .51, p < .01$), lifelong learning ($r = .43, p < .001$), teamwork ($r = .47, p < .001$), leadership skill ($r = .50, p < .001$), communication skill ($r = .52, p < .001$), and society-oriented future goal ($r = .47, p < .001$), suggesting that the higher the CCA parental autonomy support, the higher their CCA peer autonomy support, school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

The third CCA interpersonal relationship factor, CCA peer autonomy support, was also found to be positively correlated with school belongingness ($r = .55, p < .001$), academic buoyancy ($r = .44, p < .001$), educational aspiration ($r = .50, p < .01$), classroom engagement ($r = .51, p < .001$), confidence ($r = .51, p < .01$), lifelong learning ($r = .60, p < .001$), teamwork ($r = .62, p < .001$), leadership skill ($r = .51, p < .001$), communication skill ($r = .56, p < .001$), and society-oriented future goal ($r = .57, p < .001$). These correlations showed that the higher the students' perceived CCA peer autonomy support, the higher their school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

On the whole, the correlations suggested preliminary support for the hypothesised relationships between CCA motivational orientations, CCA interpersonal-relationship factors, and academic and non-academic outcomes. Nonetheless, it is important to determine the unique role of CCA participation explained by the respective predictors through SEM that accounts for shared variance with other variables examined in the study, including covariates. This is the focus of the next analysis.

Table 4.2

Time-1 Correlation Matrix for CCA Factors, Academic and Non-Academic Outcomes

	Age (F1)	Gender (F2)	Parental Education (F3)	Uniformed Groups (F4)	Visual & Performing Arts (F5)	Clubs & Societies (F6)	Physical Sports (F7)	Intensity (F8)	Breadth (F9)	Duration (F10)	Autonomous Motivation (F11)	Controlled Motivation (F12)	CCA Instructor Autonomy Support (F13)	Parental Autonomy Support (F14)	Peer Autonomy Support (F15)	School Belongingness (F16)	Academic Buoyancy (F17)	Educational Aspiration (F18)	Classroom Engagement (F19)	Confidence (F20)	Lifelong Learning (F21)	Teamwork (F22)	Leadership Skill (F23)	Communication Skill (F24)	Society-oriented Future Goal (F25)
F11	-08	03	02	01	-01	-14	12	04	-01	-04	-														
F12	01	11	-01	<u>07</u>	<u>-08</u>	02	01	-01	<i>04</i>	-01	33	-													
F13	-06	09	01	01	-01	-12	09	01	-01	-03	64	21	-												
F14	-09	10	08	10	<u>-08</u>	-04	00	-02	01	<u>-06</u>	48	28	61	-											
F15	-07	02	02	02	03	-17	<u>08</u>	06	-01	-03	63	20	82	59	-										
F16	-09	14	07	11	-12	-02	03	-01	02	<u>-07</u>	41	13	54	47	55	-									
F17	-07	15	04	09	-11	-03	03	<u>-05</u>	-01	<u>-07</u>	31	16	47	43	44	58	-								
F18	-04	01	10	08	-01	-04	-05	02	00	<u>-06</u>	32	10	45	36	50	61	49	-							
F19	<i>-05</i>	10	04	08	<u>-07</u>	03	-04	-03	-02	<u>-06</u>	36	19	50	46	51	67	60	62	-						
F20	-02	20	<i>05</i>	08	-12	02	05	01	02	-02	42	17	53	51	51	60	63	50	59	-					
F21	-01	06	06	05	-03	-03	01	03	00	-02	45	14	57	43	60	60	50	69	64	68	-				
F22	02	<i>07</i>	<i>05</i>	<u>05</u>	-05	-05	04	04	-01	02	44	16	59	47	62	62	53	57	63	73	76	-			
F23	<u>05</u>	09	07	<u>07</u>	<u>-09</u>	01	03	02	03	03	38	15	51	50	51	52	50	43	53	70	58	72	-		
F24	-02	12	08	05	<i>-06</i>	-02	03	01	00	-02	44	17	56	52	56	57	58	53	64	78	72	81	76	-	
F25	-02	<u>07</u>	06	<u>07</u>	-02	-03	-02	02	01	-03	45	17	57	47	57	58	50	58	61	68	83	75	63	74	-

Note 1. Decimal point omitted. r values significant at $p < .001$ are presented in **bold**, $p < .01$ underlined, and $p < .05$ in *italics*.

Note 2. F1 = Age, F2 = Gender, F3 = Parental Education, F4 = Uniformed Groups, F5 = Visual and Performing Arts, F6 = Clubs and Societies, F7 = Physical Sports, F8 = Intensity, F9 = Breadth, F10 = Duration, F11 = Autonomous Motivation, F12 = Controlled Motivation, F13 = CCA Teacher Autonomy, F14 = CCA Parental Autonomy

Support, F15 = CCA Peer Autonomy Support, F16 = School Belongingness, F17 = Academic Buoyancy, F18 = Educational Aspiration, F19 = Classroom Engagement, F20 = Confidence, F21 = Lifelong Learning, F22 = Teamwork, F23 = Leadership Skill, F24 = Communication Skill, F25 = Society-oriented Future Goal.

Note 3. Gender (1 = female, 2 = male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0 - 2 hours, 2 = 3 - 4 hours, 3 = 5 - 6 hours, 4 = 7 - 8 hours, 5 = 9 - 10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months). CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (1), non-Physical Sports (0).

4.4 Hierarchical Approach to Mediation Analysis

The central focus of the present study was to test the hypothesised multivariate CCA model via path analysis, which is a statistical technique in structural equation modelling (SEM). The model is one that hypothesised the role of CCA motivational orientations (autonomous and controlled motivation) in mediating the relationships between CCA type and quantity predictors, as well as CCA interpersonal relationships (CCA instructor autonomy support, CCA parental autonomy support and CCA peer autonomy support) on one side of the model, and academic and non-academic outcomes on the other side, while controlling for covariates (age, gender and parental education).

The variables of CCA types represent students' main CCA membership. Specifically, students whose main CCA was used to name a CCA-type variable (e.g., Uniformed Groups) were dummy-coded 1 while all other students whose main CCA was not classified as Uniformed Groups were dummy-coded 0. A similar coding procedure was done for the other CCA-type variables of Visual and Performing Arts and Clubs and Societies. Physical Sports was designated as a reference CCA group (dummy-coded 0) against which all the other CCA types (i.e., Uniformed Groups, Visual and Performing Arts, and Clubs and Societies) were compared. Therefore, the variable of Physical Sports was excluded from the models. This means that a positive regression weight or beta coefficient associated with the effect of a CCA-type variable (e.g., Uniformed Groups) on an outcome variable (e.g., autonomous motivation) indicated that students whose main CCA was classified as Uniformed Groups were higher on autonomous motivation than students whose main CCA was classified as Physical Sports. In contrast, a negative regression weight or beta coefficient associated with the effect of Uniformed Groups on autonomous motivation indicated that students whose main CCA was Uniformed Groups were lower on their autonomous motivation than students whose main CCA was classified as Physical Sports.

One of the two analytic approaches to performing a mediational path analysis in this study was the hierarchical and incremental approach. In Step 1 of this approach, covariates or control variables (age, gender and parental education) were entered as the only set of predictors of mediators (autonomous and controlled motivation) and outcomes (e.g., school belongingness). In Step 2, CCA types were added as a set of predictors, whereas in Step 3, quantitative indicators of CCA participation (intensity, duration, and breadth) were entered as a set of predictors of motivational orientations and outcomes in the model. In Step 4, CCA interpersonal relationships (instructor, parental, and peer autonomy supports) were added as predictors of motivational orientations and outcomes. Lastly, in Step 5, the two CCA motivational orientations as mediators in the hypothesised model were entered as predictors of outcomes. The models tested in Steps 1 – 5 are saturated ‘fully forward’ model in which all the possible paths from predictors to outcomes (or predicted variables) were freed or estimated, resulting in ($\chi^2 = 0$, $df = 0$, RMSEA = 0.00, CFI = 1.00, and TLI = 1.00).

These step-by-step entries were done to evaluate the change of explained variance (ΔR^2) in each predicted factor and of standardised beta (β) parameters for the various predictors when a new set of predictors were entered. This approach to evaluating the strength of the relationships between CCA predictors and predicted factors (mediators and outcomes) is robust because the shared variance that might exist among variables was controlled. Table 4.3 reports the standardised beta coefficients (β) for respective predictors and the explained variance (R^2) in each outcome examined in the study.

Step 1: Entering covariates as predictors. In the first step, three covariates (age, gender, and parental education) were entered as predictors of each of the motivational orientation mediators and outcomes. Age negatively predicted autonomous motivation ($\beta = -.07$, $p < .01$), school belongingness ($\beta = -.09$, $p < .001$), academic buoyancy ($\beta = -.07$, $p < .01$), classroom engagement ($\beta = -.04$, $p < .05$), and positively predicted leadership skill ($\beta = .06$, $p < .01$). This showed that older students tended to be lower on autonomous

motivation, school belongingness, academic buoyancy, and classroom engagement, but higher on their perceived leadership skills. Gender predicted controlled motivation ($\beta = .09$, $p < .001$), school belongingness ($\beta = .10$, $p < .001$), academic buoyancy ($\beta = -.12$, $p < .001$), classroom engagement ($\beta = .07$, $p < .01$), confidence ($\beta = .15$, $p < .001$), teamwork ($\beta = -.05$, $p < .05$), leadership skill ($\beta = .07$, $p < .01$), communication skill ($\beta = .08$, $p < .001$) and society-oriented future goal ($\beta = .05$, $p < .05$), suggesting that male students were higher on controlled motivation, school belongingness, classroom engagement, confidence, leadership skill, communication skill, and society-oriented future goal than female students, but lower on academic buoyancy and teamwork. Parental education predicted school belongingness ($\beta = .05$, $p < .05$), educational aspiration ($\beta = .10$, $p < .001$), lifelong learning ($\beta = .05$, $p < .05$), teamwork ($\beta = .04$, $p < .05$), leadership skill ($\beta = .07$, $p < .01$), communication skill ($\beta = -.07$, $p < .001$) and society-oriented future goal ($\beta = .06$, $p < .05$). Collectively, age, gender and parental education explained around 1% of the variance in autonomous and controlled motivation, and between 1% and 2% of the variance in the outcomes, showing that these covariates accounted for a small amount of variation in these variables.

Step 2: Entering CCA types as predictors, controlling for covariates. To address RQ1 “To what extent do students in three different CCA types (i.e., Visual and Performing Arts, Clubs and Societies, Uniformed Groups) differ from those in Physical Sports (i.e., reference group) in terms of their CCA motivational orientations as well as academic and non-academic outcomes?”, in the second step, three CCA types (Uniformed Groups, Visual and Performing Arts, and Clubs and Societies), with Physical Sports as a reference or “left out” group, were entered into the model. Over and above the effects of covariates, participation in Uniformed Groups negatively predicted autonomous motivation ($\beta = -.06$, $p < .05$), and positively predicted educational aspiration ($\beta = .08$, $p < .01$), classroom engagement ($\beta = .07$, $p < .05$), and society-oriented future goal ($\beta = .06$, $p < .05$). This suggests that students in the Uniformed Groups demonstrated a lower level of autonomous

motivation but higher levels of classroom engagement, educational aspiration, and society-oriented future goal than students who participated in Physical Sports.

Participation in Visual and Performing Arts did not significantly predict any of the outcomes, suggesting that students who participated in Physical Sports and Visual and Performing Arts did not differ in their level of academic and non-academic outcomes. Finally, participation in Clubs and Societies positively predicted autonomous motivation ($\beta = .12, p < .001$) and teamwork ($\beta = .05, p < .05$), showing that students who participated in Clubs and Societies demonstrated higher levels of autonomous motivation and teamwork than students who took part in Physical Sports.

Uniformed Groups, Visual and Performing Arts and Physical Sports contributed around 2% of the variance in autonomous motivation and 1% in controlled motivation, as well as between 1% and 3% of the variance in academic and non-academic outcomes. Relative to prior step, the incremental variance attributed to CCA type is around 1%, indicating that CCA membership accounts for minimal variance in the respective outcome variables.

Step 3: Entering quantitative indicators of CCA participation as predictors, controlling for covariates and CCA types. To address RQ2 “To what extent do quantitative indicators of students’ CCA participation (i.e., the breadth, duration, and intensity of CCA participation) predict their CCA motivational orientations and academic and non-academic outcomes?”, the third step in the analysis included quantitative indicators of CCA participation (intensity, duration and breadth of CCA participation) as predictors. The intensity of CCA participation did not significantly predict motivational orientations and most of the outcomes, with the β values ranging from $-.05$ to $.02$, except academic buoyancy ($\beta = -.06, p < .05$). Likewise, the breadth of CCA participation did not significantly predict motivational orientations and the outcomes, with the β values ranging from $-.15$ to $.12$. Similarly, the duration of CCA participation did not predict motivational

orientations and any of the outcomes, with values ranging from -.03 to .01. CCA intensity, breadth and duration contributed 2% of the variance in autonomous motivation and 1% in that of controlled motivation, and approximately 1% to 3% of the variance in academic and non-academic outcomes. CCA quantity indicators conferred an incremental invariance of around 1% over prior step in CCA model. Thus, CCA quantity indicators contribute relatively little towards the variance of various predictors.

Step 4: Entering CCA interpersonal relationships, controlling for covariates, CCA types and quantitative indicators of CCA participation. To address RQ3, “To what extent do students’ perceptions of CCA interpersonal contexts (i.e., perceived CCA instructors, CCA peers, and CCA parental autonomy support) predict their CCA motivational orientations and academic and non-academic outcomes?”, in Step 4, students’ perceptions of CCA interpersonal-relationships factors were included as predictors in the model, while controlling for the effects of the sets of predictors entered in the previous three steps. CCA teacher autonomy support positively predicted most factors: autonomous motivation ($\beta = .36, p < .001$), school belongingness ($\beta = .20, p < .001$), academic buoyancy ($\beta = .24, p < .001$), educational aspiration ($\beta = .10, p < .01$), classroom engagement ($\beta = .16, p < .001$), confidence ($\beta = .23, p < .001$), lifelong learning ($\beta = .21, p < .001$), teamwork ($\beta = .19, p < .001$), leadership skill ($\beta = .18, p < .001$), communication skill ($\beta = .23, p < .001$) and society-oriented future goal ($\beta = .27, p < .001$). This shows that the higher the level of CCA instructor autonomy support perceived by students, the higher the level of students’ autonomous motivation, school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

Parental autonomy support was positively predictive of the motivational orientations, autonomous motivation ($\beta = .10, p < .001$) and controlled motivation ($\beta = .24, p < .001$), and all the outcomes, including school belongingness ($\beta = .15, p < .001$), academic buoyancy (β

= .20, $p < .001$), educational aspiration ($\beta = .07$, $p < .01$), classroom engagement ($\beta = .20$, $p < .01$), confidence ($\beta = .26$, $p < .001$), lifelong learning ($\beta = .08$, $p < .01$), teamwork ($\beta = .12$, $p < .001$), leadership skill ($\beta = .27$, $p < .001$), communication skill ($\beta = .24$, $p < .001$), and society-oriented future goal ($\beta = .14$, $p < .001$). This shows that the higher the level of CCA parental autonomy support perceived by students, the higher the level of students' autonomous and controlled motivation, school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

Peer autonomy support was found to positively predict autonomous motivation ($\beta = .26$, $p < .001$), and of all of the outcomes, including school belongingness ($\beta = .30$, $p < .001$), academic buoyancy ($\beta = .13$, $p < .01$), educational aspiration ($\beta = .38$, $p < .001$), classroom engagement ($\beta = .27$, $p < .001$), confidence ($\beta = .17$, $p < .001$), lifelong learning ($\beta = .38$, $p < .001$), teamwork ($\beta = .41$, $p < .001$), leadership skill ($\beta = .22$, $p < .001$), communication skill ($\beta = .24$, $p < .001$) and society-oriented future goal ($\beta = .28$, $p < .001$). This shows that the higher the level of CCA peer autonomy support, the higher the level of students' autonomous motivation, school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

Collectively, CCA instructor autonomy support, CCA parental autonomy support, and CCA peer autonomy support accounted for 43% and 8% of the variance in autonomous and controlled motivation respectively, and between 24% and 41% of the variance in the outcomes. The incremental invariance of CCA interpersonal relationships over prior step ranged between 8% and 43%. These findings showed that a significant amount of the variation in motivational orientations and outcomes was attributable to students' perceptions of the CCA interpersonal-relationship factors.

Step 5: Entering CCA motivational orientation as predictors, controlling for covariates, CCA types, quantitative indicators of CCA participation and CCA interpersonal-relationship perceptions. To address RQ4, “To what extent do students’ CCA motivational orientations mediate the link between the types of CCA that students participate in, the quantitative indicators of their CCA participation, and their perceptions of CCA interpersonal contexts to academic and non-academic outcomes?”, the fifth step included CCA motivational orientations — alongside covariates, CCA types, quantitative indicators of CCA participation, and CCA interpersonal relationships—as predictors of the outcomes. This step was to examine if motivational orientations, considered as mediators in the hypothesized model, predicted outcomes over and above the effects of all the other predictors previously entered into the model. It is of interest to us to see if the effects of CCA types, quantitative indicators of CCA participation, and CCA interpersonal-relationship perceptions changed or decreased as a result of mediation by motivational orientations. The results showed that autonomous motivation positively predicted confidence ($\beta = .07, p < .05$), lifelong learning ($\beta = .09, p < .05$), communication skill ($\beta = .06, p < .05$), and society-oriented future goal ($\beta = .08, p < .05$). Controlled motivation positively predicted classroom engagement ($\beta = .04, p < .05$), but not did not significantly predict other CCA outcomes, with the β values ranging from $-.04$ to $.01$. Predictors in this step-5 model contributed 27% to 42% of the variance in academic and non-academic outcomes, and autonomous and controlled motivation added only approximately 1% of the variance in the outcomes over the variance explained by predictors in prior step.

In summary, the analyses outlined the effects of various CCA predictors on CCA outcomes controlling for the covariates. The findings revealed that CCA interpersonal context had a significantly large effect on secondary school students’ motivation and CCA outcomes, while the effects of the quantity and type of CCA participation were relatively

negligible. Table 4.4 provides a summary of standardized regression coefficients in the final (Step 5) model.

Table 4.3

Path Analysis Results for Time-1 CCA Model

Predictors	Variables											
	AM	CM	SB	AB	EA	CE	CF	LL	TW	LS	CS	SG
Step 1												
Age	-.07**(.02)	.01(.02)	-.09***(.02)	-.07**(.02)	-.03(.02)	-.04*(.02)	-.01(.02)	-.01(.02)	.03(.02)	.06**(.02)	-.01(.02)	-.01(.02)
Gender	.02(.02)	.09***(.02)	.10***(.02)	.12***(.02)	-.01(.02)	.07**(.02)	.15***(.02)	.04(.02)	.05*(.02)	.07**(.02)	.08***(.02)	.05*(.02)
Parental Education	.01(.02)	-.02(.02)	.05*(.02)	.02(.02)	.10***(.02)	.03(.02)	.04(.02)	.05*(.02)	.04*(.02)	.07**(.02)	-.07**(.02)	.06*(.02)
R ²	.01(.02)	.01*(.02)	.02***(.02)	.02**(.02)	.01**(.02)	.01*(.02)	.03***(.02)	.01(.02)	.01(.02)	.01*(.02)	.01**(.02)	.01(.02)
Step 2												
Age	-.07**(.02)	.01(.02)	-.08***(.02)	-.07**(.02)	-.03(.02)	-.04*(.02)	-.01(.02)	.01(.02)	.03(.02)	.06**(.02)	-.01(.02)	-.01(.02)
Gender	.03 (.02)	.08***(.02)	.09***(.02)	.10***(.02)	.01(.02)	.06**(.02)	.14***(.02)	.04(.02)	.05*(.02)	.05*(.02)	.08***(.02)	.05*(.02)
Parental Education	.02 (.02)	-.02(.02)	.06**(.02)	.03(.02)	.10***(.02)	.03(.02)	.04(.02)	.05*(.02)	.05*(.02)	.07**(.02)	.07**(.02)	.05*(.02)
Uniformed Groups	-.06*(.03)	.04 (.03)	.05(.03)	.02(.03)	.08**(.03)	.07*(.03)	.01(.03)	.02(.03)	-.01(.03)	.02(.02)	.01(.03)	.06*(.03)
Visual and Performing Arts	-.05(.03)	-.01(.03)	-.05(.03)	-.05(.03)	.03(.03)	.01(.03)	-.05(.03)	.01(.03)	-.04(.03)	-.05(.02)	-.02(.03)	.03(.03)
Clubs and Societies	.12***(.03)	.01(.03)	-.02(.02)	-.04(.03)	.01(.03)	.03(.02)	-.02(.02)	-.02(.03)	.05*(.03)	-.01(.02)	-.03(.02)	-.01(.02)
R ²	.02**	.01*	.03***	.02***	.02**	.01**	.03***	.01	.01*	.02**	.02**	.01*
R ² change	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
Step 3												
Age	-.06*(.03)	.03(.03)	-.09*(.03)	-.05(.03)	.01(.03)	-.01(.03)	.01(.03)	.01(.03)	.04(.03)	.09*(.03)	.01(.03)	.01(.03)
Gender	.03(.02)	.08**(.02)	.24***(.02)	.29***(.02)	.01(.02)	.17**(.02)	.41***(.02)	.10(.02)	.12*(.02)	.14*(.02)	.08***(.02)	.05*(.02)
Parental Education	.01(.02)	-.02(.02)	.06**(.02)	.03(.02)	.09*** (.02)	.03(.02)	.04(.02)	.04*(.02)	.04*(.02)	.07**(.02)	.07**(.02)	.05*(.02)
Uniformed Groups	-.06*(.03)	.03(.03)	.12(.03)	.02(.03)	.20**(.03)	.17*(.03)	.02(.03)	.07(.03)	.01(.03)	.06(.03)	.01(.03)	.06*(.03)
Visual and Performing Art	-.05(.03)	-.02(.03)	-.15(.03)	-.16(.03)	.09(.03)	.02(.03)	-.16(.03)	.01(.03)	-.09(.03)	-.15(.03)	-.02(.03)	.03(.03)
Clubs and Societies	.13***(.03)	-.01(.03)	-.11(.03)	-.20(.03)	.01(.03)	.11(.03)	-.10(.03)	-.05(.03)	.03(.03)	-.06(.03)	-.03(.03)	-.01(.03)
Intensity	.01(.02)	-.01(.02)	-.01(.02)	-.06*(.02)	.02(.02)	-.01(.02)	.01(.02)	.03(.02)	-.02(.02)	.02(.02)	.01(.02)	.02(.02)
Breadth	.02(.03)	.04(.03)	.05(.03)	-.04(.03)	-.01(.03)	-.15(.03)	.02(.03)	-.02(.03)	.01(.03)	.12(.03)	-.01(.03)	.01(.03)
Duration	-.01(.03)	-.03(.03)	-.01(.03)	-.01(.03)	-.01(.03)	-.01(.03)	-.01(.03)	-.01(.03)	.0(.03)1	-.01(.03)	-.03(.03)	-.03(.03)
R ²	.02**	.01*	.03***	.03***	.02**	.02**	.03***	.01*	.01*	.02**	.02**	.01*
R ² change	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01

	AM	CM	SB	AB	EA	CE	CF	LL	TW	LS	CS	SG
Step 4												
Age	-.02(.02)	.05(.03)	-.03(.02)	-.01(.02)	.04(.02)	.03(.02)	.05*(.02)	.05*(.02)	.08***(.02)	.11***(.02)	.06*(.02)	.05*(.02)
Gender	-.02(.02)	.06**(.02)	.05**(.02)	.07***(.02)	-.02(.02)	.03(.02)	.10***(.02)	.01(.02)	.01(.02)	.01(.02)	.04*(.02)	.01(.02)
Parental Education	.01(.02)	.04(.02)	.04*(.02)	.01(.02)	.09***(.02)	.01(.02)	.02(.02)	.04*(.02)	.03(.02)	.04*(.02)	.05**(.02)	.04*(.02)
Uniformed Groups	-.04(.02)	.02(.03)	.05*(.02)	.01(.02)	.09***(.02)	.07**(.02)	.01(.02)	.04(.02)	.01(.02)	.02(.02)	.02(.02)	.07**(.02)
Visual and Performing Art	-.04(.02)	-.02(.03)	-.04(.02)	-.05*(.02)	.04(.02)	.02(.02)	-.04(.02)	.01(.02)	-.02(.02)	-.04(.02)	-.01(.02)	.04(.02)
Clubs and Societies	-.05*(.02)	.01(.02)	.04(.02)	-.01(.02)	.06*(.02)	.09***(.02)	.03(.02)	.06**(.02)	.03(.02)	.04(.02)	.03(.02)	.06**(.02)
Intensity	.01(.02)	-.01(.02)	-.01(.02)	-.05(.02)	.01(.02)	-.02(.02)	.01(.02)	.02(.02)	.01(.02)	.01(.02)	-.01(.02)	.02(.02)
Breadth	.01(.02)	.03(.03)	.01(.03)	-.02(.03)	-.01(.02)	-.04*(.02)	-.01(.02)	-.02(.02)	-.02(.02)	.01(.03)	-.01(.03)	-.01(.02)
Duration	-.01(.02)	.03(.03)	.01(.03)	-.03(.03)	-.05*(.03)	-.05*(.03)	-.03(.02)	-.03(.03)	-.01(.02)	-.01(.02)	-.03(.02)	-.03(.02)
CCA Teacher Autonomy Support	.36***(.04)	.05(.04)	.20***(.04)	.24***(.04)	.10**(.04)	.16***(.04)	.23***(.04)	.21***(.04)	.19***(.04)	.18***(.04)	.23***(.04)	.27***(.04)
Parental Autonomy Support	.10***(.02)	.24***(.03)	.15***(.03)	.20***(.03)	.07**(.02)	.20***(.02)	.26***(.03)	.08**(.02)	.12***(.02)	.27***(.03)	.24***(.03)	.14***(.02)
Peer Autonomy Support	.26***(.04)	.02(.04)	.30***(.04)	.13**(.04)	.38***(.04)	.27***(.04)	.17***(.04)	.38***(.04)	.41***(.04)	.22***(.04)	.24***(.04)	.28***(.04)
R ²	.45***	.09***	.36***	.27***	.27***	.32***	.36***	.38***	.42***	.35***	.39***	.38***
R ² change	.43	.08	.33	.24	.25	.30	.33	.37	.41	.33	.37	.37

	AM	CM	SB	AB	EA	CE	CF	LL	TW	LS	CS	SG
Step 5												
Age	-	-	-.04(.02)	-.01(.03)	.04(.03)	.03(.02)	.07*(.02)	.05*(.02)	.08***(.02)	.11***(.02)	.06*(.02)	.05*(.02)
Gender	-	-	.14**(.02)	.18**(.02)	-.06(.02)	.07(.02)	.29***(.02)	.01(.02)	.01(.02)	.01(.02)	.04*(.02)	.01(.02)
Parental Education	-	-	.04*(.02)	.02(.02)	.08***(.02)	.01(.02)	.02(.02)	.04*(.02)	.03(.02)	.04*(.02)	.05**(.02)	.04*(.02)
Uniformed Groups	-	-	.15*(.02)	.03(.02)	.22***(.02)	.17**(.02)	-.04(.02)	.05*(.02)	.02(.02)	.02(.02)	.02(.02)	.07**(.02)
Visual and Performing Art	-	-	-.12(.02)	-.14*(.02)	.10(.02)	.04(.02)	-.13(.02)	.01(.02)	-.02(.02)	-.04(.02)	-.01(.02)	.04(.02)
Clubs and Societies	-	-	.16(.02)	-.02(.02)	.21*(.02)	.31***(.02)	.14(.02)	.06**(.02)	.03(.02)	.04(.02)	.04(.02)	.06**(.02)
Intensity	-	-	-.01(.02)	-.06*(.02)	.01(.02)	-.02(.02)	.01(.02)	.02(.02)	-.01(.02)	.01(.02)	-.01(.02)	.02(.02)
Breadth	-	-	.01(.02)	-.08(.02)	-.05(.02)	-.20*(.02)	.03(.02)	-.02(.02)	.07*(.02)	.01(.02)	-.01(.02)	-.01(.02)
Duration	-	-	-.01(.03)	-.01(.03)	-.01*(.03)	-.01*(.03)	-.01(.02)	-.03(.03)	-.01(.02)	-.01(.02)	-.03(.02)	-.03(.02)
CCA Teacher Autonomy Support	-	-	.19***(.04)	.25***(.04)	.10*(.04)	.16***(.04)	.20***(.04)	.18***(.04)	.18***(.04)	.17***(.04)	.21***(.04)	.24***(.04)
Parental Autonomy Support	-	-	.16***(.03)	.20***(.03)	.07**(.03)	.19***(.03)	.25***(.03)	.07**(.03)	.12***(.03)	.27***(.03)	.23***(.03)	.13***(.03)
Peer Autonomy Support	-	-	.29***(.04)	.14***(.04)	.38***(.04)	.27***(.04)	.15***(.04)	.36***(.04)	.40***(.04)	.21***(.04)	.22***(.04)	.26***(.04)
Autonomous Motivation	-	-	.04(.03)	-.04(.03)	-.01(.04)	-.02(.03)	.07*(.03)	.09*(.04)	.03(.03)	.02(.03)	.06*(.03)	.08*(.03)
Controlled Motivation	-	-	-.04(.02)	.02(.02)	-.01(.02)	.04*(.02)	-.01(.02)	-.02(.02)	-.01(.02)	-.02(.02)	-.01(.02)	.01(.02)
R ²	-	-	.36***	.27***	.27***	.32***	.37***	.39***	.42***	.35***	.39***	.39***
R ² change	-	-	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01

Note 1. * $p < .05$, ** $p < .01$, *** $p < .001$.

Note 2. AM = Autonomous Motivation, CM = Controlled Motivation, SB = School Belongingness, AB = Academic Buoyancy, EA = Educational Aspiration, CE = Classroom Engagement, CF = Confidence, LL = Lifelong Learning, TW = Teamwork, LS = Leadership Skill, CS = Communication Skill, SG = Society-oriented Future Goal.

Note 3. Gender (1 = female, 2 = male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0 - 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months). CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (0) is a reference group in this path analysis.

Note 4. Values in the parentheses are standard errors.

Table 4.4

Summary of Standardized Regression Coefficients (Betas) in the Path Mediation Models Predicting Different Outcomes at Time 1

Variables	Covariates		CCA Types				Quantity			Interpersonal Relationship			Motivation	
	Age	Gender	Parental Education	Uniformed Groups	Art	Club	Intensity	Breadth	Duration	Instructor	Parent	Peer	Autonomous	Controlled
Autonomous Motivation	-.02(.02)	-.02(.02)	.00(.02)	-.04(.02)	-.04(.02)	-.05(.02)	.01(.02)	.01(.02)	-.01(.02)	.36***(.03)	.10***(.02)	.26***(.04)	-	-
Controlled Motivation	.05*(.03)	.06**(.02)	-.04(.02)	.02(.03)	-.02(.03)	.00(.03)	-.01(.02)	.03(.02)	-.03(.02)	.05(.04)	.24***(.03)	.02(.04)	-	-
School Belongingness	-.03(.02)	.05(.02)	.04*(.02)	.05(.02)	-.04(.02)	.04(.02)	-.01(.02)	.00(.02)	-.02(.03)	.19***(.04)	.16***(.03)	.29***(.04)	.04(.03)	-.04(.02)
Academic Buoyancy	-.01(.03)	.07**(.02)	.01(.02)	.01*(.02)	-.05*(.02)	-.01(.02)	-.05(.02)	-.02(.02)	-.03(.03)	.25***(.04)	.20***(.03)	.14***(.04)	-.04(.03)	.02(.02)
Educational Aspiration	.04(.03)	-.02(.02)	.09***(.02)	.09***(.02)	.04(.02)	.06(.02)	.01(.02)	-.01(.02)	-.05*(.03)	.10***(.04)	.07***(.03)	.38***(.04)	-.01(.04)	-.01(.02)
Classroom Engagement	.03(.02)	.03(.02)	.01(.02)	.07**(.02)	.02(.02)	.09***(.02)	-.02(.02)	-.04*(.02)	-.05(.03)	.16***(.04)	.19***(.03)	.27***(.04)	-.02(.03)	.04*(.02)
Confidence	.05*(.02)	.10***(.02)	.02(.02)	.01(.02)	-.04(.02)	.03(.02)	.01(.02)	-.01(.02)	-.03(.02)	.20***(.04)	.25***(.03)	.15***(.04)	.07*(.03)	-.01(.02)
Lifelong Learning	.05*(.02)	.01(.02)	.04*(.02)	.05*(.02)	.01(.02)	.06**(.02)	.02(.02)	-.02(.02)	-.03(.02)	.18***(.04)	.07***(.02)	.36***(.04)	.09*(.04)	-.02(.02)
Teamwork	.08***(.02)	.01(.02)	.03(.02)	.02(.02)	-.02(.02)	.03(.02)	.01(.02)	-.02(.02)	.00(.02)	.18***(.04)	.12***(.03)	.40***(.04)	.03(.03)	-.01(.02)
Leadership Skills	.11***(.02)	.01(.02)	.04*(.02)	.02(.02)	-.04(.02)	.04*(.02)	.01(.02)	.01(.02)	-.01(.02)	.17***(.04)	.27***(.03)	.21***(.04)	.02(.03)	-.02(.02)
Communication Skills	.06**(.02)	.04*(.02)	.05**(.02)	.02(.02)	-.01(.02)	.04(.02)	.00(.02)	-.01(.02)	-.03(.02)	.21***(.04)	.23***(.03)	.22***(.04)	.06*(.03)	-.01(.02)
Society-oriented Future Goals	.05(.02)	.01(.02)	.04*(.02)	.07**(.02)	.04(.02)	.06*(.02)	.02(.02)	-.01(.02)	-.03(.02)	.24***(.04)	.13***(.03)	.26***(.04)	.08*(.03)	.01(.02)

Note 1. * $p < .05$, ** $p < .01$, *** $p < .001$.

Note 2. Art = Visual and Performing Arts, Club = Clubs and Societies, Instructor = Instructor autonomy support, Parent = CCA Parental autonomy support, Peer = CCA Peer autonomy support, Autonomous = Autonomous motivation, Controlled = Controlled motivation.

Note 3. Gender (1 = female, 2 = male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0 - 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months). CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (0) is a reference group in this path analysis.

Note 4. Values in the parentheses are standard errors.

4.5 Bootstrapping Approach to Mediation Analysis

The previous analysis sought to examine the mediational model via the five-step hierarchical approach. This approach allowed us to identify the incremental contribution of the different sets of predictors entered sequentially into the model to predict outcomes. These sets of predictors of mediators and outcomes were as follows:

1. covariates (age, gender and parental education);
2. CCA types (Uniformed Groups, Visual and Performing Arts, and Clubs and Societies; Physical Sports as the reference group);
3. quantitative indicators of CCA participation (intensity, breadth and duration);
4. perceptions of CCA interpersonal relationship factors (CCA instructor autonomy support, CCA parental autonomy support and CCA peer autonomy support); and
5. CCA motivational orientations (CCA autonomous and controlled motivation) as mediators in the model.

The next analysis aimed to take a bootstrapping approach to examine the significance of the mediating role of CCA motivation in the relationships between CCA types, quantitative indicators of CCA participation, and CCA interpersonal-relationship perceptions on the one side, and CCA outcomes on the other side of the model. This analysis was done also to address RQ4.

The bootstrapping technique in this study made use of the Mplus syntax for multiple mediation prepared by Preacher and Hayes (2008) to estimate parameters of both direct and indirect effects related to the two motivational orientations in linking predictors and outcomes. For the purpose of the analysis, parameter estimates and 95% bias-corrected confidence intervals of the indirect effects were conducted with 5,000 random samples.

Mediation occurs when indirect effects are significant. More specifically, it occurs when the confidence intervals for the parameter estimates do not include zero. Table 4.5 reports the direct, indirect and total effects (and their 95% confidence intervals) in the mediation model.

As can be seen in Table 4.5, the total effects of instructor, parental, and peer autonomy support on each of the academic and non-academic outcomes were significant. These total effects can be broken down into direct and indirect effects. While the direct effects of teacher, parental and peer autonomy support on all the outcomes were significant, only a few of the indirect effects mediated through the two motivational orientations were significant. The indirect effects of instructor and peer autonomy support on confidence through autonomous motivation were significant ($\beta = .02$ and $\beta = .02$, $p < .05$, respectively). So were the effects of these two interpersonal-relationship factors on lifelong learning ($\beta = .03$ and $\beta = .03$, $p < .05$, respectively), confidence ($\beta = .02$ and $\beta = .02$, $p < .05$, respectively), and society-oriented future goal ($\beta = .03$ and $\beta = .02$, $p < .05$, respectively). The effects of instructor and peer autonomy support on communication skill through autonomous motivation were marginally significant ($\beta = .02$ and $\beta = .01$, $p < .10$, respectively). The only significant indirect effect of parental autonomy support, mediated by controlled motivation, was on classroom engagement ($\beta = .01$, $p < .05$). Taken together, the findings showed that the role of autonomous and controlled motivation in mediating the effects of predictors on outcomes was hardly significant, and even when these mediated effects were significant, they were relatively small. Importantly, the mediation results derived from the hierarchical and bootstrapping approaches corroborated, providing evidence for the lack of mediation by the two motivational orientations in the links between predictors and outcomes.

Table 4.5

Summary of Direct, Indirect, and Total Effects in the Multiple Mediation Path Models at Time 1: A Bootstrapping Approach

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting School Belongingness					
Age	-.03(-.07- .02)	.01(-.01- .01)	.01(-.01 - .01)	-.03(-.08- .02)	-.03(-.08-.02)
Gender	.05** (.01 - .09)	.01(-.01- .01)	.01(-.01 - .01)	.01(-.01- .01)	.05** (.01-.08)
Parental Education	.04*(.01 - .07)	.01(-.01- .01)	.01(-.01 - .01)	.01(-.01- .01)	.04*(.01-.07)
Uniformed Groups	.15*(.03 - .27)	-.01(-.02- .01)	.01(-.01 - .01)	-.01(-.02- .01)	.15* (.03-.27)
Visual and Performing Arts Clubs and Societies	-.12(-.25- .01)	-.01(-.02- .01)	-.01(-.01 - .01)	.01(-.02- .01)	-.12 (-.26-.01)
CCA Intensity	.16(-.01- .32)	-.01(-.03- .01)	.01(-.01 - .01)	-.01(-.03-.01)	.15(-.02-.01)
CCA Breadth	-.01(-.06- .03)	.01(-.01- .01)	.01(-.01 - .01)	.01(-.01- .01)	-.01 (-.06-.03)
CCA Duration	.01(-.17- .18)	.01(-.01- .02)	-.01(-.02 - .01)	-.01(-.02- .01)	.01(-.16-.18)
Instructor Autonomy Support	-.01(-.01- .01)	.01(-.01- .01)	.01(-.01 - .01)	.01(-.01- .01)	-.01(-.01-.01)
Parental Autonomy Support	.20*** (.12 - .28)	.01(-.01- .01)	.01(-.01 - .01)	.01 (-.01 - .04)	.22*** (.14 - .29)
Peer Autonomy Support	.16*** (.11 - .21)	.01(-.01- .01)	-.01 (-.02 - .01)	-.01 (-.02 - .01)	.15*** (.10- .20)
Peer Autonomy Support	.31*** (.23 - .39)	.01 (-.01 - .03)	-.01(-.01 - .01)	.01 (-.01 - .03)	.30*** (.22 - .37)
Predicting Academic Buoyancy					
Age	-.01(-.06-.06)	.01(-.01- .01)	-.01(-.06-.06)	.01(-.01-.01)	.01(-.06 - .06)
Gender	.18**(.07 - .29)	.01(.01 - .01)	.01(-.01 - .01)	.01(-.01- .02)	.19**(.08 - .29)
Parental Education	.02(-.02- .05)	.01(-.01- .01)	-.01(-.01 - .01)	-.01(-.01- .01)	-.01(-.02 - .05)
Uniformed Groups	.03(.01 - .16)	.01(-.01- .06)	-.01(-.01 - .01)	.03(-.01 - .01)	.03(-.03 - .01)
Visual and Performing Arts Clubs and Societies	-.14* (-.28 - -.01)	.01(.01 - .01)	-.01(-.01 - .01)	-.01(-.01- .01)	.01(-.05 - .09)
CCA Intensity	-.02(-.20- .15)	.01(-.01- .03)	-.01(-.01 - .01)	.01(-.01- .03)	-.01(-.05 - .04)
CCA Breadth	-.06*(-.10 - -.01)	.01(-.01- .01)	-.01(-.01 - .01)	-.01(-.01- .01)	-.06*(-.10 -- .01)
CCA Duration	-.08(-.26- .10)	-.01(-.02- .01)	.01(-.01 - .02)	.01(-.01-.02)	-.08(.26 - .10)
Instructor Autonomy Support	-.01(-.01- .01)	.01(.01 - .01)	.01(.01-.01)	.01(.01-.01)	-.01(-.01 - .01)
Parental Autonomy Support	.25***(.18 - .33)	-.02(-.04- -.01)	.01 (-.01 - .01)	-.01 (-.04- -.01)	.24*** (.17 - .31)
Peer Autonomy Support	.20*** (.15 - .25)	-.01(-.01- .01)	.01 (-.01 - .02)	.01 (-.01 - .01)	.20*** (.15 - .26)
Peer Autonomy Support	.15***(.07 - .22)	-.02* (-.03 - -.01)	.01 (-.01 - .01)	-.01 (-.03 - .01)	.13*** (.06 - .20)

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Educational Aspiration					
Age	.04(-.01 - .09)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.04 (-.01 - .09)
Gender	-.02(-.06 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.02 (-.06 - .01)
Parental Education	.09*** (.05 - .12)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.08*** (.04 - .11)
Uniformed Groups	.08*** (.04 - .11)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.09*** (.04 - .13)
Visual and Performing Arts	.04(-.01 - .08)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.04 (-.01 - .09)
Clubs and Societies	.06* (.01 - .11)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.01* (.11 - .61)
CCA Intensity	.01(-.03 - .05)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.01 (-.03 - .05)
CCA Breadth	-.01(-.06 - .03)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	-.01 (-.06 - .03)
CCA Duration	-.01* (.01 - .01)	.01(.01 - .01)	.01 (.01 - .01)	.01(.01 - .01)	-.01* (-.01 - .01)
Instructor Autonomy Support	.10**(.03 - .17)	-.01(-.03 - .02)	.01(.01 - .01)	-.01(-.03 - .02)	.10** (.03 - .16)
Parental Autonomy Support	.06**(.02 - .15)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.06** (.02 - .10)
Peer Autonomy Support	.36*** (.28 - .44)	-.01(-.02 - .02)	.01(-.01 - .01)	-.01(-.02 - .01)	.35*** (.28 - .43)

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Classroom Engagement					
Age	.03(-.02 - .08)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.03 (-.02 - .08)
Gender	.03(-.01 - .07)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.03 (-.01 - .07)
Parental Education	.01(-.02 - .05)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.01 (-.02 - .05)
Uniformed Groups	.07** (.02 - .11)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.07** (.02 - .11)
Visual and Performing Arts	.02(-.01 - .06)	-.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.02 (-.03 - .06)
Clubs and Societies	.04*** (-.01 - .09)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.04*** (-.01 - .09)
CCA Intensity	-.02(-.06 - .02)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	-.02 (-.06 - .02)
CCA Breadth	-.04* (-.08 - -.01)	.01(-.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	-.04* (-.08 - -.01)
CCA Duration	-.05*(-.10 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.05* (-.10 - .01)
Instructor Autonomy Support	.16*** (.09 - .24)	-.01(-.03 - .01)	.01(-.01 - .01)	-.01(-.03 - .01)	.15*** (.08 - .22)
Parental Autonomy Support	.17*** (.13 - .22)	-.01(-.01 - .01)	.01* (.01 - .02)	.01(-.01 - .02)	.18*** (.14 - .22)
Peer Autonomy Support	.26*** (.18 - .34)	-.01(-.02 - .01)	.01(-.01 - .01)	-.01(-.02 - .01)	.25*** (.18 - .33)

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Confidence					
Age	.05* (.01 - .10)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.05* (.01 - .10)
Gender	.10*** (.07 - .13)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.10*** (.06 - .13)
Parental Education	.02** (-.02 - .05)	-.01*(-.01 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	.02** (-.02 - .05)
Uniformed Groups	.01(-.03 - .05)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.03 - .05)
Visual and Performing Arts	.10(.07 - .13)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.10(.06 - .13)
Clubs and Societies	.10(.07 - .13)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.10(.06 - .13)
CCA Intensity	.10(.07 - .13)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.10(.06 - .13)
CCA Breadth	.10(.07 - .13)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.10(.06 - .13)
CCA Duration	.10(.07 - .13)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.10(.06 - .13)
Instructor Autonomy Support	.23***(.15 - .31)	.02* (.01 - .04)	-.01(-.01 - .01)	.02* (.01 - .04)	.25*** (.16-.30)
Parental Autonomy Support	.26***(.21 - .32)	.01(.01 - .01)	-.01(-.01 - .01)	.01(-.01 - .02)	.27***(.21-.32)
Peer Autonomy Support	.17***(.10 - .25)	.02* (.01 - .03)	.01(-.01 - .01)	.02* (.01 - .04)	.19***(.11-.27)

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Lifelong Learning					
Age	.05* (.01 - .10)	-.01(-.01 - .01)	-.01(-.01 - .01)	.05(.01- .10)	.05* (.01 - .10)
Gender	.05(.01 - .10)	-.01(-.01 - .01)	-.01(-.01 - .01)	.05(.01- .10)	.05(.01 - .10)
Parental Education	.05* (.01 - .10)	.01(-.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	.04* (.01 - .07)
Uniformed Groups	.01* (-.03 - .05)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.01* (-.03 - .05)
Visual and Performing Arts	-.04(-.09 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.04(-.09 - .10)
Clubs and Societies	.03** (-.01 - .07)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.03** (-.01 - .07)
CCA Intensity	.02(-.02 - .05)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.02(-.02 - .05)
CCA Breadth	.05(.01 - .10)	-.01(-.01 - .01)	-.01(-.01 - .01)	.05(.01- .10)	-.02(-.05 - .02)
CCA Duration	-.03(-.08 - .02)	-.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	-.03(-.08 - .02)
Instructor Autonomy Support	.17*** (.10 - .25)	.03* (.01 - .07)	-.01(-.01 - .01)	.03*(.01 - .06)	.19*** (.13-.26)
Parental Autonomy Support	.06** (.02 - .10)	.01# (.01 - .02)	-.01(-.02 - .01)	.01(-.01 - .01)	.07**(.03-.10)
Peer Autonomy Support	.33***(.26 - .41)	.03* (.01 - .04)	.01(-.01 - .01)	.02* (.01 - .04)	.35***(.28-.42)

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Teamwork					
Age	.05*** (.01 - .10)	-.01(-.01 - .01)	-.01(-.01 - .01)	.05(.01 - .10)	.05** (.01 - .10)
Gender	.05(.01 - .10)	-.01(-.01 - .01)	-.01(-.01 - .01)	.05(.01 - .10)	.05(.01 - .10)
Parental Education	.05(.01 - .10)	-.01(-.01 - .01)	-.01(-.01 - .01)	.05(.01 - .10)	.05(.01 - .10)
Uniformed Groups	.05(.01 - .10)	-.01(-.01 - .01)	.01(-.03 - .06)	-.01(-.01 - .01)	.01(-.03 - .05)
Visual and Performing Arts	-.02(-.06 - .02)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.02(-.07 - .02)
Clubs and Societies	.03(-.01 - .07)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.04(-.09 - .10)
CCA Intensity	.03(-.01 - .07)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.03(-.01 - .07)
CCA Breadth	-.02(-.05 - .02)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	-.02(-.05 - .02)
CCA Duration	-.02(-.05 - .04)	-.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.05 - .04)
Instructor Autonomy Support	.18*** (.11 - .25)	.01(-.01 - .04)	.01(-.01 - .01)	.01(-.01 - .03)	.18*** (.12 - .25)
Parental Autonomy Support	.11*** (.06 - .15)	.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	.11*** (.07 - .15)
Peer Autonomy Support	.39*** (.32 - .47)	.01(-.01 - .02)	.01(-.01 - .01)	.01(-.01 - .02)	.40*** (.33-.47)

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Leadership Skill					
Age	.11*** (.07 - .15)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.11*** (.06- .15)
Gender	.01(-.03 - .04)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.03 - .04)
Parental Education	.04* (.01 - .08)	.01(-.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	.04* (.01 - .08)
Uniformed Groups	.02(-.02 - .06)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(.01 - .01)	.02(-.02 - .06)
Visual and Performing Arts	-.04(-.08 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.04(-.08 - .01)
Clubs and Societies	.03* (-.01 - .07)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.03* (-.01 - .07)
CCA Intensity	.02(-.02 - .05)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.02(-.02 - .05)
CCA Breadth	.01(-.02 - .05)	.01(-.01 - .01)	-.01(-.01 - .01)	.05(.01 - .10)	-.02(-.05 - .02)
CCA Duration	-.01(-.06 - .04)	.01(-.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	-.01(-.06 - .04)
Instructor Autonomy Support	.21*** (.13-.28)	.02(.01 - .05)	-.01(.01 - .01)	.02(-.01-.05)	.23*** (.16-.30)
Parental Autonomy Support	.23*** (.18 - .28)	.01(.01 - .01)	-.01(.01 - .01)	.01(-.01 - .02)	.24*** (.19-.29)
Peer Autonomy Support	.22*** (.15 - .29)	.02(.01 - .04)	.01(.01 - .01)	.02(-.01 - .04)	.24*** (.17-.32)

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Communication Skill					
Age	.06* (.02 - .11)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01- .01)	.06*(.01 - .10)
Gender	.04* (.01 - .08)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01- .01)	.04* (.01 - .07)
Parental Education	.05** (.01 - .08)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01- .01)	.05** (.01 - .08)
Uniformed Groups	.01(-.03 - .05)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(.01 - .01)	.01 (-.03 - .05)
Visual and Performing Arts	-.04(-.09 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01- .01)	-.04 (-.09 - .10)
Clubs and Societies	.03(-.01 - .07)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01- .01)	.03 (-.01 - .07)
CCA Intensity	-.01(-.04 - .03)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01- .01)	.02 (-.02 - .05)
CCA Breadth	-.01(.05 - .02)	-.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.01- .01)	-.01 (-.04 - .03)
CCA Duration	-.03(-.08 - .02)	.01(-.01 - .01)	.01(.01 - .01)	.01(-.01- .01)	-.03 (-.08 - .02)
Instructor Autonomy Support	.21*** (.14-.31)	.02# (.01 - .04)	.01(.01 - .01)	.02(.01 -.04)	.21*** (.14-.29)
Parental Autonomy Support	.23*** (.18 - .28)	.01(.01 - .01)	-.01(.01 - .01)	.01(-.01- .02)	.23*** (.18-.28)
Peer Autonomy Support	.23*** (.16 - .30)	.02# (.01 - .03)	.01(.01 - .01)	.01(.01 - .03)	.24*** (.17-.31)

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Society-oriented Future Goal					
Age	.05* (.01 - .10)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01- .01)	.05* (.01 - .10)
Gender	.01(-.02 - .05)	-.01* (-.01 - .01)	.01* (-.01 - .01)	.01(-.01- .01)	.01 (-.02 - .05)
Parental Education	.04* (.01 - .07)	.01 (.01 - .02)	.01 (-.01 - .01)	.01(-.01- .02)	.04* (.01 - .07)
Uniformed Groups	.07** (.03 - .11)	-.01(.01 - .02)	.01(-.01 - .01)	-.01(.01 - .01)	.07** (.03 - .11)
Visual and Performing Arts	.04(-.01 - .08)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01- .01)	.04 (-.01 - .08)
Clubs and Societies	.06**(.01 - .10)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01- .01)	.06** (.01 - .10)
CCA Intensity	.02(-.02 - .05)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01- .01)	.02 (-.02 - .05)
CCA Breadth	-.01(-.04 - .03)	.01(-.01 - .01)	.01(-.01 - .01)	.01(.01 - .01)	-.02 (-.05 - .02)
CCA Duration	-.03* (-.08 - .02)	-.01**(-.01 - .01)	.01**(.01 - .01)	-.01** (-.01 - .01)	-.03* (-.08 - .01)
Instructor Autonomy Support	.24*** (.16 - .32)	.03* (.01 - .05)	.01(-.01 - .01)	.02*(.01 - .05)	.27*** (.19-.34)
Parental Autonomy Support	.13*** (.08 - .18)	.01* (.01 - .02)	.01* (-.01 - .01)	.01(-.01- .02)	.14*** (.09-.19)
Peer Autonomy Support	.26*** (.18 - .34)	.02* (.01 - .04)	-.01(.01 - .01)	.02* (.01 - .04)	.28*** (.20-.36)

Note 1. # $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Note 2. Gender (1 = female, 2= male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0- 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months). CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (0) is a reference group in this path analysis.

Note 3. Values in parentheses are 95% confidence intervals.

4.6 Overview of Time-1 Analyses and Findings

In sum, the analyses reported in this chapter aimed to examine psychometric properties and construct validity of the subscales used to measure the different factors at Time 1. Preliminary analyses showed that all the subscales (2 motivational orientations, 3 interpersonal relationships, and 10 outcome factors) included in the analysis at Time 1 had sound psychometric properties. CFA M showed that each of the subscales had robust and well-defined construct validity, as evident from the fit indices of the measurement models tested and factor loadings of items. Further, Cronbach's alpha internal consistency reliability of each subscale was above $\alpha = .70$. CFA multigroup invariance was also done and indicated the relative invariance for various measurement parameters, and provided support for the generalisation across three key groups (i.e., gender, age and parental education).

Correlation analysis showed the presence of significant relationships between CCA types (Physical Sports, Uniformed Groups, Visual and Performing Arts, and Clubs and Societies), quantitative indicators of CCA participation (intensity, breadth and duration), CCA interpersonal-relationships factors, CCA motivation and CCA outcomes, providing preliminary evidence for the hypothesised relationships between these factors. Age, gender and parental education were found to have systematic relationships with some of the factors, such as school belongingness and leadership skill. This suggests the need to include them as sociodemographic factors to be controlled for (i.e., covariates) in testing the hypothesised model.

Main analyses were conducted in two ways, namely the five-step hierarchical approach and the bootstrapping approach to mediational analysis. The purpose of the former was to find out the incremental invariance of respective predictors that were consecutively entered in the model, whereas the latter was to assess the role of CCA motivational orientations (i.e., CCA autonomous and controlled motivation) as mediators between CCA type and quantitative indicators, as well as CCA interpersonal relationships and CCA

outcomes. Taken together, findings from both analytic approaches corroborated in that, in general, there was little evidence for the role of autonomous and controlled motivation in mediating the relationships between CCA type and CCA quantitative indicators, as well as CCA interpersonal relationship and outcomes. The contribution of variance for covariates, CCA type and CCA quantitative indicators ranged between 1% and 3% towards autonomous and controlled motivation, and academic and non-academic outcomes. Interpersonal relationships contributed variance that ranged between 8% and 43%, and CCA motivational orientation contributed 27% to 42% of variance to CCA outcomes. The incremental variance for covariates, CCA type, CCA quantity and CCA motivational orientation was around 1% whereas CCA interpersonal relationship contributed over and beyond prior step, ranging from 24% to 43%. For mediation analyses, autonomous motivation contributed to the relationship between CCA interpersonal relationships (i.e., CCA instructor autonomy support and CCA peer autonomy support) and CCA outcomes such as confidence, lifelong learning and society-oriented future goal, whereas negligible mediation properties exist between other CCA predictors (i.e., CCA types and CCA quantitative indicators) and outcomes. The following chapter likewise replicates the analyses with Time-2 data, and thereafter, it considers the longitudinal analysis of the substantive CCA model.

CHAPTER 5

TIME-2 CROSS-SECTIONAL RESULTS

This chapter presents results from data analyses of Time-2 data. Like Time-1 analyses (reported in Chapter 4), confirmatory factor analysis (CFA) was applied to test for underlying factor structure and multi-group invariance across key subgroups (i.e., age, gender and parental education). Next, it evaluated the psychometric properties of various constructs by examining the descriptive statistics (i.e., mean and standard deviation), distributional (i.e., skewness and kurtosis) and internal consistency (i.e., Cronbach's alpha). Similarly, it assessed the interrelationship among all the factors and outcomes by using correlational analyses. Finally, it investigated the key substantive CCA model and the hypothesised relationship among CCA predictor factors (i.e., CCA types and CCA quantitative participation indicators), CCA motivational factors as mediator, CCA interpersonal relationships and various educational outcomes through path analyses, while accounting for age, gender and parental level of education.

Table 5.1

Descriptive Statistics, Distributional Properties, Cronbach's Alphas, and Summary of CFA Loadings

Variable	Time 2						No. of Items
	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's Alpha	Range (Mean) of CFA Loadings	
CCA Participation							
Breadth	1.06	0.56	23.55	684.51	-	-	1
Duration	24.89	15.78	1.52	3.91	-	-	1
Intensity	2.67	1.12	1.18	1.19	-	-	1
Motivation							
Autonomous Motivation	5.30	2.32	-.99	1.96	.94	.72-.95 (.87)	8
Controlled Motivation	4.57	2.15	-.51	.57	.89	.37-.94 (.68)	8
CCA Interpersonal Relationships							
Instructor Autonomy Support	5.07	2.27	-1.11	2.00	.96	.82-.93 (.91)	6
Parental Autonomy Support	4.63	2.16	-.72	.94	.93	.85-.89 (.87)	3
Peer Autonomy Support	5.20	2.31	-1.25	2.40	.98	.92-.95 (.94)	3

Variable	Time 2						No. of Items
	Mean	Standard Deviation	Skewness	Kurtosis	Cronbach's Alpha	Range (Mean) of CFA Loadings	
CCA Outcomes							
School Belongingness	5.23	2.31	-1.26	1.94	.96	.90-.95 (.93)	4
Academic Buoyancy	4.95	2.24	-.98	1.49	.88	.81-.89 (.86)	4
Educational Aspiration	5.72	2.45	-1.80	4.14	.95	.86-.94(.91)	4
Classroom Engagement	5.24	2.31	-1.40	3.25	.96	.90-.94 (.93)	4
Confidence	5.08	2.31	-1.23	1.70	.95	.91-.95 (.93)	4
Lifelong Learning	5.51	2.45	-1.76	4.41	.96	.94-.95 (.95)	4
Teamwork	5.33	2.38	-1.56	3.22	.96	.92-.95 (.93)	4
Leadership Skill	4.80	2.24	-1.03	1.42	.91	.84-.93 (.89)	4
Communication Skill	5.08	2.24	-1.26	2.23	.96	.91-.94 (.93)	4
Society-oriented Future Goal	5.33	2.38	-1.53	3.21	.97	.95-.97 (.96)	3

Note 1. For, the variables of duration, intensity, and breadth, they were named in such a way that the higher their values, the longer the period of students' participation in their main CCA (in months), the longer the amount of time of their weekly participation in their main CCA (in hours), and the more number of the CCAs that students were involved in (in continuous values of 0, 1, 2, etc.), respectively.

Note 2. Gender (1 = female, 2 = male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0- 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, , 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months).

5.1 Construct Validity

Similar to Time-1 factor analyses, the data analyses centred CFA to uncover the underlying factor structure for Time-2 data. Like the analysis conducted with Time-1 data (reported in Chapter 4), CFA was conducted three times, once for socio-contextual factors (i.e., Time-2 CCA instructor autonomy support, parental autonomy support, and peer autonomy support), once for motivational orientations (i.e., Time-2 autonomous and controlled motivation), and once for CCA outcomes (i.e., Time-2 school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal). Table 5.1 reports a summary of CFA factor loadings of the subscales in terms of their range and mean factor loadings. Goodness-of-fit indices were also evaluated to examine how closely the data matched the measurement model. CFA results, with the following indices, CCA motivational orientations ($\chi^2 = 1037$, $df = 97$, RMSEA = .08, CFI = .92, TLI = .92), CCA socio-contextual factors ($\chi^2 = 240$, $df = 51$, RMSEA = .05, CFI = .98, TLI = .98) and CCA outcomes ($\chi^2 = 3707$, $df = 657$, RMSEA = .05; CFI = .94, TLI = .93), indicated that each set of constructs was well-defined. These indices showed an acceptable fit between the model and the data. All the factor loadings for Time-2 CFA are significant at $p < .001$ and reported in Appendices E1, E2, and E3.

In addition, multigroup invariance CFA was done to examine for invariance of key measurement parameters across key sub-groups. Like prior CFA invariance tests conducted with Time-1 data, CFA key parameters were deemed to be invariant when the difference in the CFIs between the more restrictive and less restrictive models is less .01 (Cheung & Rensvold, 2001, 2002) and the difference in the RMSEAs between these two models is less than .015 (Chen, 2007). Findings showed that comparisons of CFIs and RMSEAs across models that successively constrained key measurement parameters provided evidence for the configural, metric, and scalar invariance across gender, age or educational level groups, and

parental education for Time-2 data (all the Δ CFIs $< .01$ and all the Δ RMSEAs $< .015$).

Overall, the results of the multigroup analyses indicated that the data is relatively comparable across age, gender and parental education. On this basis, it is viable to pool the data across groups for Time-2 data and for the analysis of research model to be done at the whole sample level.

5.2 Time-2 Descriptive Statistics, Distributional Properties and Reliability Analysis

Consistent with Time 1, descriptive analyses involved finding out subscale means, variances (standard deviation), distributional properties and reliability. Findings are presented in Table 5.1. Again, reliability of the scale is measured by Cronbach's alpha, where values closer to .70 indicates acceptable reliability (Anastasi & Urbina, 1997; Sattler, 2001). Cronbach's alpha ranged from .88 for academic buoyancy to .97 for society-oriented future goal. The value of skewness ranged from -1.80 for educational aspiration to -0.51 for controlled motivation. The kurtosis for variables ranged from 0.57 for controlled motivation to 4.41 for lifelong learning. The descriptive statistics, reliability, distributional and factor-analytic results reflected similar patterns as Time 1. As mentioned earlier, most secondary school students participate in only one CCA within the stipulated time period that limit excessive participation or deviation from compulsory students' frequency of participation. As mentioned earlier, secondary school students participate in CCA according to the allocated time and frequency set by teachers, which minimizes the likelihood of excess participation. This explains the relatively skewed and kurtosis values for the breadth of CCA participation variable.

5.3 Correlations

As with the Time-1 data analysis, correlational analysis for Time 2 delved into the relationship between CCA predictors, CCA motivational orientations, CCA interpersonal relationships, and CCA academic and non-academic outcomes. Again, for the purpose of

analyses, the four variables represented the CCA types (i.e., Physical Sports, Uniformed Groups, Visual and Performing Arts, and Clubs and Societies). Students whose main CCA was Physical Sports were dummy-coded as 1 and all other students whose main CCA was not Physical Sports were dummy-coded 0. As such, a positive correlation coefficient between a CCA type (e.g., Physical Sports) and a given variable (e.g., autonomous motivation) indicated that students whose main CCA was Physical Sports scored higher on autonomous motivation than students in non-Physical Sports. Conversely, a negative correlation coefficient between Physical Sports and autonomous motivation indicated that students whose main CCA was Physical Sports were lower in autonomous motivation than those whose main CCA was not Physical Sports.

Table 5.2 shows the correlation matrix for the various CCA predictors and outcomes. As seen in this table, Uniformed Groups was positively correlated with controlled motivation ($r = .09, p < .01$) and parental autonomy support ($r = .06, p < .05$). So, participation in Uniformed Groups was associated with higher levels of controlled motivation and perceived parental autonomy support, as compared to participation in non-Uniformed Groups. Visual and Performing Arts was negatively correlated with autonomous motivation ($r = -.07, p < .05$), controlled motivation ($r = -.09, p < .05$), parental autonomy support ($r = -.13, p < .001$), academic buoyancy ($r = -.10, p < .001$), and confidence ($r = -.08, p < .01$). But it was positively correlated with educational aspiration ($r = .07, p < .05$). This meant that students who participated in Visual and Performing Arts had lower of autonomous and controlled motivation, academic buoyancy and confidence but demonstrated higher level of educational aspiration as compared to those who participated in non-Visual and Performing Arts.

Clubs and Societies was positively correlated with autonomous motivation ($r = .09, p < .01$), controlled motivation ($r = .15, p < .001$), parental autonomy support ($r = .07, p < .01$), academic buoyancy ($r = .10, p < .001$) and classroom engagement ($r = .11, p < .001$). This

suggested that students' participation in Clubs and Societies was associated with higher level of autonomous motivation, controlled motivation, perceived parental autonomy support, academic buoyancy and classroom engagement as compared to students who participated in non-Clubs and Societies. Physical Sports was positively correlated with autonomous motivation ($r = .09, p < .01$) and CCA instructor autonomy support ($r = .06, p < .01$) and, conversely, negatively correlated with controlled motivation ($r = -.07, p < .01$) and classroom engagement ($r = -.07, p < .05$). This indicated that students in Physical Sports had higher levels of autonomous motivation and perceived level of CCA instructor autonomy support but lower levels of controlled motivation and classroom engagement than those who were not in Physical Sports.

CCA intensity was positively correlated with educational aspiration only, but not significant with the rest of CCA outcomes. Breadth was not significantly correlated with any CCA outcomes. Duration is positively correlated with autonomous motivation ($r = .06, p < .01$), controlled motivation ($r = .07, p < .001$), CCA instructor autonomy support ($r = .06, p < .05$), teamwork ($r = .06, p < .05$) and leadership skill ($r = .08, p < .001$). Thus, students who participated in CCA more frequently had higher levels of educational aspiration. Similarly, the longer the students' participation in CCA, the higher their levels of autonomous and controlled motivation, perceived CCA instructor autonomy support, teamwork and leadership skill. Also, it showed that the range of CCA participation had no relationship with the level of students' motivation and CCA outcomes.

Autonomous motivation was correlated with school belongingness ($r = .46, p < .001$), academic buoyancy ($r = .43, p < .001$), educational aspiration ($r = .42, p < .01$), classroom engagement ($r = .45, p < .001$), confidence ($r = .45, p < .01$), lifelong learning ($r = .50, p < .001$), teamwork ($r = .51, p < .001$), leadership skill ($r = .46, p < .001$), communication skill ($r = .49, p < .001$) and society-oriented future goal ($r = .49, p < .001$). It showed that the higher the students' autonomous motivation, the higher the students' level of school

belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

Controlled motivation was positively correlated with school belongingness ($r = .23, p < .001$), academic buoyancy ($r = .26, p < .001$), educational aspiration ($r = .21, p < .01$), classroom engagement ($r = .28, p < .001$), confidence ($r = .24, p < .01$), lifelong learning ($r = .26, p < .001$), teamwork ($r = .25, p < .001$), leadership skill ($r = .25, p < .001$), communication skill ($r = .28, p < .001$) and society-oriented future goal ($r = .26, p < .001$). This showed that the higher the level of controlled motivation, the higher the level of students' school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal. These correlations, however, were relatively lower than those with autonomous motivation.

CCA instructor autonomy support was positively correlated with parental autonomy support ($r = .74, p < .001$), peer autonomy support ($r = .89, p < .001$), school belongingness ($r = .61, p < .001$), academic buoyancy ($r = .61, p < .001$), educational aspiration ($r = .58, p < .01$), classroom engagement ($r = .62, p < .001$), lifelong learning ($r = .61, p < .001$), confidence ($r = .61, p < .001$), teamwork ($r = .66, p < .001$), leadership skill ($r = .63, p < .001$), communication skill ($r = .64, p < .001$), society-oriented future goal ($r = .66, p < .001$). This suggested that the higher the level of perceived CCA instructor autonomy support, the higher the level of perceived parental autonomy support, peer autonomy support, school belongingness, academic buoyancy, educational aspiration, classroom engagement, lifelong learning, confidence, teamwork, leadership skill, communication skill and society-oriented future goal.

CCA parental autonomy support was positively correlated with peer autonomy support ($r = .72, p < .001$), school belongingness ($r = .55, p < .001$), academic buoyancy ($r = .55, p < .001$), educational aspiration ($r = .58, p < .01$), classroom engagement ($r = .62, p < .001$), lifelong learning ($r = .61, p < .001$), confidence ($r = .61, p < .001$), teamwork ($r = .66, p < .001$), leadership skill ($r = .63, p < .001$), communication skill ($r = .64, p < .001$), society-oriented future goal ($r = .66, p < .001$).

= .57, $p < .001$), educational aspiration ($r = .48, p < .01$), classroom engagement ($r = .57, p < .001$), lifelong learning ($r = .58, p < .001$), confidence ($r = .55, p < .001$), teamwork ($r = .58, p < .001$), leadership skill ($r = .62, p < .001$), communication skill ($r = .62, p < .001$) and society-oriented future goal ($r = .58, p < .001$). Hence, the higher the level of perceived CCA parental autonomy support, the higher the level of students' perceived peer autonomy support, school belongingness, academic buoyancy, educational aspiration, classroom engagement, lifelong learning, confidence, teamwork, leadership skill, communication skill and society-oriented future goal.

CCA peer autonomy support was positively correlated with school belongingness ($r = .64, p < .001$), academic buoyancy ($r = .59, p < .001$), educational aspiration ($r = .60, p < .01$), classroom engagement ($r = .62, p < .001$), confidence ($r = .59, p < .01$), lifelong learning ($r = .67, p < .001$), teamwork ($r = .70, p < .001$), leadership skill ($r = .61, p < .001$), communication skill ($r = .63, p < .001$) and society-oriented future goal ($r = .65, p < .001$). This suggested that the higher the perceived level of CCA peer autonomy support, the higher the level of school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

On the whole, the correlational analyses showed preliminary support for the hypothesised relationships among CCA predictors, CCA motivational orientations and CCA interpersonal relationships and CCA-relevant outcomes. As a follow-up, SEM was utilised to extract the unique variance attributable to the respective predictors while accounting for shared variance among covariates, predictors and outcomes. It then evaluated the substantive analytic model that comprises CCA predictors, motivational factors and interpersonal factors in relation to a range of academic outcomes, while accounting for various sociodemographic covariates.

Table 5.2

Time-2 Correlation Matrix for CCA Factors, Academic and Non-Academic Outcomes

	Age (F1)	Gender (F2)	Parental Education (F3)	Uniformed Groups (F4)	Visual & Performing Arts (F5)	Clubs & Societies (F6)	Physical Sports (F7)	Intensity (F8)	Breadth (F9)	Duration (F10)	Autonomous Motivation (F11)	Controlled Motivation (F12)	CCA Instructor Autonomy Support (F13)	Parental Autonomy Support (F14)	Peer Autonomy Support (F15)	School Belongingness (F16)	Academic Buoyancy (F17)	Educational Aspiration (F18)	Classroom Engagement (F19)	Confidence (F20)	Lifelong Learning (F21)	Teamwork (F22)	Leadership Skill (F23)	Communication Skill (F24)	Society-oriented Future Goal (F25)
F11	-01	10	04	-03	<i>-07</i>	<i>09</i>	<u>09</u>	00	-02	<u>06</u>	-														
F12	02	10	03	09	<u>-09</u>	15	<i>-07</i>	-02	-03	07	52	-													
F13	-01	14	03	-03	-05	07	<i>06</i>	-01	-01	06	69	34	-												
F14	-02	14	07	<i>06</i>	-13	13	01	-04	-02	02	60	43	74	-											
F15	-01	08	02	-03	-01	02	05	02	00	05	67	31	89	72	-										
F16	-01	15	03	04	-05	08	-02	00	01	01	46	23	61	55	64	-									
F17	-02	19	03	03	-10	10	03	00	02	01	43	26	61	57	59	73	-								
F18	01	00	06	-04	07	02	-06	05	01	01	42	21	58	48	60	74	68	-							
F19	-01	10	05	01	-01	11	-07	01	00	01	45	28	62	57	62	81	78	80	-						
F20	01	16	02	01	<u>-08</u>	08	04	00	01	03	45	24	61	58	59	66	74	63	70	-					
F21	02	05	03	-06	04	04	-01	04	00	04	50	26	66	55	67	68	66	80	76	80	-				
F22	04	03	02	-02	00	01	03	03	-01	06	51	25	66	58	70	71	68	73	74	80	88	-			
F23	<u>06</u>	09	02	03	-05	04	02	01	-01	08	46	25	63	62	61	66	68	61	69	82	75	82	-		
F24	03	09	04	-01	-04	05	03	01	00	05	49	28	64	62	63	67	71	67	74	86	84	89	86	-	
F25	03	05	02	-01	02	01	-01	04	-01	04	49	26	66	58	65	68	65	73	73	77	89	86	78	84	-

Note 1. Decimal point omitted. r values significant at $p < .001$ are presented in **bold**, $p < .01$ underlined, and $p < .05$ in *italics*.

Note 2. F1 = Age, F2 = Gender, F3 = Parental Education, F4 = Uniformed Groups, F5 = Visual and Performing Arts, F6 = Clubs and Societies, F7 = Physical Sports, F8 = Intensity, F9 = Breadth, F10 = Duration, F11 = Autonomous Motivation, F12 = Controlled Motivation, F13 = CCA Instructor Autonomy, F14 = CCA Parental

Autonomy Support, F15 = CCA Peer Autonomy Support, F16 = School Belongingness, F17 = Academic Buoyancy, F18 = Educational Aspiration, F19 = Classroom Engagement, F20 = Confidence, F21 = Lifelong Learning, F22 = Teamwork, F23 = Leadership Skill, F24 = Communication Skill, F25 = Society-oriented Future Goal.
Note 3. Gender (1 = female, 2 = male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0 - 2 hours, 2 = 3 - 4 hours, 3 = 5 - 6 hours, 4 = 7 - 8 hours, 5 = 9 - 10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months). CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (1), non-Physical Sports (0).

5.4 Hierarchical Approach to Mediation Analysis

Similar to Time-1 analyses, the SEM approach was adopted to examine the hypothesised relationships among CCA predictor, mediator, and outcome variables in the multivariate CCA model for Time 2. The approach considered the hypothesised role of CCA motivational orientations (autonomous and controlled motivation) in mediating the relationships involving CCA type and participation quantitative predictors, as well as CCA interpersonal-relationship perceptions (CCA instructor autonomy support, CCA parental autonomy support, and CCA peer autonomy support) on the one side of the model, and CCA-relevant outcomes on the other side of the model. This study first used the hierarchical approach to examine the hypothesised CCA model at Time 2. Covariates, CCA types, quantitative indicators of CCA participation, CCA motivational orientations (autonomous motivation and controlled motivation), and CCA interpersonal-relationships (instructor autonomy support, parental autonomy support and peer autonomy support), were consecutively entered into the model to consider the effect of each predictor and incremental variance for each set of predictor in explaining outcomes.

Similar to Time-1 analyses, in this Time-2 path analysis, students whose main CCA was used to name a CCA type variable (e.g., Uniformed Groups) were dummy-coded 1 and all other students who were not in this particular CCA (i.e., Uniformed Groups) were dummy-coded 0. Physical Sports were designated as the reference or 'left out' CCA group against which all the other groups (i.e., Uniformed Group, Visual and Performing Arts, and Clubs and Societies) were compared. A positive regression weight or beta coefficient associated with the effect of a CCA type (e.g., Uniformed Groups) on a variable (e.g., autonomous motivation) indicated that students whose main CCA was Uniformed Groups scored higher on autonomous motivation than students whose main CCA was Physical Sports. In contrast, a negative regression weight or beta coefficient would indicate that

students whose main CCA was Uniformed Groups were lower in their autonomous motivation than students whose main CCA was Physical Sports.

In this study, a hierarchical or incremental approach to mediational analysis was first performed. In Step 1, covariates or control variables (age, gender and parental education) were entered as the only set of predictors of mediators (autonomous and controlled motivation) and outcomes (e.g., school belongingness) into the model. Step 2 added CCA types as a set of predictors, whereas Step 3 entered CCA-participation quantitative indicators (types, intensity, duration, and breadth) as another set of predictors of motivational orientations and outcomes in the model. Step 3 included CCA motivational orientations (autonomous motivation and controlled motivation). Step 4 went on to add in CCA relationships (instructor autonomy support, parental autonomy support, and peer autonomy support) as predictors of motivational orientations and outcomes. Lastly, in Step 5, the two CCA motivational orientations as mediators were entered as predictors of outcomes. As mentioned in Chapter 4, the cross-sectional models tested in Steps 1 – 5 are saturated ‘fully forward’ model in which all the possible paths from predictors to outcomes (or predicted variables) were freed or estimated, resulting in ($\chi^2 = 0$, $df = 0$, RMSEA = 0.00, CFI = 1.00, TLI = 1.00).

These step-by-step entries enabled the evaluation of the change of explained variance (ΔR^2) in each outcome and of standardised beta (β) parameters for the various predictors when a new set of predictors was entered. This is a heuristic approach in evaluating the strength of the relationships between CCA predictors and outcome factors (mediators and CCA-related outcomes) by controlling for shared variance that might exist among variables. Table 5.3 reports the standardised beta coefficients (β) for the respective predictors and the explained variance (R^2) in each outcome.

Step 1: Entering covariates as predictors. In the first step, three covariates (i.e., age, gender and parental education) were included as predictors prior to other predictors of

interest. Age positively predicted leadership skill ($\beta = .07, p < .01$) but not other CCA outcomes, with the values ranging from $-.01$ for school belongingness to $.04$ for teamwork and communication skill. Thus, the older the students, the higher their level of leadership skill. Gender positively predicted autonomous motivation ($\beta = .07, p < .01$), controlled motivation ($\beta = .08, p < .01$), school belongingness ($\beta = .12, p < .001$), academic buoyancy ($\beta = .15, p < .001$), classroom engagement ($\beta = .07, p < .01$), confidence ($\beta = .13, p < .001$), leadership skill ($\beta = .07, p < .01$) and communication skill ($\beta = .07, p < .01$). So, relative to female students, male students had higher levels of autonomous motivation, controlled motivation, school belongingness, academic buoyancy, classroom engagement, confidence, leadership skill and communication skill.

Parental education positively predicted educational aspiration ($\beta = .06, p < .05$), but it was not a significant predictor of CCA outcomes, with the β values ranging from $.01$ for school belongingness, confidence, and leadership skill to $.05$ for classroom engagement. The higher the students' parental education, the higher their level of educational aspiration. Overall, covariates accounted for only around 1% in autonomous and controlled motivation, and around 1% to 2% of the variance in CCA outcomes. This indicated that covariates accounted for a relatively small amount of variation in the respective outcomes.

Step 2: Entering CCA types as predictors, controlling for covariates. To address RQ1 “To what extent do students in three different CCA types (i.e., Visual and Performing Arts, Clubs and Societies, Uniformed Groups) differ from those in Physical Sports (i.e., reference group) in terms of their CCA motivational orientations as well as academic and non-academic outcomes?”, in the second step, three CCA types (Uniformed Groups, Visual and Performing Arts, and Clubs and Societies), with Physical Sports as a reference or “left out” group, were entered into the model. After controlling for the effects of covariates, participation in Uniformed Groups positively predicted controlled motivation ($\beta = .10, p < .01$) but not other CCA outcomes, with the β values ranging from $-.06$ for autonomous

motivation to .05 for classroom engagement. Students in Uniformed Groups had higher levels of controlled motivation as compared to those who participated in Physical Sports. Participation in Visual and Performing Arts predicted educational aspiration ($\beta = .07, p < .05$) and classroom engagement ($\beta = .07, p < .05$), but not the other CCA outcomes, with the β values ranging from -.06 for autonomous motivation to .05 for lifelong learning. So, students in Visual and Performing Arts had higher levels of educational aspiration and classroom engagement as compared to those who participated in Physical Sports. Participation in Clubs and Societies predicted controlled motivation ($\beta = .12, p < .001$) and classroom engagement ($\beta = .08, p < .01$), but it was not significantly predictive of the other CCA outcomes, with the β values ranging from -.01 for teamwork to .05 for school belongingness. This suggested that students in Clubs and Societies had higher levels of controlled motivation and classroom engagement than students in Physical Sports. Overall, participation in different types of CCA explained around 1% to 2% of the variance in autonomous and controlled motivation, and around 1% of the variance in CCA outcomes. The incremental variance of CCA types was around 1% over covariates.

Step 3: Entering quantitative indicators of CCA participation as predictors, after controlling for covariates and CCA types. To address RQ2 “To what extent do quantitative indicators of students’ CCA participation (i.e., the breadth, duration, and intensity of CCA participation) predict their CCA motivational orientations and academic and non-academic outcomes?”, the third step in the analysis included quantitative indicators of CCA participation (intensity, duration and breadth of CCA participation) as predictors. CCA intensity did not significantly predict any of the outcomes, with the β values ranging from -.01 for autonomous motivation to .05 for educational aspiration. CCA breadth predicted controlled motivation ($\beta = .05, p < .05$), but not other variables, with the β values ranging from -.03 for autonomous motivation to .01 for academic buoyancy and educational aspiration. This suggests that greater the number of CCA groups that students participated in

was associated with higher controlled motivation. CCA duration positively predicted autonomous motivation ($\beta = .10, p < .001$), controlled motivation ($\beta = .12, p < .001$) and leadership skill ($\beta = .07, p < .05$), while the nonsignificant β values ranged from $-.04$ for communication to $.05$ for teamwork. This suggests that the longer students participated in their CCA the higher their autonomous motivation, controlled motivation, and leadership skill. CCA quantitative indicators approximately contributed 1% to 2% of variance to CCA motivational orientations, and 1% to 3% to academic and non-academic outcomes. These indicators accounted for around 1% of incremental variance over the earlier step.

Step 4: Entering CCA interpersonal relationship perceptions, controlling for covariates, CCA types and quantitative indicators of CCA participation. To address RQ3, “To what extent do students’ perceptions of CCA interpersonal contexts (i.e., perceived CCA instructors, CCA peers, and CCA parental autonomy support) predict their CCA motivational orientations and academic and non-academic outcomes?”, in Step 4, students’ perceptions of CCA interpersonal-relationships factors were included as predictors in the model, while controlling for the effects of the sets of predictors entered in the previous three steps. CCA instructor autonomy support was positively predictive of autonomous motivation ($\beta = .38, p < .001$), school belongingness ($\beta = .12, p < .05$), academic buoyancy ($\beta = .29, p < .001$), educational aspiration ($\beta = .22, p < .001$), classroom engagement ($\beta = .21, p < .001$), confidence ($\beta = .25, p < .001$), lifelong learning ($\beta = .25, p < .001$), teamwork ($\beta = .15, p < .001$), leadership skill ($\beta = .24, p < .001$), communication skill ($\beta = .23, p < .001$), and society-oriented future goal ($\beta = .27, p < .001$). This showed that the higher the level of students’ perception of CCA instructor’ autonomy support, the higher the levels of students’ autonomous motivation, school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

CCA parental autonomy support predicted autonomous motivation ($\beta = .16, p < .001$), controlled motivation ($\beta = .39, p < .001$), school belongingness ($\beta = .14, p < .001$), academic buoyancy ($\beta = .23, p < .001$), educational aspiration ($\beta = .07, p < .05$), classroom engagement ($\beta = .22, p < .001$), confidence ($\beta = .26, p < .001$), lifelong learning ($\beta = .09, p < .01$), teamwork ($\beta = .15, p < .001$), leadership skill ($\beta = .32, p < .001$), communication skill ($\beta = .30, p < .001$), and society-oriented future goal ($\beta = .18, p < .001$). This indicated that the higher the level of CCA parental autonomy support, the higher the levels of autonomous motivation, controlled motivation, school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal.

CCA peer autonomy support positively predicted autonomous motivation ($\beta = .22, p < .001$), and all CCA outcomes, including school belongingness ($\beta = .43, p < .001$), academic buoyancy ($\beta = .16, p < .01$), educational aspiration ($\beta = .36, p < .001$), classroom engagement ($\beta = .28, p < .001$), confidence ($\beta = .18, p < .001$), lifelong learning ($\beta = .39, p < .001$), teamwork ($\beta = .46, p < .001$), leadership skill ($\beta = .17, p < .001$), communication skill ($\beta = .22, p < .001$) and society-oriented future goal ($\beta = .28, p < .001$). This showed that the higher the level of CCA peer autonomy support, the higher the levels of autonomous motivation, school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal.

In sum, CCA interpersonal relationships accounted 51% and 21% of the variance in autonomous and controlled motivation respectively, and between 38% and 51% in academic and non-academic outcomes. It conferred an incremental variance of 20% to 50% for academic and non-academic outcomes over the prior step.

Step 5: Entering CCA motivational orientation as predictors, controlling for covariates, CCA types, quantitative indicators of CCA participation and CCA

interpersonal-relationship perceptions. To address RQ4, “To what extent do students’ CCA motivational orientations mediate the link between the types of CCA that students participate in, the quantitative indicators of their CCA participation, and their perceptions of CCA interpersonal contexts to academic and non-academic outcomes?”, the fifth step included CCA motivational orientations — alongside covariates, CCA types, quantitative indicators of CCA participation, and CCA interpersonal relationships—as predictors of the outcomes. This step aimed to examine if motivational orientations, considered as mediators in the hypothesised CCA model, predicted CCA outcomes over and above the effects of all other predictors entered earlier into the model. This is to assess if the effects of CCA types, quantitative indicators of CCA participation, and CCA interpersonal-relationship perceptions increased or decreased as a result of being mediated by motivational orientations.

Autonomous motivation did not significantly positively predicted any outcomes: Others were not significantly predicted with the β values ranging from -.04 for classroom engagement to .04 for teamwork. So, the level of autonomous motivation was not related to higher or lower level of CCA outcomes. Controlled motivation only predicted classroom engagement ($\beta = .05, p < .05$). Other outcomes were not significantly predicted, with the β values ranging from -.03 for leadership skill to .01 for academic buoyancy. Thus, CCA motivational orientations conferred 38% and 51% of variance to academic and non-academic outcomes, and an incremental variance of 1% over the earlier step. Taken together, the stepwise path mediation model analyses revealed that CCA interpersonal relationships had a major influence in CCA outcomes above and beyond CCA participation factors and after controlling for covariates. Table 5.4 provides the summary of the regression weights in the final model derived from the hierarchical approach to mediational analysis.

Table 5.3

Path Analysis Results for Time-2 CCA Model

Predictors	Mediator and Outcome Variables											
	AM	CM	SB	AB	EA	CE	CF	LL	TW	LS	CS	SG
Step 1												
Age	.01(.03)	.03(.03)	-.01(.02)	-.02(.02)	.01(.02)	.01(.02)	.01(.02)	.02(.02)	.04(.02)	.07**(.02)	.04(.02)	.03(.03)
Gender	.07**(.02)	.08**(.02)	.12***(.02)	.15***(.02)	-.01(.02)	.07**(.02)	.13***(.02)	.04(.02)	.03(.02)	.07**(.02)	.07**(.02)	.04(.02)
Parental Education	.04(.02)	.03(.02)	.01(.02)	.02(.02)	.06*(.02)	.05(.02)	.01(.02)	.02(.02)	.02(.02)	.01(.02)	.03(.02)	.02(.02)
R ²	.01	.01	.01*	.02**	.01	.01	.02**	.01	.01	.01*	.01**	.01
Step 2												
Age	.01(.03)	.02(.03)	-.01(.02)	-.02(.02)	.01(.02)	-.01(.02)	.01(.02)	.02(.02)	.04(.03)	.07**(.02)	.04(.02)	.03(.03)
Gender	.06*(.03)	.06*(.03)	.12***(.03)	.13***(.03)	.01(.03)	.08**(.03)	.12***(.03)	.06*(.03)	.03(.03)	.07*(.03)	.06*(.03)	.05(.03)
Parental Education	.04(.02)	.02(.02)	.01(.02)	.02(.02)	.06*(.02)	.04(.02)	.01(.02)	.02(.02)	.02(.02)	.01(.02)	.03(.02)	.02(.02)
Uniformed Groups	-.06(.03)	.10**(.03)	.05(.03)	.01(.03)	.01(.03)	.05(.03)	-.01(.03)	-.02(.03)	-.03(.03)	.01(.03)	-.02(.03)	.01(.03)
Visual and Performing Arts	-.06(.03)	.03(.03)	.04(.03)	-.01(.03)	.07*(.03)	.07*(.03)	-.01(.03)	.05(.03)	-.01(.03)	-.01(.03)	-.01(.03)	.04(.03)
Clubs and Societies	.01(.03)	.12***(.03)	.05(.03)	.04(.03)	.03(.03)	.08**(.03)	.03(.03)	.02(.03)	-.01(.03)	.01(.03)	.01(.03)	.01(.03)
R ²	.01*	.02**	.02**	.02**	.01	.01*	.02**	.01	.01	.01*	.01	.01
R ² change	.01	.01	.01	.01	.01	.01	.01	.01	.01*	.01	.01	.01
Step 3												
Age	-.06(.03)	-.05(.03)	-.02(.03)	-.04(.03)	-.01(.03)	-.03(.03)	-.01(.03)	-.01(.03)	.01(.03)	.03(.03)	.01(.03)	.01(.03)
Gender	.06*(.03)	.06*(.03)	.12(.03) ***	.13***(.03)	.01(.03)	.08**(.03)	.12***(.03)	.06*(.03)	.03(.03)	.06*(.03)	.06*(.03)	.05(.03)
Parental Education	.04(.02)	.03(.02)	.01(.02)	.02(.02)	.05*(.02)	.04(.02)	.01(.03)	.02(.02)	.02(.02)	.01(.03)	.03(.02)	.02(.03)
Uniformed Groups	-.04(.03)	.12***(.03)	.06(.03)	.01(.03)	.01(.03)	.05(.03)	.01(.03)	-.01(.03)	-.01(.03)	.02(.03)	-.01(.03)	.02(.03)
Visual and Performing Art	-.04(.03)	.05(.03)	.04(.03)	-.01(.03)	.07*(.03)	.08*(.03)	-.16(.03)	.05(.03)	.01(.03)	.01(.03)	-.01(.03)	.05(.03)
Clubs and Societies	.03(.03)	.14***(.03)	.06*(.03)	.05(.03)	.04(.03)	.09**(.03)	-.10(.03)	.04(.03)	.01(.03)	.03(.03)	.02(.03)	.03(.03)
Intensity	-.01(.03)	.01(.03)	.01(.03)	.02(.03)	.05(.03)	.02(.03)	.01(.03)	.03(.03)	.03(.03)	.01(.03)	.01(.03)	.04(.03)
Breadth	-.03(.03)	-.05*(.02)	-.01(.03)	.01(.03)	.01(.03)	-.02(.03)	-.01(.03)	-.01(.03)	-.01(.03)	-.01(.02)	-.01(.03)	-.02(.03)
Duration	.10***(.03)	.12***(.03)	.03(.03)	.04(.03)	.02(.03)	.04(.03)	.04(.03)	.04(.03)	.05(.03)	.07*(.03)	-.04(.03)	.04(.03)
R ²	.02**	.01*	.02	.03	.01	.02	.03***	.01*	.01*	.02**	.02**	.01*
R ² change	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01

	AM	CM	SB	AB	EA	CE	CF	LL	TW	LS	CS	SG
Step 4												
Age	-.02(.02)	-.02(.03)	.01(.02)	-.01(.02)	.02(.02)	.01(.02)	.03(.02)	.04(.02)	.05*(.02)	.07**(.02)	.05*(.02)	.04(.02)
Gender	-.01(.02)	.02(.02)	.07**(.02)	.08***(.02)	-.04(.02)	.03(.02)	.06**(.02)	.01(.02)	-.03(.02)	.01(.02)	.01(.02)	-.01(.02)
Parental Education	.02(.02)	.01(.02)	-.01(.02)	-.01(.02)	.03(.02)	.02(.02)	-.02(.02)	.01(.02)	-.01(.02)	-.02(.02)	.01(.02)	-.01(.02)
Uniformed Groups	-.03(.02)	.11***(.03)	.06**(.02)	.02(.02)	.03(.03)	.06*(.02)	.01(.02)	-.01(.02)	-.01(.02)	.02(.02)	-.01(.02)	.03(.02)
Arts	-.04(.02)	.06*(.03)	.04(.03)	-.01(.02)	.07**(.03)	.08**(.03)	.01(.03)	.05*(.02)	.01(.02)	.01(.02)	-.01(.03)	.05(.02)
Club & Societies	.01(.02)	.11***(.02)	.04(.02)	.03(.02)	.03(.02)	.07**(.02)	.01(.02)	.02(.02)	-.01(.02)	-.01(.02)	-.01(.02)	.01(.02)
Intensity	.01(.02)	.01(.03)	.01(.02)	.02(.02)	.04*(.02)	.02(.02)	.01(.02)	.03(.02)	.02(.02)	.02(.02)	.02(.02)	.04*(.02)
Breadth	-.01(.01)	-.04*(.02)	.01(.01)	.02(.01)	.01(.01)	-.01(.01)	.01(.01)	.01(.01)	.01(.01)	.01(.01)	.01(.01)	-.01(.01)
Duration	.04(.02)	.09**(.03)	-.02(.02)	-.03(.02)	-.03(.02)	-.02(.02)	-.02(.02)	-.02(.02)	-.01(.02)	-.01(.02)	-.02(.02)	-.01(.02)
CCA Instructor Autonomy Support	.38***(.04)	.11(.06)	.12*(.05)	.29***(.05)	.22***(.06)	.21***(.05)	.25***(.05)	.25***(.05)	.15***(.05)	.24***(.05)	.23***(.05)	.27***(.05)
Parental Autonomy Support	.16***(.03)	.39***(.04)	.14**(.03)	.23***(.03)	.07*(.03)	.22***(.04)	.26***(.03)	.09**(.03)	.15***(.03)	.32***(.03)	.30***(.03)	.18***(.03)
Peer Autonomy support	.22***(.05)	-.07(.06)	.43***(.05)	.16**(.05)	.36***(.06)	.28***(.05)	.18***(.05)	.39***(.05)	.46***(.05)	.17***(.05)	.22***(.05)	.28***(.05)
R2	.51***	.21***	.43***	.41***	.38***	.43***	.41***	.48***	.51***	.46***	.47***	.47***
R2 change	.49	.20	.41	.38	.37	.41	.38	.47	.50	.44	.45	.46
	AM	CM	SB	AB	EA	CE	CF	LL	TW	LS	CS	SG
Step 5												
Age	-	-	.01(.02)	-.01(.02)	.02(.02)	.01(.02)	.03(.02)	.04(.02)	.05*(.02)	.07**(.02)	.05*(.02)	.04(.02)
Gender	-	-	.07**(.02)	.07***(.02)	-.04(.02)	.02(.02)	.06**(.02)	.01(.02)	-.03(.02)	.01(.02)	.01(.02)	-.01(.02)
Parental Education	-	-	-.01(.02)	-.01(.02)	.03(.02)	.02(.02)	-.02(.02)	.01(.02)	-.01(.02)	-.02(.02)	.01(.02)	-.01(.02)
Uniformed Groups	-	-	.07**(.02)	.01(.03)	.02(.02)	.05*(.02)	.01(.02)	-.01(.02)	-.01(.02)	.02(.02)	-.01(.02)	.03(.02)
Arts	-	-	.05(.03)	-.01(.03)	.07**(.03)	.07**(.03)	.01(.03)	.06*(.03)	.01(.02)	.01(.02)	-.01(.03)	.05*(.02)
Club & Societies	-	-	.05*(.02)	.02(.02)	.03(.02)	.06**(.02)	.01(.02)	.02(.02)	-.01(.02)	-.01(.02)	-.01(.02)	.01(.02)
Intensity	-	-	.01(.02)	.02(.02)	.04*(.02)	.02(.02)	.01(.02)	.03(.02)	.03(.02)	.02(.02)	.02(.02)	.04*(.02)
Breadth	-	-	.01(.01)	.02(.02)	.01(.02)	-.01(.01)	.01(.01)	.01(.01)	.01(.01)	.01(.01)	.01(.01)	-.01(.01)
Duration	-	-	-.02(.02)	-.02(.02)	-.03(.02)	-.02(.02)	-.02(.02)	-.02(.02)	-.01(.02)	.02(.02)	-.02(.02)	-.01(.02)
CCA Instructor Autonomy Support	-	-	.11*(.05)	.30***(.05)	.22***(.06)	.22***(.05)	.25***(.05)	.23***(.05)	.14**(.05)	.24***(.05)	.22***(.05)	.26***(.05)
Parental Autonomy Support	-	-	.15***(.03)	.23***(.04)	.07*(.04)	.20***(.03)	.27***(.04)	.08*(.03)	.15***(.03)	.33***(.03)	.29***(.04)	.18***(.03)
Peer Autonomy support	-	-	.42***(.05)	.17**(.05)	.36***(.06)	.29***(.05)	.17**(.05)	.38***(.05)	.45***(.05)	.17**(.05)	.21***(.05)	.28***(.05)
Autonomous Motivation	-	-	.03(.04)	-.04(.03)	-.01(.04)	-.04(.04)	.02(.03)	.03(.04)	.04(.03)	-.01(.03)	.03(.03)	.03(.03)
Controlled Motivation	-	-	-.02(.02)	.01(.03)	.01(.03)	.05*(.02)	-.03(.03)	.01(.03)	-.02(.02)	-.03(.03)	-.01(.03)	-.01(.02)
R2	-	-	.44***	.41***	.38***	.43***	.41***	.48***	.51***	.46***	.47***	.47***
R2 change	-	-	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01

Note 1. * $p < .05$, ** $p < .01$, *** $p < .001$.

Note 2. AM = Autonomous Motivation, CM = Controlled Motivation, SB = School Belongingness, AB = Academic Buoyancy, EA = Educational Aspiration, CE = Classroom Engagement, CF = Confidence, LL = Lifelong Learning, TW = Teamwork, LS = Leadership Skill, CS = Communication Skill, SG = Society-oriented Future Goal.

Note 3. Gender (1 = female, 2 = male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0 - 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months). CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (0) is a reference group in this path analysis.

Note 4. Values in parentheses are standard errors.

Table 5.4

Summary of Standardised Regression Coefficients (Betas) in the Path Models Predicting Different Dimensions of Outcomes (Time 2)

Variables	Covariates		CCA Types				Quantity			Interpersonal Relationship			Motivation	
	Age	Gender	Parental Education	Uniformed Groups	Art	Club	Intensity	Breadth	Duration	Instructor	Parent	Peer	Autonomous	Controlled
Autonomous Motivation	-.02(.02)	-.01(.02)	.02(.02)	-.03(.02)	-.04(.02)	.01(.02)	.00(.02)	-.01(.02)	.04(.02)	.38***(.04)	.16***(.03)	.22***(.05)		
Controlled Motivation	-.02(.03)	.02(.02)	.00(.02)	.11***(.03)	.06(.03)	.11***(.02)	.01(.02)	-.04(.02)	.09**(.03)	.11(.06)	.39***(.04)	-.07(.06)		
School Belongingness	.01(.02)	.07**(.02)	-.01(.02)	.07**(.02)	.05(.03)	.05(.02)	.01(.02)	.01(.02)	-.02(.02)	.11(.05)	.15***(.03)	.42***(.05)	.03(.04)	-.02(.02)
Academic Buoyancy	.00(.02)	.07***(.02)	-.01(.02)	.01(.02)	.00(.03)	.02(.02)	.02(.02)	.02(.02)	-.02(.02)	.30***(.05)	.23(.04)	.17**(.05)	-.04(.03)	.01(.03)
Educational Aspiration	.02(.02)	-.04(.02)	.03(.02)	.02(.03)	.07*(.03)	.03(.02)	.04*(.02)	.01(.02)	-.03(.02)	.22***(.06)	.07*(.04)	.36***(.06)	-.01(.04)	.00(.03)
Classroom Engagement	.01(.02)	.02(.02)	.02(.02)	.05*(.03)	.07**(.03)	.06(.02)	.02(.02)	.00(.01)	-.02(.02)	.22***(.05)	.20***(.03)	.29***(.05)	-.04(.04)	.05*(.02)
Confidence	.03(.02)	.06**(.02)	-.02(.02)	.01(.02)	.01(.03)	.01(.02)	.01(.02)	.01(.01)	-.02(.02)	.25***(.05)	.27***(.04)	.17***(.05)	.02(.04)	-.03(.05)
Lifelong Learning	.04(.02)	.00(.02)	.00(.02)	.00(.02)	.06*(.02)	.02(.02)	.03(.02)	.01(.01)	-.02(.02)	.23***(.05)	.08*(.03)	.38***(.05)	.03(.04)	.01(.03)
Teamwork	.05*(.02)	-.03(.02)	.00(.02)	.00(.02)	.01(.02)	-.01(.02)	.03(.02)	.00(.01)	-.01(.02)	.14**(.05)	.15***(.03)	.45***(.05)	.04(.03)	-.02(.02)
Leadership Skills	.07**(.02)	.00(.02)	-.02(.02)	.02(.02)	.01(.02)	.00(.02)	.02(.02)	.01(.01)	.02(.02)	.24***(.05)	.33***(.03)	.17**(.05)	-.01(.03)	-.03(.03)
Communication Skills	.05*(.02)	.00(.02)	.00(.02)	-.01(.02)	.00(.02)	-.01(.02)	.02(.02)	.01(.01)	-.02(.02)	.22***(.05)	.29***(.04)	.21***(.05)	.03(.03)	-.03(.03)
Society-oriented Future Goals	.04(.02)	-.01(.02)	-.01(.02)	.03(.02)	.05*(.02)	.01(.02)	.04*(.02)	.00(.01)	-.01(.02)	.26***(.05)	.18***(.03)	.28***(.05)	.03(.03)	-.01(.02)

Note 1. * $p < .05$, ** $p < .01$, *** $p < .001$.

Note 2. Gender (1 = female, 2 = male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0 - 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months). CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (0) is a reference group in this path analysis.

Note 3. Values in parentheses are standard errors.

5.5 Bootstrapping Approach to Mediation Analysis

A five-step approach was used to examine the incremental variance of respective sets of predictors that were consecutively entered into the model to predict CCA outcomes. These were the sets of predictors of mediators and outcomes:

1. covariates (age, gender and parental education);
2. CCA types (Uniformed Groups, Visual and Performing Arts, and Clubs and Societies; with Physical Sports as the reference group);
3. quantitative indicators of CCA participation (intensity, breadth and duration);
4. perceptions of CCA interpersonal-relationship factors (CCA instructor autonomy support, CCA parental autonomy support and CCA peer autonomy support); and
5. CCA motivational orientations (CCA autonomous and controlled motivation) were included as predictors of outcomes to examine their role as mediators in the CCA hypothesised model.

To also address RQ4, similar to Time-1 analysis, a bootstrapping approach was used to evaluate the mediating role of CCA motivational orientations in the relationships between CCA types, CCA quantitative indicators, CCA interpersonal-relationship perceptions on the one side of the model, and CCA outcomes on the other side of the model. As explained in Chapter 4, the approach involved Mplus syntax for multiple mediation to estimate parameters of both direct and indirect effects attributed to the two motivational orientations associated with CCA predictors and outcomes. This analysis adopted parameter estimates and 95% bias-corrected confidence intervals of the indirect effects as well as with 5,000 random samples. Table 5.5 shows the direct, indirect and total effects (and their confidence intervals) in the mediation model.

As shown in Table 5.5, while the direct effects of instructor, parental and peer autonomy support on all the outcomes were significant, only one indirect effect mediated by controlled motivation was significant. This only significant indirect effect of parental autonomy support mediated by controlled motivation was on classroom engagement ($\beta = .02$, $p < .05$). Taken together, the findings showed that the role of autonomous and controlled motivation in mediating the effects of predictors on outcomes at Time 2 (i.e., approaching the end of their CCA participation) was relatively negligible, with there was only one significant but small indirect effect of controlled motivation. In contrast, the direct effects of instructor, parental and peer autonomy support on all CCA outcomes were found to be significant. Overall, the findings found little support for the role of CCA motivational orientation in mediating the effects of CCA interpersonal relationships on outcomes.

5.6 Overview of Time-2 Analyses and Findings

In sum, Time-2 data analyses entailed assessing measurement properties and the hypothesised CCA model with SEM. Similar to Time 1, preliminary analyses aimed to test for subscales' reliability and distributional properties. The preliminary analyses demonstrated sound psychometric properties and construct validity for the different subscales (2 motivation, 3 interpersonal-relationship, and 10 outcome factors) at Time 2. The Cronbach's alpha of each subscale was above $\alpha = .70$, which indicated their reliability.

As with Time 1, the five-step approach determines the incremental invariance of various predictors that were sequentially entered into the model. The bootstrapping approach tested the role of CCA motivational orientations as mediators between CCA types, CCA quantitative indicators and CCA interpersonal relationship factors and outcomes. In the hypothesised CCA model, covariates, CCA types and CCA quantitative indicators explained 1% to 3% of variance for CCA autonomous and controlled motivation, and academic and non-academic outcomes. CCA interpersonal relationships accounted for variance of between 21% and 58% of variance, and CCA motivational orientations explained 38% to 51% of

variance for CCA outcomes. In the mediation analyses, CCA autonomous motivation did not significantly contribute to the relationship between CCA interpersonal relationships (i.e., CCA instructor autonomy support, CCA parental autonomy support and peer autonomy support) and CCA outcomes. Similarly, CCA controlled motivation did not mediate the relationships between perceived CCA interpersonal relationships and CCA-relevant outcomes except in mediating the effect of CCA parental autonomy support on classroom engagement. No significant mediational effects existed between CCA type and quantitative indicators and CCA outcomes.

Table 5.5

Summary of Direct, Indirect, and Total Effects in the Multiple Mediation Path Models Predicting Different Dimensions of CCA Outcomes at Time 2

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting School Belongingness					
Age	.02(-.05 - .08)	-.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.02(-.05 - .08)
Gender	.21** (.08 - .34)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.21**(.08 - .34)
Parental Education	-.01(-.06 - .03)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.05 - .04)
Uniformed Groups	.22** (.07 - .39)	-.01(-.02 - .01)	-.01(-.03 - .01)	-.01(-.04 - .01)	.21* (.06- .38)
Visual and Performing Arts	.15(-.01 - .30)	-.01(-.02 - .01)	-.01(-.02 - .01)	-.01(-.03 - .01)	.14(-.02- .30)
Clubs and Societies	.21(.01 - .42)	.01(-.01 - .02)	-.01(-.04- .01)	-.01(-.04 - .01)	.20(-.01- .40)
CCA Intensity	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.04 - .06)
CCA Breadth	.01(-.08 - .17)	-.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.08 - .17)
CCA Duration	-.01(-.08 - .02)	.01(.01 - .01)	-.01(.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.12* (.01 - .24)	.01(-.02 - .04)	-.01(-.01 - .01)	.01(-.02 - .04)	.13* (.02 - .24)
Parental Autonomy Support	.15*** (.08 - .22)	.01(-.01 - .02)	-.01(-.03 - .01)	-.01(-.02 - .02)	.15*** (.08 - .22)
Peer Autonomy Support	.45*** (.33 - .57)	.01(-.01 - .03)	.01(-.01 - .01)	.01(-.01 - .03)	.46*** (.34 - .57)
Predicting Academic Buoyancy					
Age	-.01(-.07 - .06)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.07 - .06)
Gender	.23*** (.10 - .35)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.23*** (.10 - .35)
Parental Education	.04(-.01 - .08)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.04(-.01 - .08)
Uniformed Groups	.04(-.11 - .20)	.01(-.01 - .01)	.01(-.01 - .03)	.01(-.01 - .03)	.05(-.10 - .20)
Visual and Performing Arts	-.01(-.17 - .14)	.01(-.01 - .02)	.01(-.01 - .02)	.01(-.01 - .03)	-.01(-.16- .15)
Clubs and Societies	.11(-.10 - .31)	-.01(-.02 - .01)	.01(-.02 - .04)	.01(-.02 - .03)	.12(-.09 - .32)
CCA Intensity	.03(-.02 - .78)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.03(-.02 - .08)
CCA Breadth	.05(-.13 - .20)	.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	.05(-.14 - .20)
CCA Duration	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.32***(.21- .43)	-.02(-.04 - .01)	.01(-.01 - .01)	-.02(-.04 - .01)	.30***(.20 - .41)
Parental Autonomy Support	.24***(.17 - .31)	-.01(-.02 - .01)	.01(-.01 - .03)	-.01(-.02 - .02)	.24***(.17 - .30)
Peer Autonomy Support	.18**(.07 - .21)	-.01(-.03 - -.01)	-.01(-.01 - .01)	-.01(-.03 - .01)	.16**(.06 - .27)

CCA predictors	Indirect Effect				
	Direct Effect	Autonomous Motivation	Controlled Motivation	Total Indirect Effect	Total Effect
Predicting Education Aspiration					
Age	.07(.02 - .14)	.01(.01 - .03)	.01(-.01 - .01)	.01(.01 - .01)	.09(.02 - .15)
Gender	-.10(-.21 - .01)	-.01(-.03 - .02)	.01(-.01 - .01)	-.01(-.03 - .02)	-.11(-.21 - .01)
Parental Education	.03(-.01 - .07)	-.01(-.01 - .01)	.01(.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)
Uniformed Groups	.09(-.31 - .49)	.01(-.01 - .02)	.01(-.02 - .02)	.01(-.02 - .03)	.08(-.08 - .23)
Visual and Performing Arts	.22** (.04 - .37)	.01(-.01 - .02)	.01(-.01 - .01)	.01(-.01 - .02)	.22** (.05 - .38)
Clubs and Societies	.13(-.10 - .34)	.01(-.01 - .01)	.01(-.02 - .02)	.13(-.10 - .34)	.13(-.09 - .34)
CCA Intensity	.06* (.01 - .11)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.06* (.01 - .11)
CCA Breadth	.03(-.16 - .22)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.03(-.16 - .22)
CCA Duration	-.01(-.01 - .01)	.01(.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.22*** (.12 - .34)	-.01(-.03 - .03)	.01(-.01 - .01)	-.01(-.03 - .03)	.22*** (.11 - .33)
Parental Autonomy Support	.07(.01 - .15)	-.01(-.01 - .01)	.01(-.02 - .02)	-.01(-.02 - .02)	.07* (.01 - .14)
Peer Autonomy Support	.37*** (.26 - .49)	-.01(-.02 - .02)	.01(-.01 - .01)	-.01(-.02 - .02)	.37*** (.26 - .48)
Predicting Classroom Engagement					
Age	.07(-.05 - .19)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.04(-.14 - .07)
Gender	.01(-.03 - .04)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.07(-.05 - .19)
Parental Education	.02(-.02 - .06)	-.01(-.01 - .01)	.01(-.01 - .04)	-.01(-.01 - .01)	.02(-.02 - .06)
Uniformed Groups	.15* (.01 - .29)	.01(-.01 - .02)	.01(-.01 - .02)	.01(-.02 - .03)	.15** (.02 - .30)
Visual and Performing Arts	.27** (.07 - .47)	.01(-.02 - .02)	.01(-.01 - .33)	.01(-.01 - .04)	.20(.06 - .34)
Clubs and Societies	.03** (-.02 - .07)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.02** (-.02 - .07)
CCA Intensity	.03(-.30 - .31)	.02(-.02 - .06)	.01(-.01 - .03)	.01(-.01 - .01)	.03(-.02 - .07)
CCA Breadth	-.01(-.23 - .10)	.01(-.01 - .01)	-.01(.01 - .01)	-.01(.01 - .01)	-.01(-.24 - .09)
CCA Duration	.22*** (.13 - .32)	.01(-.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.21*** (.12 - .31)	-.02(.04 - .01)	.01(.01 - .02)	-.01(-.04 - .02)	.20*** (.11 - .30)
Parental Autonomy Support	.19*** (.13 - .26)	-.01(-.02 - .01)	.02* (.01 - .04)	.01(-.01 - .03)	.21*** (.15 - .26)
Peer Autonomy Support	.28*** (.19 - .38)	-.01(-.03 - .01)	-.01(-.01 - .01)	-.01(-.03 - .01)	.27*** (.18 - .37)

CCA predictors	Indirect Effect				
	Direct Effect	Autonomous Motivation	Controlled Motivation	Total Indirect Effect	Total Effect
Predicting Confidence					
Age	.04(-.03 - .12)	.01(-.01 - .01)	.01(-.01 - .01)	.01(.01 - .02)	.04(-.03 - .12)
Gender	.04** (-.09 - .15)	-.01(-.02 - .01)	-.01(-.01 - .01)	.01(-.02- .01)	.03** (-.09 - .15)
Parental Education	.01(-.05- .03)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01- .01)	-.01(-.05- .03)
Uniformed Groups	.03(-.13- .19)	-.01(-.02 - .01)	-.01(-.09 - .01)	-.01(-.04- .01)	-.02(-.14- .18)
Visual and Performing Arts	.02(-.16- .19)	-.01(-.02 - .01)	-.01(-.03 - .01)	-.01(-.03- .01)	-.07(-.23- .09)
Clubs and Societies	.07(-.17- .29)	.01(-.01 - .02)	-.01(-.05 - .01)	-.01(-.05- .01)	-.05(-.18- .28)
CCA Intensity	.02(-.03- .07)	-.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01- .01)	.02(-.04 - .07)
CCA Breadth	.04(-.12- .18)	-.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01- .01)	.04(-.12 - .18)
CCA Duration	-.01(-.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	.01(-.01- .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.28*** (.17 - .39)	.01(-.02 - .04)	-.01(-.02 - .01)	.01(-.02- .03)	.28*** (.17 - .39)
Parental Autonomy Support	.29*** (.21 - .37)	.01(-.01 - .02)	-.01(-.03 - .01)	-.01(-.03- .01)	.28*** (.20 - .35)
Peer Autonomy Support	.19** (.08 - .30)	.01(-.01 - .02)	.01(-.01 - .01)	.01(-.01- .03)	.19*** (.09 - .30)
Predicting Lifelong Learning					
Age	.05(-.01- .12)	-.01(-.01 - .01)	.01(.01 - .01)	-.01(-.01- .01)	.05(-.01- .12)
Gender	.01(-.12- .12)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(.01 - .01)	.01(-.12 - .01)
Parental Education	.01(-.04- .04)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01- .01)	.01(-.04 - .04)
Uniformed Groups	-.01(-.15 - .14)	-.01(.02 - .01)	-.01(-.01 - .02)	-.01(-.02- .02)	-.01(-.15 - .14)
Visual and Performing Arts	.17* (.02 - .32)	.01(-.02 - .01)	.02(-.01 - .03)	-.01(-.01- .01)	.17* (.02 - .32)
Clubs and Societies	.08(-.13- .29)	.01(-.01 - .02)	.01(-.02 - .01)	.01(-.02- .03)	.09(-.13 - .29)
CCA Intensity	.02(-.03- .08)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01- .01)	.04(-.02 - .09)
CCA Breadth	.02(-.17- .11)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(.01 - .01)	.02(-.17- .11)
CCA Duration	.01(-.01- .01)	.01(.01 - .01)	.01(.01 - .01)	.01(-.01- .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.24*** (.15 - .34)	.01(-.01 - .04)	.01(-.01 - .01)	.01(-.01- .04)	.25*** (.16 - .35)
Parental Autonomy Support	.08* (.02 - .15)	.01(-.01 - .02)	.01(-.02 - .02)	.01(-.01- .03)	.09** (.03 - .15)
Peer Autonomy Support	.39*** (.29 - .49)	.01(-.01 - .02)	.01(-.01 - .01)	.01(-.10- .03)	.40*** (.30 - .49)

CCA predictors	Indirect Effect				
	Direct Effect	Autonomous Motivation	Controlled Motivation	Total Indirect Effect	Total Effect
Predicting Teamwork					
Age	.05* (.01 - .10)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(.01 - .01)	.07* (.01 - .13)
Gender	-.09(-.21 - .04)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.09(-.21 - .04)
Parental Education	-.01(-.04 - .04)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.04 - .04)
Uniformed Groups	-.01(-.15 - .14)	-.01(-.02 - .01)	-.01(-.02 - .01)	-.01(-.03 - .01)	-.02(-.16 - .12)
Visual and Performing Arts	.02(-.13 - .17)	-.01(-.02 - .01)	-.01(-.02 - .01)	-.01(-.03 - .01)	.01(-.14 - .16)
Clubs and Societies	-.04(-.25 - .15)	.01(-.01 - .01)	-.01(-.03 - .02)	-.01(-.03 - .02)	-.05(-.26 - .14)
CCA Intensity	.03(-.02 - .08)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.03(-.02 - .08)
CCA Breadth	.05(.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	.05(.01 - .10)	-.02(-.05 - .02)
CCA Duration	-.01(-.081 - .02)	-.01(-.01 - .01)	-.01(.01 - .01)	.01(-.01 - .01)	-.03(-.08 - .02)
Instructor Autonomy Support	.15** (.05-.25)	.01(-.01 - .04)	-.01(-.01 - .01)	.01(-.01 - .04)	.16** (.06 - .26)
Parental Autonomy Support	.15*** (.09-.22)	.01(-.01 - .02)	-.01(-.03 - .01)	-.01(-.02 - .02)	.15*** (.09 - .21)
Peer Autonomy Support	.46***(.36-.56)	.01(-.01 - .04)	-.01(-.01 - .01)	.01(-.01 - .03)	.47***(.37 - .56)
Predicting Leadership Skill					
Age	.10** (.04 - .16)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.10**(.04- .17)
Gender	.01(-.12 - .14)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.12 - .13)
Parental Education	-.02(-.06 - .02)	.01(-.01 - .01)	.01(-.01 - .01)	-.01 (-.01 - .01)	-.02(-.06 - .02)
Uniformed Groups	.01(-.03 - .05)	.01(.01 - .01)	-.01(-.01 - .01)	-.01(-.03- .02)	.06(-.08 - .21)
Visual and Performing Arts	.02(-.14 - .17)	.01(-.01 - .01)	-.01(-.02 - .01)	-.01(-.02 - .01)	-.11(-.14- .16)
Clubs and Societies	-.01(-.22 - .17)	.01(-.01 - .01)	-.01(-.04 - .01)	-.02(-.04 - .01)	-.02(-.24 - .19)
CCA Intensity	.02(-.03 - .08)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)
CCA Breadth	.02(-.09 - .15)	.01(-.01 - .01)	.01(-.01 - .01)	.05(.01 - .01)	.02(-.09 - .15)
CCA Duration	.01(-.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)
Instructor Autonomy Support	.25*** (.15 - .35)	-.01(-.03 - .01)	-.01(-.01 - .01)	-.01(-.03 - .02)	.26*** (.15 - .36)
Parental Autonomy Support	.35*** (.28 - .42)	-.01(-.01 - .01)	-.01(-.03 - .01)	-.01(-.03 - .01)	.33***(.27 - .40)
Peer Autonomy Support	.18***(.08 - .28)	-.01(-.02 - .01)	.01(-.01 - .01)	.01(-.02 - .02)	.18***(.08 - .28)

CCA predictors	Indirect Effect				
	Direct Effect	Autonomous Motivation	Controlled Motivation	Total Indirect Effect	Total Effect
Predicting Communication Skill					
Age	.08*(.01 - .15)	-.01(-.01 - .01)	-.01 (-.01 - .01)	-.01 (-.01 - .01)	.08(.01-.15)
Gender	-.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.13-.13)
Parental Education	.01(-.04 - .04)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.04-.04)
Uniformed Groups	-.03(-.17 - .11)	-.01(-.02 - .01)	-.01(-.02-.02)	-.01(-.03-.02)	-.04(-.18-.11)
Visual and Performing Arts	-.01(-.17 - .14)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.18-.14)
Clubs and Societies	-.03(-.24 - .17)	-.01(-.02 - .01)	-.01(-.03-.02)	.01(-.03-.03)	-.03(-.24-.17)
CCA Intensity	.02(-.03 - .07)	.01 (-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.02(-.03-.07)
CCA Breadth	.04(-.12 - .16)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.04(-.12-.16)
CCA Duration	-.01(-.01 - .01)	.01(.01 - .01)	.01(.01 - .01)	.01(.01 - .01)	-.01(-.01-.01)
Instructor Autonomy Support	.23***(.13 - .34)	.01(-.02 - .04)	.01(-.01 - .01)	.01(-.01 - .03)	.24***(.14-.34)
Parental Autonomy Support	.30*** (.23 - .37)	.01(-.01 - .02)	-.01(-.02 - .02)	.01(-.01 - .02)	.31*** (.24-37)
Peer Autonomy Support	.22*** (.12 - .32)	.01(-.01 - .02)	.01(-.01 - 0.1)	.01(-.01 - .03)	.23*** (.13-33)
Predicting Society-Oriented Future Goal					
Age	.06(-.01 - .12)	-.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	.06(-.01 - .12)
Gender	-.03(-.16 - .10)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01-.01)	-.03(-.16- .10)
Parental Education	-.01(-.05 - .03)	.01(-.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	-.01(-.05-.03)
Uniformed Groups	.09(-.06 - .23)	-.01(-.02 - .01)	-.01(-.02 - .02)	-.01(-.03 - .02)	.08(-.06 - .22)
Visual and Performing Arts	.16(-.01 - .31)	-.01(-.02 - .01)	-.01 (-.01 - .01)	-.01(-.02 - .01)	.15(-.01 - .30)
Clubs and Societies	.03* (-.19 - .24)	.01(-.01 - .02)	-.01(-.03 - .02)	-.01(-.03 - .03)	.02* (-.19 - .23)
CCA Intensity	.05* (.01 - .10)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.05(.01- .10)
CCA Breadth	-.01(-.20 - .08)	-.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.20 - .08)
CCA Duration	-.01(-.01- .01)	.01(.01 - .01)	-.01(-.01 - .01)	.01(.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.27*** (.17 - .39)	.01(-.02 - .04)	-.01(-.01 - .01)	.01(-.01 - .01)	.28*** (.18 - .40)
Parental Autonomy Support	.18*** (.12 - .25)	.01(-.01 - .02)	-.01(-.02 - .02)	.01(-.02 - .02)	.19*** (.12 - .25)
Peer Autonomy Support	.29***(.17 - .39)	.01(-.01 - .02)	.01(-.01 - .01)	.01(-.01 - .03)	.29***(.18 - .40)

Note 1. * $p < .05$, ** $p < .01$, *** $p < .001$.

Note 2. Gender (1 = female, 2= male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0 - 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months. CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (0) is a reference group in this path analysis.

Note 3. Values in parentheses are 95% confidence intervals.

CHAPTER 6

LONGITUDINAL RESULTS

This last chapter on results reports findings related to the longitudinal data analyses. It is based on the matched sample of students who participated in both Time-1 and Time-2 surveys. Confirmatory factor analysis (CFA) was conducted to assess factorial structures of the constructs in the longitudinal analysis. Subsequently, multi-time point CFA tests were also performed to demonstrate the invariance in the factor structure across Time-1 and Time-2 responses. The descriptive properties, internal consistency (i.e., reliability) and distribution parameters (i.e., skewness and kurtosis) were examined as part of the analyses. Further, it examined the correlational relationships among variables across the two time points. Lastly, path analysis was conducted to investigate the predictive relationships among: (a) socio-demographic covariates (e.g., age, gender and parental education), (b) CCA types, (c) CCA quantitative predictors (i.e., intensity, breadth and duration), (4) CCA motivational orientations (i.e., autonomous and controlled motivation), and (5) interpersonal relationships (i.e., CCA instructor autonomy support, parental autonomy support, and peer autonomy support) based on matched Time 1–Time 2 samples, while accounting for prior variance.

Table 6.1

Longitudinal Data Descriptive Statistics, Distributional Properties, Cronbach's Alpha, and Summary of CFA Loadings

Variables	Matched Time 1-Time 2												No. of Items
	Mean		Standard Deviation		Skewness		Kurtosis		Cronbach's Alpha		CFA Loadings		
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	
CCA Participation													
Breadth	1.05	1.04	0.25	0.22	5.51	6.07	33.71	41.99	-	-	-	-	1
Duration	19.35	24.02	15.66	14.96	1.48	1.60	3.42	4.48	-	-	-	-	1
Intensity	2.71	2.72	1.17	1.10	1.06	1.04	0.91	1.06	-	-	-	-	1
Motivation													
Autonomous Motivation	5.57	5.34	1.07	1.10	-0.81	-0.44	0.79	0.06	0.91	0.93	.50-.92 (.79)	.82-.91 (.87)	8
Controlled Motivation	4.48	4.56	1.29	1.23	-0.20	-0.31	-0.15	0.18	0.87	0.88	.65-.92 (.79)	.36-.90 (.68)	8
CCA Interpersonal Relationships													
Instructor Autonomy Support	5.20	5.22	1.20	1.20	-0.50	-0.43	0.25	0.05	0.92	0.95	.73-.87 (.81)	.82-.91 (.88)	6
Parental Autonomy Support	4.59	4.75	1.32	1.28	-0.24	-0.16	-0.20	-0.07	0.88	0.91	.71-.80 (.77)	.80-.86 (.82)	3
Peer Autonomy Support	5.44	5.38	1.20	1.17	-0.67	-0.5	0.42	0.19	0.97	0.98	.86-.91 (.89)	.92-.92 (.92)	3
CCA Outcomes													
School Belongingness	5.44	5.46	1.28	1.22	1.28	1.22	-0.77	-0.68	0.91	0.94	.81-.90 (.88)	.85-.92 (.91)	4
Academic Buoyancy	4.99	5.10	1.30	1.28	1.30	1.28	-0.32	-0.32	0.77	0.85	.64-.79 (.74)	.76-.85 (.85)	4
Educational Aspiration	6.04	5.94	1.07	1.08	1.07	1.08	-1.04	-0.87	0.83	0.91	.68-.81 (.75)	.73-.93 (.86)	4
Classroom Engagement	5.34	5.43	1.13	1.09	1.13	1.09	-0.38	-0.25	0.91	0.93	.70-.89 (.83)	.83-.91 (.88)	4
Confidence	5.30	5.28	1.34	1.29	1.34	1.29	-0.76	-0.71	0.91	0.93	.79-.89 (.85)	.82-.93 (.88)	4
Lifelong Learning	5.89	5.72	1.03	1.05	1.03	1.05	-0.82	-0.52	0.88	0.91	.81-.89 (.85)	.88-.90 (.89)	4
Teamwork	5.60	5.50	1.14	1.13	1.14	1.13	-0.70	-0.64	0.88	0.91	.78-.88 (.83)	.82-.92 (.87)	4
Leadership Skill	4.74	5.02	1.34	1.25	1.34	1.25	-0.36	-0.45	0.83	0.86	.73-.86 (.80)	.77-.89 (.83)	4
Communication Skill	5.21	5.30	1.24	1.17	1.24	1.17	-0.49	-0.44	0.89	0.92	.79-.86 (.84)	.85-.91 (.88)	4
Society-oriented Future Goal	5.59	5.55	1.19	1.12	1.19	1.12	-0.71	-0.58	0.92	0.94	.89-.91 (.90)	.90-.92 (.91)	3

The variables of duration, intensity and breadth, were named in such a way that the higher their values, the longer the period of students' participation in their main CCA (in months), the longer the amount of time they participated in their main CCA weekly (in hours), and the more number of CCAs students were involved in (in continuous values of 0, 1, 2, etc.), respectively

6.1 Construct Validity

Like Time-1 and Time-2 cross-sectional analyses (reported in Chapters 4 and 5, respectively), the CFA conducted here examined the extent to which items loaded onto their respective intended (i.e., targeted) latent factors. Goodness-of-fit indices chi-square, RMSEA, and CFI were reviewed to determine how closely the hypothesised model matches the longitudinal data. CFA was conducted three times, once for socio-contextual factors (i.e., Time-1 and Time-2 CCA instructor autonomy support, parental autonomy support, and peer autonomy support), once for motivational orientations (i.e., Time-1 and Time-2 autonomous and controlled motivation), and once for CCA outcomes (i.e., Time-1 and Time-2 school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal). Table 6.1 reports a summary of CFA factor loadings of the subscales in terms of their range and mean factor loadings. Goodness-of-fit indices were also evaluated to examine how closely the data matched the measurement model. CFA results, with the following indices, CCA motivational orientations ($\chi^2 = 2332$, $df = 446$, RMSEA = .06, CFI = .91, TLI = .90), CCA socio-contextual factors ($\chi^2 = 694$, $df = 237$, RMSEA = .04, CFI = .97, TLI = .97) and CCA outcomes ($\chi^2 = 8376$, $df = 2735$, RMSEA = .04; CFI = .91, TLI = .90), indicated that each set of constructs was well-defined. These indices showed an acceptable fit between the model and the data. All the factor loadings for matched Time-1 – Time-2 CFA are significant at $p < .001$ and reported in Appendices E1, E2, and E3.

Multi-time point invariance analysis was carried out on longitudinal data to ascertain that measurement parameters did not differ across the respective subgroups of the matched sample of Time-1 and Time-2. The longitudinal analyses involved assessing if factor structures, factor loading and items intercepts were invariant across Time-1 and Time-2 responses of the matched sample. Similar to Time-1 and Time-2 invariance analyses, the longitudinal invariance test assessed various models with parameters that are increasingly restrained. The first model, known as configural or baseline model, had unrestrained parameters across responses at the two time points, and this model was used as basis for comparison with subsequent more restrictive models. The second model, known as metric model held factor loading constant across Time-1 and Time-2 datasets. Lastly, scalar model held factor loadings and item intercepts constant across Time-1 and Time-2 datasets. By establishing the longitudinal invariance, it enabled the analysis involving Time-1 and Time-2 datasets because that means measurement parameters of key factors in the study were relatively comparable or invariant across the two time points. As with prior analyses, goodness-of-fit indices were presented to appraise the comparability invariance of parameters across the two time points. Multi-time point invariance tests were done on each set of constructs (motivational regulation, socio-contextual factors, and CCA outcomes) to determine the invariance across matched sample of Time-1 and Time-2. The result showed that measurement parameters of key factors in the study were relatively invariant across the two time points, as demonstrated in the findings that the differences in CFIs and RMSEAs between the less and more restrictive models were below .01 and .015, respectively (i.e., Δ CFIs < .01 and all the Δ RMSEAs < .015).

6.2 Longitudinal Descriptive Statistics, Distributional Properties and Reliability Analysis

The longitudinal analyses similarly comprised analyses of the descriptive statistics of scales, including scale mean and variance, distributional properties, reliability, skewness and

kurtosis. Table 6.1 summarises these findings. The results indicated that the predictor and outcome variables have a good level of reliability and the data is normally distributed.

Longitudinal Time-1 and Time-2 factors demonstrated reasonable reliability. For Time 1, the reliability ranged from .77 for academic resilience to .97 for peer autonomy support. The values for skewness fell in the range of 0.20 for parental autonomy support to 1.30 for controlled motivation. As for kurtosis, the values ranged from -1.04 for educational aspiration to 0.42 for peer relatedness. For Time 2, the values for reliability fell within the range of .85 for academic resilience to .98 for peer relatedness. The skewness is within the range of -0.05 for peer relatedness to 1.29 for confidence. The kurtosis values were from -0.87 for educational aspiration to 0.19 for peer autonomy support. Table 6.1 provides the values of mean, skewness, kurtosis, Cronbach alpha and factor loadings.

6.3 Correlations

The longitudinal correlation analyses examined the cross-time relationships among CCA predictor factors, CCA motivational-orientation factors, CCA interpersonal relationships and CCA-desired outcomes. At the same time, it considered the correlations between Time-1 factors and the matching Time-2 factors. Table 6.2 presents the full range of relationships among CCA predictors, including between Time-1 outcomes and the respective Time-2 factors.

Correlations in Table 6.2 shows that CCA intensity was negatively correlated with autonomous motivation ($r = -.06, p < .05$) and parental autonomy support ($r = -.08, p < .01$), the higher the intensity of CCA participation the lower of the level of autonomous motivation and perceived parental autonomy support. Breadth was not significantly correlated with CCA motivational orientations and CCA outcomes, ranging from -.01 for parental autonomy support to .05 for school belongingness. Thus, the range of CCA participation was not related to an increase or decrease in CCA motivational orientation or outcomes. Duration was positively significantly correlated with leadership skills ($r = .09, p$

< .01) but was not significantly associated with any of the CCA motivational orientation and the rest of CCA outcomes.

Autonomous motivation was positively correlated with CCA instructor autonomy support ($r = .74, p < .001$), parental autonomy support ($r = .62, p < .001$), peer autonomy support ($r = .72, p < .001$), school belongingness ($r = .51, p < .001$), academic buoyancy ($r = .46, p < .001$), educational aspiration ($r = .46, p < .01$), classroom engagement ($r = .52, p < .001$), confidence ($r = .52, p < .01$), lifelong learning ($r = .63, p < .001$), teamwork ($r = .60, p < .001$), leadership skill ($r = .51, p < .001$), communication skill ($r = .59, p < .001$), and society-oriented future goal ($r = .59, p < .001$). This suggested that the higher the level of CCA autonomous motivation, the higher students' levels of school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal. Also, the higher the level of students' autonomous motivation, the higher the perceived level of CCA instructor autonomy support, parental autonomy support, peer autonomy support. Albeit lower than the relations between CCA autonomous motivation and outcomes, CCA controlled motivation was also positively correlated with school belongingness ($r = .22, p < .001$), academic buoyancy ($r = .22, p < .001$), educational aspiration ($r = .19, p < .01$), classroom engagement ($r = .29, p < .001$), confidence ($r = .22, p < .01$), lifelong learning ($r = .26, p < .001$), teamwork ($r = .22, p < .001$), leadership ($r = .26, p < .001$), communication ($r = .27, p < .001$) and society-oriented future goal ($r = .25, p < .001$). This showed that the higher the controlled motivation, the higher the students' school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

CCA instructor autonomy support was positively correlated with school belongingness ($r = .50, p < .001$), academic buoyancy ($r = .48, p < .001$), educational aspiration ($r = .41, p < .01$), classroom engagement ($r = .50, p < .001$), confidence ($r = .52, p$

< .01), lifelong learning ($r = .59, p < .001$), teamwork ($r = .59, p < .001$), leadership skill ($r = .55, p < .001$), communication skill ($r = .57, p < .001$), and society-oriented future goal ($r = .58, p < .001$). This indicated that the higher the students' perceptions of CCA instructor autonomy support, the higher the students' levels of school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

CCA parental autonomy support positively correlated with school belongingness ($r = .44, p < .001$), academic buoyancy ($r = .45, p < .001$), educational aspiration ($r = .31, p < .01$), classroom engagement ($r = .50, p < .001$), confidence ($r = .50, p < .01$), lifelong learning ($r = .43, p < .001$), teamwork ($r = .59, p < .001$), leadership skill ($r = .55, p < .001$), communication skill ($r = .57, p < .001$) and society-oriented future goal ($r = .48, p < .001$). This meant that the higher the students' perceived CCA parental autonomy support, the higher the students' level of school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

Lastly, CCA peer autonomy support was positively correlated with school belongingness ($r = .56, p < .001$), academic buoyancy ($r = .45, p < .001$), educational aspiration ($r = .45, p < .01$), classroom engagement ($r = .50, p < .001$), confidence ($r = .48, p < .01$), lifelong learning ($r = .61, p < .001$), teamwork ($r = .59, p < .001$), leadership skill ($r = .52, p < .001$), communication skill ($r = .57, p < .001$) and society-oriented future goal ($r = .59, p < .001$). Hence, it indicated that the higher the students' perceived level of CCA peer autonomy support, the higher their levels of school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

Table 6.2

Matched Time 1–Time 2 Correlation Matrix for CCA factors, Academic and Non-Academic Outcomes

	Age (F1)	Gender (F2)	Parental Education (F3)	Uniformed Groups (F4)	Visual & Performing Arts (F5)	Clubs & Societies (F6)	Physical Sports (F7)	Intensity (F8)	Breadth (F9)	Duration (F10)	Autonomous Motivation (F11)	Controlled Motivation (F12)	CCA Instructor Autonomy Support (F13)	Parental Autonomy Support (F14)	Peer Autonomy Support (F15)	School Belongingness (F16)	Academic Buoyancy (F17)	Educational Aspiration (F18)	Classroom Engagement (F19)	Confidence (F20)	Lifelong Learning (F21)	Teamwork (F22)	Leadership Skill (F23)	Communication Skill (F24)	Society-oriented Future Goal (F25)	
Corr with T1								54	58	83	43	45	46	45	45	49	43	40	47	56	48	50	50	52	48	
F8	02	-04	11	<u>-12</u>	<u>11</u>	-31	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F9	03	<u>10</u>	04	04	-01	22	07	03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F10	60	03	04	-02	-02	-09	<u>11</u>	09	01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F11	01	<u>11</u>	03	-03	-09	<u>14</u>	05	-06	04	03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F12	01	14	04	08	-10	24	<u>-12</u>	-05	02	05	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F13	-01	16	03	-01	-09	<u>12</u>	05	-03	-01	03	74	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F14	-04	15	05	06	-16	21	03	<u>-08</u>	03	-01	62	44	62	-	-	-	-	-	-	-	-	-	-	-	-	-
F15	-02	08	02	-03	-03	06	06	01	05	03	72	27	83	57	-	-	-	-	-	-	-	-	-	-	-	-
F16	<u>01</u>	13	01	06	<u>-14</u>	20	-01	06	04	01	51	22	50	44	56	-	-	-	-	-	-	-	-	-	-	-
F17	-01	19	-01	04	-16	21	01	-02	04	-01	46	22	48	45	45	60	-	-	-	-	-	-	-	-	-	-
F18	03	-03	<u>08</u>	-11	09	07	-02	-03	03	-02	46	19	41	31	45	58	49	-	-	-	-	-	-	-	-	-
F19	-01	08	03	-01	-05	21	-08	-02	04	-01	52	29	50	47	49	70	64	64	-	-	-	-	-	-	-	-
F20	01	17	02	06	03	<u>17</u>	04	-03	03	01	52	22	52	50	48	54	66	46	55	-	-	-	-	-	-	-
F21	05	07	03	-08	03	09	02	05	04	02	63	26	59	43	61	58	51	70	63	65	-	-	-	-	-	-
F22	05	04	03	-03	-02	08	02	04	03	04	60	22	59	48	64	61	54	58	61	67	78	-	-	-	-	-

	Age (F1)	Gender (F2)	Parental Education (F3)	Uniformed Groups (F4)	Visual & Performing Arts (F5)	Clubs & Societies (F6)	Physical Sports (F7)	Intensity (F8)	Breadth (F9)	Duration (F10)	Autonomous Motivation (F11)	Controlled Motivation (F12)	CCA Instructor Autonomy Support (F13)	Parental Autonomy Support (F14)	Peer Autonomy Support (F15)	School Belongingness (F16)	Academic Buoyancy (F17)	Educational Aspiration (F18)	Classroom Engagement (F19)	Confidence (F20)	Lifelong Learning (F21)	Teamwork (F22)	Leadership Skill (F23)	Communication Skill (F24)	Society-oriented Future Goal (F25)
F23	<u>08</u>	<u>10</u>	-02	05	-06	<u>11</u>	-03	01	04	<u>09</u>	51	26	55	55	52	52	55	41	55	71	60	71			
F24	03	09	02	-02	-05	<u>11</u>	03	01	03	03	59	27	57	54	55	56	59	52	62	76	73	80	79		
F25	03	06	01	-02	-01	05	01	03	03	01	59	25	58	48	59	57	47	58	60	62	82	74	64	72	-

Note 1. Decimal point omitted. r values significant at $p < .001$ are presented in **bold**, $p < .01$ underlined, and $p < .05$ in *italics*.

Note 2. F1 = Age, F2 = Gender, F3 = Parental Education, F4 = Uniformed Groups, F5 = Visual and Performing Arts, F6 = Clubs and Societies, F7 = Physical Sports, F8 = Intensity, F9 = Breadth, F10 = Duration, F11 = Autonomous Motivation, F12 = Controlled Motivation, F13 = CCA Instructor Autonomy Support, F14 = CCA Parental Autonomy Support, F15 = CCA Peer Autonomy Support, F16 = School Belongingness, F17 = Academic Buoyancy, F18 = Educational Aspiration, F19 = Classroom Engagement, F20 = Confidence, F21 = Lifelong Learning, F22 = Teamwork, F23 = Leadership Skill, F24 = Communication Skill, F25 = Society-oriented Future Goal.

Note 3. Gender (1 = female, 2 = male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0- 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months. CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (1), non-Physical Sports (0).

6.4 Longitudinal Hierarchical Approach to Mediation Analysis

The correlational analyses were done to provide initial support for the hypothesised relationships between predictors, mediators, and academic and non-academic outcomes in the hypothesised CCA model. However, such analyses could not determine the unique effects of CCA predictors as it did not account for shared variance among factors. So, it is important ascertain the unique variance traced to each CCA predictor. Parallel to Time-1 and Time-2 analyses, path analysis was applied to examine the relationships between CCA predictors, mediators, and academic and non-academic outcomes within a multivariate model. In the longitudinal model analysis, the prior variance of Time-1 outcomes (auto-regression) was accounted for and included Time-1 outcome factors as predictors in the model.

Longitudinal analyses involved a six-step incremental approach. Step 1 examined the relationships between Time-1 academic and non-academic outcomes and Time-2 academic and non-academic outcomes. In Step 2, we entered covariates or control variables (age, gender and parental education) as the sole predictor of mediators (autonomous and controlled motivations) and outcomes (e.g., school belongingness) into the model. Step 3 included CCA types as a set of predictors. Following this, CCA-participation quantitative indicators (intensity, duration and breadth) in Step 4 as a set of predictors of motivational orientations and outcomes in the model. Step 5 further added CCA interpersonal relationships (instructor autonomy support, parental autonomy support, and peer autonomy support) as predictors of motivational orientations and outcomes. Finally, the two CCA motivational orientations as mediators in the hypothesised CCA model were entered as predictors of outcomes in Step 6. Table 6.3 reports the regression weights at the different steps of the analysis.

Step 1: Entering Time-1 factors.

The first stage of the path modelling involved considering the effects of prior variance from corresponding Time-1 outcomes. The step-1 model showed an acceptable fit to the data ($\chi^2 = 346.48$, $df = 132$, $RMSEA = .037$, $CFI = .98$, $TLI = .96$). The results showed significant

auto-regressive paths, ranging from $\beta = .31$ for educational aspiration to $\beta = .42$ for controlled motivation. The variance contributed by Time-1 factors towards motivational orientations and CCA outcomes at Time 2 ranged from 10% to 18%.

Step 2: Entering covariates as predictors, controlling for prior variance.

Next, we included the covariates for Time-2 data to extract the effects of respective predictors on various outcomes and also controlling for prior variance. This step-2 model analysis produced a good fit to the data ($\chi^2 = 486.34$, $df = 168$, $RMSEA = .039$, $CFI = .97$, $TLI = .95$). By considering covariates and prior variance of corresponding outcomes, this allows the extraction of the effects of various predictors entered in Step 2. Age did not significantly predict CCA motivational orientations. It positively predicted lifelong learning ($\beta = .07$, $p < .01$), teamwork ($\beta = .05$, $p < .05$), leadership skill ($\beta = .08$, $p < .01$) and communication skill ($\beta = .05$, $p < .05$). Thus, older students had greater gain the level of lifelong learning, teamwork, leadership skill, and communication skill than younger students. Gender predicted autonomous motivation ($\beta = .07$, $p < .01$), controlled motivation ($\beta = .08$, $p < .01$), academic buoyancy ($\beta = .10$, $p < .001$), confidence ($\beta = .08$, $p < .001$) and leadership skill ($\beta = .06$, $p < .05$). Relative to female students, male students had greater gain in levels of autonomous motivation, controlled motivation, academic resilience, confidence and leadership skill than female students. Parental education significantly correlated with only educational aspiration ($\beta = .06$, $p < .05$) but did not significantly correlate with other predicted factors, with β values ranging from $-.04$ for leadership skill to $.03$ for controlled motivation. Thus, students with higher level of parental education reported greater gain in the students' level of educational aspiration than those with lower of parental education. In sum, covariates explained around 1% of the variance for each of the predicted variables.

Step 3: Entering CCA types as predictors, controlling for covariates and prior variance. To address RQ5, "To what extent do students in three different CCA types (i.e., Visual and Performing Arts, Clubs and Societies, Uniformed Groups) differ from those in

Physical Sports (i.e., reference group) differentially gain or decline in terms of their CCA motivational orientations as well as academic and non-academic outcomes?”, CCA types were entered as predictors into the model. This step-3 model analysis yielded a good fit to the data ($\chi^2 = 346.98$, $df = 132$, $RMSEA = .036$, $CFI = .98$, $TLI = .95$). In Step 3, three CCA types were included (i.e., Uniformed Groups, Visual and Performing Arts, and Clubs and Societies), with Physical Sports as a reference group. Uniformed-Group participation predicted controlled motivation ($\beta = -.11$, $p < .01$) and teamwork ($\beta = -.06$, $p < .05$), but had no significant gain or loss in CCA outcomes with β values ranging from $-.05$ for educational aspiration to $.05$ for leadership skill. Visual and Performing Arts predicted controlled motivation ($\beta = .07$, $p < .05$), but had no significant gain or loss in CCA outcomes with β values ranging from $-.05$ for lifelong learning to $.06$ for educational aspiration. Participation in Clubs and Societies positively predicted autonomous motivation ($\beta = .10$, $p < .01$), controlled motivation ($\beta = .18$, $p < .001$), school belongingness ($\beta = .12$, $p < .001$), academic buoyancy ($\beta = .09$, $p < .01$), classroom engagement ($\beta = .14$, $p < .001$), lifelong learning ($\beta = .07$, $p < .05$) and communication ($\beta = .07$, $p < .05$) but negatively predicted leadership skill ($\beta = -.09$, $p < .01$). Thus, students in Clubs and Societies reported gain in the level of autonomous motivation, controlled motivation, school belongingness, academic buoyancy, classroom engagement, lifelong learning and communication but loss in the level of leadership skill as compared to students in Physical Sports. The model accounted for 13% and 21% of the variance in CCA motivational orientations, and 10% to 18% of the variance in the CCA-desired outcomes. CCA types accounted for an incremental variance of 1% over the prior step.

Step 4: Entering quantitative indicators of CCA participation as predictors, controlling for prior variance, covariates and CCA types. To address RQ6, “To what extent do quantitative indicators of students’ CCA participation (i.e., the breadth, duration, and intensity of CCA participation) predict gains or declines in their CCA motivational

orientations and academic and non-academic outcomes?”, the fourth step in the analysis included CCA-participation quantitative indicators (i.e., CCA intensity, breadth and duration) as predictors. The step-4 model analysis indicated an accepted fit with the data ($\chi^2 = 582.73$, $df = 231$, $RMSEA = .035$, $CFI = .97$, $TLI = .95$). CCA intensity did not significantly predict CCA and outcomes and β values ranged from $-.04$ for autonomous motivation to 0.5 for lifelong learning. The level of CCA intensity did not have significant gain or loss in students’ level of CCA outcomes. CCA breadth did not significantly predict CCA motivational orientations and outcomes with β values ranged from $-.01$ for autonomous motivation and $.03$ for confidence. The level of CCA breadth did not have significant gain or loss in students’ level of CCA outcomes. Duration positively predicted controlled motivation ($\beta = .08$, $p < .01$) and leadership skill ($\beta = .06$, $p < .05$) and the rest of β values ranged from $-.03$ for educational aspiration to $.05$ for autonomous motivation. The longer the duration of students’ CCA participation had greater gain in the students’ level of controlled motivation and leadership skill than those who participated for shorter duration. Predictors in this model contributed 10% to 22% to respective CCA outcomes, and a 1% incremental variance over prior step.

Step 5: Entering CCA interpersonal-relationships perceptions, after controlling for prior variance, covariates, CCA types and quantitative indicators of CCA participation. To address RQ7, “To what extent do students’ perceptions of CCA interpersonal contexts (i.e., perceived CCA instructors, CCA peers, and CCA parental autonomy support) predict the gains or declines in their CCA motivational orientations and academic and non-academic outcomes?”, in Step 5, students’ perceptions of CCA interpersonal-relationship factors were added as predictors into the model while accounting for the effects of other sets of predictors in prior steps. The step-5 model yielded an acceptable model fit to the data ($\chi^2 = 781.03$, $df = 354$, $RMSEA = .031$, $CFI = .97$, $TLI = .95$). CCA instructor autonomy support positively predicted autonomous motivation ($\beta = .30$, $p < .001$), academic buoyancy ($\beta = .18$, $p < .001$), educational aspiration ($\beta = .10$, $p < .05$),

classroom engagement ($\beta = .13, p < .01$), confidence ($\beta = .19, p < .001$), lifelong learning ($\beta = .19, p < .001$), teamwork ($\beta = .11, p < .05$), leadership skill ($\beta = .19, p < .001$), communication skill ($\beta = .19, p < .001$) and society-oriented future goal ($\beta = .18, p < .001$). This meant that the higher the level of students' perceived CCA teacher autonomy support also had greater gain in the students' levels of autonomous motivation, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal.

CCA parental autonomy support positively predicted autonomous motivation ($\beta = .22, p < .001$), controlled motivation ($\beta = .33, p < .001$), school belongingness ($\beta = .15, p < .0011$), academic buoyancy ($\beta = .21, p < .001$), educational aspiration ($\beta = .07, p < .05$), classroom engagement ($\beta = .22, p < .001$), confidence ($\beta = .24, p < .001$), lifelong learning ($\beta = .10, p < .001$), teamwork ($\beta = .16, p < .001$), leadership skill ($\beta = .30, p < .001$), communication skill ($\beta = .27, p < .01$) and society-oriented future goal ($\beta = .18, p < .001$). Thus, students with higher perceived CCA parental autonomy support also had greater gain in the levels of students' autonomous motivation, controlled motivation, school belongingness, academic buoyancy, education aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill and society-oriented future goal than those with lower perceived CCA parental autonomy support.

CCA peer autonomy support positively predicted autonomous motivation ($\beta = .28, p < .001$), school belongingness ($\beta = .38, p < .001$), academic buoyancy ($\beta = .10, p < .05$), educational aspiration ($\beta = .28, p < .001$), classroom engagement ($\beta = .18, p < .001$), lifelong learning ($\beta = .33, p < .001$), teamwork ($\beta = .39, p < .001$), leadership skill ($\beta = .12, p < .05$), communication skill ($\beta = .17, p < .001$), and society-oriented future goal ($\beta = .27, p < .001$). So, students with higher the perceived level of CCA peer autonomy support had greater gains in the students' levels of school belongingness, educational aspiration, lifelong learning,

teamwork and society-oriented future goal than those with lower level of perceived level of CCA peer autonomy support.

Overall, all the predictors in this model accounted for 62% and 33% of the variance in autonomous and controlled motivations, and between 31% to 49% of the variance in academic and non-academic outcomes. CCA interpersonal relationships contributed an incremental variance of 11% to 49% over prior step.

Step 6: Entering CCA motivational orientations as predictors, controlling for prior variance, covariates, CCA types, quantitative indicators of CCA participation and CCA interpersonal-relationship perceptions. To address RQ8, “To what extent do students’ CCA motivational orientations mediate the link between types of CCA that students participate in, the quantitative indicators of their CCA participation, and their perceptions of CCA interpersonal contexts to the gains or declines in their academic and non-academic outcomes?”, the sixth step included CCA motivational orientations, together with covariates, CCA types, quantitative indicators of CCA participation, and CCA interpersonal relationships, as predictors of the outcomes. The purpose was to test if motivational orientations are mediators in the hypothesised CCA model. The aim is to determine if the effects of CCA types, quantitative indicators of CCA participation, and CCA interpersonal-relationship perceptions increased or decreased as a result of being mediated by motivational orientations. This step-6 model analysis yielded accepted fit to the data ($\chi^2 = 861.33$, $df = 372$, $RMSEA = .033$, $CFI = .97$, $TLI = .95$).

Autonomous motivation positively predicted educational aspiration ($\beta = .24$, $p < .001$), academic buoyancy ($\beta = .11$, $p < .01$), classroom engagement ($\beta = .16$, $p < .01$), confidence ($\beta = .16$, $p < .001$), lifelong learning ($\beta = .29$, $p < .001$), leadership skill ($\beta = .15$, $p < .001$), teamwork ($\beta = .21$, $p < .001$), communication skill ($\beta = .22$, $p < .001$) and society-oriented future goal ($\beta = .21$, $p < .01$). Students with higher level of autonomous motivation had greater gain in educational aspiration, academic buoyancy, classroom engagement,

confidence, lifelong learning, leadership skill, teamwork, communication skill and society-oriented future goal than those with lower level of autonomous motivation. Controlled motivation did not significantly predict any outcomes, with β values ranging from $\beta = -.01$ for school belongingness to $\beta = .01$ for educational aspiration. Students' level of controlled motivation had no gain or loss in CCA outcomes. CCA motivational orientation contributed 33% to 49% towards the variance for academic and non-academic outcomes. Also, CCA motivational orientations conferred an incremental variance of 1% to 2% over the prior step. Table 6.4 reports the summary of standardized regression weight of the final (Step 6) mediational model.

Table 6.3

Path Analysis Results for Longitudinal CCA Model

Predictors	Variables											
	AM	CM	SB	AB	EA	CE	CF	LL	TW	LS	CS	SG
Step 1												
T1 Factor Outcome	.34***(.03)	.42***(.03)	.39***(.03)	.38***(.03)	.31***(.02)	.36***(.02)	.40***(.02)	.31***(.02)	.32***(.03)	.34***(.03)	.33***(.02)	.31***(.03)
R ²	.12***	.18***	.16***	.14***	.10***	.13***	.16***	.10***	.10***	.12***	.11***	.10***
Step 2												
T1 Factor Outcome	.34***(.03)	.42***(.03)	.39***(.03)	.37***(.03)	.31***(.02)	.35***(.02)	.39***(.02)	.30***(.02)	.32***(.03)	.34***(.03)	.33***(.02)	.31***(.03)
Age	.05(.03)	-.01(.03)	.05(.03)	.03(.03)	.04(.03)	.03(.03)	.05(.03)	.07*(.03)	.06*(.03)	.08**(.03)	.06*(.03)	.05(.03)
Gender	.07**(.03)	.08**(.03)	.05(.03)	.10***(.07)	-.04(.03)	.03(.03)	.08**(.03)	.08(.03)	.01(.03)	.06*(.03)	.04(.03)	.04(.03)
Parental Education	.01(.03)	.03(.03)	-.01(.03)	-.02(.03)	.06*(.03)	.02(.03)	.01(.03)	.01(.03)	.03(.03)	-.04(.03)	-.01(.03)	-.01(.02)
R ²	.12***	.18***	.16***	.15***	.10***	.13***	.17***	.11***	.10***	.13***	.11***	.10***
R ² Change	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
Step 3												
T1 Factor Outcome	.34***(.03)	.42***(.03)	.39***(.03)	.37***(.03)	.31***(.02)	.35***(.02)	.39***(.02)	.31***(.02)	.32***(.03)	.34***(.03)	.33***(.02)	.31***(.03)
Age	.05(.03)	-.02(.03)	.04(.03)	.03(.03)	.04(.03)	.02(.03)	.05(.03)	.07*(.03)	.06*(.03)	.08(.03)	.05(.03)	.04(.03)
Gender	.04(.03)	.05(.03)	.02(.03)	.08**(.03)	-.02(.03)	.02(.04)	.05(.03)	.05(.03)	.01(.03)	.04(.03)	.02(.03)	.04(.03)
Parental Education	.01(.03)	.02(.03)	-.01(.03)	-.03(.03)	.05*(.03)	.02(.03)	.01(.03)	.01(.03)	.02(.03)	-.04(.03)	-.01(.03)	-.02(.03)
Uniformed Groups	-.02(.03)	.11**(.03)	.04(.03)	.01(.03)	-.05(.03)	.03(.03)	-.03(.03)	-.05(.04)	-.06*(.03)	.04(.03)	-.02(.03)	-.01(.03)
Visual and Performing Arts	-.03(.03)	.07*(.03)	.01(.03)	-.01(.03)	.06(.03)	.05(.04)	-.05(.03)	.04(.03)	.01(.03)	.03(.03)	-.01(.03)	.03(.04)
Clubs & Societies	.10**(.03)	.18***(.03)	.12(.03)***	.09**(.03)	.05(.03)	.14***(.03)	.05(.03)	.07*(.03)	.06(.03)	-.09**(.03)	.07*(.03)	.06(.03)
R ²	.13***	.21***	.17***	.16***	.11***	.14***	.18***	.11***	.11***	.14***	.12***	.10***
R ² Change	.01	.03	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01

	AM	CM	SB	AB	EA	CE	CF	LL	TW	LS	CS	SG
Step 4												
T1 Factor Outcome	.34***(.03)	.42***(.03)	.39***(.03)	.37***(.03)	.31***(.02)	.35***(.02)	.39***(.02)	.31***(.02)	.32***(.03)	.34***(.03)	.33***(.02)	.31***(.03)
Age	.02(.03)	-.07*(.04)	.03(.03)	.02(.03)	.04(.03)	.01(.03)	.05(.04)	.09*(.04)	.06(.03)	.04(.03)	.04(.04)	.06(.04)
Gender	.04(.03)	.05(.03)	.02(.03)	.07*(.03)	-.02(.03)	.02(.03)	.05(.03)	-.02(.03)	-.01(.03)	.04(.03)	.01(.03)	.03(.03)
Parental Education	.01(.03)	.02(.03)	-.01(.03)	-.03(.03)	.05*(.03)	.02(.03)	.01(.03)	.01(.03)	.02(.03)	-.04(.03)	-.01(.03)	-.02(.03)
Uniformed Groups	-.02(.04)	.10**(.03)	.03(.04)	.01(.04)	-.07(.04)	.03(.04)	-.04(.03)	-.06(.04)	-.04(.04)	.04(.03)	-.02(.04)	-.01(.04)
Visual and Performing Art	-.03(.04)	.07*(.04)	.01(.03)	-.01(.04)	.04(.04)	.04(.04)	-.06(.04)	.02(.04)	-.02(.03)	.02(.03)	-.01(.04)	.02(.04)
Clubs and Societies	.07**(.03)	.18***(.03)	.10***(.03)	.08*(.03)	.03(.03)	.12***(.03)	.03(.04)	.04(.04)	.03(.04)	.07(.04)	.07*(.04)	.06(.04)
Intensity	-.04(.03)	-.02(.03)	-.02(.03)	-.01(.03)	-.02(.03)	-.03(.03)	-.01(.03)	-.01(.03)	-.02(.03)	-.01(.03)	.02(.04)	.01(.03)
Breadth	-.01(.03)	.01(.03)	.04(.03)	.03(.03)	.06(.03)	.02(.03)	.05(.03)	.01(.03)	.02(.03)	.01(.03)	.02(.03)	.05(.03)
Duration	.05(.03)	.08**(.03)	.03(.03)	.01(.03)	.01(.03)	.02(.03)	-.01(.03)	-.02(.04)	.01(.03)	.06*(.03)	.04(.04)	-.03(.04)
R ²	.13***	.22***	.17***	.16***	.12***	.14***	.18***	.12***	.11***	.14***	.12***	.10***
R ² change	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
	AM	CM	SB	AB	EA	CE	CF	LL	TW	LS	CS	SG
Step 5												
T1 Factor Outcome	.22***(.03)	.42***(.03)	.34***(.03)	.35***(.03)	.30***(.02)	.34***(.03)	.37***(.02)	.28***(.02)	.27***(.03)	.30***(.03)	.30***(.02)	.27***(.04)
Age	.06*(.03)	-.05(.04)	.08*(.03)	.05(.03)	.07*(.03)	.04(.03)	.07*(.03)	.10**(.03)	.08**(.03)	.07*(.03)	.08**(.04)	.07*(.04)
Gender	-.03(.03)	.05(.03)	-.02(.03)	.04(.03)	-.05(.03)	-.02(.03)	.01(.03)	.01(.03)	-.04(.03)	-.01(.03)	-.03(.03)	-.01(.03)
Parental Education	-.01(.03)	.01(.03)	-.02(.03)	-.04(.03)	.04(.03)	.01(.03)	-.01(.03)	-.01(.03)	.01(.03)	-.06*(.03)	-.03(.03)	-.04(.03)
Uniformed Groups	-.06(.03)	.26**(.03)	.03(.03)	-.0(.03)	-.04(.04)	.04(.04)	-.03(.03)	-.03(.03)	-.01(.03)	.05(.03)	-.02(.03)	.01(.03)
Visual & Performing Arts	-.05(.03)	.21*(.03)	.01(.03)	.01(.03)	.06(.04)	.06(.03)	-.04(.03)	.05(.03)	.01(.03)	.05(.03)	.01(.03)	.03(.04)
Club & Societies	.09(.03)	.46***(.03)	.08**(.03)	.04(.03)	.03(.03)	.10***(.03)	.01(.03)	.04(.03)	.02(.04)	.04(.04)	.02(.04)	.02(.04)
Intensity	-.02(.03)	.01(.03)	-.01(.03)	.01(.03)	.05*(.03)	.03(.03)	.02(.03)	.06**(.03)	.05*(.03)	.05*(.03)	.04(.03)	.05*(.03)
Breadth	-.03(.03)	.15(.03)	.02(.03)	.04(.03)	.03(.03)	.01(.03)	.04(.03)	.01(.03)	.02(.03)	.03(.03)	.03(.03)	.01(.03)
Duration	.01(.03)	.01*(.03)	-.02(.03)	-.03(.03)	-.06(.03)	-.02(.03)	-.04(.03)	-.04(.04)	-.04(.03)	.02(.03)	-.02(.04)	-.04(.03)
CCA Instructor Autonomy Support	.30***(.04)	.06(.04)	-.01(.05)	.18***(.04)	.10*(.05)	.13**(.05)	.19***(.04)	.19***(.04)	.11*(.04)	.19***(.04)	.19***(.05)	.18***(.05)
Parent Autonomy Support	.22***(.03)	.33***(.03)	.15***(.03)	.21***(.03)	.07*(.03)	.22***(.03)	.24***(.03)	.10**(.03)	.16***(.03)	.30***(.03)	.27**(.03)	.18***(.04)
Peer Autonomy Support	.28***(.04)	-.02(.04)	.38***(.05)	.10*(.05)	.28***(.05)	.18***(.05)	.09(.05)	.33***(.05)	.39***(.05)	.12*(.04)	.17***(.05)	.27***(.05)
R ²	.49	.11	.25	.21	.19	.24	.24	.35	.38	.30	.34	.35
R ² change	.26	.11	.08	.05	.07	.10	.06	.23	.27	.16	.22	.25

	AM	CM	SB	AB	EA	CE	CF	LL	TW	LS	CS	SG
Step 6												
T1 Factor Outcome	-	-	.37***(.03)	.36***(.03)	.30***(.03)	.33***(.03)	.38***(.02)	.27***(.02)	.27***(.03)	.30***(.03)	.30***(.02)	.28***(.04)
Age	-	-	.06(.03)	.05(.03)	.07*(.03)	.04(.03)	.07*(.03)	.09**(.03)	.08**(.03)	.07*(.03)	.07*(.03)	.09*(.04)
Gender	-	-	-.01(.03)	.04(.03)	-.05(.03)	-.02(.03)	.01(.03)	.01(.03)	-.04(.03)	-.01(.03)	-.03(.03)	.01(.03)
Parental Education	-	-	-.02(.03)	-.04(.03)	.04(.03)	.01(.03)	-.01(.03)	-.01(.03)	.01(.03)	-.06*(.03)	-.03(.03)	-.04(.03)
Uniformed Group	-	-	.04(.03)	.01(.03)	-.04(.04)	.03(.04)	-.02(.03)	-.02(.03)	.01(.03)	.05(.03)	-.02(.03)	-.01(.03)
Visual & Performing Arts	-	-	.01(.03)	.01(.03)	.07(.04)	.04(.03)	-.04(.03)	.05(.03)	.02(.03)	.05(.03)	.01(.03)	.01(.04)
Club & Societies	-	-	.08**(.03)	.04(.03)	.03(.03)	.15***(.03)	.01(.03)	.04(.03)	.03(.04)	.04(.04)	.02(.03)	.07(.04)
Intensity	-	-	.01(.03)	.01(.03)	.06*(.03)	.03(.03)	.02(.03)	.07**(.03)	.05*(.03)	.05*(.03)	.05*(.03)	.01(.03)
Breadth	-	-	.03(.03)	.04(.03)	.03	.01(.03)	.04(.03)	.01(.03)	.02(.03)	.03(.03)	.03(.03)	.04(.03)
Duration	-	-	-.02(.03)	-.03(.03)	-.06(.03)	-.02(.03)	-.03(.03)	-.04(.03)	-.03(.03)	.03(.03)	-.02(.03)	-.04(.03)
CCA Instructor Auto. Sup.	-	-	-.04(.05)	.16**(.05)	.02(.05)	.08(.05)	.13**(.05)	.09*(.05)	.04(.05)	.16**(.04)	.12*(.05)	.11*(.05)
Parent Auto. Support	-	-	.13***(.03)	.19***(.03)	.01(.03)	.17***(.03)	.22***(.03)	.02(.03)	.12***(.04)	.28***(.03)	.22***(.04)	.13***(.04)
Peer Auto. Support	-	-	.34***(.05)	.08(.05)	.20***(.05)	.13*(.05)	.04(.05)	.24***(.05)	.32***(.05)	.09(.05)	.11*(.05)	.21***(.05)
Autonomous Mot.	-	-	.10 (.04)	.11*(.04)	.24**(.04)	.16**(.04)	.16***(.04)	.29**(.04)	.21***(.04)	.15***(.04)	.22***(.04)	.21**(.04)
Controlled Mot.	-	-	-.01(.03)	.01(.03)	.01(.03)	.04(.03)	-.03(.03)	.01(.03)	-.04(.03)	-.01(.03)	-.01(.03)	-.01(.03)
R ²	-	-	.42***	.37***	.33***	.39***	.42***	.49***	.49***	.44***	.47***	.45***
R ² Change	-	-	.01	.01	.02	.01	.01	.02	.01	.01	.02	.01

Note 1. * $p < .05$, ** $p < .01$, *** $p < .001$.

Note 2. AM = Autonomous Motivation, CM = Controlled Motivation, SB = School Belongingness, AB = Academic Buoyancy, EA = Educational Aspiration, CE = Classroom Engagement, CF = Confidence, LL = Lifelong Learning, TW = Teamwork, LS = Leadership Skill, CS = Communication Skill, SG = Society-oriented Future Goal.

Note 3. Gender (1 = female, 2 = male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0 - 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months). CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (0) is a reference group in this path analysis.

Note 4. Values in parentheses are standard errors.

Table 6.4

Summary of Standardised Regression Coefficients (Betas) in the Path Models Predicting Different Dimensions of Outcomes (Matched T1 T2)

Heading	Covariates			CCA Types			Quantity			Interpersonal Relationship		T1	Motivation	
	Age	Gender	Parental Education	Uniformed Groups	Art	Club	Intensity	Breadth	Duration	Instructor	Parent	Peer	Autonomous	Controlled
Autonomous Motivation	.06(.03)	-.03(.03)	-.01(.03)	-.06(.03)	-.05(.03)	.09(.03)	-.02(.03)	-.03(.03)	.01(.03)	.28***(.04)	.19***(.03)	.26***(.04)	.20***(.03)	
Controlled Motivation	-.05(.04)	.05(.03)	.01(.03)	.26**(.03)	.21*(.03)	.46***(.03)	.01(.03)	.15(.03)	.01*(.03)	.06(.04)	.31***(.03)	-.02(.04)	.39***(.03)	
School Belongingness	.06(.03)	-.01(.03)	-.02(.03)	.03(.03)	.01(.03)	.08**(.03)	-.01(.03)	.02(.03)	.02(.03)	-.01(.05)	.15***(.03)	.38**(.05)	.34***(.03)	.10*(.04)
Academic Buoyancy	.05(.03)	.04(.03)	-.04(.03)	-.01(.03)	.01(.03)	.04(.03)	.01(.03)	.04(.03)	-.03(.03)	.18***(.05)	.21***(.03)	.10*(.05)	.35***(.03)	.05(.04)
Educational Aspiration	.07*(.03)	-.05(.03)	.04(.03)	-.04(.04)	.06(.04)	.03(.03)	.05*(.03)	.03(.03)	-.06(.03)	.10*(.05)	.07*(.03)	.28***(.05)	.30***(.03)	.24***(.04)
Classroom Engagement	.04(.03)	-.02(.03)	.01(.03)	.04(.03)	.06(.04)	.10***(.03)	.03(.03)	.01(.03)	-.02(.03)	.13**(.05)	.22***(.03)	.18***(.05)	.34***(.03)	.16**(.04)
Confidence	.07*(.03)	.01(.03)	-.01(.03)	-.03(.03)	-.04(.03)	.01(.03)	.02(.03)	.04(.03)	-.04(.03)	.19***(.05)	.24***(.03)	.09(.05)	.37***(.02)	.16***(.04)
Lifelong Learning	.10**(.03)	.01(.03)	-.01(.03)	-.03(.03)	.05(.03)	.04(.03)	.06**(.03)	.01(.03)	-.04(.03)	.19***(.05)	.10**(.03)	.33***(.05)	.28***(.02)	.29***(.04)
Teamwork	.08**(.03)	-.04(.03)	.01(.03)	-.01(.03)	.01(.03)	.02(.04)	.05*(.03)	.02(.03)	-.04(.03)	.11*(.05)	.16***(.04)	.39***(.05)	.27***(.03)	.21***(.04)
Leadership Skills	.07*(.03)	-.01(.03)	-.06*(.03)	.05(.03)	.05(.03)	.04(.03)	.05*(.03)	.03(.03)	.02(.03)	.19***(.04)	.30***(.05)	.12***(.05)	.30***(.03)	.08(.04)
Communication Skills	.08**(.03)	-.03(.03)	-.03(.03)	-.02(.03)	.01(.03)	.02(.03)	.04(.03)	.03(.03)	-.02(.03)	.19***(.05)	.27***(.04)	.17***(.05)	.17***(.02)	.22***(.04)
Society-oriented Future Goals	.07*(.03)	-.01(.03)	-.04(.03)	.01(.03)	.03(.04)	.02(.03)	.05*(.03)	.01(.03)	-.04(.03)	.18***(.05)	.18***(.04)	.27***(.05)	.27***(.04)	.21**(.04)

Note 1. Decimal point omitted. * $p < .05$, ** $p < .01$, *** $p < .001$

Note 2. Gender (1 = female, 2 = male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0- 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months). CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (0) is a reference group in this path analysis.

Note 3. Values in parentheses are standard errors.

6.5 Bootstrapping Approach to Mediation Analysis

The longitudinal data analyses aimed to examine the mediational model through a six-step path modelling by considering the increase or decrease in the CCA outcomes across Time 1 and Time 2. It examined the incremental variance of respective sets of predictors entered in sequences that predict CCA outcomes. These involved sets of CCA predictors of mediators and outcomes:

1. prior variance;
2. covariates (age, gender and parental education);
3. CCA types (Uniformed Groups, Visual and Performing Arts, and Clubs and Societies; with Physical Sports as a reference group);
4. quantitative indicators of CCA participation (intensity, breadth and duration);
5. perceptions of CCA interpersonal-relationship factors (CCA instructor autonomy support, CCA parental autonomy support and CCA peer autonomy support); and
6. CCA motivational orientations (autonomous and controlled motivation) were included as predictors of outcomes.

Subsequently, to address RQ8, analysis adopted a bootstrapping approach to test the mediating role of CCA motivational orientations in the relationship between CCA types, CCA quantitative indicators of participation and CCA interpersonal-relationship perceptions. This technique made use of Mplus syntax for multiple mediation in order to estimate the parameters of both direct and indirect effects pertaining to motivational orientation factors in the relationship between predictors and outcomes (Muthén, Muthén, & Asparouhov, 2016). The parameter estimates and 95% bias-corrected confidence intervals of the indirect effects were conducted with 5,000 random samples.

As can be seen in Table 6.5, the total effects of teacher, parental and peer autonomy support on each of the academic and non-academic outcomes were significant. These total effects can be broken down into direct and indirect effects. CCA instructor autonomy support had significant direct effects on the following: academic buoyancy ($\beta = .17, p < .01$), confidence ($\beta = .14, p < .01$), leadership skill ($\beta = .17, p < .01$), communication skill ($\beta = .11, p < .05$) and society-oriented future goal ($\beta = .10, p < .05$). The indirect effects of CCA instructor autonomy support through autonomous motivation were significant for school belongingness ($\beta = .03, p < .05$), educational aspiration ($\beta = .07, p < .001$), classroom engagement ($\beta = .04, p < .01$), confidence ($\beta = .05, p < .01$), lifelong learning ($\beta = .08, p < .001$), teamwork ($\beta = .06, p < .001$), communication skill ($\beta = .06, p < .001$) and society-oriented future goal ($\beta = .06, p < .001$).

CCA parental autonomy support had significant direct effects on CCA outcomes: school belongingness ($\beta = .12, p < .001$), academic buoyancy ($\beta = .20, p < .001$), classroom engagement ($\beta = .14, p < .001$), confidence ($\beta = .21, p < .001$), teamwork ($\beta = .11, p < .001$), leadership skill ($\beta = .27, p < .001$), communication skill ($\beta = .11, p < .001$) and society-oriented future goal ($\beta = .17, p < .01$). The indirect effects of CCA parental autonomy support through autonomous motivation were significant on school belongingness ($\beta = .02, p < .05$), educational aspiration ($\beta = .05, p < .001$), classroom engagement ($\beta = .03, p < .001$), confidence ($\beta = .04, p < .001$), lifelong learning ($\beta = .05, p < .001$), teamwork ($\beta = .04, p < .001$), communication skill ($\beta = .04, p < .001$), and society-oriented future goal ($\beta = .04, p < .001$).

CCA peer autonomy support had significant direct effects on school belongingness ($\beta = .36, p < .001$), educational aspiration ($\beta = .17, p < .01$), classroom engagement ($\beta = .12, p < .05$), lifelong learning ($\beta = .17, p < .01$), teamwork ($\beta = .31, p < .001$), communication skill ($\beta = .10, p < .05$) and society-oriented future goal ($\beta = .20, p < .001$). The indirect effects of

CCA peer autonomy support predicted school belongingness ($\beta = .03, p < .05$), educational aspiration ($\beta = .06, p < .001$), classroom engagement ($\beta = .04, p < .01$), confidence ($\beta = .05, p < .01$), lifelong learning ($\beta = .07, p < .001$), teamwork ($\beta = .06, p < .001$), communication skill ($\beta = .06, p < .001$) and society-oriented future goal ($\beta = .06, p < .001$) through autonomous motivation. In sum, the findings supported the findings found in the hierarchical approach to examining mediation, confirming the significant role of autonomous motivation in mediating the effects of CCA predictors, more specifically, CCA relationship factors (i.e., CCA Instructor autonomy support, CCA parental autonomy support and CCA peer autonomy support) on CCA outcomes. This highlighted the facilitative role of CCA autonomous motivation in autonomy supportive CCA context to promote CCA outcomes.

Table 6.5

Summary of Direct, Indirect, and Total Effects in the Multiple Mediation Path Models Predicting Different Dimensions of CCA Outcomes for Matched Time 1 – Time 2 Samples

CCA predictors	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting School Belongingness					
Age	.08* (.01 - .15)	.01(.01 - .02)	.01(-.01 - .01)	.01(.01 - .02)	.08*(.02 - .15)
Gender	-.01(-.13 - .11)	-.01(-.02 - .01)	.01(-.01 - .01)	-.01(-.02 - .01)	-.01 (-.13 - .10)
Parental Education	-.02(-.06 - .02)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.02(-.06 - .02)
Uniformed Groups	-.14(-.52 - .26)	-.02(-.08 - .01)	-.01(-.02 - .01)	-.02(-.07 - .01)	.20(-.16 - .26)
Visual and Performing Arts	.05(-.11 - .20)	-.01(-.02 - .01)	-.01(-.02 - .01)	-.01(-.02 - .02)	.05(-.11 - .20)
Clubs and Societies	.17* (.02 - .33)	.01(-.01 - .02)	-.01(-.01 - .01)	.01(-.03 - .03)	.17* (.02 - .33)
CCA Intensity	-.01(-.06 - .05)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01(-.06 - .05)
CCA Breadth	.07(-.19 - .32)	.01(-.01 - .06)	-.01(-.02 - .01)	.01(-.01 - .01)	.08(-.18 - .33)
CCA Duration	-.01(-.01 - .01)	.01(.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	-.04(-.15 - .06)	.03* (.01 - .06)	.01(-.01 - .01)	.03* (.01-.06)	-.01*** (-.12 - .09)
Parental Autonomy Support	.12*** (.06 - .19)	.02* (.01 - .04)	-.01(-.02 - .02)	.02(.01 - .05)	.14*** (.08 - .20)
Peer Autonomy Support	.36*** (.25 - .46)	.03* (.01 - .06)	.01(-.01 - .01)	.03* (.01 - .06)	.39*** (.28 - .49)
Predicting Academic Buoyancy					
Age	.06(-.02 - .14)	.01(.01 - .02)	.01(-.01 - .01)	.01(-.01 - .02)	.07(-.01 - .15)
Gender	.10(-.03 - .22)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.03 - .22)
Parental Education	-.04(-.08 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	-.04(-.08 - .01)
Uniformed Groups	-.14(-.52 - .26)	-.02(-.07 - .01)	.01(-.02 - .02)	-.02(-.07 - .01)	-.16(-.53 - .27)
Visual and Performing Arts	.02(-.15 - .18)	.02(.01 - .06)	.01(-.01 - .02)	-.01(-.02 - .02)	.01(-.15 - .18)
Clubs and Societies	.10(-.06 - .26)	-.01(-.01 - .02)	-.01(-.01 - .02)	.01(-.02 - .03)	.10(-.06 - .23)
CCA Intensity	-.01(-.05 - .06)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.06 - .06)
CCA Breadth	.03(-.04 - .64)	.01(-.01 - .05)	.01(-.01 - .01)	.01(-.01 - .05)	.30(-.02 - .65)
CCA Duration	-.01(-.01 - .01)	.01(.01 - .01)	.01(.01 - .01)	.01(.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.17** (.07 - .26)	.03(.01 - .06)	.01(-.01 - .01)	.03(.01-.06)	.19*** (.10 - .29)
Parental Autonomy Support	.20*** (.12 - .27)	.02(.01 - .04)	.01(-.02 - .02)	.02(-.01 - .04)	.22*** (.15 - .29)
Peer Autonomy Support	.09(-.01 - .19)	.02(.01 - .06)	.01(-.01 - .01)	.02(.01 - .06)	.11*(.01 - .21)

	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Educational Aspiration					
Age	.07* (.01 - .14)	.01* (.01 - .03)	.01(-.01 - .01)	.01(.01 - .03)	.09*(.02 - .15)
Gender	-.10(-.21 - .01)	-.01(-.03- .02)	.01(-.01 - .01)	-.01(-.02 - .01)	-.11(-.13 - .10)
Parental Education	.03(-.01 - .07)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.03(-.01 - .06)
Uniformed Groups	-.04(-.46 - .33)	-.05(-.12 - .02)	.01(-.01 - .02)	-.05(-.12- .20)	-.09(-.52 - .30)
Visual and Performing Arts	.13(-.02 - .28)	-.01(-.03 - .02)	.01(-.01 - .01)	-.01(-.02 - .02)	.13(-.11 - .20)
Clubs and Societies	-.01(-.15 - .15)	.01(-.02 - .03)	-.01(-.02- .02)	.01(-.03 - .04)	.01(-.15 - .15)
CCA Intensity	.05* (-.01 - .10)	-.01(-.02 - .01)	.01(-.01 - .01)	-.01(-.02 - .01)	.05* (-.01 - .09)
CCA Breadth	.18(-.10- .43)	.02(-.03 - .09)	.01(-.01 - .02)	.02(-.03 - .09)	.20(-.06- .44)
CCA Duration	-.01(-.01 - .01)	-.01(-.01 - .01)	.01 (.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.02(-.06 - .11)	.07*** (.04 - .10)	.01(-.01-.01)	.07*** (.04-.10)	.09(.01 - .18)
Parental Autonomy Support	.01(-.05 - .08)	.05*** (.03 - .07)	.01(-.01 - .02)	.05*** (.03 - .08)	.06* (.01 - .12)
Peer Autonomy Support	.19*** (.09 - .28)	.06*** (.04 - .10)	.01(-.01 - .01)	.06*** (.04 - .10)	.25*** (.16 - .34)

	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Classroom Engagement					
Age	.04(-.02 - .11)	.01(.01 - .02)	-.01(-.01 - .01)	.01(-.01 - .02)	.05(-.01 - .11)
Gender	-.03(-.14 - .07)	-.01(-.02 - .01)	.01(-.01 - .01)	-.01(-.02 - .02)	-.04(-.14 - .07)
Parental Education	.01(-.03 - .04)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.04 - .04)
Uniformed Groups	.09(-.31 - .49)	-.03(-.09 - .01)	-.01(-.01 - .04)	-.03(-.08 - .03)	.06(-.35 - .49)
Visual and Performing Arts	.15* (.01 - .29)	-.01(-.02 - .02)	.01(-.01 - .02)	.01(-.02 - .03)	.15* (.02 - .30)
Clubs and Societies	.19** (.06 - .32)	-.01(-.02 - .02)	-.01(-.01 - .03)	.01(-.01 - .04)	.20** (.06 - .34)
CCA Intensity	.03(-.02- .07)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.02(-.02 - .07)
CCA Breadth	.01(-.30- .31)	.02(-.01 - .01)	.01(-.01 - .03)	.02(-.02 - .07)	.03(-.29 - .34)
CCA Duration	-.01(-.01 - .01)	-.01(-.01 - .01)	.01(.01 - .01)	.01(.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.07(-.02 - .16)	.04** (.02 - .08)	.01(-.01 - .01)	.05** (.02 - .08)	.12* (.03 - .21)
Parental Autonomy Support	.14*** (.08 - .20)	.03**(.02 - .05)	.01(-.01 - .03)	.04*** (.02 - .07)	.18*** (.13 - .24)
Peer Autonomy Support	.12*(.03 - .21)	.04** (.02 - .07)	-.01(-.01 - .01)	.04** (.02 - .07)	.16**(.07 - .25)

	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Confidence					
Age	.08* (.01 - .16)	.01* (.01 - .02)	.01(-.01 - .01)	.01* (.01 - .02)	.10(.02 - .17)
Gender	.04(-.09 - .15)	-.01 (-.02 - .01)	-.01(-.01 - .01)	-.01(-.02 - .01)	.03 (-.09 - .15)
Parental Education	-.01(-.05 - .0)	-.01 (-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01 (-.01 - .03)
Uniformed Groups	-.07(-.38 - .23)	-.04 (-.10 - .01)	-.01(-.04 - .01)	-.04(-.10 - .01)	-.12 (-.43 - .20)
Visual and Performing Arts	-.06(-.21 - .10)	-.01 (-.03 - .02)	-.01(-.02 - .01)	-.01(-.04 - .01)	-.07(-.23 - .09)
Clubs and Societies	.01(-.15 - .15)	.01 (-.02 - .03)	-.01(-.03 - .01)	-.01(-.04 - .02)	-.01 (-.16 - .14)
CCA Intensity	-.01(-.06 - .04)	-.01 (-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01 (-.06 - .05)
CCA Breadth	.07(-.19 - .32)	.01 (-.01 - .06)	-.01(-.02 - .01)	.01(-.01 - .01)	.08 (-.14 - .33)
CCA Duration	-.02(-.06 - .02)	.01 (-.01 - .01)	-.01 (.01 - .01)	.01(-.01 - .01)	-.01 (-.01 - .01)
Instructor Autonomy Support	.14** (.03 - .23)	.05** (.03 - .09)	-.01(-.01 - .01)	.05** (.02 - .08)	.19*** (.08 - .29)
Parental Autonomy Support	.21*** (.14 - .30)	.04*** (.02 - .06)	-.01(-.03 - .01)	.03* (.01 - .05)	.24*** (.17 - .31)
Peer Autonomy Support	.05(-.06 - .15)	.05** (.02 - .08)	.01(-.01 - .01)	.05** (.03 - .08)	.10 (-.01 - .20)

	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Lifelong Learning					
Age	.09** (.03 - .14)	.01* (.01 - .03)	-.01(-.01 - .01)	.01* (.01 - .03)	.11**(.04 - .16)
Gender	.01(-.08 - .10)	-.01 (-.03 - .02)	.01(-.01 - .01)	-.01(-.03 - .02)	.01 (-.09 - .10)
Parental Education	-.01(-.04 - .03)	-.01 (-.01 - .01)	.01(.01 - .01)	-.01(-.01 - .01)	-.01 (-.04 - .03)
Uniformed Groups	.15** (-.42 - .13)	-.04 (-.11 - .01)	-.01(-.04 - .01)	-.05(-.11 - .01)	-.19** (-.47 - .09)
Visual and Performing Arts	.05(-.10 - .20)	-.01 (-.02 - .01)	-.01(-.02 - .02)	-.01(-.02 - .02)	.05(-.11 - .20)
Clubs and Societies	.03(-.09 - .15)	.01 (-.03 - .04)	.01(-.01 - .02)	.01(-.03 - .04)	.04 (-.08 - .16)
CCA Intensity	.06** (.02 - .10)	-.01 (-.02 - .01)	-.01(-.01 - .01)	-.01(-.02 - .01)	.05** (.02 - .09)
CCA Breadth	.18(-.05 - .40)	.03 (-.03 - .10)	.01(-.01 - .02)	.03(-.03 - .10)	.21 (-.10 - .41)
CCA Duration	-.01(-.01 - .01)	.01 (-.01 - .01)	.01 (.01 - .01)	.01(-.01 - .01)	-.01 (-.01 - .01)
Instructor Autonomy Support	.08(-.01 - .16)	.08*** (.05 - .11)	.01(-.01 - .01)	.08*** (.05 - .11)	.15*** (.08 - .23)
Parental Autonomy Support	.02(-.02 - .07)	.05*** (.03 - .07)	.01(-.01 - .02)	.06*** (.04 - .08)	.08*** (.04 - .13)
Peer Autonomy Support	.22*** (.13 - .30)	.07*** (.04 - .10)	.01(-.01 - .01)	.07*** (.04 - .11)	.29*** (.20 - .37)

	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Teamwork					
Age	.09* (.03 - .15)	.01* (.01 - .02)	.01(.01 - .01)	.01* (.01 - .03)	.10**(.04 - .17)
Gender	-.07(-.18- .02)	-.01(-.02 - .02)	-.01(-.01 - .01)	-.01(-.03 - .01)	-.08 (-.19- .02)
Parental Education	.01(-.03- .04)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.01(-.03 - .04)
Uniformed Groups	.14(-.52- .26)	-.02(-.07 - .01)	.01(-.01 - .02)	-.02(-.07 - .01)	-.16(-.16 - .26)
Visual and Performing Arts	.03(-.10- .15)	-.01(-.03 - .02)	-.01(-.02 - .02)	-.01(-.04 - .01)	.02(-.12- .14)
Clubs and Societies	.17(.02 - .33)	.01(-.01 - .02)	.01(-.01 - .01)	-.01(-.04 - .02)	.01(-.12 - .13)
CCA Intensity	.05(.01 - .09)	-.01(-.02 - .01)	.01(-.01 - .01)	-.01(-.02 - .01)	.04(-.01- .09)
CCA Breadth	.15(-.11- .40)	.02(-.02 - .08)	-.01(-.03 - .01)	.02(-.03 - .07)	.16(-.09 - .41)
CCA Duration	-.01(-.01 - .01)	-.01(-.01 - .01)	-.01(.01 - .01)	-.01(-.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.03(-.06 - .11)	.06*** (.04 - .09)	-.01(-.01 - .01)	.06*** (.03 - .09)	.09(-.01 - .17)
Parental Autonomy Support	.11*** (.05 - .16)	.04*** (.03 - .06)	-.01(-.03 - .01)	.03** (.01 - .05)	.14*** (.09 - .19)
Peer Autonomy Support	.31*** (.22 - .41)	.06***(.03 - .09)	.01(-.01 - .01)	.06*** (.03 - .09)	.37***(.27 - .47)

	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Leadership Skill					
Age	.09* (.02 - .16)	.01(.01 - .01)	.01(-.01 - .01)	.01(-.01 - .02)	.09**(.03 - .16)
Gender	-.01(-.12 - .10)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.01 (-.12- .10)
Parental Education	-.05(-.09 - -.01)	.01(-.01 - .01)	.01(-.01 - .01)	.01(-.01 - .01)	-.05* (-.09 - .01)
Uniformed Groups	.06(-.26- .37)	-.02(-.06 - .01)	-.01(-.03 - .01)	-.02(-.06 - .01)	-.04(-.28 - .36)
Visual and Performing Arts	.12(-.03- .26)	-.01(-.02 - .01)	-.01(-.02 - .01)	-.01(-.02 - .01)	.05(-.11 - .20)
Clubs and Societies	.13(-.13- .40)	.01(-.01 - .05)	-.01(-.02 - .01)	-.01(-.03 - .02)	.12(-.02- .26)
CCA Intensity	.05(.01 - .11)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	.05(-.01 - .10)
CCA Breadth	.13(-.13- .40)	.01(-.01 - .05)	-.01(-.02 - .01)	-.01(.01 - .04)	.14(-.12 - .41)
CCA Duration	.01(-.01- .01)	.01(.01 - .01)	.01 (.01 - .01)	.01(.01 - .01)	.01(-.01 - .01)
Instructor Autonomy Support	.17** (.06 - .27)	.02(.01 - .06)	.01(-.01 - .01)	.02(.01 - .06)	.19*** (.09 - .29)
Parental Autonomy Support	.27*** (.21 - .33)	.02(.01 - .04)	-.01(-.02 - .01)	.02(-.01 - .04)	.29*** (.23 - .35)
Peer Autonomy Support	.10(-.01- .20)	.02(.01 - .05)	.01(-.01 - .01)	.02(.01 - .05)	.12* (.02 - .22)

	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Communication Skill					
Age	.08* (.01 - .14)	.01* (.01 - .03)	.01(-.01 - .01)	.01* (.01 - .03)	.09**(.02 - .16)
Gender	-.06(-.16 - .04)	-.01(-.03 - .02)	.01(.01 - .01)	-.01(-.03-.02)	-.06(-.17 - .04)
Parental Education	-.02(-.06 - .02)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01-.01)	-.02(-.06 - .01)
Uniformed Groups	.14(-.52 - .26)	-.05(-.12- .01)	.01(-.02 - .01)	-.05(-.12- .02)	-.29(-.06 - .02)
Visual and Performing Arts	.01(-.13 - .15)	-.01(-.02 - .01)	.01(-.01 - .01)	-.01(-.03-.02)	-.01(-.14 - .14)
Clubs and Societies	.01(-.12 - .14)	.01(-.02 - .03)	.01(-.02 - .02)	.01(-.03-.03)	.01(-.12 - .14)
CCA Intensity	.04(-.01 - .09)	-.01(-.02 - .01)	.01(-.01 - .01)	-.01(-.02-.01)	.04(-.01 - .08)
CCA Breadth	.25*(-.02 - .49)	.02(-.02 - .09)	.01(-.01 - .01)	.02(-.02 - .08)	.27*(.04 - .50)
CCA Duration	-.01(-.01 - .01)	.01(-.01 - .01)	.01(.01 - .01)	-.01(-.01-.01)	-.01(-.01 - .01)
Instructor Autonomy Support	.11* (.02 - .20)	.06*** (.04 - .10)	.01(-.01 - .01)	.06*** (.04 - .10)	.17*** (.08 - .26)
Parental Autonomy Support	.20*** (.14 - .26)	.04*** (.03 - .07)	.01(-.02 - .02)	.04*** (.02 - .07)	.24*** (.19 - .30)
Peer Autonomy Support	.10* (.02 - .19)	.06***(.03 - .10)	.01(-.01 - .01)	.06*** (.03 - .09)	.16*** (.08 - .25)

	Direct Effect	Indirect Effect		Total Indirect Effect	Total Effect
		Autonomous Motivation	Controlled Motivation		
Predicting Society-Oriented Future Goal					
Age	.07(.01 - .13)	.01* (.01 - .02)	.01(.01 - .01)	.01(.01 - .02)	.08* (.02 - .15)
Gender	-.02(-.12 - .08)	-.01(-.02 - .01)	-.01(-.01 - .01)	-.01(-.02 - .01)	-.03(-.13 - .08)
Parental Education	-.03(-.07 - .01)	-.01(-.01 - .01)	.01(-.01 - .01)	-.01(-.01 - .01)	-.03(-.07 - .01)
Uniformed Groups	-.24(-.55- .10)	-.04(-.11 - .01)	-.01(-.03 - .01)	-.04(-.11 - .01)	-.28(-.61 - .07)
Visual and Performing Arts	.08(-.05- .21)	-.01(-.03 - .02)	-.01(-.02- .01)	-.01(-.03 - .03)	.06(-.07- .19)
Clubs and Societies	.07(-.06 - .19)	.01(-.02 - .03)	-.01(-.02 - .01)	-.01(-.03 - .03)	.06(.02 - .19)
CCA Intensity	.06* (.01 - .10)	-.01(-.02 - .01)	.01(-.01 - .01)	-.01(-.02 - .01)	.05* (.01 - .10)
CCA Breadth	.11(-.25 - .40)	.02(-.02 - .08)	-.01(-.02 - .01)	.02(-.02 - .08)	.13(-.22 - .42)
CCA Duration	-.01(-.01 - .01)	-.01(.01 - .01)	.01(.01 - .01)	.01(.01 - .01)	-.01(-.01 - .01)
Instructor Autonomy Support	.10* (.01 - .19)	.06*** (.03 - .10)	-.01(-.01 - .01)	.06*** (.03 - .09)	.15** (.06 - .25)
Parental Autonomy Support	.11*** (.06 - .17)	.04*** (.02 - .06)	-.01(-.02 - .01)	.04** (.02 - .06)	.15*** (.10 - .21)
Peer Autonomy Support	.20*** (.11 - .29)	.06*** (.03 - .09)	.01(-.01 - .01)	.06***(.03 - .09)	.25*** (.16 - .35)

Note 1. * $p < .05$, ** $p < .01$, *** $p < .001$.

Note 2. Gender (1 = female, 2= male); Parental Education (1 = primary school, 2 = secondary school, 3 = diploma, 4 = pre-university, 5 = University, 6 = postgraduate); Intensity (1 = 0 - 2 hours, 2 = 3 - 4 hours, 3 = 5-6 hours, 4 = 7-8 hours, 5 = 9-10 hours, 6 = More than 10 hours); Breadth (1 = 1, 2 = 2, 3 = 3, 4 = More than 3); Duration (number of months). CCA type variables: Uniformed Groups (1), non-Uniformed Groups (0); Visual & Performing Arts (1), non-Visual & Performing Arts (0); Clubs & Societies (1), non-Clubs & Societies (0); Physical Sports (0) is a reference group in this path analysis.

Note 3. Values in parentheses are 95% confidence intervals.

6.6 Overview of Longitudinal Analyses and Findings

In all, the longitudinal data analyses of matched Time-1 and Time-2 sample provided the basis for investigating the substantive empirical models related to CCA. The preliminary data analyses found that the factors were reliable and relatively normally distributed. CFA exhibited a sound factor structure and measurement properties for the subscale items. Multigroup invariance tested the equivalence of factor structures across subgroups, and formed the basis for whole-sample analyses. Correlation analysis provided preliminary support for the hypothesised relationships between CCA participation factors and its motivational orientation and interpersonal relationships and CCA outcomes. This hierarchical SEM factored in shared variance and the role of CCA motivational orientations as a mediator between CCA participation factors, as well as CCA interpersonal-relationship factors and CCA outcomes. This chapter focused on the longitudinal analysis of the substantive CCA model to examine the increase or decrease in CCA outcomes between Time 1 and Time 2.

This research began longitudinal data analysis by determining the psychometric properties and validity of subscales for respective factors at longitudinal data. The analyses indicated that the subscales (2 motivation, 3 interpersonal-relationships, and 10 outcome factors) had sound psychometric properties. Again, the finding that Cronbach's alpha value of each subscale was above $\alpha = .70$ for matched Time-1 and Time-2 data.

The two main analyses used were the six-step approach and the bootstrapping approach to mediational analysis. The six-step approach to path modelling was used to find out the incremental variance of various predictors that were entered in the model accordingly. The mediational analysis aimed to investigate the role of CCA motivational orientations (i.e., CCA autonomous and controlled motivation) as mediators between CCA type and quantity indicators, as well as CCA interpersonal relationships and CCA outcomes. In general, the findings from both analytical approaches were consistent and highlighted the

mediating role of CCA autonomous motivation. Specifically, autonomous motivation mediated the relationship between CCA interpersonal relationship and outcomes. Specifically, autonomous motivation mediated to the relationships between CCA interpersonal relationships (i.e., CCA instructor autonomy support, parent autonomy support and peer autonomy support) and CCA outcomes, including school belongingness, educational aspiration, classroom engagement, confidence, teamwork, lifelong learning, communication skill and society-oriented future goal, whereas negligible mediation existed between other CCA predictors (i.e., CCA types and CCA quantitative indicators) and outcomes. In relation to that, CCA interpersonal-relationship factors had significant direct effects on CCA outcomes (e.g., school belongingness, communication skill and society-oriented future goal).

CHAPTER 7 DISCUSSION

7.1 Introduction

The present study investigated the mediating role of students' co-curricular activity (CCA) motivational orientations in the relationships between CCA participation indicators (i.e., types of CCA, frequency, duration, and breadth of CCA participation) and perceived interpersonal-relationship factors (i.e., CCA instructor autonomy support, CCA parental autonomy support, and CCA peer autonomy support) and academic and non-academic outcomes. This chapter first highlights key findings reported in Chapters 4, 5 and 6. It then discusses implications for policies and practices for CCA teachers, parents, and students in optimising the effectiveness of school-based CCA participation for promoting both academic and non-academic outcomes (together, referred to as developmental outcomes). The chapter also considers both contributions and limitations of the study, as well as possible research directions seeking to further clarify the role of CCA participation in outcomes related to holistic development. The chapter ends with the conclusion that points to the importance of ensuring that students have optimal experiences during their participation in CCAs.

7.2 Overview and Purpose of the Study

Co-curricular activities (CCAs) form a normative and integral part of secondary school students' educational experience in Singapore. Like education systems in other countries (see e.g., Caldwell & Faulk, 2013; Eccles & Gootman, 2002; Holland & Andre, 1987; Larson, 2000), Singapore views CCAs as an important platform for students' non-academic experiences and as opportunities for their holistic development and growth. Conversely, others theorised that CCAs may potentially distract students from academic endeavours and adversely affect their academic performance (see e.g., Marsh & Kleitman,

2002). These inconsistencies can be traced back to research and methodological issues, which this study aims to address.

As reviewed in Chapter 2, the inconsistencies in prior findings may be linked to research issues, including: (a) small sample sizes that did not include participants from a wide range of CCA types, (b) a lack of consideration of both quantity and quality of CCA participation in understanding the impact of CCA participation on CCA outcomes, (c) a lack of consideration of CCA interpersonal contexts, (d) a lack of longitudinal research that tracks students at the beginning and end of their CCA participation, (d) a lack of the modelling of hypothesised relationships among predictors and outcomes, (e) a lack of the inclusion of both academic and non-academic outcomes, and (f) absence of sociodemographic covariates in analysis. The present study was conceptualised with consideration of these prior research limitations. Further, very little research had delved into the effects of CCA participation in Singapore. This scarcity is especially true as far as research that adopts a substantive-methodological synergy is concerned. The substantive-methodological synergy is the term coined by Marsh and Hau (2007) to refer to research that harness and makes the best use of methodological advancements in addressing important substantive educational issues. The substantive-methodological synergy is addressed in this study by harnessing an application of structural equation modelling (i.e., path analysis) and involving multiple factors, including covariates (i.e., gender, age, parental education), CCA types (i.e., Physical Sports, Visual and Performing Arts, Clubs and Societies, and Uniformed Groups), CCA-participation quantitative indicators (i.e., intensity or frequency, breadth, and duration of CCA participation), CCA-participation qualitative indicators (i.e., autonomous and controlled motivation during CCA participation), and CCA interpersonal relationships (i.e., perceived CCA instructor autonomy support, perceived CCA parental autonomy support, and perceived CCA peer autonomy support) in predicting multiple outcomes, both academic (e.g.,

classroom engagement, educational aspiration, academic buoyancy) and non-academic (e.g., teamwork, communication skill, lifelong learning) outcomes.

The main aim of the present study is to assess the relationships between school-based CCA participation and a range of developmental outcomes based on the self-determination theory (SDT; Ryan & Deci, 2017). To this end, this research is guided by theoretical-conceptual frameworks related to CCA, motivation, and youth development, which framed the research and provided a basis to interpret findings. It aimed to test a CCA hypothesised model formulated from a large-scale, longitudinal survey which drew data over two time points (i.e., 9 months apart) from 14 government-based secondary schools in Singapore. By utilising path analysis, the study evaluated CCA multivariate analytic models by way of cross-sectional (i.e., Time 1 and Time 2) and longitudinal (i.e., Time-2 controlling for Time-1 variance) analyses in a stepwise manner. This technique assessed the contribution of the respective sets of CCA predictors towards students' CCA outcomes. It was specifically hypothesised that CCA motivational orientations, as indicators of the quality of CCA participation, would play a mediating role in linking students' CCA-participation and perceived CCA interpersonal relationships to their academic and non-academic outcomes. This chapter elaborates and interprets key findings related to the research and discusses implications and applications for educators, parents, and students. Lastly, it proposes possible research directions, building upon the merits and advancement made in the present research.

7.3 Cross-Sectional and Longitudinal Construct Validation of the Instrument

Prior to the testing of the cross-sectional and longitudinal CCA hypothesised model, it is important to assess the psychometric properties of the respective measures. Results of the cross-sectional and longitudinal construct validation demonstrated the following: (1) confirmatory factor analysis (CFA) indicated a sound factor structure based on goodness-of-fit indices and factor loadings, (2) responses to the scales had good internal consistency

reliability, (3) multigroup invariance showed equivalence in key measurement parameters across gender (male vs. female), age (lower vs. upper secondary school level) and parental education (low vs. high) for Time 1 and Time 2, and (4) longitudinal invariance showed equivalence in key measurement parameters across the two time points of measurement. Overall, the preliminary analyses established the reliability and validity of cross-sectional and longitudinal data for further analyses aimed to address main research questions.

7.4 Answering the Research Questions with Cross-Sectional and Longitudinal Data

The present study adopted both hierarchical and bootstrapping approaches to path mediation analysis. The hierarchical approach was to assess the incremental variance in CCA-desired outcomes explained by respective sets of predictors entered into the model sequentially. The bootstrapping approach was to examine the significance of the mediating role of CCA motivational orientations in the relationships between CCA types, quantitative indicators of CCA participation, and CCA interpersonal-relationship perceptions and CCA outcomes. The convergence of results based on the two approaches, especially those pertinent to the mediating role of motivational orientations in the model, provided stronger supporting evidence for the findings. Before summarizing key findings, it is useful to reiterate the Research Questions (RQs) posed in Chapter 2.

Research Questions pertinent to Time-1 and Time-2 cross-sectional data analyses are as follow:

- **RQ1:** To what extent do students in three different CCA types (i.e., Visual and Performing Arts, Clubs and Societies, Uniformed Groups) differ from those in Physical Sports (i.e., reference group) in terms of their CCA motivational orientations as well as academic and non-academic outcomes?

- **RQ2:** To what extent do quantitative indicators of students' CCA participation (i.e., the breadth, duration, and intensity of CCA participation) predict their CCA motivational orientations and academic and non-academic outcomes?
- **RQ3:** To what extent do students' perceptions of CCA interpersonal contexts (i.e., perceived CCA instructors, CCA peers, and CCA parental autonomy support) predict their CCA motivational orientations and academic and non-academic outcomes?
- **RQ4:** To what extent do students' CCA motivational orientations mediate the link between the types of CCA that students participate in, the quantitative indicators of their CCA participation, and their perceptions of CCA interpersonal contexts to academic and non-academic outcomes?

Research Questions pertinent to longitudinal data analysis are as follows:

- **RQ5:** To what extent do students in three different CCA types (i.e., Visual and Performing Arts, Clubs and Societies, Uniformed Groups) differ from those in Physical Sports (i.e., reference group) differentially gain or decline in terms of their CCA motivational orientations as well as academic and non-academic outcomes?
- **RQ6:** To what extent do quantitative indicators of students' CCA participation (i.e., the breadth, duration, and intensity of CCA participation) predict gains or declines in their CCA motivational orientations and academic and non-academic outcomes?
- **RQ7:** To what extent do students' perceptions of CCA interpersonal contexts (i.e., perceived CCA instructors, CCA peers, and CCA parental autonomy support) predict the gains or declines in their CCA motivational orientations and academic and non-academic outcomes?
- **RQ8:** To what extent do students' CCA motivational orientations mediate the link between types of CCA that students participate in, the quantitative indicators of their CCA participation, and their perceptions of CCA interpersonal contexts to the gains or declines in their academic and non-academic outcomes?

7.4.1 Summary of Time-1 model findings.

For Time-1 findings, the consecutive entry of covariates (i.e., age, gender and parental education) in Step 1, CCA type in Step 2 and CCA quantitative indicators (i.e., intensity, breadth and duration) in Step 3 showed that the contribution of these predictors toward CCA motivational orientation and CCA outcomes were relatively small, inconsistent, and mostly nonsignificant. At Step 4, CCA interpersonal relationships (i.e., CCA parental autonomy support, CCA instructor autonomy support, and CCA peer autonomy support) had consistent and significant effects on all CCA outcomes. In this step, CCA interpersonal relationships (i.e., parental autonomy support, instructor autonomy support and peer autonomy support) significantly and positively predicted CCA autonomous motivation but only parental autonomy support significantly predicted controlled motivation. In Step 5, CCA autonomous motivation significantly and positively predicted confidence, lifelong learning, communication skill and society-oriented future goal. CCA controlled motivation only significantly and positively predicted classroom engagement but not the rest of the CCA outcomes. Like in Step 4, CCA interpersonal relationships (i.e., parental autonomy support, instructor autonomy support and peer autonomy support) significantly and positively predicted all CCA outcomes in Step 5. In terms of the mediating role of CCA motivational orientations, the indirect effects of CCA instructor and peer autonomy support on confidence, lifelong learning and society-oriented future goal through autonomous motivation were significant, whereas the indirect effects of CCA instructor and peer autonomy support on communication skill through autonomous motivation were marginally significant. The only significant indirect effect of parental autonomy support, mediated by controlled motivation, was on classroom engagement.

7.4.2 Summary of Time-2 model findings.

Consistent with Time-1 findings, Step 1 to Step 3 analyses that involved consecutive entries of covariates, CCA types and CCA quantitative indicators revealed inconsistent pattern and mostly nonsignificant relationships among CCA predictors and outcomes. Again, CCA interpersonal relationships significantly predicted all CCA outcomes in Step 4 and Step 5. It attested to the salience of CCA interpersonal relationship factors as predictors. In Step 4, CCA interpersonal relationship factors positively and significantly autonomous motivation, and only CCA parental autonomy support significantly and positively predicted controlled motivation. In Step 5, autonomous motivation did not significantly predict any of the outcomes, whereas controlled motivation significantly predicted classroom engagement. As a result, in terms of CCA motivational orientations as mediators, CCA autonomous motivation did not significantly mediate the relationship between CCA interpersonal relationships (i.e., CCA instructor autonomy support, parental autonomy support and CCA peer autonomy support) and CCA outcomes. Similarly, CCA controlled motivation did not mediate the relationships between perceived CCA interpersonal relationships and CCA outcomes except in mediating the effect of CCA parental autonomy support on classroom engagement.

7.4.3 Summary of longitudinal model findings.

The longitudinal model aimed to assess the gain or decline in CCA outcomes over the course of 8 months by way of controlling for shared variance with corresponding Time-1 outcome factors in each of Time-2 outcome factors. In Step 1, Time-1 outcome factors were entered to predict their Time-2 corresponding factors. In Steps 2 to 4, sociodemographic covariates, CCA types and quantitative indicators of CCA participation were entered sequentially. Other than the significant relationship between Time-1 and Time-2 outcomes, most of sociodemographic covariates, CCA types, and quantitative indicators of CCA participation did not significantly and consistently predicted gains or declines in CCA outcomes. When the three interpersonal factors were entered in Step 5, similar to Time-1

findings, CCA instructor, parental, and peer autonomy support significantly and positively predicted the gain in CCA autonomous motivation, whereas it was only parental autonomy support significantly and positively predicted the gain in controlled motivation. In this step, the interpersonal factors predicted the gains in most of academic and non-academic outcomes. In Step 6, autonomous motivation significantly and positively predicted the gains in all the outcomes except school belongingness and leadership skill. Supporting this finding, the bootstrapping analysis showed that autonomous motivation significantly mediated the relationships between CCA interpersonal relationships (i.e., CCA instructor autonomy support, parent autonomy support and peer autonomy support) and the gains in CCA outcomes, including school belongingness, educational aspiration, classroom engagement, confidence, teamwork, lifelong learning, communication skill and society-oriented future goal.

7.5 Notable Findings

Having reviewed the results of cross-sectional and longitudinal data analyses, it is important to consider both significant and nonsignificant / inconsistent findings in the context of theories and prior research. These theories and prior findings provide the context in shedding light on these notable findings.

7.5.1 Non-significant and/or inconsistent findings.

Non-significant findings are not necessarily bad and still important to further our understanding of the relationship between CCA participation and students' development. These findings primarily concerned categories or types and quantitative indicators of CCA participation in relation to CCA motivational orientations and CCA outcomes. The different categories of CCA vary in terms of the dynamics of social interaction, level of competition, programme and activity arrangement and these differences will contribute to students' development of specific competencies, qualities and skills in different ways

(Bohnert et al., 2010). In Singapore, parents and teachers generally place emphasis on Uniformed Groups and Physical Sports, and perceive these CCAs as being more effective in promoting students' development as compared to Clubs and Societies and Visual and Performing Arts. Such perceptions are attributed to the rigorous nature of Uniformed Groups and Physical Sports. However, CCA types were found to be non-significant and mostly inconsistent in predicting the range of CCA outcomes in cross-sectional analysis and across time points. These suggested that the type of CCAs was perhaps less crucial in determining students' CCA outcomes. Such findings concurred with Farb and Matjasko's (2012) review suggesting a mixed picture regarding the relationships between CCA types and outcomes, which specifically showed that the various CCAs did not differ substantially and consistently in their relations to academic variables (e.g., educational aspiration, classroom engagement, academic achievement). Although participation in various CCAs might lead to slightly different developmental and academic trajectories, these differences would tend to equalise over time, with participants attaining similar levels of development and academic outcomes eventually.

In terms of quantitative indicators of CCA participation, CCA participation intensity was found to be nonsignificant in predicting most of CCA outcomes in cross-sectional and longitudinal analyses. It seemed that the number of hours of CCA participation was not a key factor in determining students' CCA outcomes. Although CCA participation intensity negatively predicted academic buoyancy at Time 1 (at the beginning of the school year), the effect was relatively small and did not generalize to Time 2 (at the end of the school year). On the whole, this finding contradicted a common concern that CCA participation would hinder academic activities as well as the idea of a "the more the merrier" relationship between the number of hours of CCA participation and students' development.

According to positive youth development (Lerner, 2002), CCA settings represent potential resources for youth development. These developmental settings provide resources that complement and bolster development in other contexts especially school and family (Benson et al., 2006). Thus, it is plausible to posit a positive relationship between the number of CCAs students participate in (i.e., breadth of CCA participation) and students' level of psychosocial functioning (e.g., Fredricks & Eccles, 2006a; Mahoney et al., 2003; Zaff, Moore, Papillo, & Williams, 2003). However, CCA participation breadth did not have any significant effect on CCA outcomes, both cross-sectionally and longitudinally in this study. Again, this finding did not support the idea that, as far as CCA participation breadth is concerned, the more the better.

Lastly, CCA participation duration was not significantly and consistently predictive of the majority of CCA outcomes. This was true both cross-sectionally and longitudinally. This suggested that secondary school students' prior and ongoing CCA participation did not contribute significantly to their academic and non-academic development. This could be attributed to the delay in the socioemotional effect on students as a result of an event, specifically CCA participation in this instance. This may account for how the effect of CCA participation may become more salient over time (Kumkale & Albarracín, 2004). However, CCA participation duration positively predicted lifelong learning in the Time-2 and longitudinal analyses. Finding also showed that CCA participation duration positively predicted CCA autonomous and controlled motivation at Time 2 and positively predicted controlled motivation in the longitudinal analysis. These suggest that the length of time that students participate in CCA is associated with their inclination for lifelong learning and their motivation in participating in CCA. Given that the non-experimental design of the present study, these relationships should not be interpreted as CCA participation duration being the 'cause' of lifelong learning and CCA motivation being the consequences of CCA participation duration. The relationship may be reverse. That is, it might be the case that it

was the students' higher inclinations for lifelong learning and higher levels of CCA motivation that made them continue to be involved in CCA.

Farb and Matjasko (2012) highlighted that measurement and operationalisation issues related to CCA participation could possibly account for inconsistencies regarding the effect of quantitative indicators of CCA participation. In an attempt to mitigate this issue, the present study had adopted a nuanced approach towards CCA-participation dimensions by incorporating the intensity, breadth, and duration measures of CCA participation. However, the present study did not find strikingly obvious patterns and effects of these measures on CCA outcomes. Rather than it being a methodological issue, this could be explained by the nature and characteristics of students' CCA participation patterns that are unique to the Singapore education system. In Singapore secondary schools, students are required to participate in at least one CCA to fulfil a curriculum requirement and are expected to create a balance between academic and non-academic demands. Secondary schools usually designate specific time slots during the week for CCA participation. While it is argued that certain CCAs (e.g., Uniformed Groups and Physical Sports) are more rigorous and taxing, participation in these CCAs would be restricted to stipulated days and time slots, and that additional training sessions for competition are usually arranged over term breaks and weekends. Further, it is most likely that various CCAs will be taking place concurrently and it is difficult for students to participate in another CCA due to the overlapped schedules. So, most students participate in one CCA but rarely more as it requires approval from the school, even if CCAs' schedules do not overlap. As a result, the number of hours and the range of CCA participation become restricted and relatively similar across all students during academic term time. Moreover, many of the students did not begin participating in CCAs in their Secondary 1 and they did not have ongoing and active prior participation in primary schools, which limited the potential benefit of participating in CCAs over time.

Certain developmental benefits, such as the development of positive and supportive relationships in CCAs and skill expertise, require time to develop and emerge.

Indeed, specific skills, such as goal-setting, conflict resolution, adherence to rules and positive social interaction, are attributed to the effect of CCA participation on development (Feldman & Matjasko, 2005). According to the channeling theory (Martin, White, & Perlman, 2003), students are channelled to peer groups that foster school engagement and identification with school, which would socialise students' academic motivation and behaviour. Thus, within and beyond the specific of CCA participation, students who identified with positive school norms and prosocial values would favour affiliation with peers who share such values (Véronneau, Vitaro, Brendgen, Dishion, & Tremblay, 2010). Similarly, research showed support for the generalisation effect of autonomous motivation from CCA context to other school contexts. CCAs develop students' sense of motivation and persistence in school activities, which would further contribute to students' educational success and development (Vansteenkiste & Ryan, 2013). Hence, future research may examine intermediate processes in predicting CCA outcomes to assess the effect of CCA duration, which would not otherwise be apparent. Having examined the relationship between nuanced quantitative indicators of CCA participation and CCA outcomes, it appears that category (type), amount, and range of CCA participation might be less critical. These findings are helpful in understanding secondary school students' CCA participation patterns and bring to our attention that the mere amount of CCA involvement might not be pivotal in developing students' academic and non-academic outcomes. There is, then, a need to pay attention to the quality of CCA participation.

7.5.2 Significant and/or more consistent findings.

In reviewing notable significant and more consistent findings in the study, this section focuses on students' CCA motivational orientations and CCA interpersonal relationship factors which were found to be salient for student developmental outcomes, as

evidenced in the cross-sectional and longitudinal analyses. CCA motivational orientations and autonomy-supportive relationships with CCA instructors, parents, and CCA peers represent the quality and sociocontextual aspects of CCA participation, respectively.

7.5.2.1 CCA motivational orientations.

Self-determination theory (SDT) highlights the importance of motivation that underlies and drives behaviours, and it specifically makes a distinction between autonomous and controlled motivation (Deci & Ryan, 2000; Ryan & Deci, 2000, 2017). CCA autonomous motivation refers to students' participation in CCA due to interest, enjoyment, and personal meaning, whereas CCA controlled motivation refers to students' participation in CCAs for rewards or externally imposed pressures (Ryan & Deci, 2000). CCA motivational orientations, particularly autonomous motivation, were found to be significant factors that contribute to gains in academic and non-academic outcomes. This finding is consistent with that of Hansen and Larson (2007) who found that autonomously motivated youth tended to garner significantly more positive developmental outcomes in extracurricular activities participation. Related research demonstrated that students' engagement mediated the relationship between their extracurricular activities' participation and social-skill development (Shernoff, 2010). Not only was the present finding aligned with prior research findings, it is also aligned with the theoretical proposition of SDT which postulates that the degree of intrinsic motivation is related to the fulfilment of psychological needs (i.e., competence, autonomy, and relatedness) (Ryan & Deci, 2000, 2017). The present study provided indirect evidence that students whose basic psychological needs are satisfied through their participation in CCA, especially in their interactions with CCA instructors, CCA peers, and parents who are supportive of their CCA, are more likely to show gains in academic and non-academic outcomes. This seems to be the case because these students would tend to be more engaged in what they do during their CCA participation, and in turn are more likely to reap the benefits of CCA participation.

This study also tested the mediating role of CCA motivational orientations in the relationships between CCA autonomy-supportive relationships and outcomes. The result showed that CCA motivational orientations, especially CCA autonomous motivation, mediated the relationship between CCA autonomy-supportive relationships and students' development. As prior SDT research has shown (e.g., Furrer & Skinner, 2003; Jang et al., 2009; Patrick & Williams, 2009; Reeve, Deci, & Ryan, 2004; Williams & Deci, 1998), interpersonal contexts that foster autonomy in students have positive effects on students' autonomous motivation and well-being (Ryan & Deci, 2000, 2002). In this study, this was evident in the positive relationship between students' perceived CCA interpersonal-relationship factors (i.e., CCA instructor autonomy support, parental autonomy support and CCA peer autonomy support) and their CCA autonomous motivation. As mentioned earlier, this seems to suggest that autonomy-supportive relationships facilitate and nurture students' CCA autonomous motivation by fulfilling their basic psychological needs (Filak & Sheldon, 2003; Ryan & Deci, 2017). That is, CCA provides a context for students to meet their needs for relatedness, autonomy, and competence. In the process, CCA participation facilitates the development of students' autonomous motivation. Students with higher levels of CCA autonomous motivation are likely to be more engaged in their CCA participation. This in turn optimises CCAs as a platform for them to develop the skills and competencies targeted by CCAs. Taken together, students' CCA autonomous motivation is an important factor in optimizing the fruition of CCA participation and should be a target of intervention seeking to optimize students' CCA participation outcomes.

7.5.2.2 CCA interpersonal relationships.

Part of students' developmental tasks involve autonomy (Erikson, 1968; Hill & Holmbeck, 1986). This tendency to experience a sense of autonomy and self-regulation manifests in various domains including CCA and this sense of autonomy is particularly crucial for students' optimal functioning (for overviews see Deci & Ryan, 2000; Vallerand

et al., 1997). This is evident from the salient effect of autonomy support (i.e., instructors, parents and peers) in students' CCA academic and non-academic outcomes. CCA interpersonal factors (i.e., CCA instructor autonomy support, parental autonomy support, and CCA peer autonomy support) were salient among all CCA participation factors in predicting outcomes. This is perhaps not too surprising because teachers and parents are key figures in students' motivation and development (Manzi, Regalia, Pelucchi, & Fincham, 2012; Roeser, Eccles, & Sameroff, 2000). Further, as students are involved in school activities and CCAs, they interact with their peers for extensive periods of time, and hence peers have an influence on development as well (Deci, La Guardia, Moller, Scheiner, & Ryan, 2006). These findings have implications in promoting students' learning, motivation and development. Each of these relationships is discussed below.

7.5.2.2.1 CCA instructor autonomy support.

Like teachers, CCA instructors have a pivotal role in motivating students and facilitating positive developmental outcomes (Assor et al., 2002; Jang, 2008; McLaughlin, 2000). This is in fact the case in the present study. Research in educational psychology has demonstrated that autonomy-supportive instructional style is related to students' sense of school engagement and adjustment (Assor et al., 2002; Deci et al., 1991; Wentzel, Battle, Russell, & Looney, 2010). Findings showed that CCA instructor's autonomy support was a major and consistent predictor of CCA autonomous motivation and CCA academic and non-academic outcomes in the study. Specifically, findings showed that CCA instructors autonomy support significantly and positively predicted CCA autonomous motivation and all the 10 outcomes considered in this study, namely school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal. This pattern holds true across the Time-1, Time-2, and longitudinal analyses.

From a social-capital perspective, CCA instructors provide interpersonal resources for students to learn to be ‘effective’ in school through the mentoring role that they play to students (Coleman, 1990; Croninger & Lee, 2001; Stanton-Salazar, 1997). Such mentoring relationships have been proven to lead to students’ improvement in school belongingness, academic proficiency, and psychological well-being (Rhodes, Grossman, & Resch, 2000). Alternatively, the relationship with CCA instructors is a source for positive social relationships with non-parental adult figures (Keller, 2005), especially when youth lack parental support or other positive proximal relationships (Olds, Kitzman, Cole, & Robinson, 1997). Apart from this, through coaching, CCA mentors can impart important ‘life’ skills (e.g., emotional regulation and social competence) that promotes youth’s social and emotional development (Gottman, 2001). Beyond cultivating social networks and developing socioemotional competence, mentoring relationships in CCAs facilitate students’ cognitive development through introducing intellectual stimulation, developing skills and knowledge in specialised fields, and promoting academic success *via* development of student motivation and provision of structure in student life (Rhodes, Spencer, Keller, Liang, & Noam, 2006). Thus, the present findings seem to support the proposed benefits of having positive adult role models for student development.

From the self-determination perspective, autonomy-supportive instructional style is likely to foster positive youth development by responding to students’ developmental and socioemotional needs (Eccles et al., 1993; Eccles & Roeser, 2011). Such autonomy-supportive practices can harness students’ motivational resources by aligning activities to students’ needs, preferences, interests, and levels of ability – this in turn facilitates students’ engagement in their CCA participation (Niemic & Ryan, 2009). Prior research indicated that teacher autonomy supportiveness is associated with autonomous motivation (Reeve & Jang, 2006), classroom engagement (Hafen et al., 2012), academic performance (Boggiano, Flink, Shields, Seelbach, & Barrett, 1993; Vansteenkiste, Simons, Lens, Sheldon, & Deci,

2004), and psychological well-being (Black & Deci, 2000). The present study found that CCA instructors' autonomy support predicted all CCA outcomes across time, and that its effects on CCA outcomes were relatively greater than those of CCA types, quantitative indicators of CCA participation, or even sociodemographic factors (discussed earlier). Thus, the present finding highlights and provides evidence for the importance of autonomy support practices in fostering students' autonomous motivation and desired outcomes in the context of CCA, beyond the classroom setting that has been more widely documented in the literature. The theoretical implication of the present finding to SDT is elaborated below.

7.5.2.2.2 CCA parental autonomy support.

Like CCA instructors, parents are a significant figure who is instrumental in shaping youth development (e.g., Grolnick et al., 1991; Soenens & Vansteenkiste, 2005) and contributing to well-being of children and adolescents (Niemic et al., 2006). Parental socialization practices are instrumental in students' development of autonomy (Holmbeck, Paikoff, & Brooks-Gunn, 1995). While parents might not be directly involved in their children's CCA participation, they play an important supplemental and supportive role at home. Their support for children's CCA choices and initiatives, for example, would have an impact on students' sense of autonomous motivation in participating in CCAs (Grolnick, 2009). Parental autonomy support practices are also developmentally beneficial and provide a structure that promotes autonomous motivation (Chirkov & Ryan, 2001), academic outcomes (Fan & Chen, 2001; Pomerantz, Moorman, & Litwack, 2007), socioemotional outcomes (Downie et al., 2007; Niemic et al., 2006; Soenens et al., 2007), prosocial behaviours (Day & Padilla-Walker, 2009), and higher levels of participation in extracurricular activities (Wormington, Corpus, & Anderson, 2012). Another aspect of parental autonomy supportiveness involves setting clear expectations and boundaries for learning, which can promote academic motivation (Reeve, 2006). Research has indicated that such parental autonomy supportiveness is significantly correlated with a range of

academic outcomes, including academic achievement and persistence (Duchesne, Ratelle, Larose, & Guay, 2007; Ratelle, Larose, Guay, & Senecal, 2005; see also Guay et al., 2008). This is congruent with past evidence showing that parents' autonomy supportive practices led to the development of autonomous motivation and gains in important academic outcomes (e.g., homework completion and classroom engagement) (Grolnick & Ryan, 1989; Vansteenkiste et al., 2004).

Parental involvement has also been found to be crucial in facilitating children's adjustment in school (Fan & Chen, 2001). In the context of CCA, several key aspects of parenting-involvement practices that may help students in reaping the benefits of CCA participation include: (a) home-based school involvement practices that entail ensuring youth's participation, assisting and facilitating their participation and preparation for CCAs and articulating their expectation for CCAs; (b) home-school communication that involves parent-teacher correspondence *via* phone and e-mails or parent-teacher meetings; and (c) school-focused parenting entails partnering with schools in organising events and supporting CCA events *via* volunteering or sponsoring resources (Fantuzzo, Tighe, & Childs, 2000). These parenting practices promote youths' sense of autonomy, assurance and appreciation for CCA participation (Gonzalez-DeHass, Willems, & Holbein, 2005).

The result of the presents study attested to the positive effects of parental autonomy support. Specifically, CCA parental autonomy support was found to be significantly predicting CCA autonomous and all CCA academic and non-academic outcomes, including school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal. This pattern holds true across Time-1, Time-2, and longitudinal findings. Like CCA instructor autonomy support discussed earlier, CCA parental autonomy support was found to be more salient than quantitative indicators of CCA participation in contributing to students' CCA academic and non-academic outcomes. This further attests to

the significance of interpersonal context in CCA participation. It also outlines the importance of parent partnership with school in CCA arrangement as well as parental encouragement for student to participate in CCA and school activities.

Unlike CCA instructor autonomy support, however, CCA parental autonomy support also positively predicted CCA controlled motivation. This might suggest that parental involvement in their children's life, including CCA, may be perceived by the children as 'controlling', 'condescending' or 'patronising' especially when parents communicate their expectations in an authoritarian way. This particular finding, elaborated below, holds an important applied implication for parenting practices.

7.5.2.2.3 CCA peer autonomy support.

Peers have a prominent role in adolescent development outside of the family (Brown, 2004; Brustad, Babkes, & Smith, 2001). Supportive peer relationships are especially crucial for students' development during early adolescence (Johnson & Johnson, 1985; Moran & Gonyea, 2003; Wentzel & Caldwell, 1997; Zitzmann, 2005). These relationships, characterised by perceived peer acceptance and friendship quality (Asher, Parker, & Walker, 1996), were predictive of motivation in students' activity participation and socioemotional functioning (Smith, Ullrich-French, Walker, & Hurley, 2006; Ullrich-French & Smith, 2006). CCAs provide a context for youth to interact with peers in a group setting (Mahoney, Larson et al., 2005). The quality of relationships with peers in CCAs provide a source of emotional support for youth (Collins & Madsen, 2006) and contributes to students' overall psychological well-being (Argyle, 2001). Research similarly pointed out that students develop their sense of autonomy when they are empathetic towards one another (Youniss & Haynie, 1992) and engage in collaborative activities, which are common in CCAs (Beiswenger & Grolnick, 2010; Deci et al., 2006). While peer relationships may not forge youth's autonomy-supportiveness the way relationships with parents and teachers do, the presence of emotional and instrumental support characterises quality peer relationship

(Furman & Buhrmester, 1985; Parker & Asher, 1993) and positive classroom climate (Cabello & Terrell, 1994). Such a supportive atmosphere entails communication, emotional and instrumental support, mutual respect and exchange of ideas, and sense of belongingness (Ciani, Middleton, Summers, & Sheldon, 2010; Furrer & Skinner, 2003; Martin & Dowson, 2009). Through the process involving supportive peer relationships in CCAs, students' sense of competence and mastery can be developed via adhering to positive behaviour norms, common activity goals, exchange feedback and modelling excellence (Parr, 2002; Wentzel, 2009).

In the present study, the relevance of positive peer relationship was apparent in the significant relationships between CCA peer autonomy support and CCA autonomous motivation and all the outcomes. Prior studies have shown that students' positive association with their peers leads to many positive academic outcomes (e.g., homework completion, educational aspiration and academic buoyancy) and non-academic outcomes (e.g., leadership, confidence and teamwork) (Feldman & Matjasko, 2005), and facilitates activity engagement and retention (e.g., school belongingness and classroom engagement) (Fredricks et al., 2002; Fredricks & Eccles, 2010; Persson, Kerr, & Stattin, 2007). Thus, the present results are in line with prior research on the importance of peer autonomy-supportive relationship in youth development within the CCA context.

It is widely believed that parents and teachers have a greater role in contributing to youth autonomy and development as compared to peers, and that peers may contribute to youth autonomy and development differently from parents and teachers. In this study, however, peer autonomy support was found to be as significant as parental autonomy support and CCA instructor autonomy support in promoting CCA motivation and CCA outcomes. This affirms the significance of peers in youth development, which showed that peer autonomy support to be as salient as CCA instructor and parents in promoting students' motivation and CCA desired outcomes. According to the sensitisation model of

need satisfaction (see Moller, 2007; Moller, Deci, & Elliot, 2010), all sources of autonomy-supportiveness (i.e., parents, teachers and peers) are vital in promoting youth well-being and development. Conversely, the finding provides no evidence for the satiation model of need satisfaction suggesting that autonomy support from one key source is sufficient, or more important than that from others, in promoting youth well-being and development (Baumeister & Leary, 1995). As proposed by Laursen and Mooney (2008), students' psychological well-being is positively related with the multiple sources of relationships (i.e., parents, teachers and peers) that students develop. Thus, this study indirectly tested and confirmed the contribution of various sources of social support to students' academic and non-academic outcomes.

In sum, this section examined significant and non-significant findings in relation to relevant prior research and suggested possible explanations. Findings, especially those derived from the longitudinal analysis, demonstrated that the mediating role of CCA motivational orientations was significant in the relationship between CCA participation and CCA desired outcomes. At the same time, it was brought to our attention that CCA motivational orientations (i.e., CCA quality of participation) and CCA interpersonal relationships (i.e., context of CCA participation) were found to be more important than students' type and quantity of CCA participation. It highlighted the importance of fostering an autonomy-supportive CCA context that would nurture students' motivation and in turn, develop positive development. Thus, an intervention that focuses on CCA interpersonal relationship factors may "kill two birds with one stone" because as shown in this study, CCA instructor, parental and CCA peer autonomy support contributed to the development of CCA autonomous motivation, as well as desired academic and non-academic outcomes.

7.5.3 Covariates.

Having considered the main CCA predictors (i.e., CCA types, quantitative and qualitative indicators of CCA participation, CCA-related social contexts), it is also important

to consider findings associated with covariates (i.e., parental education, gender, school level as a proxy of age) in the present study. These sociodemographic characteristics were found to predict some of CCA motivation and outcomes. By taking into account the effect of these covariates, not only could we extricate the unique effects of respective CCA participation factors (i.e., CCA participation frequency, breadth, duration, CCA motivational orientations, and CCA-related interpersonal relationships) on CCA outcomes, we could also identify groups of students who are in greater needs for intervention.

The present study found that parental education had a positive and significant effect on students' educational aspiration, consistently in the cross-sectional and longitudinal analyses. This warrants the inclusion of parental education as a covariate, to ascertain 'purer' effects of other CCA predictors. This finding – that students with higher levels of parental education tended to have higher levels of educational aspiration – is probably due to the possibility that parents with higher levels of education would have higher parental expectations of their children's academic present performance and future aspiration (Rockwell, 2011). As shown in prior studies, parental expectations had a significant predictive effect on student expectations for further education (Jodl, Michael, Malanchuk, Eccles, & Sameroff, 2001; Marjoribanks, 1995) and students' academic self-efficacy (Benner & Mistry, 2007). In view of this finding, there is a benefit of encouraging students with lower parental education to participate in CCAs in that their educational aspirations could be heightened as a result of their CCA participation, especially their CCA autonomous motivation and perceived autonomy support which, as discussed earlier, were found to have positive effects on educational aspiration.

In the present study, male students were found to score higher than female students in term of CCA outcomes (i.e., academic buoyancy, leadership skill, and confidence). Due to the effects of gender in predicting some of the CCA outcomes, it is necessary to the control for the effect of gender in the interpretation of the results. Prior research indicated that male

students are more likely to engage in CCAs as a means to build up their credential and recognition. Female students, however, have a lower tendency to perceive the direct relationship between the value of CCA participation and future prospect (Thompson, 2008). This may have contributed to the reported lower levels of some of the CCA outcomes. In view of this finding, CCA participation could be made more inclusive for female students in terms of, for example, encouraging their active participation and making leadership positions available for them.

In the longitudinal analysis, after taking into account for shared prior variance, older students were found to have higher gains in confidence, lifelong learning, teamwork, leadership skill, and communication skill. The gains in these attributes could be due to their ongoing involvement of CCA participation over the years. Not only does this participation require them to work together closely with their peers and deepen their desire for learning, it also provides opportunities for the older students to take up, or be assigned, leadership positions in their CCAs. This in turn sharpens their leadership qualities, communication skill, and confidence. In addition, the finding might be attributed to developmental reasons. That is, older students are likely to have a firmer sense of identity than their younger counterparts. This would contribute to their heightened self-beliefs which in turn provide a basis for their more positive perceived communication and leadership skills.

Collectively, covariates (i.e., parental education, gender, and school level) did not consistently predict CCA motivational orientation and outcomes as compared to CCA interpersonal-relationship factors. Although these covariates are important in their own right and have to be taken into consideration in this study, CCA motivational orientations and outcomes are less systematically associated with individual dispositions or sociodemographic characteristics as compared to CCA sociocontextual factors. This highlights the importance of sociocontextual factors which are more malleable than individual dispositions and sociodemographic characteristics. This further implies that CCA related interpersonal

relationships, including those with CCA instructors, parents, and peers, can be targeted and optimised in order to facilitate students' development as a function of their CCA participation.

7.6 Implications of the Findings

The current findings have implications for theory, policy, and practice seeking to promote the benefits of school-based CCA participation for students' academic and non-academic development. These implications are elaborated below

7.6.1 Significance of the findings for theories.

7.6.1.1 *Self-determination theory.*

Self-determination theory (SDT; Ryan & Deci, 2000, 2003, 2017) is the main theoretical framework that guides the present study and, especially in developing the hypothesised CCA model. Of particular importance are the organismic integration and cognitive evaluation mini-theories in SDT used to frame the present research by understanding students' motivational process and how classroom context promotes student motivation and functioning (Ryan & Deci, 2002; Vansteenkiste et al., 2010).

The organismic integration perspective explains how students' CCA autonomous motivation is related to the degree they internalise the value of CCA participation, which is reflected in the differing dimensions of motivation (Vansteenkiste et al., 2010). It suggests that students may initially participate in CCA because of a sense of imposition due to school policy and curricular requirements but they gradually internalise the value of CCA participation and, especially, of the skills they learn during that participation (Ryan et al., 2009). This research likewise recognises that while CCA participation is prescribed by schools, students perceive the utility of CCA differently and place varying levels of commitment behind such participation. Findings in this present study confirm prior research in terms of the importance of autonomous motivation in promoting students' positive

functioning (Deci & Ryan, 2000; Field, Sarver, & Shaw, 2003; Flink, Boggiano, & Barrett, 1990). Students who are intrinsically motivated and engaged tend to benefit more from CCA participation in terms of academic and non-academic outcomes. Indeed, the findings noted that students' CCA autonomous motivation significantly and positively predicted the majority of CCA outcomes while controlled motivation was neither significantly nor consistently in predicting CCA outcomes. In the longitudinal analysis, CCA autonomous motivation predicted gains in many of the outcomes, but this was not the case for CCA controlled motivation.

The cognitive evaluation perspective posits the role of learning or developmental context in facilitating the development of students' motivation and positive functioning (Ryan & Deci, 2000). In the present study, CCA instructor, parental, and CCA peer autonomy-supportive practices promoted students' CCA autonomous motivation which in turn predicted academic and non-academic outcomes. This provide evidence that the CCA autonomy-supportive social contexts that fulfil students' needs for autonomy, relatedness, and competence would nurture and foster their autonomous motivation in CCA participation. It provides insights on how powerful CCA contexts and autonomy-supportive CCA interpersonal relationships can be in promoting students' motivation, development, and well-being (Reeve, 2009).

7.6.1.2 Extracurricular activities theory.

Marsh and Kleitman (2002) theorised models regarding the relationship between extracurricular activity participation and students' academic and non-academic outcomes. Of relevance to the present study are two of their models. These are: the zero-sum model and the developmental model.

The zero-sum model (Marsh & Kleitman, 2002) states that CCA participation adversely affects secondary school students' academic learning. In other words, CCA participation would lead to reduced academic outcomes. Findings of the present study did not

support the zero-sum model in that neither students' participation in specific CCA types nor quantity of CCA participation (i.e., CCA intensity, breadth and duration) consistently negatively predicted outcomes. Thus, it appears that CCA participation did not hinder students' academic pursuits by competing for their limited time and attention as proposed by the zero-sum model. This might be the case because Singapore secondary schools set restriction to avoid over-involvement in CCAs, and they limit students' CCA participation when students' grades are affected. Close monitoring of student academic results, rooted in the importance of education and academic results to students, parents, and teachers, may buffer the potentially adverse effect of CCA participation. As a result of this practice, the zero-sum (over-scheduling) effect was not evident.

The developmental model posits that CCA participation promotes students' academic success via the acquisition of a range of positive psychosocial outcomes (Anderman, 2002; Broh, 2002; Fejgin, 1994; Finn, 1989; Fredricks & Eccles, 2005; Hansen, Larson, & Dworkin, 2003; Holland & Andre, 1987; Larson et al., 2006; Lewis, 2004; Mahoney & Cairns, 1997; Mahoney et al., 2003; Marsh, 1992; Osterman, 2000; Valentine et al., 2002). That is, such participation enables students to develop life skills and personal qualities (Eccles & Barber, 1999; Gilman, 2004; Zaff et al., 2003), gain social capital through the presence of prosocial peers and adults (Liu et al., 2014), and strengthen school belongingness and academic skills (Mahoney & Stattin, 2000). Indeed, the results of the present study showed that CCA participation is associated with a wide range of academic and non-academic outcomes, including school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal. These findings provide support to the developmental model of CCA participation.

7.6.1.3 Ecological systems theory.

The bioecological systems theory (Bronfenbrenner, 1979) highlights the mutual interaction between students and their developmental environment, and how it shapes students' development via a dynamic process over time. More importantly, the model was used to guide the inclusion of predictors in this study: students' sociodemographic (i.e., parental education, gender, and school level); intrapsychic attributes (i.e., CCA motivational orientations); factors in the microsystem (i.e., CCA instructor, parental, and CCA peer autonomy support); factors in the exosystem (e.g., type and quantity of school-based CCA participation); and the time-related factor associated with the chronosystem (by conducting the study longitudinally). As highlighted earlier, the study recognises the key role of students' CCA-related interpersonal contexts in facilitating their motivation, which was linked to students' development in the process. The findings highlight the stronger contribution of the students' individual (motivational orientations) and microsystem (interpersonal-relationship contexts) factors towards the prediction of students' outcomes than factors associated with the exosystem (the types and amount of CCA students were involved in). This shows that students' intrapsychic factors such as motivation and their perceptions of others (CCA instructors, parents, and CCA peers), collectively, play an important role in positive development. This seems to suggest that the quantity or type of CCA that students participate in might not be as fundamental as their motivation in the activity and the quality of interpersonal-relationships that they experience during the activity in promoting developmental outcomes. Importantly, the study showed that CCA instructors, parents, and peers are equally important in directly predicting outcomes and indirectly through their effects on motivation. Clearly, the quality of interpersonal relationships should be focused on in interventions seeking to optimise the benefits of CCA participation.

This research indicated that time should be taken into consideration in understanding students' development, including development as a function of CCA participation. The role

of time was taken into consideration by conducting the study at two time points and the longitudinal analysis. The design and analysis allowed for prior CCA outcomes to be included as covariates such that findings can be interpreted as gains or declines in CCA outcomes. That is, significant prediction of Time-2 outcomes can be considered to be uniquely related to CCA participation factors (see e.g., Martin, 2011). The longitudinal analysis underscored the saliency of CCA motivational orientations as mediators in the relationship between CCA participation and outcomes, which would otherwise not be strongly evident in Time-1 or Time-2 findings. The longitudinal analysis revealed the significant gains in CCA outcomes attributed to CCA motivational orientations and CCA autonomy supportive relationships. Indeed, the study showed that the effects on CCA outcomes became more apparent over time especially after taking into account for students' baseline measures on the factors considered to be outcomes. Thus, this study further attests the dynamic nature of person-context interaction in CCA settings across time (Tudge, Mokrova, Hatfield, & Karnik, 2009). Academic and non-academic outcomes can be optimised by promoting the quality of the context through encouraging CCA instructors, parents, and peers to be more autonomy supportive. In sum, the bioecological systems model (Bronfenbrenner & Morris, 2006) provides insights regarding the influence of various factors, including students' own dispositions and interpersonal contexts, in shaping students' development as a function of their CCA participation, as encapsulated in the hypothesised CCA model. This framework is useful in evaluating CCA programmes and understanding how each level of the bioecological contexts posited in the model can be targeted and reinforced for greater CCA participation and outcomes.

7.6.1.4 Positive youth development.

Positive youth development (PYD) is a contemporary approach that entails a paradigm shift from a deficit-reduction perspective to an asset-promotion perspective (Lerner, 2002). This perspective postulates the dynamic and mutual interaction between

students and their ecologies (e.g., CCA, classroom, and home) (Lerner, 2006; Overton, 2013). This model posits that students' growth and flourishing are optimised when their capacities are compatible or matched with environmental opportunities that supports the development of the capacities (e.g., school and family). Specifically, Lerner, Dowling and Anderson (2003) suggested the connection between extracurricular participation and success in intrapersonal and interpersonal outcomes, as encapsulated by the 5Cs of the PYD: competence, connection, character, confidence, and caring (e.g., Lerner et al., 2005; Theokas et al., 2005; Zarrett et al., 2009). This means that CCAs are perceived as a form of environmental asset that can promote youth development (Eccles & Gootman, 2002) by aligning students' strengths with assets in ecologies within the various contexts (Benson et al., 2006; Benson et al., 2011). Similarly, Benson and colleagues (1998) pointed out that extracurricular activity participation as a developmental opportunity that youth can tap on. As theorised by Benson and Saito (2000), youth flourishes as a result of input of developmental resources, such as CCA programmes, parental and teacher support, and these translate into students' CCA outcomes, including the aforementioned 5Cs.

Consistent with the PYD model, findings from this study supported the idea that CCA is indeed an environmental asset that fosters students' developmental outcomes. From this model, the benefits of CCA participation is conjectured as a result of the following characteristics of CCA ecology and the consequences of participating in that ecology: (a) the presence of warm, supportive relationships with peers and adults, (b) heightened school engagement and belongingness, (c) personal growth and skill building opportunities, and (d) adult supervision and guidance (Mahoney, Larson et al., 2005). Indeed, these features are the hallmarks of quality CCAs that promote students' development through the garnering of developmental assets and youth engagement (Eccles & Gootman, 2002; Larson, 2000). This is consistent with the present research's findings that showed the significant contribution of

CCA instructor autonomy-supportive relationships and students' CCA autonomous motivation to academic and non-academic outcomes.

In line with the PYD perspective, the relationship between CCA participation factors and gains in students' CCA outcomes is apparent from the finding. It also further ascertained the need for specific characteristics in CCA programmes and the support of the community for CCA programmes to be effective. PYD provides understanding of the contribution of CCA to students' positive development, as well as characteristics of programmes that foster students' motivation and well-beings. CCA instructors are expected to structure CCA programmes to include PYD qualities that promote students' motivation, engagement, and desired outcomes.

In sum, the abovementioned theoretical frameworks formed the basis for the selection of CCA factors, the development of the hypothesised model in this study, and the theoretical backdrops against which the present findings are interpreted. These theoretical frameworks are interrelated and provided a holistic perspective of students' CCA motivation and outcomes as a function of CCA participation. With regard to the extracurricular activity perspective, for example, there was some evidence supporting the developmental model; however, the evidence did not support for the zero-sum model. The positive youth development model received support through findings demonstrating the significance of the CCA context in fostering CCA outcomes. Finally, self-determination theory formed the main thrust of the research and accounted for the qualitative aspects of CCA participation. It is instrumental not only in determining the positioning of CCA motivation as a mediator in linking CCA-related interpersonal contexts (CCA instructor, parental, and CCA peer autonomy support) to CCA participation outcomes but also in demonstrating the importance of the quality of CCA participation and CCA social contexts in optimising the benefits of CCA participation.

7.7 Implications for Practice

Having considered the findings of this present study in view of the various theoretical models, it is important to discuss their implications for educational policies, instructional practices, as well as parenting practices in relation to the significance and salience of autonomy supportive interpersonal relationships (i.e., CCA instructor, parent and peers). These implications are discussed based on distinct but related major CCA settings that students are mainly surrounded by: the school or education system, CCA instructors, and parents.

7.7.1 School-level and educational policy implications.

In recent years, there has been an emphasis to nurture 21st century competencies through non-curricular activities (Henry & Costantino, 2015; Piirto, 2011; Suto, 2013). The 21st century competencies refer to a skill set that encompasses life, social and applied skills deemed necessary for students to function effectively in a globalised, fast-paced and multicultural world. Similarly, Singapore's Ministry of Education (2014) emphasises holistic education and recognises the importance of both academic and non-academic developments. Rather than viewing CCAs as an activity that will compete with academic endeavours and impede academic achievement, schools should highlight the developmental benefits of CCA participation to parents so that they would be supportive of their children's involvement in CCA.

Based on the findings of this research, school management may consider developing professional development programmes for CCA instructors that coach them with instructional strategies that effectively develop students' autonomous motivation. Programme evaluation had established the efficacy of intensive professional development programmes in facilitating teachers' positive mind-sets, teaching strategies and classroom management styles that impact students' motivation (Guay, Valois, Falardeau, & Lessard, 2016). For instance, schools can help teachers to be more effective in identifying and improving students'

motivation by adopting autonomy-supportive interpersonal styles and enhancing perceived value of educational activities (Hardré & Sullivan, 2009). As the provision of autonomy support is likely to nurture different psychological needs, stakeholders can channel resources to training CCA instructors that emphasises on autonomy support (Standage et al., 2006). School administrators and educators can focus on enhancing the quality of the implementation of school-based CCAs instead of focusing on the quantity of CCA participation or encouraging students to participate in certain CCAs. This is especially pertinent when structuring CCA programmes to equip students with 21st century competencies. Some important features of CCA programmes include opportunities for students to take up a leadership role and make decisions. CCA programmes could be designed to include goal-setting and socioemotional skill-development components that may have positive impact on academic and socioemotional outcomes (Durlak, Mahoney et al., 2010; Durlak, Weissberg, & Pachan, 2010). To achieve this, school activities, including CCAs, can be organised in such a way that allows for a lower teacher-student ratio and more personalised interaction to promote closer teacher-student ties, a greater sense of school belongingness, and in turn more active participation and engagement. Indeed, extant literature indicated that smaller learning groups facilitate cohesiveness among students and teachers, which also leads to improvement in students' academic achievement and motivation (Zvoch, 2006). In terms of CCA allocation, students could be given the autonomy to pursue the CCA of their interest. As demonstrated in the present research, the CCA types and quantity of CCA participation did not determine students' CCA outcomes as much as the students' autonomous motivation in their CCA participation. According to SDT, providing students a sense of choicefulness fosters students' autonomy and is related to students' psychological well-being (Deci & Ryan, 2000; Vallerand et al., 1997). By giving students such flexibility, they are likely to begin their CCA participation with intrinsic (autonomous) motivation that can be optimised in an autonomy-supportive and enriching CCA environments. This also

fulfils students' psychological needs for autonomy (Baker, Sigmon, & Nugent, 2001; Conchas & Rodríguez, 2008). Taken together, it is for schools to design CCA programmes that involves high quality mentorship, fosters more collaborative interactions among CCA participants, provides opportunities for students to make autonomous decisions, and creates a supportive interpersonal climate to meet students' basic psychological and socioemotional needs.

Although preliminary analyses suggested that the different outcomes in this study, both academic and non-academic, are empirically distinct factors, the conceptual distinction between academic and non-academic outcomes could be rather blurred. Certain academic outcome such as academic buoyancy entails self-regulation and school-related tasks like school work. Similarly, non-academic outcomes like society-oriented future goal requires self-reflection and cognitive understanding of students' future goals (Anderson & Fraillon, 2009). Such conceptualization is vital as it shapes schools' approach and direction in developing CCA curriculum. Specifically, it is important for CCA curriculum developers to have a common and more precise understanding of the definition of CCA outcomes in order to devise practical way to operationalize and assess improvement of these outcomes within the context. This warrants the consideration of skills and qualities that underlie these outcomes as well as ways of imparting these skills and qualities such that the effect of CCA participation on outcomes are more tangible (Brookes, 2003).

7.7.2 Implications for CCA instructors.

Besides academic subject teachers, CCA instructors are valuable social agents that provide adolescents with a meaningful connection with adults. To optimise their positive role in student development, there is a value for CCA instructors to adopt an autonomy-supportive principles and practices in conducting CCA programmes. The literature has established the connection between adults' autonomy supportiveness and students' school

belongingness, which in turn promotes students' retention and engagement (e.g., Eisenman, 2007; Niemiec & Ryan, 2009). In line with stage-environment fit theory, CCA instructors and peers can foster a learning environment that is responsive to adolescents' developmental needs (Eccles et al., 1993; Eccles & Roeser, 2011). These developmental needs include high quality peer friendships and acceptance, and close relationships with non-familial adults as well as fulfilling students' dynamic cognitive, social, personal, and emotional needs (Brown, 2004; Eccles & Roeser, 2011). Self-determination theory likewise proposes that students have basic psychological needs for competence, autonomy, and relatedness (Deci & Ryan, 2000), and meeting students' psychological needs promote motivation and positive adjustment in school (Deci et al., 1991). With respect to the implementation of CCAs, CCA instructors are expected to create opportunities for students to make decisions, allow students to share their views in generating rules and regulations about their CCA involvement, and provide opportunities for self-expression and exploration (Eisenman, 2007; Niemiec & Ryan, 2009). Further, CCA instructors may consider designing activities and assigning tasks that fulfil students' psychological needs for relatedness, autonomy, and competence (Assor et al., 2002; Reeve, 2009; Reeve, Jang et al., 2004). This can be done in various ways. In SDT, motivated engagement requires a match between a task's difficulty level and a student's level of competence. Thus, CCA programmes should be designed with students' ability in mind and the level of difficulty of a task should be set in a progressive manner as students' competence and experience in the task increase. In terms of the need for autonomy, CCA instructors may grant students more cognitive and procedural flexibility and freedom by giving them more control over activities and CCA arrangements. Such autonomy-supportive practices have been effective in promoting students' learning and motivation in the classroom setting (Furtak & Kunter, 2012). Further, CCA instructors may also adopt a more personalised approach in coaching students by running small-group

activities for more effective teacher-student contact time. This is a possible way of satisfying students' need for relatedness in the context of CCA.

It is important to note that, similar to the malleable nature of students' motivation, CCA instructors can also adjust and modify their instructional or coaching style. CCA-related training and coaching programmes can be implemented to develop teaching practices that are more autonomy-supportive and targeted at fostering students' autonomous motivation (see e.g., Reeve, Jang et al., 2004). These include, for example, providing explanations and informational feedback on student work or performance pertinent to the skill learned in CCA, offering choices, setting clear expectations and directions, and promoting self-directed learning (Jang, Reeve, & Deci, 2010; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009). Some alternative approaches include letting students take part in community-involvement projects within their existing education context such that students have the opportunity to experience 'real-life' challenges. Beyond mere participation, students should also be encouraged to reflect and draw connections between community issues and curriculum content (Bridgeland, DiIulio, & Wulsin, 2008). Another possibility would be using information and communications technology (ICT) in CCA. For instance, computer games can be used to reinforce and demonstrate learning concepts. Social media platforms such as Facebook can be used to stimulate online discussions and exchanges of learning ideas among CCA participants and their CCA instructors.

7.7.3 Implications for parents.

Though parents are not directly involved in students' CCA participation, their effective partnership with the school is necessary for students' sustained CCA participation and optimal outcomes, such as CCA attendance rate (Bennett, 2004). Parenting style has a role in fostering an autonomy-supportive climate which promotes students' motivation, which in turn is associated a range of adaptive outcomes (Ryan & Deci, 2002). Based on findings, parents can be encouraged to work closely with school for CCA scheduling and

motivating students' participation. As elaborated earlier, extensive developmental benefits for students can potentially be harnessed through well-organised CCAs, and in this case parents may partner with schools in terms of scheduling and structuring students' after-class activities to avoid potential overscheduling effects. This can be done, for example, by not taxing students with private academic tuitions that take up a lot of students' time. Parents can also provide an enriching learning and supportive environment at home to promote self-directed learning and help actualise youth's learning potential (Deci & Ryan, 2000; Huff, Houskamp, Watkins, Stanton, & Tavegia, 2005). At the same time, it is important that parents to set clear and realistic goals, expectations, and boundaries in terms of their children's learning and CCA participation which would make children to feel less burdened and pressured in their CCA participation (Morawska, Winter, & Sanders, 2009). To support their children's CCA involvement, parents may consider engaging their children in joint decision-making related to their CCA involvement, making CCA-related learning resources available for children, and providing informational and encouraging feedback. By way of open communication, parents could encourage children to internalise the value of CCA and the skills honed during the activity – this in turn would develop children's autonomous motivation in their CCA participation.

To reinforce children's sense of competence, parents could recognise and reward students for their effort and initiative instead of narrowly focusing on outcomes, such as winning or outperforming their peers in CCA. In other words, parents could choose to value students' learning process as much as learning outcomes (Niemic & Ryan, 2009). This means that parents should also place a greater emphasis on non-academic achievements and give their children more discretion to participate in CCAs that allow them to develop important socioemotional qualities. They can also try to encourage their children to spend their free time by engaging in more productive and meaningful activities like CCAs, which may help reduce the likelihood of delinquency and other adverse psychological outcomes

(Farb & Matjasko, 2012). When parents value learning, students will strive to excel in their learning and performance (Bloom, 1985; Olszewski-Kubilius, 2002). By being actively involved in students' CCA participation and school learning, parents and children will develop a stronger connection too.

Thus, from the SDT perspective, parental autonomy support has a role in developing children's autonomous motivation (Ryan et al., 2006). This involves cultivating engagement by structuring activities with autonomy-supportive practices such as: (a) providing genuine support and affirmation of children's CCA-related competence and development (Fletcher, Elder, & Mekos, 2000; Huebner & Mancini, 2003; Raymore, Godbey, & Crawford, 1994; Simpkins, et al., 2005); (b) providing opportunities and resources to develop CCA skills and experience mastery (Carruthers & Busser, 2000; Gambone & Arbreton, 1997; Perkins et al., 2007); (c) providing children with opportunities to make CCA-related decisions (Huebner & Mancini, 2003); and d) providing a home environment that ensures a sense of psychological safety in children regardless of their CCA performance (Borden et al., 2006; Gambone & Arbreton, 1997). Taken together, in relation to children's CCA participation, parents need to strive to create an autonomy-supportive home environment to enhance children's autonomous motivation which in turn optimise the benefits of CCA participation.

7.8 Limitations and Future Research Directions

The present study has provided insights and made contributions towards the CCA literature by investigating a model that involves sociodemographic covariates, CCA-participation factors, student CCA motivational orientations, and CCA-related interpersonal relationships as predictors of CCA outcomes. While the research has a sound basis drawn from CCA conceptual frameworks, empirical research, and valid and reliable measurement, a number of potential limitations should be noted as we consider and interpret the findings. These limitations provide directions for future research seeking to clarify the benefits of

CCA participation for young people's developmental outcomes. These limitations and their corresponding recommendations are outlined below.

The present study utilised self-reported data regarding students' perceptions of their CCA participation. This is a valid method in its own right and one that enables access to a large pool of participants in an efficient way (Shiffman, 2000). However, self-reported data are susceptible to biases such as social desirability bias that affect responses when participants wish to leave favourable impressions to the researchers (Beretvas, Meyers, & Leite, 2002; Nancarrow & Brace, 2000) or leniency bias that affects responses when participants over-rate people whom they are closely affiliated to (Guilford, 1954). Related to the reliance of the current study on self-report data, it was observed that the correlations between predictors and between outcomes were relatively high. For example, the correlations between peer and instructor autonomy support were $r = .82, p < .001$ at Time 1 (see Table 4.2) and $r = .89, p < .001$ at Time 2 (see Table 5.2) and the correlations between teamwork and communication skills were $r = .81, p < .001$ at Time 1 (see Table 4.2) and $r = .89, p < .001$ at Time 2 (see Table 5.2). While a series of CFAs conducted on predictors and outcomes at the preliminary analysis stage at each time point showed statistical evidence for the multidimensionality of the different types of autonomy support and of outcomes, path analytic findings should be interpreted with both substantive and methodological cautions, especially with regard to the potential multicollinearity issue that occurs when two predictors are highly correlated ($r_s > .70$; Tabachnick & Fidell, 2019) and the discriminant validity of the outcome variables.

Another limitation pertains to the utilisation of the Self-Regulation Questionnaire (SRQ) (Ryan & Connell, 1989) that did not measure integrated regulation or motivation. Future research could aim to include this important construct of SDT and consider its implications in relation to CCA desired outcomes. Triangulation with qualitative methodologies (e.g., interviews, focus group discussions, open-ended surveys) is

recommended as they can more aptly capture the rich experience of students' CCA participation, which might otherwise not be obtained by a quantitative and statistical approach. Delving into the experience of students during their CCA participation enables us to understand how students' psychological states develop and evolve over time (Corbin & Strauss, 2008). Thus, future studies should complement quantitative with qualitative approaches to research to gather information about students' CCA participation motivation and their perceptions of how CCA programmes and social contexts affect their CCA participation and outcomes. By doing so, the dynamic role of factors that influence students' CCA motivation and outcomes can be better understood.

While the present study is mainly based on a between-variable approach to research and specifically concerned with the relationships between CCA participation-related predictors, CCA motivational orientations, and CCA-desired outcomes, a between-individual approach is also needed to understand if there is systematic variation in CCA participation experience according to, for example, gender, educational level, ethnicity, or CCA type. Possible analytic approaches within this between-individual research framework is the use of such statistical techniques as cluster analysis or latent profile analysis that allows researchers to identify groups of participants based on their similarities and dissimilarities in their responses to the measures. Another interesting research direction would be to examine the non-linear relationship between CCA participation factors, specifically the quantitative indicators and CCA motivation and outcomes.

Another possible angle to research seeking to better understand CCA participation and its impacts on outcomes is through analyses that aim to detect changes over time in students' daily life of CCA participation (e.g., La Guardia, Ryan, Couchman, & Deci, 2000; Sheldon, Ryan, & Reis, 1996). This may include research approaches, such as the experience sampling method (ESM; Csikszentmihalyi & Larson, 1987) that intensively gathers data pertaining to CCA participation over a certain period of time. This research method greatly

increases the validity and reliability of the data, and in turn findings, as it records observations in real time and does not rely on participants' recollections of their past experiences (Shiffman, 2000). It specifically enables repeated measurement for longitudinal analyses to be conducted (e.g., Affleck, Tennen, Urrows, & Higgins, 1994) so that the casual links between CCA variables and outcomes can be established more effectively and the ecological validity of the research can be improved by gathering data in naturalistic settings in real time. In terms of analyses, the study adopted scale scores in modelling the relationship between CCA participation factors and CCA outcomes. Even though using scale scores is methodologically defensible in its own right, another methodological possibility is to extract factor scores from the CFA models and use those scores in modelling the hypothesised relationships. This is one approach that future research may consider taking. Analyses could also be extended to include effect size to facilitate the interpretation of results.

The present study has focused on understanding the links between CCA participation and a wide range of academic and non-academic outcomes, including school belongingness, academic buoyancy, educational aspiration, classroom engagement, confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal. Other important outcomes, including academic performance and 'softer' social competencies such social awareness, empathy, perspective taking, were not included in the present. Further, the present was grounded in self-determination theory as its main theoretical underpinning especially in developing the hypothesised model of the relationships between CCA participation predictors and interpersonal factors, CCA motivational orientations, and outcomes. Other meaningful research directions could involve examining the degree to which CCA participation facilitates the development of socioeconomically disadvantaged students or those with learning challenges. Thus, there is a value for future studies to examine the role of CCA participation in promoting academic and non-academic outcomes not focused on in

this study, use other motivation theories, such as expectancy-value theory, achievement goal theory or personal investment theory, as a theoretical framework, and involve specific groups of students such as students of low-income background and with learning challenges.

Although CCA motivation orientations were mediators of the CCA participation variables, motivation orientations could be a moderator of the CCA participation variables. Since CCA participation is mandatory, it is plausible that CCA motivation orientations could moderate the effect of CCA participation. This could be another interesting research direction for future studies. By doing so, our understanding of CCA participants and its impact on student development can be enhanced.

Another potential limitation relates to the statistical approach taken in this study. The present study adopted path analysis that confers inherent reliability and validity benefits. This technique is particularly versatile in modeling longitudinal data. It ascertains the nature and direction among variables as well as accounts for measurement errors associated with observed variables or indicators (Tomarken & Waller, 2005). Of significance, the study procedure involved estimation of autoregressive paths in longitudinal analyses. This entails linking variables measured at earlier time point with corresponding variables measured at a later time point. Hence, the influence of constructs on subsequent variables is considered to be dependent on the earlier construct (MacCallum & Austin, 2000; Martin et al., 2010; Martin & Marsh, 2008; Martin, Marsh, & Debus, 2001; Martin, Marsh, Williamson, & Debus, 2003). While this approach is robust and commendable in its own right, it is important to note that there are other potential alternatives of longitudinal analysis. For instance, autoregressive longitudinal mediation model could allow for cross-lagged relations among variables. In a cross-lagged model, a Time-1 predictor is hypothesised to predict a Time-2 outcome besides its corresponding Time-2 factor, and a Time-1 outcome is hypothesised to predict Time-2 predictor besides its corresponding Time-2 outcome factor. Further, longitudinal data

could address the simultaneous or concurrent mediation relations among variables (see Dwyer, 1983; Rogosa, 1988). In addition, as opposed to the ‘residualised change’ method adopted in path analyses conducted in the present study (i.e., by way of auto-regressive paths), the ‘difference scores’ method is another possible technique that can be adopted to analyse a longitudinal data. In this latter method, each outcome variable will be represented by a change or a discrepancy between its Time-1 and Time-2 scores (see Castro-Schilo & Grimm, 2017). While both statistical techniques are methodologically plausible, it is interesting for future studies to compare results of the two techniques.

Lastly, latent growth curve modelling is another informative and appropriate technique that models development as a function of multiple, repeated measurement over time (Duncan, Duncan, & Strycker, 2006). This is particularly useful as the targeted outcomes would change systematically over time, and the repeated measurements were structured equally across participants. In other words, it describes a single individual’s developmental trajectory as well as individual differences in these trajectories over time (Bell, 1953; Tucker-Drob, 2009). These analyses could test for increasingly sophisticated models for easier identification of potential sources of poor model fit as compared to an analysis of a prediction model in a single step (Bollen & Curran, 2006; Kline, 2011). Additionally, this potent technique could evaluate multiple-wave data points (i.e., more than two time points) and bolster the precision of parameter estimates that tend to increase together with the number of observations for each individual (Duncan & Duncan, 2009). While SEM-related techniques do not allow causal inferences of the relationship among variables and could lead to excessive subjectivity in drawing conclusion, it provides a good starting point in developing and testing conceptual models with inherent degree of reliability and validity (Marsh, Hau, & Wen, 2004).

At the school level, teachers and administrators regard CCA participation as an integral part of secondary school curriculum. Specific time slots are allocated for CCAs to

take place concurrently in order to ensure uniform participation and to minimise disruption and potential clashes in different school commitments. As CCAs are scheduled to take place concurrently, it restricts the possibility of students participating in more than one or two CCAs, which was evident from the data. This reduces the likelihood of students being overly taxed as a result of heavy participation in CCAs. At the same time, the role of students' motivational orientation and interpersonal relationships in accounting for students' development is indirectly accentuated when the quantity and range of CCA participation are regulated. As students' participation in Singapore context is usually limited to one or two CCAs, the result might not be generalisable to other educational contexts where students' participation is not mandatory or regulated in any way.

Finally, departing from the substantive focus of the present study, it is also important for future research evaluate various aspects of CCA programmes and examine their impacts on students' CCA motivation and outcomes. These aspects include, for example, the amount of time that students are to be committed to, the nature of activities students are to be involved in, the quality of facilitation of CCA instructors, and the number of CCAs and the starting point at which students are expected to participate in CCA. Such evaluation is necessary to ascertain which components will effectively foster motivation and bring about changes in outcomes. This, too, is a worthy undertaking that warrants our better understanding of the impact of CCA participation on youth development.

7.9 Conclusion

In Singapore, Co-Curricular Activity (CCA) has been recognised as a platform to develop young people holistically. Yet, there is a relative scarcity in research in this area in Singapore. Thus, the present research was set and conceptualised to address a number of research gaps in the literature, such as a lack of Singapore-based research on CCA participation, the reliance of relatively small sample sizes, a lack of longitudinal design, a limited range of CCA-participation factors and outcomes, and the absence of covariates in

analyses. With a relatively large sample of Singapore secondary-school students, the present research focuses on the role of school-based CCA participation in outcomes at the beginning of the school year (Time 1), at the end of the school year (Time 2), and longitudinally by controlling for prior variance in outcomes. Guided by self-determination theory, the study specifically tested a model depicting the role of CCA motivational orientations (autonomous and controlled motivation) in mediating the relationships between CCA-participation factors (i.e., type of CCA and CCA participation intensity, breadth, and duration) and CCA-related interpersonal contexts (i.e., CCA instructor, parental, and CCA peer autonomy support) and a wide range of academic (i.e., school belongingness, academic buoyancy, educational aspiration, classroom engagement) and non-academic (i.e., confidence, lifelong learning, teamwork, leadership skill, communication skill, and society-oriented future goal) outcomes. Findings showed that the quality of students' CCA participation (i.e., CCA motivational orientations) and its facilitating condition (i.e., CCA interpersonal contexts) had an important role in contributing to students' academic and non-academic outcomes, more so than the type of CCA students participate in and the amount of such CCA participation. This calls for a paradigm shift from the commonly held belief that CCA type and CCA-participation quantity lead to differing participation outcomes. The present study did not find consistent relationships between CCA-participation factors and outcomes. Instead, it revealed that CCA interpersonal contexts and students' CCA autonomous motivation more consistently and positively predicted outcomes than did CCA membership and quantitative indicators of CCA participation predictors. All these suggest that effort to promote the benefits of school-based CCA participation should be geared towards fostering autonomy-supportive CCA contexts and students' autonomous motivation so as to optimise the benefits of CCA participation for students' holistic development.

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APPENDIX A:

SECONDARY SCHOOL CO-CURRICULAR ACTIVITY SURVEY

PART ONE

SECTION A: BACKGROUND INFORMATION

School: _____

Class: _____

Class index number: _____

Gender: Female Male

When is your date of birth? _____ (dropdown menu)

What is your ethnicity? (dropdown menu)

- Chinese Malay Eurasian
 Indian Chinese Others, please specify _____

What grade are you in now? Secondary 1, Secondary 2, Secondary 3, Secondary 4, Secondary 5

Which stream are you in now? NT, NA, E, SAP, GEP

What is your nationality? Singaporean, Permanent Resident, Non-Singaporean

Are you in IB (International Baccalaureate) or IP (Integrated Programme)? Yes, IB; Yes, IP; /No

What is your parent's/guardian's level of education? (For each parent/guardian, please select one only)

	Mother	Father
Primary school	1. <input type="checkbox"/>	1. <input type="checkbox"/>
Secondary school	2. <input type="checkbox"/>	2. <input type="checkbox"/>
Diploma	3. <input type="checkbox"/>	3. <input type="checkbox"/>
Pre-University	4. <input type="checkbox"/>	4. <input type="checkbox"/>
University	5. <input type="checkbox"/>	5. <input type="checkbox"/>
Postgraduate	6. <input type="checkbox"/>	6. <input type="checkbox"/>

**SECTION B:
YOUR PARTICIPATION IN SCHOOL-BASED CO-CURRICULAR ACTIVITIES (CCAs)**

1. How many CCAs are you taking part in at school?

- 1 2 3 More than 3

2. Which CCA(s) are you taking part in?

CCA 1: (select one); If your CCA 1 is not in the list, please specify _____

Sports and Games		Uniformed Groups	Performing Arts	Clubs & Societies
1) Air Rifle	17) Netball	1) NCC (Boys) *	1) Choir	1) Aero-modelling
2) Archery +	18) Rugby	2) NCC (Girls) *	2) Dance	2) Art & Craft
3) Badminton	19) Sailing	3) NCC (Air) *	3) School Band*	• Batik Printing
4) Basketball	20) Sepaktakraw	4) NCC (Sea) *	4) Chinese Orchestra	• Ceramics
5) Billiard /Snooker +	21) Soccer	5) NPCC (Boys) *	5) Western Orchestra	• Chinese Painting

CCA 2: (select one); If your CCA 2 is not in the list, please specify _____

Sports and Games		Uniformed Groups	Performing Arts	Clubs & Societies
1) Air Rifle	17) Netball	1) NCC (Boys) *	1) Choir	1) Aero-modelling
2) Archery +	18) Rugby	2) NCC (Girls) *	2) Dance	2) Art & Craft
3) Badminton	19) Sailing	3) NCC (Air) *	3) School Band*	<ul style="list-style-type: none"> • Batik Printing • Ceramics • Chinese Painting
4) Basketball	20) Sepaktakraw	4) NCC (Sea) *	4) Chinese Orchestra	3) Audio Visual
5) Billiard /Snooker +	21) Soccer	5) NPCC (Boys) *	5) Western Orchestra	4) CABIN
6) Cricket	22) Softball	6) NPCC (Girls) *	6) Singapore National Youth Orchestra	5) Chess
7) Canoeing	23) Squash	7) Boys' Brigade	7) Instrumental Groups	6) Community Service <i>(eg. Interact Club, Rotary Club)</i>
8) Dragon Boat	24) Swimming	8) Girls' Brigade	<ul style="list-style-type: none"> • Angklung/ Kulingtang • Gamelan • Guitar • Guzheng • Hand Bells /Hand Chimes • Harmonica • Indian Orchestra • Lap Harp • String Ensemble 	7) Computer / Multi Media
9) Equestrian +	25) Taekwando +	9) Guides		8) Library
10) Fencing +	26) Table Tennis	10) Red Cross Youth		9) Literary, Drama and Debating Society
11) Floor ball +	27) Tennis	11) Scouts		10) Photography
12) Golf	28) Tenpin Bowling	12) St John Ambulance Brigade		11) Singapore Youth Flying Club
13) Gymnastics	29) Track and Field			12) Weiqi
14) Hockey	30) Volleyball			
15) Judo	31) Waterpolo			
16) Karate +	32) Wind Surfing			
	33) Wushu			

CCA 3: (select one); If your CCA 3 is not in the list, please specify _____

Sports and Games		Uniformed Groups	Performing Arts	Clubs & Societies
1) Air Rifle	17) Netball	1) NCC (Boys) *	1) Choir	1) Aero-modelling
2) Archery +	18) Rugby	2) NCC (Girls) *	2) Dance	2) Art & Craft
3) Badminton	19) Sailing	3) NCC (Air) *	3) School Band*	<ul style="list-style-type: none"> • Batik Printing • Ceramics • Chinese Painting
4) Basketball	20) Sepaktakraw	4) NCC (Sea) *	4) Chinese Orchestra	3) Audio Visual
5) Billiard /Snooker +	21) Soccer	5) NPCC (Boys) *	5) Western Orchestra	4) CABIN
6) Cricket	22) Softball	6) NPCC (Girls) *	6) Singapore National Youth Orchestra	5) Chess
7) Canoeing	23) Squash	7) Boys' Brigade	7) Instrumental Groups	6) Community Service
8) Dragon Boat	24) Swimming	8) Girls' Brigade	<ul style="list-style-type: none"> • Angklung/ Kulingtang 	

3. Which is your main CCA (i.e., CCA that you are most involved in)?

Sports and Games		Uniformed Groups	Performing Arts	Clubs & Societies
1) Air Rifle	17) Netball	1) NCC (Boys) *	1) Choir	1) Aero-modelling
2) Archery +	18) Rugby	2) NCC (Girls) *	2) Dance	2) Art & Craft
3) Badminton	19) Sailing	3) NCC (Air) *	3) School Band*	• Batik Printing
4) Basketball	20) Sepaktakraw	4) NCC (Sea) *	4) Chinese Orchestra	• Ceramics
5) Billiard /Snooker +	21) Soccer	5) NPCC (Boys) *	5) Western Orchestra	• Chinese Painting
6) Cricket	22) Softball	6) NPCC (Girls) *	6) Singapore National Youth Orchestra	3) Audio Visual
7) Canoeing	23) Squash	7) Boys' Brigade	7) Instrumental Groups	4) CABIN
8) Dragon Boat	24) Swimming	8) Girls' Brigade	• Angklung/ Kulingtang	5) Chess
9) Equestrian +	25) Taekwando +	9) Guides	• Gamelan	6) Community Service <i>(eg. Interact Club, Rotary Club)</i>
10) Fencing +	26) Table Tennis	10) Red Cross Youth	• Guitar	7) Computer / Multi Media
11) Floor ball +	27) Tennis	11) Scouts	• Guzheng	8) Library
12) Golf	28) Tenpin Bowling	12) St John Ambulance Brigade	• Hand Bells /Hand Chimes	9) Literary, Drama and Debating Society
13) Gymnastics	29) Track and Field		• Harmonica	10) Photography
14) Hockey	30) Volleyball		• Indian Orchestra	11) Singapore Youth Flying Club
15) Judo	31) Waterpolo		• Lap Harp	12) Weiqi
16) Karate +	32) Wind Surfing		• String Ensemble	
	33) Wushu			

4. On average, how many hours per week do you spend on your main CCA in the past 2 months?

- 0 – 2 hours 3 – 4 hours 5 – 6 hours 7 – 8 hours 9 – 10 hours More than 10 hours

5. How long have you been taking part in your main CCA? ____ years and ____ months

PART TWO

SECTION A:

Disagree
Strongly

Agree
Strongly

1. I am good at my main CCA.	1	2	3	4	5	6	7
2. It's important for me personally to do well in my main CCA.	1	2	3	4	5	6	7
3. I enjoy doing things related to my main CCA.	1	2	3	4	5	6	7
4. The skills I learn in my main CCA will be useful for me later in life.	1	2	3	4	5	6	7
5. Doing well in my main CCA requires me to give up a lot of my time and energy.	1	2	3	4	5	6	7
6. I do well in my main CCA.	1	2	3	4	5	6	7
7. The skills I learn in my main CCA are important for me personally.	1	2	3	4	5	6	7
8. I like taking part in my main CCA.	1	2	3	4	5	6	7
9. Being good at my main CCA is useful for my future studies or work.	1	2	3	4	5	6	7
10. I have to give up a lot of my time and energy to do well in my main CCA.	1	2	3	4	5	6	7
11. I learn things quickly in my main CCA.	1	2	3	4	5	6	7
12. It is important to me personally to be good at my main CCA.	1	2	3	4	5	6	7
13. I find that activities in my main CCA are fun.	1	2	3	4	5	6	7
14. Doing well in my main CCA can be useful for my future.	1	2	3	4	5	6	7
15. Success in my main CCA requires that I give up other activities I enjoy.	1	2	3	4	5	6	7
16. Tasks in my main CCA are easy for me.	1	2	3	4	5	6	7

SECTION B:

<i>The reasons why I take part in my main CCA is...</i>	Disagree Strongly				Agree Strongly		
1. Because I enjoy doing things in my main CCA.	1	2	3	4	5	6	7
2. Because CCA participation is important to strengthen my resume.	1	2	3	4	5	6	7
3. Because I will feel bad about myself if I don't do it.	1	2	3	4	5	6	7

4. Because CCA is something I have to do so that I will not be punished.	1	2	3	4	5	6	7
5. Because my main CCA is fun to me.	1	2	3	4	5	6	7
6. Because CCA participation is important to me to determine my next education	1	2	3	4	5	6	7
7. Because I will be ashamed of myself if I don't do it.	1	2	3	4	5	6	7
8. Because CCA is what I must do to avoid punishment.	1	2	3	4	5	6	7
9. Because I enjoy taking challenges in my main CCA.	1	2	3	4	5	6	7
10. Because it is important to me to do well in CCA.	1	2	3	4	5	6	7
11. Because I will feel that I am wrong if I don't do it.	1	2	3	4	5	6	7
12. Because CCA is the school' rule and I will get punishment if I don't.	1	2	3	4	5	6	7
13. Because I find that activities in my main CCA are interesting.	1	2	3	4	5	6	7
14. Because it is important to me to get CCA points.	1	2	3	4	5	6	7
15. Because I will feel guilty of myself if I don't do it.	1	2	3	4	5	6	7
16. Because CCA is compulsory in the school and I will get punished if I don't.	1	2	3	4	5	6	7

SECTION C:

	Never							Always
1. During my main CCA, I work as hard as possible.	1	2	3	4	5	6	7	
2. I pay attention during my main CCA sessions.	1	2	3	4	5	6	7	
3. I feel good when I am in my main CCA sessions.	1	2	3	4	5	6	7	
4. I think my main CCA is boring.	1	2	3	4	5	6	7	
5. Before I start working on tasks in my main CCA, I try to figure out the best way to do it.	1	2	3	4	5	6	7	
6. During my main CCA, I keep trying even if the tasks are difficult.	1	2	3	4	5	6	7	

7. When I am in my main CCA, I just act as if I am working.	1	2	3	4	5	6	7
8. I feel interested when I do things in my main CCA.	1	2	3	4	5	6	7
9. I can't concentrate because I am so bored during my main CCA.	1	2	3	4	5	6	7
10. I try to plan things out before I start working on tasks in my main CCA.	1	2	3	4	5	6	7
11. During my main CCA, I try to do my best to master the skills and knowledge taught.	1	2	3	4	5	6	7
12. I enjoy doing activities in my main CCA.	1	2	3	4	5	6	7
13. I follow the rules and regulations in my main CCA.	1	2	3	4	5	6	7
14. I am so bored that I can't stay awake in my main CCA.	1	2	3	4	5	6	7
15. Before I start working on tasks in my main CCA, I think about what I want to achieve.	1	2	3	4	5	6	7
16. During my main CCA, I put forth my best effort.	1	2	3	4	5	6	7
17. I come late to my main CCA sessions.	1	2	3	4	5	6	7
18. I get excited when I work on things in my main CCA.	1	2	3	4	5	6	7
19. My main CCA is so boring that I don't feel like taking part in it anymore.	1	2	3	4	5	6	7
20. I try to find ways of how to do things before I start working on tasks in my main CCA.	1	2	3	4	5	6	7

SECTION D:

	Disagree				Agree		
	Strongly				Strongly		
1. My parents support me in the things I do in my main CCA.	1	2	3	4	5	6	7
2. My parents set very high standards for me to achieve in my main CCA.	1	2	3	4	5	6	7
3. In my main CCA, students help each other improve.	1	2	3	4	5	6	7
4. Students in my main CCA make their peers feel valued.	1	2	3	4	5	6	7
5. In my main CCA, students encourage their peer to try their hardest.	1	2	3	4	5	6	7
6. I feel that my main CCA coach/instructor provides me choices and options.	1	2	3	4	5	6	7
7. My main CCA coach/instructor emphasizes us to learn the skills and knowledge.	1	2	3	4	5	6	7
8. My main CCA coach/instructor tells us which students are better than others in	1	2	3	4	5	6	7

	Disagree							Agree						
	Strongly							Strongly						
CCA performance.														
9.	My parents approve the choice of my main CCA.							1	2	3	4	5	6	7
10.	My parents expect me to be the best at my main CCA.							1	2	3	4	5	6	7
11.	In my main CCA, students offer to help their peers develop new skills.							1	2	3	4	5	6	7
12.	Students in my main CCA make their peers feel accepted.							1	2	3	4	5	6	7
13.	In my main CCA, students praise their peers who try hard.							1	2	3	4	5	6	7
14.	I feel understood by my main CCA coach/instructor.							1	2	3	4	5	6	7
15.	My main CCA coach/instructor really wants us to enjoy learning the skills and knowledge.							1	2	3	4	5	6	7
16.	My main CCA coach/instructor lets us know which students have performed the best in our CCA.							1	2	3	4	5	6	7
17.	My parents encourage me to do well in my main CCA.							1	2	3	4	5	6	7
18.	Only outstanding performance in my main CCA is good enough for my parents.							1	2	3	4	5	6	7
19.	In my main CCA, students work together to improve the skills they don't do well.							1	2	3	4	5	6	7
20.	Students in my main CCA care about everyone's opinion.							1	2	3	4	5	6	7
21.	In my main CCA, students are pleased when their peers try hard.							1	2	3	4	5	6	7
22.	My main CCA coach/instructor expresses confidence in my ability to do well in our CCA.							1	2	3	4	5	6	7
23.	My main CCA coach/instructor gives us time to really master new skills or knowledge.							1	2	3	4	5	6	7
24.	My main CCA coach/instructor tells us how we compare to other students in our CCA performance.							1	2	3	4	5	6	7
25.	My parents praise me when I do well in my main CCA.							1	2	3	4	5	6	7
26.	My parents expect excellence from me in my main CCA.							1	2	3	4	5	6	7
27.	My main CCA coach/instructor encourages me to ask questions.							1	2	3	4	5	6	7
28.	In my main CCA, students teach their peers new things.							1	2	3	4	5	6	7
29.	Students in my main CCA make their peers feel appreciated.							1	2	3	4	5	6	7
30.	In my main CCA, students encourage their peers to keep trying their best.							1	2	3	4	5	6	7
31.	My main CCA coach/instructor listens to how I would like to do things.							1	2	3	4	5	6	7
32.	My main CCA coach/instructor tells us to try hard to learn the skills and knowledge.							1	2	3	4	5	6	7
33.	My main CCA coach/instructor tells us to do better than other students in our CCA group.							1	2	3	4	5	6	7
34.	My main CCA coach/instructor tries to understand how I do things before suggesting a new way to do things.							1	2	3	4	5	6	7

SECTION E:

How often do you do and complete your homework? (circle one)

- 1 = never
- 2 = rarely
- 3 = sometimes
- 4 = often
- 5 = always

	Never					Always	
1. I enjoy being a student at this school.	1	2	3	4	5	6	7
2. I'm happy to stay on and complete secondary school.	1	2	3	4	5	6	7
3. I don't let study stress get on top of me.	1	2	3	4	5	6	7
4. I keep my attention on my class work during the entire lesson.	1	2	3	4	5	6	7
5. I like my school.	1	2	3	4	5	6	7
6. I want to keep studying even after I complete secondary school.	1	2	3	4	5	6	7
7. I think I'm good at dealing with schoolwork pressures.	1	2	3	4	5	6	7
8. I pay attention well in the class.	1	2	3	4	5	6	7
9. Being a student at this school is pretty good.	1	2	3	4	5	6	7
10. I want to complete secondary school.	1	2	3	4	5	6	7
11. I don't let a bad mark affect my confidence.	1	2	3	4	5	6	7
12. I listen carefully when the teacher explains something.	1	2	3	4	5	6	7
13. When I'm at school I feel pretty happy.	1	2	3	4	5	6	7
14. I want to continue studying after I complete secondary school.	1	2	3	4	5	6	7
15. I'm good at dealing with setbacks (bad mark, negative feedback on my work).	1	2	3	4	5	6	7
16. I try my best to complete class work.	1	2	3	4	5	6	7

SECTION F:

Very untrue	Very true
----------------	--------------

	of me							of me
1. I believe in myself.	1	2	3	4	5	6	7	
2. When I am leading, my group listens to me.	1	2	3	4	5	6	7	
3. I want to make a contribution to my society.	1	2	3	4	5	6	7	
4. I always want to learn as much as I can.	1	2	3	4	5	6	7	
5. I communicate well with others.	1	2	3	4	5	6	7	
6. I work well in a team.	1	2	3	4	5	6	7	
7. I have confidence in myself.	1	2	3	4	5	6	7	
8. I am often asked to be the leader.	1	2	3	4	5	6	7	
9. I want to help my society.	1	2	3	4	5	6	7	
10. I always want to learn new skills.	1	2	3	4	5	6	7	
11. I can explain myself clearly to others.	1	2	3	4	5	6	7	
12. I listen to my team members' opinion.	1	2	3	4	5	6	7	
13. I can do things well.	1	2	3	4	5	6	7	
14. People trust and see me as their leader.	1	2	3	4	5	6	7	
15. I want to develop my society.	1	2	3	4	5	6	7	
16. I always want to improve myself.	1	2	3	4	5	6	7	
17. I can express my ideas well.	1	2	3	4	5	6	7	
18. I cooperate with my team members.	1	2	3	4	5	6	7	
19. I am a confident person.	1	2	3	4	5	6	7	
20. I am good at leading others to work towards our goals.	1	2	3	4	5	6	7	
21. I want to keep learning.	1	2	3	4	5	6	7	
22. I speak clearly to others.	1	2	3	4	5	6	7	
23. I get along with my team members.	1	2	3	4	5	6	7	

THANK YOU – THAT IS THE END OF THE SURVEY

APPENDIX B:

INVITATION TO PARTICIPATE IN RESEARCH STUDY FOR SCHOOL

PRINCIPALS



1 North Buona Vista Drive
Singapore 138675
Robinson Road P.O. Box 746
Telephone : (65) 68722220
Facsimile : (65) 67755826
Website : www.moe.gov.sg
Email : muhd_imran_yusof@moe.gov.sg
leong_choi_peng@moe.gov.sg

Ministry of Education
SINGAPORE

EDUN N32-07-005

Request No.: **RP08-14(01)**

23 January 2014

The Principal

PARTICIPATION IN SCHOOL-BASED CO-CURRICULAR ACTIVITIES AND STUDENT DEVELOPMENT: A MOTIVATION AND ENGAGEMENT PERSPECTIVE

The National Institute of Education has proposed a study on participation in school-based co-curricular activities and student development: a motivation and engagement perspective. This project is funded by the Ministry.

2. You may decide whether to allow the research team to conduct the research in your school, but you are strongly encouraged to view the request favourably and facilitate the conduct of the research project in your school. If you do, please inform your teachers/pupils that participation in the study is voluntary and they do not need to provide any sensitive information (for e.g. name and NRIC no.).
3. If you require any clarification, please contact the principal investigator, Dr Liem Gregory Arief D. at gregory.liem@nie.edu.sg or 6219 6045.
4. Thank you.

Yours faithfully

Muhamad Imran Bin Mohd Yusof (Mr)
Management Information/Corporate Research Officer
Management Information/Corporate Research
for Permanent Secretary (Education)

APPENDIX C:

INSTITUTIONAL REVIEW BOARD APPROVAL FOR RESEARCH STUDY



Research Support Office

3. No deviation from, or changes of, the protocol should be initiated without prior written NTU IRB approval of an appropriate amendment.
4. The Principal Investigator should report promptly to NTU IRB regarding:
 - a. Deviation from, or changes to the protocol.
 - b. Changes increasing the risk to the subjects and/or affecting significantly the conduct of the trial
 - c. All serious adverse events (SAEs) which are both serious and unexpected.
 - d. New information that may affect adversely the safety of the subjects of the conduct of the trial.
 - e. Completion of the study.
5. Continuing Review Request/ Notice of Study completion form should be submitted to NTU IRB for the following:
 - a. Annual review: Status of the study should be reported to the NTU IRB at least annually using the Continuing Review Request/ Notice of Study completion form.
 - b. Study completion or termination: Continuing Review Request/ Notice of Study completion form is to be submitted within 4 to 6 weeks of study completion or termination.

A handwritten signature in black ink, appearing to read 'Lee Sing Kong'.

Professor Lee Sing Kong,
Chair, NTU Institutional Review Board
encl.

cc Director, National Institute of Education
Members, NTU Institutional Review Board

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APPENDIX D

MEANS OF OUTCOME VARIABLES BY CCA TYPES

Outcome Variables	Visual and Performing							
	Physical Sports		Uniformed Groups		Arts		Clubs and Societies	
	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2	Time 1	Time 2
School Belongingness	5.54 (1.15)	5.42 (1.19)	5.52 (1.20)	5.52 (1.22)	5.36 (1.28)	5.38 (1.20)	5.40 (1.36)	5.69 (1.18)
Academic Buoyancy	5.00 (1.28)	5.10 (1.23)	5.00 (1.21)	5.16 (1.31)	4.78 (1.28)	4.97 (1.27)	5.12 (1.31)	5.40 (1.22)
Educational Aspiration	5.98 (1.01)	5.85 (1.09)	6.06 (0.96)	5.84 (1.13)	5.95 (1.03)	5.95 (1.01)	5.95 (1.10)	5.94 (1.03)
Classroom Engagement	5.42 (1.14)	5.37 (1.12)	5.47 (1.07)	5.54 (1.12)	5.44 (1.02)	5.50 (1.01)	5.66 (1.09)	5.80 (1.02)
Confidence	5.31 (1.27)	5.35 (1.17)	5.44 (1.20)	5.35 (1.23)	5.18 (1.24)	5.20 (1.21)	5.46 (1.24)	5.58 (1.24)
Lifelong Learning	5.96 (0.99)	5.73 (1.04)	5.90 (1.08)	5.66 (1.09)	5.91 (0.99)	5.80 (0.96)	5.83 (1.11)	5.88 (1.11)
Teamwork	5.71 (1.04)	5.61 (1.02)	5.64 (1.13)	5.52 (1.15)	5.64 (1.02)	5.61 (1.01)	5.57 (1.14)	5.66 (1.22)
Leadership Skills	4.82 (1.31)	5.00 (1.16)	4.84 (1.32)	5.06 (1.27)	4.72 (1.26)	4.93 (1.23)	4.79 (1.37)	5.23 (1.35)
Communication Skills	5.32 (1.17)	5.35 (1.15)	5.33 (1.21)	5.30 (1.20)	5.23 (1.14)	5.27 (1.10)	5.29 (1.26)	5.52 (1.24)
Society-oriented Future Goals	5.65 (1.17)	5.54 (1.07)	5.60 (1.28)	5.52 (1.19)	5.60 (1.17)	5.55 (1.09)	5.46 (1.24)	5.58 (1.23)

APPENDIX E.1 CFA FACTOR LOADINGS FOR AUTONOMOUS AND CONTROLLED MOTIVATION ITEMS

	Cross-Sectional		Longitudinal	
	T1	T2	T1	T2
Autonomous Motivation				
Autonomous motivation item 1	.93	.94	.92	.93
Autonomous motivation item 2	.92	.95	.91	.94
Autonomous motivation item 3	.81	.87	.80	.86
Autonomous motivation item 4	.91	.93	.90	.94
Autonomous motivation item 5	.76	.85	.77	.80
Autonomous motivation item 6	.69	.87	.71	.85
Autonomous motivation item 7	.86	.84	.82	.84
Autonomous motivation item 8	.52	.72	.50	.69
Controlled Motivation				
Controlled motivation item 1	.74	.81	.72	.83
Controlled motivation item 2	.83	.88	.84	.89
Controlled motivation item 3	.85	.43	.84	.42
Controlled motivation item 4	.87	.91	.86	.88
Controlled motivation item 5	.87	.37	.66	.36
Controlled motivation item 6	.86	.94	.65	.90
Controlled motivation item 7	.71	.58	.92	.59
Controlled motivation item 8	.65	.54	.84	.54

APPENDIX E.2 CFA FACTOR LOADINGS FOR INTERPERSONAL RELATIONSHIP AUTONOMY-SUPPORT ITEMS

CCA Instructor	Cross-Sectional		Longitudinal	
	T1	T2	T1	T2

CCA Instructor autonomy support item 1	.82	.90	.76	.85
CCA Instructor autonomy support item 2	.86	.90	.82	.87
CCA Instructor autonomy support item 3	.87	.91	.83	.88
CCA Instructor autonomy support item 4	.78	.87	.73	.82
CCA Instructor autonomy support item 5	.87	.92	.85	.89
CCA Instructor autonomy support item 6	.88	.93	.87	.91
Parental	T1	T2	T1	T2
Parental autonomy support item 1	.76	.85	.71	.81
Parental autonomy support item 2	.84	.89	.80	.86
Parental autonomy support item 3	.81	.87	.79	.80
Peer Autonomy Support	T1	T2	T1	T2
Peer autonomy support item 1	.93	.95	.91	.92
Peer autonomy support item 2	.89	.93	.86	.92
Peer autonomy support item 3	.92	.95	.91	.92

APPENDIX E.3 CFA FACTOR LOADINGS FOR CCA OUTCOMES

CCA Outcomes	Cross-Sectional		Longitudinal	
	T1	T2	T1	T2
School belongingness item 1	.90	.94	.87	.91
School belongingness item 2	.91	.94	.90	.91
School belongingness item 3	.91	.95	.89	.92
School belongingness item 4	.83	.90	.81	.85

CCA Outcomes	Cross-Sectional		Longitudinal	
	T1	T2	T1	T2
Academic buoyancy item 1	.67	.81	.64	.76
Academic buoyancy item 2	.81	.89	.79	.85
Academic buoyancy item 3	.77	.85	.74	.82
Academic buoyancy item 4	.80	.89	.78	.85
Education aspiration item 1	.84	.92	.81	.89
Education aspiration item 2	.78	.91	.68	.85
Education aspiration item 3	.79	.86	.71	.76
Education aspiration item 4	.84	.94	.81	.89
Classroom engagement item 1	.90	.94	.89	.91
Classroom engagement item 2	.89	.94	.86	.90
Classroom engagement item 3	.88	.92	.87	.89
Classroom engagement item 4	.77	.90	.70	.83
Leadership skill item 1	.75	.87	.73	.79
Leadership skill item 2	.80	.84	.76	.77
Leadership skill item 3	.86	.90	.84	.85
Leadership skill item 4	.88	.93	.86	.89
Communication skill item 1	.84	.91	.79	.85
Communication skill item 2	.87	.93	.84	.85
Communication skill item 3	.89	.94	.85	.91
Communication skill item 4	.88	.94	.86	.91
Lifelong learning item 1	.90	.95	.89	.88
Lifelong learning item 2	.90	.95	.87	.88
Lifelong learning item 3	.89	.95	.84	.90
Lifelong learning item 4	.86	.94	.81	.88

CCA Outcomes	Cross-Sectional		Longitudinal	
	T1	T2	T1	T2
Teamwork item 1	.84	.93	.80	.82
Teamwork item 2	.84	.92	.78	.85
Teamwork item 3	.90	.95	.88	.92
Teamwork item 4	.89	.94	.86	.89
Confidence item 1	.86	.92	.83	.88
Confidence item 2	.91	.95	.89	.93
Confidence item 3	.85	.91	.79	.82
Confidence item 4	.88	.92	.87	.89
Society-oriented future goal item 1	.93	.96	.91	.92
Society-oriented future goal item 2	.91	.96	.89	.90
Society-oriented future goal item 3	.91	.96	.90	.92

APPENDIX F.1 TIME-1 LATENT VARIABLE CORRELATIONS BETWEEN KEY FACTORS IN THE STUDY

Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10	Factor 11	Factor 12	Factor 13	Factor 14	Factor 15	Factor 16	Factor 17	Factor 18	Factor 19	Factor 20	Factor 21	Factor 22	Factor 23	Factor 24	Factor 25	
Age (F1)																									
Gender (F2)																									
Parental Education (F3)																									
Uniformed Groups (F4)																									
Visual & Performing Arts (F5)																									
Clubs & Societies (F6)																									
Physical Sports (F7)																									
Intensity (F8)																									
Breadth (F9)																									
Duration (F10)																									
Autonomous Motivation (F11)																									
Controlled Motivation (F12)																									
CCA Instructor Autonomy Support (F13)																									
Parental Autonomy Support (F14)																									
Peer Autonomy Support (F15)																									
School Belongingness (F16)																									
Academic Buoyancy (F17)																									
Educational Aspiration (F18)																									
Classroom Engagement (F19)																									
Confidence (F20)																									
Lifelong Learning (F21)																									
Teamwork (F22)																									
Leadership Skill (F23)																									
Communication Skill (F24)																									
Society-oriented Future Goal (F25)																									

APPENDIX F.2 TIME-2 LATENT VARIABLE CORRELATIONS BETWEEN KEY FACTORS IN THE STUDY

	Age (F1)	Gender (F2)	Parental Education (F3)	Uniformed Groups (F4)	Visual & Performing Arts (F5)	Clubs & Societies (F6)	Physical Sports (F7)	Intensity (F8)	Breadth (F9)	Duration (F10)	Autonomous Motivation (F11)	Controlled Motivation (F12)	CCA Instructor: Autonomy Support (F13)	Parental Autonomy Support (F14)	Peer Autonomy Support (F15)	School Belongingness (F16)	Academic Buoyancy (F17)	Educational Aspiration (F18)	Classroom Engagement (F19)	Confidence (F20)	Lifelong Learning (F21)	Teamwork (F22)	Leadership Skill (F23)	Communication Skill (F24)	Society-oriented Future Goal (F25)
F11	-01	08	04	-04	-05	04	<u>08</u>	01	-01	<u>08</u>	-														
F12	01	<u>08</u>	04	05	-07	<u>07</u>	-02	-01	-06	<u>08</u>	58	-													
F13	-01	11	03	-02	-04	05	04	-01	-01	06	72	46	-												
F14	-02	09	<u>08</u>	02	-07	06	03	-04	-01	03	65	47	82	-											

APPENDIX F.3 MATCHED TIME-1 AND TIME-2 LATENT VARIABLE CORRELATIONS BETWEEN KEY FACTORS IN THE STUDY

	Age (F1)	Gender (F2)	Parental Education (F3)	Uniformed Groups (F4)	Visual & Performing Arts (F5)	Clubs & Societies (F6)	Physical Sports (F7)	Intensity (F8)	Breadth (F9)	Duration (F10)	Autonomous Motivation (F11)	Controlled Motivation (F12)	CCA Instructor Autonomy Support (F13)	Parental Autonomy Support (F14)	Peer Autonomy Support (F15)	School Belongingness (F16)	Academic Buoyancy (F17)	Educational Aspiration (F18)	Classroom Engagement (F19)	Confidence (F20)	Lifelong Learning (F21)	Teamwork (F22)	Leadership Skill (F23)	Communication Skill (F24)	Society-oriented Future Goal (F25)	
Corr with T1								54	58	83	43	45	46	45	45	49	43	40	47	56	48	50	50	52	48	
F8	10	-05	04	-12	09	-19	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F9	-02	10	05	03	-02	28	06	05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F10	60	02	-07	-01	-01	-05	08	10	05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F11	-13	05	04	-02	01	-11	11	-01	-02	-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F12	01	07	02	02	-06	-02	07	02	-05	03	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F13	-10	10	06	-01	01	-12	11	02	-03	-04	71	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F14	-14	<u>09</u>	15	05	01	-07	01	03	-03	<u>-09</u>	55	30	64	-	-	-	-	-	-	-	-	-	-	-	-	-
F15	-12	04	05	01	03	-14	<u>08</u>	03	-03	-04	64	34	83	59	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX G

RESULTS OF REPEATED MEASURE T-TESTS ON T1-T2 DIFFERENCES ON CCA OUTCOMES

Variables	<i>Mean (SD)</i>		Mean Difference	T Value and Significance
	T1	T2		
School Belongingness	5.44 (1.28)	5.46 (1.22)	0.02	-0.19, ns
Academic Buoyancy	4.99 (1.30)	5.10 (1.28)	0.11	-3.42***
Educational Aspiration	6.04 (1.07)	5.94 (1.08)	0.10	2.64**
Classroom Engagement	5.34 (1.13)	5.43 (1.09)	0.09	-0.72, ns
Confidence	5.30 (1.34)	5.28 (1.29)	0.02	0.19, ns
Lifelong Learning	5.89 (1.03)	5.72 (1.05)	0.17	5.52***
Teamwork	5.60 (1.14)	5.50 (1.13)	0.10	2.90**
Leadership Skill	4.74 (1.34)	5.02 (1.25)	0.30	-5.81***
Communication Skill	5.21 (1.24)	5.30 (1.17)	0.09	-1.10, ns
Society-oriented Future Goal	5.59 (1.19)	5.55 (1.12)	0.04	1.61, ns

Note: * $p < .05$, ** $p < .01$, *** $p < .001$