The Influence of Culture on the Development and Organisation of Self-Regulated Learning Skills

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A dissertation submitted in partial fulfilment

of the requirements for the degree of

Doctor of Philosophy

of

University College London.

Department of Psychology and Human Development

University College London

September 2017

I, Gideon Sappor, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the work.

Signed:

Abstract

Self-regulated learning (SRL) skills have recently attracted a lot of research interest because they have been identified as arguably the most important determinants of academic performance and achievement. Learners with good SRL skills perform better because they have a clearer awareness of the effective strategies needed for a task and when to apply and adapt them - above all, they learn more effectively. Furthermore, they are intrinsically motivated so they set higher goals, put in more effort and show greater perseverance at learning tasks.

It is of crucial significance to understand how these skills are developed and why some children acquire them better than others. It has been observed that some cultural groups consistently exhibit higher achievement than others and variation in SRL skills by culture has also been observed. This research was therefore aimed at examining whether cultural differences impact on the organisation of SRL skills in a consistent and predictable fashion. A better understanding of the processes pertaining to this construct could provide some insight about how to promote SRL skills development in all children.

Quantitative data was collected from three studies, two in the UK and one in Beijing, designed to test hypotheses derived from models of how culture (White British vs Chinese backgrounds; Confucian vs non-Confucian backgrounds, as defined by a novel measure of filial piety) could influence SRL variables. These models introduced a conceptual advancement by utilising constructs from the theory of planned behaviour (TPB) to capture the motivational elements of SRL.

The data largely supported the overarching hypothesis that culture impacts on the nature and operation of the motivational elements of SRL, not the cognitive ones, with a consistent pattern of these being driven by external expectations among Confucian children, and by experientially derived attitudes among non-Confucian. The findings from the current research provide a huge impetus to cross-cultural research in SRL development by providing a model (SRL+TPB) that operationalises the interaction of cultural elements with SRL; and also point to ways in which classroom interventions to support SRL might take advantage of both patterns of effects to achieve optimal outcomes.

Impact Statement

Self-regulated learning skills (SRL) has been established as arguably the most important set of factors that determine optimum learning and achievement in schools. SRL consists of a set of skills and variables that enable learners to build greater resilience and be adaptable to change in their social and academic lives leading to them becoming independent, self-motivated learners. Yet, there is variability in how learners develop these all-important skills; hence, it is of crucial importance to understand how they develop and more importantly, the role of cultural variables since variation by culture has also been observed.

This thesis has shown the potential to make a significant contribution to SRL research by proposing a new model – fusion of SRL and theory of planned behaviour (TPB) – that is a conceptual advancement on existing models. It allows the assessment of specific areas of SRL that culture may wield its influence, providing a mechanism in researching SRL in different cultural contexts.

Understanding how culture influences the development of SRL skills has many practical applications. As culture wielded its influence through the motivational dimension, it gives the scope to manipulate the potential drivers behind the sources of motivation – whether internal or external. In the school and classroom context, it gives the possibility of having a nuanced approach at interventions with learners from different cultural backgrounds, armed with the knowledge some cultural groups may give greater value to certain aspects than others.

Furthermore, as culture influences SRL skills development through the motivational dimension, parents may have a particularly crucial role. It does not require parents to have particular technical expertise regarding tasks – the cognitive dimension. Their influence could be targeted at supporting the children to develop those positive affective elements of self-efficacy and motivation – equally crucial if their children are to become successful learners. As parents are the primary purveyors of a child's culture, it highlights to educators the key role of parents and families.

Due to the pressures created by international performance league tables, policy makers in Western countries such as the UK who fall behind East Asian countries come up with strategies to imitate those countries. This research study provides some insight about the importance of cultural factors in learning dispositions; hence, policy makers must exercise caution in transplanting of policies and curricular across countries with differing cultural backgrounds. Best practice can be emulated, but the role of cultural factors must be taken into account in its implementation.

For the research findings to have the desired impact, it has to be disseminated. The findings has been presented at conferences both local and abroad. Also, two research papers are being written for publication in peer-reviewed journals. Furthermore, there is ongoing engagement with the wider public by sharing the main findings in accessible content through social media platforms.

Acknowledgements

I would like to convey my deepest gratitude to my supervisor, Prof Andy Tolmie, for his tremendous support in guiding, tutoring and mentoring me every step of the way during the PhD journey.

To my wife, and children, I am most grateful for the support, tolerance and understanding. This research project was possible only because of the love and cooperation of my family and the depths of my gratitude is beyond what words can convey. I am also blessed with an extended family and friends who have been a source of constant encouragement.

Finally, I deeply thank God for His grace and love in guiding me through these past six years of my doctoral programme, for strength and provision.

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	Abbreviation
Attitudes	ATT
Collective agency	CA
Confucian heritage culture	CHC
Experiential self-efficacy	ESE
Filial piety	FP
Intention	INT
Learning and Study Strategies Inventory	LASSI
Metacognitive Awareness Inventory	MAI
Metacognitive knowledge	MK
Motivated Strategies for Learning Questionnaire	MSLQ
Perseverance and effort	PE
Personal agency	PA
Received self-efficacy	RSE
Regulation of cognition	RC
Self determination theory	SDT
Self-efficacy	SE
Self-regulated learning	SRL
Self-regulated learning interview scale	SRLIS
Subjective norms	SN
Theory of planned behaviour	TPB
Theory of reasoned action	TRA
Vicarious self-efficacy	VSE

Chapter 1

General Introduction

This chapter outlines the rationale and premise for this piece of research. It discusses the ideas behind the planning, development and execution of the programme of studies. There will also be a preliminary discussion of the potential relevance of the findings to the classroom context and the contribution these might make to knowledge and understanding of the factors that contribute to raising academic performance and attainment in the multicultural world in which teachers and learners find themselves.

1.1 Introduction

The factors that determine optimum learning and achievement in schools have attracted considerable interest for a long time. William James in 1907 suggested the need to study and unravel the different types of human abilities; and also, how individuals get to deploy those abilities (James, 1907). A great deal of emphasis has been placed in intelligence and aptitude tests as measures of ability with some success; however, there is a lesser degree of success with understanding the factors that influenced the deployment of those abilities. A question that has challenged researchers in the fields of psychology and education has been why some individuals outperform others of similar intelligence and ability (Duckworth et. al., 2007). The quest continues in current times urged on by 'within country' academic performance league tables and international league tables between countries.

Enormous amounts of money and political capital have been spent by successive governments along with changes to the curriculum all with the aim of improving teaching and learning (Burr, 2008). Such is the interest among all stakeholders (teachers, parents, learners, politicians, society at large, etc.) that it has sometimes led to conflict between groups. Governments particularly have always seen the need to come up with initiatives and policies with the aim of raising school standards. Teachers and school leaders have often felt the brunt of the policies and decry what they see as constant meddling by politicians. Professor Masud Hoghughi, writing in the Times Education Supplement (TES) in 1999, criticised government policies for only focusing on the mechanistic elements of teaching and learning but neglecting the disposition and potential of learners (Hoghughi, 1999).

Subsequently, policy makers have realised the need to develop children's social and emotional skills that would enable them to build greater resilience and become adaptable to change in their social and academic lives. The need has been to produce independent, self-motivated learners. 'The Children's Plan' (DCSF, 2007) was one such policy document that introduced the renewed emphasis and focus on self-regulated learning (SRL) skills development.

1.2 Background and Rationale for Research

According to Pintrich (1995), SRL is a process within which a learner monitors their own performance on an activity and applies their understanding of ways of adjusting performance when it is less than optimal, resulting in both immediate improvements in that learning which in turn supports more optimal performance on future occasions. Even though there are subtle differences in the various models created by researchers of SRL (see Pintrich, 1995; Winne & Hadwin, 1998; Wolters, 2003; Zimmerman, 2005; Zimmerman, Schunk & Dibenedetto, 2015), there is consistent agreement that there are at least three components involved in this process:

- Metacognitive awareness, including monitoring of performance and recognition of factors that can affect it both positively and negatively. It is the knowledge or awareness a leaner has about him/herself as a learner – often referred to as 'knowing about knowing'.

- Knowledge of cognitive strategies that can improve performance. This is the level of skills and strategies a learner has about how to learn or solve learning based problems and tasks.

- A motivational component that prompts the deployment of the SRL skills and helps promote persistence in the face of less optimal performance. This component involves the reason(s) a learner has for engaging in a learning task – what drives the behaviours needed to complete the learning task.

As well as having become a major area of research over the last ten to fifteen years, most new initiatives and best practice in primary education can be seen to have important tenets of SRL as an influence (see Grau & Whitebread, 2012; Pintrich, 2000). SRL has had this impact among both educators and psychologists because it presents arguably the most effective theoretical account to date of the variables and processes that lead to successful learning and performance. There are repeated

research findings showing that learners who display better SRL skills are more effective learners: they are more persistent, resourceful, confident and higher achievers (Mega, Ronconi, & De Beni, 2014; Pintrich, 1995). SRL skills have been found to make a unique contribution towards academic outcomes beyond intelligence and other traits. For instance, Zuffianò, Alessandri, Gerbino, Kanacri, Di Giunta and Milioni (2012) reported self-efficacy beliefs in self-regulated learning (SESRL) as being a more significant determinant of academic achievement than intelligence among a sample of 13 year olds. Their findings enabled them to make this observation:

"We believe that SESRL, in comparison to intelligence, personality traits, and self-esteem, may have more practical value in academic settings". Zuffianò et al. 2012 (p3.)

This finding is consistent with that of Blair and Razza (2007) who reported early SRL skills as accounting for unique variance in subsequent academic outcomes of 3 to 5 year olds, independent of general intelligence.

Learners with strong SRL skills are more successful since they refine their abilities better and exhibit better performance because their motivation is intrinsic; they demonstrate greater levels of persistence and look for alternative ways of solving a problem in the face of difficulties. In addition, they show a positive attitude to interpret challenges and difficulties as learning opportunities (Pino-Pasternak, Whitebread &Tolmie, 2010).

Not all learners exhibit SRL to the same extent, however. Understanding the sources of individual variation in its development and how more widespread consistency can be promoted is therefore of obvious importance. In particular, the UK has now become a truly multi-cultural, ethnically diverse society and there is growing evidence of cultural variation in the development and deployment of SRL skills (Francis & Archer, 2005; Purdie, Hattie & Douglas, 1996). One major dimension that is therefore very important for educators to understand is the role of culture in the acquisition of SRL skills. Differences in culture create diversity in styles of thought and values, and consequent variation in perceptions of and strategies applied to learning. More fundamentally, different cultures establish diverse expectations about the nature and value of learning and its potential outcomes, and as a result may alter the relationship

between performance and feedback on performance - something that goes to the core of the mechanisms involved in the growth of SRL.

Bruner (1986) called for consideration to be given to the role of culture in shaping learning activities. This is because, he argued as an instance, that the levels of metacognitive activities such as self-monitoring and self-correction enacted by different individuals vary by cultural background. Yet the reasons behind such variation were unknown. He asserts:

"though it is obvious to say that the child is born into a culture and formed by it, it is not plain how a psychological theory of cognitive development deals with this fact" (Bruner, 1966 p. 6).

This theme was aptly captured by Pajares (2007 p.1): "The critical questions in education involve matters that cannot be settled by universal prescription. They demand attention to the cultural forces that shape our lives". He goes on to argue that culture plays a crucial role in the development of motivation and self-regulation in learners, and advocates studying it to understand how it influences students' success.

Pintrich (2000) also admits much of the research into SRL has a Western flavour to it. There is therefore the possibility of the models not generalising to other cultures, or the elements operating in the same way. He therefore called for research into SRL when applied to other cultures.

The object of the present research is therefore to make a significant contribution to the knowledge currently held about SRL by elucidating how culture interacts with its components. This will be achieved by outlining clear hypotheses based on models created about the culture-SRL interaction, and collecting data to test the relationships predicted by these. The intention is to bring together the various strands of knowledge held about SRL and advance such knowledge with an explication of how cultural forces shape its development in children.

In what follows, I will present a general description of SRL, then proceed to elucidate how culture might interact with the elements of SRL. As will be seen, this leads to clear predictions regarding the relationships that manifest between the components of SRL under the influence of different cultural milieus which will be examined in greater depth

in Chapter 2. The chapter concludes by providing an overview of planned empirical research to test hypotheses derived from this analysis.

1.3 Determinants of Academic Achievement - Self-Regulated Learning

Self-regulated learning skills are considered reliable determinants of academic achievement because they cover a whole suite of elements that have a positive influence in academic domains. They capture the cognitive aspects involved with knowledge and understanding of skills and strategies for learning and problem solving; a metacognitive element that covers the understanding a learner has of their own strengths and preferences; and how motivated a learner is to make the requisite effort for success, and to persevere in the face of challenge. Moreover, this model is supported by a raft of empirical research as outlined previously and subsequently. This is aptly captured by Pino-Pasternak, Whitebread and Tolmie (2010) in these words:

"On the whole, self-regulated learners: have a wide repertoire of cognitive and metacognitive strategies that they deploy appropriately and in agreement with the demands of specific tasks; adopt an organized approach toward academic tasks, planning and setting goals, monitoring performance, and changing strategies when necessary; and are intrinsically motivated, seeking challenging tasks, persisting when facing difficulties, and interpreting difficulties and failures as opportunities for learning". (Pino-Pasternak, Whitebread & Tolmie, 2010 p219).

Several models of SRL have been constructed by various researchers that explain its processes and elements and how they inter-relate (see Flavell, 1979; Pintrich, 1995; Winne & Hadwin, 1998; Wolters, 2003; Zimmerman, 2005). The elements are as varied as the models depending on the researchers' theoretical perspectives.

For instance, the social cognitive perspective as explicated by Bandura (1986) and Zimmerman (1989) focuses on three interdependent albeit separate influences - personal, behavioural and environmental. The social cognitive perspective can be summarised thus: individuals learn in part by observing others (vicariously) and by interacting socially and actual doing (enactment). The bulk of learning by humans occur vicariously as it saves the learner the time needed to perform every learning action and to undergo any negative consequences that may apply (Schunk & Usher, 2013). For instance, observing or reading about the dangers of electricity saves an individual from having to go through the enactive learning experience of having an

electric shock. Through social interaction and observation of models, the individual learns the behaviours that are met with approval and the ones that are eschewed. The individual subsequently learns to prioritise and reinforce those behaviours that are valued by the society. This must be complemented with the relevant knowledge coupled with the personal sense of agency to apply and adapt the skills in appropriate contexts. Due to the dynamic nature of personal, behavioural and environmental factors, prior performance provides feedback that is used to make adjustments during current tasks. The social cognitive perspective looks at the links between social and cognitive events as having a bidirectional relationship.

Winne and Hadwin's (1998) model has a similar orientation highlighting the complex interplay between the individual and the social context (see Hadwin et. al., 2005). This model is distinguished from the earlier social cognitive models by the strong influence Information Processing Theory had on its development (Winne, 2001; Greene & Azevedo, 2007). As a result, it explores the cognitive and metacognitive aspects of SRL in greater detail relative to the other SRL models.

On the other hand, researchers with a motivation perspective place a great deal of emphasis on the motivational element. For instance, Wolters (2003), argues regulation of motivation (different from motivation per se) is central to SRL skills. This he argues involves the use of strategies such as goal oriented self-talk, attribution control and emotion regulation.

Despite this, most SRL models share a number of common assumptions. According to Pintrich (2000), these assumptions are:

- The *active, constructive assumption*, which sees the learners as actively participating constructively in the learning process.
- The *potential for control assumption* assumes that the learners wield the potential to monitor, control and regulate their own cognition, motivation and behaviour in addition to certain aspects of their environment.
- The *goal, criterion, or standard assumption* assumes that the learner has a kind of criterion or standard against which progress during a performance is constantly compared. This provides the basis for deciding when to continue a course of action or change of strategy.

- The *mediation assumption* views the self-regulatory activities as mediating between the person and context, and actual achievement and performance.

These assumptions are corroborated by Zimmerman and Schunk (2001) (see pages 5-33) in an analysis of various theoretical perspectives of SRL. They conclude by arguing these assumptions redefine learning as "… not something that happens to students but something that happens by students" (p33).

To summarise, a learner must have some knowledge about their cognitive skills, abilities and the context in order to be able to deliberately regulate their cognition in a learning task. This enables them to make the optimum use of those skills (Pressley, 1995). In order for the benefits of their cognitive potential and ability to be realised, the learner must also have the motivation to deploy them in order to successfully achieve the learning goals. This involves believing in their ability to organise and carry out the requisite actions to achieve the goals (Bandura, 1997).

Despite the variation in emphasis given to different components within the different models, each of the components is critical to successful academic performance. This will be explored further in Chapter 2.

1.4 Increasing Recognition of SRL

As noted earlier, Self-Regulated Learning (SRL) has become a current focus of research among educators and psychologists because it is arguably the most effective approach to learning.

The emergence of research in SRL during the primary school years has provided some evidence leading to it being recognised and accepted to lead to harnessing and improving the abilities of children and their performance. Its tenets are impacting behaviour management strategies, parental involvement, assessment and feedback and the drive to raise attainment among others.

1.4.1 Behaviour management

Self-regulation could potentially wield an influence in children's behaviour – both with respect to learning and in general. The level of a child's self-regulation has a massive impact on their behaviour (Blair & Diamond, 2008), and consequently on their performance at school (Best, Miller & Naglieri, 2011; Duckworth & Seligman, 2005;

Welsh et. al., 2010). The emergence of self-regulation, in effect, has huge implications and impact on behaviour management strategies employed by teachers in schools.

Blair and Diamond (2008) suggest that behavioural problems of young children at school are indicative of problems with the development of the ability to regulate behaviour and attention early in life. They therefore suggest the promotion of self-regulation as an important remedy. Blair and Diamond posit that self-regulation has genetic and neural underpinnings and its development is influenced by the social context; consequently, they suggest family, school and community settings of children are a crucial consideration for all stakeholders.

There may be an interaction between physiological make-up, executive function and behaviour management that could have implications for SRL. Everyone possesses a variant of a gene associated with the function of the neurotransmitter, dopamine. This gene plays an important role in clearing away dopamine released in the prefrontal cortex (PFC). This gene could have either the amino acid valine or methionine or both. It has ramifications for the brain's executive function and cognitive control of attention and behaviour. There is much overlap between executive functions and self-regulation (Blair and Diamond 2008). Having more dopamine in the PFC is not only better for executive function but has the downside of also making one more sensitive to stress. (Zubieta et al., cited in Blair and Diamond, 2008, p. 901). Individuals homozygous for the valine version of the gene should show better academic performance and cognitive control under conditions of mild stress than persons with the methionine version.

When a child's behaviour elicits reactions from individuals that exacerbate that child's difficulties with regulation (ones that raise the child's stress levels), those interactions maintain a developmental course of poor regulation. In turn, repeated difficulty in regulating behaviour in interactions with others also leads a child to develop representations of their self as one who is ineffective at regulating behaviour in ways demanded in a particular context.

In contrast, if that same child were given support, encouragement and appropriate structure for attempts at self-regulation, it becomes less likely for that child to have developmental difficulties (Blair & Diamond, 2008).

According to Zito et al. (cited in Blair and Diamond, 2008, p. 900), rates of prescription for children under age five increased threefold both for stimulants and anti-depressants in a ten year period. An understanding of the biological processes in intervention and presentation could give the scope for a reduction in the use of psychotropic medication which according to Panksepp; Stanwood & Levitt (cited in Blair and Diamond, 2008, p. 900) gives a potential for longer term adverse developmental consequences. Problems have been addressed by medication but behavioural solutions would be better.

Teachers and educational settings therefore have a crucial role to play in the development of a child's self-regulating behaviour. This will in turn have an impact on the child's adjustment and behaviour at school and consequently, their performance and attainment. It behoves teachers and educators to create the right environment and structures that will develop and promote self-regulated learners. Children might have differing neural and biological dispositions; but the right behaviour management strategies contingent to each child's disposition could yield the right outcomes for all children.

The ramifications of the emergence of self-regulated learning reach even more deeply in behaviour management strategies and how the 'state' in contrast to trait of a child impacts on his/her performance. A child's motivation and emotions have a big influence on their development of individual agency, a sense that they are effective, capable learners. High stress or anxiety creates problems paying attention in class, completing assignments and inhibiting impulsive behaviours (Blair & Diamond 2008).

Children with such poor executive function find school boring as the teacher becomes frustrated with them; they expect poor standards of work and this creates a vicious cycle or self-fulfilling prophecy of poor self-regulation. In this light, children who on entry to school display poor executive functions (or self-regulation) need to be monitored and worked with so they do not slip into the vicious cycle that exacerbates their problems with self-regulation (Bahman & Maffini, 2008; Goleman, 1995).

The emphasis in introducing the 'Social and Emotional Aspects of Learning (SEAL)' curriculum in primary schools during the education reforms over a decade ago might have been influenced to a large extent by the emergence and awareness of self-regulated learning skills. The central goal of this curriculum was to help children

understand their feelings and emotions better, and to find ways and strategies to deal with any negatives (Bingham, 2009; Humphrey et. al., 2008). Most schools, particularly in deprived communities have pastoral support that help focus attention on specific children who might need emotional support.

1.4.2 Parental partnership and involvement

Pino-Pasternak, Whitebread and Tolmie (2010) demonstrated that the dynamics of parent-child interaction also have an impact on a child's self-regulated learning. This was illustrated by parent-child dyads that showed higher incidences of positive affect and responsiveness were associated with the child showing a higher level of SRL. They further observed that children who showed more evidence of metacognitive knowledge during homework sessions were more responsive to their parents and participated in interactions where the adults displayed more positive affect.

The quantitative and qualitative results suggest that children who showed more positive patterns of self-regulatory behaviours participated with their parents in positively toned interactions that were characterised by mutual displays of positive affect and responsiveness.

The findings were corroborated by Neville, Stevens, Pakulak, Bell and Fanning (2013) who reported their findings from a randomised controlled trial. It involved an 8-week training programme targeting the development of selective attention by engaging the larger context of parents and the home environment. They reported significant gains at a neural level among the sample of pre-schoolers from a lower SES backgrounds who received the training input. The group that received parent-child intervention showed statistically significant gains relative to the two control groups; one control group had no intervention while the other had a child only focused intervention. The results suggest parental support and involvement have a strong influence on children's cognitive regulatory development.

Such a research finding highlights the potentially imperative role of parent-child relationships in children's development of SRL; consequently, schools and educational settings are making significant efforts to engage parents in their child's work at school. Parents are now seen as partners by schools and various innovative ways and avenues are explored to make the partnership viable and successful leading to better outcomes for the children.

1.4.3 Learning, teaching and raising attainment

Self-regulated learners can be seen as active participants in the learning process. Being active potentially creates a sense of ownership that bodes well for the amount of effort the learner exerts and the level of motivation applied in the learning process. The areas of the learner's own cognition, motivation/affect and behaviour are within the learner's reach to attempt to monitor, control and regulate. These attempts to control or regulate are 'self-regulated' in that the individual (the personal self) is focused on trying to control or regulate his or her own cognition, motivation and behaviour (Pintrich, 2000). Others in the learner's environment can directly or indirectly, either promote or hinder their self-regulation. Significant others like peers, parents and teachers are very relevant in this situation. They provide scaffolding, direction, instruction or even distractions.

The traditional didactic model of teacher led, teacher as purveyor of knowledge relationship between teachers and their pupils is on the wane with increasing prominence given to collaborative pupil-led pedagogies, consistent with the emergence of SRL in the primary education phase. In more student-centred classrooms such as communities of learners' classrooms and project-based instruction (eg Blumfield, Soloway, Marx, Krajcik, Guzdial & Palincsar. 1991; Brown, 1997), students are asked to do much more to impact on actual control and regulation of the academic tasks, classroom climate and structure (Pintrich, 2000).

The student-centred classroom is argued as best practice in primary education by many researchers (see Hockings, 2009; Meyer, 2010; Noyes, 2012). For instance, Hockings (2009) posited that a student-centred pedagogy wielded the potential to raise interest and engagement in a more diverse academic student population body than the traditional teacher-centred approach. Pupils are involved in discussing success criteria for tasks set, the topics to be covered and the directions such topics could take, classroom displays and are involved in creating class rules, visions and targets. Pupils are encouraged to be responsible for thier own learning, responsible for how the classrom is organised and extends to the whole school. There are class councils, school councils and there is an award for schools that achieve specified criteria to become 'Investors in Pupils' (pupil voice) schools. This creates a culture where the students' engagement is cultivated and they are encouraged to self-regulate their own learning, behaviour and actions.

1.4.4 Assessment and feedback

Nicol and Macfarlane-Dick (2006) noted that 'intelligent self-regulation requires that the student has in mind some goals to be achieved against which performance can be compared and assessed'. This is clearly part of standard good practice and pedagogy in primary schools in England today (Black & Wiliam, 1998, 2009; Meyer, 2010). There is a drive towards assessment for learning (AFL) where children are given clear success criteria before they undertake a task. The children then carry out a self-assessment or peer assessment of their work after the task against the clearly defined success criteria. Nicol and Macfarlane-Dick (2006) further posited that since learners who are more effective at self-regulation engage more actively with internal and external feedback, a challenge for educators is how to get the majority, if not all learners, to become better at self-regulation. 'Those more effective at self-regulation, however, produce better feedback or are more able to use the feedback they generate to achieve their desired goals' (Butler & Winne, 1995).

Nicol and Macfarlane-Dick (2006) gave the following seven points of good feedback practice that identifiably is the accepted 'best practice' in primary education:

1. Helps clarify what good performance is (goals, criteria, expected standards);

2. Facilitates the development of self-assessment (reflection) in learning;

3. Delivers high quality information to students about their learning;

4. Encourages teacher and peer dialogue around learning;

5. Encourages positive motivational beliefs and self-esteem;

6. Provides opportunities to close the gap between current and desired performance;

7. Provides information to teachers that can be used to help shape the teaching.

They explain that these promote self-regulation in learners and leads to better performance. This is because they provide further support for the development of SRL as it enables the learners to take more ownership of their learning engendering engagement and independence (Black & Wiliam, 1998; Ion, Barrera-Cominas & Tomàs-Folch, 2016).

In summary, the emergence of self-regulated learning is having a massive impact on teaching and learning in schools today. SRL has been a powerful driver of many initiatives in primary educations and its influence is likely to increase as more research evidence emerge that supports its positive impact. Whether they are incidental coincidences or a deliberate infusion of SRL in pedagogy and practice is not always clear. SRL principles can be seen at play in various practices including behaviour management, assessment, parental involvement in schools and the general drive to raise standards and performance in primary schools. Understanding its workings is of crucial importance to educators and all stakeholders.

1.5 The Role of Culture

Culture is a widely used term but very difficult to assign a universal definition to. For instance, Rogoff (2003) defined culture as:

"the configurations of routine ways of doing things in any community's approach to living" (p3)

In other words, culture affects and influences the way members of a community think, behave and live their lives, including how they approach education and learning - entailing huge potential scope for variation, and therefore inherent difficulties in specification and categorization. It predisposes its members to do things in a certain way. Its embedded values and belief systems must certainly influence the way children perceive and approach learning. It therefore has the potential to influence academic task engagement and performance. Moreover, self-regulated learning skills are developed through processes of social modelling, social guidance and feedback, and social collaboration according to McInerney (2011). Since culture is embedded in the social fabric of a community, culture probably plays a significant role in learners' development of SRL skills.

Lachuk (2007) described culture as not being something that is simply observable and 'out there' manifesting through behaviours, customs and actions. Neither is culture simply internal or 'in the head' comprising beliefs and ideas. Instead, she refers to Shweder, Goodnow, Hatano, LeVine, Markus and Miller's (1998) perspective that captures both the symbolic and behavioural aspects.

"The symbolic inheritance refers to a cultural community's received ideas and understandings, both implicit and explicit, about persons, society, nature and divinity' while the behavioural inheritance includes a cultural community's routine or institutionalized family life and social practices" Lachuk (2007) p 236.

Elements of culture are therefore inculcated in the members of that cultural community vicariously and through experiences.

Saljo, (cited in Turingan and Yang, 2009 p.3) acknowledges the variance inherent to the different socially and culturally established conventions with respect to what constitutes learning. Differences in culture bring about diversity to styles of thoughts and values; consequently, perceptions and strategies applied in learning vary accordingly.

This line of thought is shared by Bruner (1998). Bruner argued that there are important issues around the concept of what 'knowledge' is. There are issues around what knowledge is; where it comes from; and how it is acquired. These issues, Bruner opines, have deep cultural roots. This is captured in this quote:

"Learning and thinking are always situated in a cultural setting and always dependent upon the utilization of cultural resources" (Bruner, 1998 p.4).

1.5.1 Self-Regulated learning and culture

Given the models of the various dimensions of SRL, there arises the question of where cultural influences might be expected to manifest. In many contexts, one might reasonably expect culture to affect the nature of the behaviour performed (cf. the notion of 'practice'), the cognitions and metacognitions that surround this, and the values attached to them - the three elements central to SRL. The impact of culture on academic performance could be mediated through all the variables which are the elements of SRL.

However, education is a more specialised context, especially during the earlier stages of schooling (where variation in SRL is most influential) which focuses on the development of basic skills and capacities. Within this context, the scope for variation in the more cognitive aspects - behaviour, strategy and metacognition - is likely to be much smaller even when comparing between different national curricula; if the focus is on cultural influence within a single educational system as with different cultural

groupings engaging with the English curriculum, aside from the possibility of minor strategic variation, it must necessarily be very restricted in terms of how things are done, since the target outcome is essentially the same. The implication is that cultural influences on SRL must operate predominantly through the motivational elements: expectations, values, social judgements and perceived efficacy. Even though this might influence how the cognitive elements develop or the extent to which they are acquired, the form they take is likely to be similar. In line with this, Francis and Archer (2005) reported values and social judgements as being strong influences on Chinese cultural background learners' high achievements within the English education system.

1.6 Development of SRL as seen through Bronfenbrenner's Ecological Framework

Children living in the same neighbourhood and attending the same school, may nevertheless be subjected to different cultural influences that may impact their development of SRL skills. This may be the case if the parents are from different cultural backgrounds. The ecological framework propounded by Bronfenbrenner (1979) could help explain why children in the same location and community may end up having different cultural dispositions.

Bornstein and Cheah (2003) identified the main ecological settings in which child development and parenting take place. They identified the parent-child relationship as being at the heart of the ecological contextual view. This is embedded in layers of ecological systems that ultimately create the child's cultural reality. Children with parents from similar cultural backgrounds could therefore acquire particular cultural norms and behaviours.

Bronfenbrenner's ecological framework (Figure 1) elucidates this by identifying concentric layers of environments in which individuals interact. The layer closest to the child, the microsystem, is unique to the child since it is at the level of parents and immediate family. At this level, parents and families with similar cultural dispositions will instil those values, norms and behaviours in the children although with some degree of individual variation.

Similarly, cultural norms may have a specific impact on self-efficacy. Lu and colleagues (2011) argued that cultural norms as transmitted by parents were a powerful influence on children.

"As children's self- perceived ability and intrinsic motivation are not only affected by previous achievement- related experience, but also by their parents' perceptions, expectations and attitudes towards their children; it is plausible that cultural specifics in parental attitudes may have influenced the children's self-perceptions" (Lu, Weber, Spinath & Shi, 2011 p236)

At the microsystem level, children are able to develop unique cultural norms determined by the cultural backgrounds of their parents and close family members consequently influencing how the children develop SRL skills.

The children share most aspects of the remaining layers – the mesosystem, exosystem and macrosystem with peers from all cultural backgrounds. This is because they attend the same schools; may be part of the same clubs and groups; exposure to similar content in the media and share the wider society's values, beliefs and customs.

Figure 1: Bronfenbrenner's ecological systems theory

Source: http://psychchick15.weebly.com/psych-journal/journal-8-urie-bronfenbrenners-ecological-systems-theory
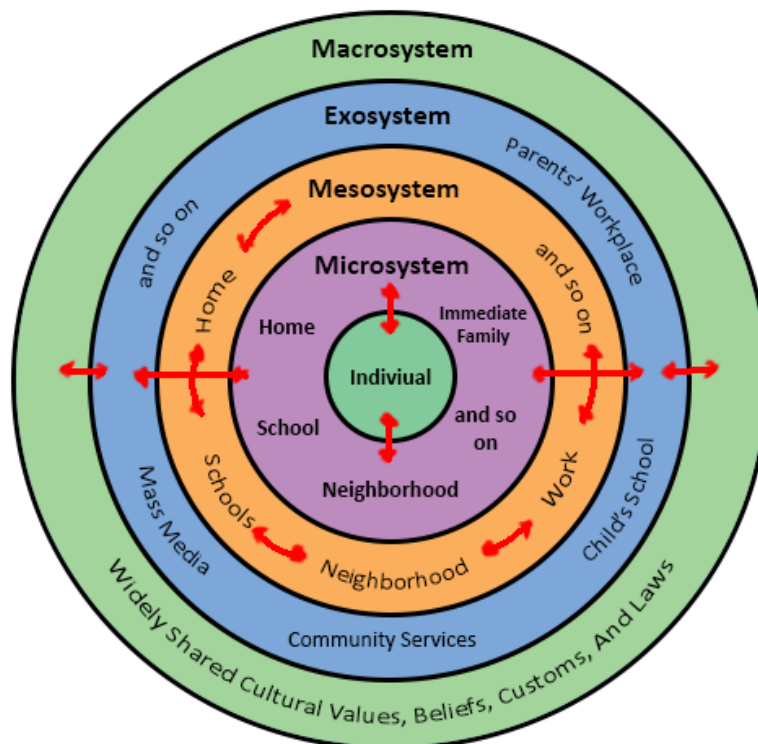
As mentioned in a previous section, it was demonstrated through the parent-child study by Pino-Pasternak, Whitebread and Tolmie (2010) that the dynamics of parent-child interaction does have an impact on a child's self-regulated learning. The results of their study suggested that the higher the incidence of positive affect and responsiveness between a parent and child, the higher the level of SRL skills shown by the child.

1.7 A Dimension of Culture

Any investigation into the impact of culture on SRL necessarily requires some means of distinguishing between different cultures in order to assess their effects. One approach to do this is to specify a dimension by which cultures could be categorised. Using this approach means it inherently captures only a generalized difference between cultures. That notwithstanding, it gives a viable and plausible framework on which to base a study of cultural differences.

A cultural dimension that could have a significant influence on Self-Regulated Learning (SRL) skills is individualism or collectivism (Hamamura & Heine, 2006; Nisbett, Peng, Choi & Norenzayan, 2001). This dimension represents the different ways in which individuals interact with each other within a society. The individualism-collectivism dimension is not perfect at delineating cultures but it gives a valuable handle on which to study different cultures, so valuable it has been suggested by some researchers (e.g. Heine, 2010; Oyserman, Coon & Kemmelmeier, 2002) as a single most useful dimension in cross-cultural psychology research.

In collectivist cultures, since the individual sees themselves as part of a closely knit collective, they are guided by the expectations of the group. Individuals are steeped deeply into the roles, obligations and orientations within their social network. In such a culture, the boundary between the self and others is relatively less distinct.

Individualistic cultures on the other hand, are characterised by individual autonomy and relative independence of others within the society. The self is characteristically distinct from others (Hamamura & Heine, 2006).

One way in which individualistic- collectivist culture dimension could impact the cognitive and motivational aspects of SRL is through its varying impact on the 'self'.

Even though it is prevalent in all cultures for individuals to have the inclination to evaluate themselves as good persons in the framework of their cultural norms, the nature of how they relate with each other (individualism-collectivism) creates a dichotomy in how this is manifested. (Heine, Lehman, Markus, & Kitayama, 1999; Norenzayan & Heine, 2005).

By the nature of the interaction in individualistic societies, people are inculcated with the values of uniqueness of self and to view themselves as self-sufficient entities. To foster this view, the individual grows to focus on those positive self-qualities and features that enable them to achieve the positive uniqueness distinct from others - what Hamamura and Heine (2008) call high self-esteem. According to Hamamura and Heine, the cultural ideal of a good person in individualistic culture is a motivation to elaborate on the positive self-characteristics relative to negative ones.

A collectivist cultural environment is a stark contrast where the self is enmeshed within the social collective. Consequently, the culturally valued person focuses on maintaining his or her 'face'. Face is explained as "… the respectability and/or deference which a person can claim for himself from others by virtue of the relative position he occupies in his social network and the degree to which he is judged to have functioned adequately in that position" (Ho, 1976 p. 883). A good person in such a society is one who has sufficiently maintained one's face which is judged from an external perspective.

Although self-esteem and face are universally accessible in all cultures, research has found self-esteem being prioritised in Western individualistic cultures whereas face is prevalent in Asian collectivist cultures (Heine, 2005; Heine & Hamamura, 2007; Heine, Lehman, Markus, & Kitayama, 1999; Norenzayan & Heine, 2005). This does not mean that there is no dimension of self-construct, but rather that self-enhancement rests on enhancing the group self (Brown & Kobayashi, 2002; Muramoto & Yamaguchi, 1997). This is still in concordance with the collective emphasis on seeing the self as part of the collective with less distinction between the individual and the group.

The distinction in how collectivist and individualistic societies work towards becoming a 'good person' has implications for SRL skills. Since SRL skills direct one's cognitions, motivations and behaviour and are prerequisites for the attainment of goals and achievement (Baumeister & Heatherton, 1996; Pintrich & Degroot, 1990;

Zimmerman, 2000); and social norms and goals which direct psychological processes are influenced by culture, SRL patterns should also be varied across cultures (Hamamura & Heine, 2008). The emphasis on self-esteem and face is consistent with the notion that cultural differences in SRL may manifest in particular through its affective rather than its cognitive dimensions.

These two ways of asserting one's value within a culture - self-esteem and face - each present differently in their ease of management. Self-esteem is relatively easy to manage as the individual has some control over it. There are a number of adaptive strategies that can be used in order to manipulate situations in order to present them in a positive self-enhancing light. The myriad of self-deceptive tactics at the individual's disposal can be seen as examples of an approach motivation - all about eliciting positive information about the self (Hamamura & Heine, 2008).

On the other hand, face is much more difficult to maintain. Opportunities to increase face may be few and achieved only by moving up the social hierarchy (e.g. when one achieves at something or a status valued and respected within the society such as passing exams, achieving a qualification or winning trophies at sport). The difficulty in managing face lies in the fact the individual has to live and meet the expectation of others. According to Hamamura and Heine 2008; collectivist societies orient their self-regulation towards avoiding the loss of face.

This dichotomy in how collectivism-individualism manifests in face and self-esteem with their inherent achievement goals has been confirmed by a number of research studies. Social groups are socialised in their cultural entities to develop those particular motivational styles. (Caudill & Weinstein, 1969; Miller, Wang, Sandel & Cho, 2002; Miller, Wiley, Fung & Liang, 1997; Wang, 2004). This will be explored in more detail in Chapter 2.

1.8 Aims and Overarching Research Questions

This research is aimed at generating a more coherent model of the key components of SRL and the factors or conditions that enable children to create and develop skills in relation to SRL. Specifically, it will look to examine whether cultural differences impact on the organisation of SRL skills in a consistent and predictable fashion. This will in turn shed light on the potential malleability of the processes feeding into SRL skills, especially with regard to the motivational dimension, and thus how they might

be actively promoted. This will give an insight about how to support children from different cultural backgrounds to develop SRL skills in the classroom.

The preceding discussion provides a general framework for examining the way culture impacts on SRL. The objective of this research is to test models created to capture the interactions between components of SRL within cultural backgrounds and address the following questions:

- Does culture have an impact on the development and organisation of SRL skills?
- Which elements of SRL skills are impacted by cultural differences?
- Does the impact of culture influence the organisation of SRL skills in a consistent and predictable fashion?

1.9 Thesis Outline

This thesis consists of six chapters. Following this introductory chapter where the background, rationale, research aims and overarching research questions were discussed, Chapter 2 discusses the relevant literature and theoretical background for this study.

This includes a discussion of the conceptual framework of SRL and the impact of social cognitive theories and sociocultural theories on its development and conceptualisation. The review of extant research will lead to a framing of the conceptual model of SRL that will be applied in the present research. An important part of the SRL model propounded for this research is the Theory of Planned Behaviour (TPB) (Ajzen & Fishbein, 1980) and how culture impacts on SRL based on the fusion of SRL and TPB.

Chapter 3 gives a description of the research methodology adopted for the first study. Also, there will be a discussion about the various tools used to measure SRL and how different conceptualisations of SRL has led to the use of specific measurement tools.

Study 1 compared two groups of pupils from contrasting cultural backgrounds (individualist white British with collective Chinese) in UK primary schools. This includes the theoretical considerations and rationale for the choice of methodology, instruments used for data collection and an explanation of the research design implemented.

Ethical issues for the participants are also discussed here. It proceeds to outline the process of data collection and analysis. The results are also presented followed by a discussion of the observations made.

Chapter 4 presents Study 2. It discusses the methodology and development of data collection tools. The procedure for data collection is also outlined followed by a presentation of the results and a discussion of the findings.

Chapter 5 presents Study 3 – a replication of Study 2 in an authentic Confucian context in Beijing. There is a presentation of the process of data collection, the results and a discussion of the findings.

In Chapter 6, there is a general discussion of the findings from the research project as a whole – from Study 1 through to Study 3. It will seek to reconcile the findings from the UK studies with that of the Beijing study looking for patterns, consistencies or otherwise that emerge. In this concluding chapter, there will also be a presentation of the conclusions that can be drawn from the research and their practical implications. The thesis closes with a discussion of the limitations as well as recommendations for further studies.

Chapter 2

Review of the Literature

Chapter 2 discusses the relevant literature and theoretical background for this study. This includes a discussion of the conceptual framework of SRL and the impact of social cognitive theories and sociocultural theories on its development and conceptualisation. Some relevant prominent models will be discussed namely those of Winne and Hadwin (1998), Zimmerman (1989, 2000) and Pintrich (2000). These three models share a common feature that is relevant to the approach taken in this research; each of the models addresses processes that occur in relation to specific learning tasks. However, while Winne and Hadwin's model focuses on cognitive processes; Zimmerman's model focuses on the interaction between three processes – person, behaviour and environment; Pintrich's model focuses on the contribution made by the motivational dimension to the other processes.

The differences in foci for these models provide a point of departure that instigates the approach taken in this research leading to a fusion of the processes into a more coherent SRL model – a conceptual improvement (see Section 2.3). An important part of the SRL model propounded for this research is the Theory of Planned Behaviour (TPB) (Ajzen & Fishbein, 1980) and how culture impacts on SRL based on the fusion of SRL and TPB.

These models themselves are laid out in Section 2.1, before drawing out their key contributions to an overarching synthesis in Section 2.3.

2.1 Models of SRL

2.1.1 Winne and Hadwin's Model

Winne and Hadwin's model of SRL (Figure 2.1) (Winne & Hadwin, 1998) was influenced by Information Processing Theory (IPT) (Winne, 2001). Using a computer metaphor of information-processing enabled a fine-grained conceptualisation of the processes that occur during memory processing, storage and retrieval and the processes involved during strategy formation and deployment – in effect outlining more specifically the cognitive processes that take place during learning and task performance (SRL).

In this model, the process of task definition is separate from those of goal setting and planning. Also theorised is that a set of processes influenced by IPT takes place during each phase. The acronym – COPES – is used to describe the facets of academic tasks that students' metacognition engages with. These facets - **c**onditions, **o**perations, **p**roducts, **e**valuations and **s**tandards are used to characterise the four phases of SRL as defined by this model. IPT's influence can be seen in the fact that each of the aspects of COPES, apart from operations, are seen as information that the individual uses or produces during learning or task performance; and operations can be regarded as a result of cognitive output (Greene & Azevedo, 2007). Greene and Azevedo further observed that 'It is within this cognitive architecture, composed of COPES, that the work of each phase is completed' (Greene & Azevedo, 2007 p335). Winne and Hadwin (1998) theorised that there are four basic phases in a process of learning (sections 2.1.1i to 2.1.1iv below). The phases are distinguished by the **p**roducts created at each level (Winne & Hadwin, 1998). Some aspects of COPES are relatively more dominant in certain phases than others.

2.1.1i Phase 1: Defining the Task

This phase describes the cognitive activities through which a learner interprets and creates an understanding of the task and how any updates to that understanding that arise during performance of the task are perceived.

The student or learner, in this phase, generates a perception about what the studying or problem-solving task is. There is also an appraisal of the constraints on the task and the resources available to carry it out. How the student perceives the task is highly influenced by aspects of COPES. The **c**onditions are particularly relevant; the learner's interests, goal orientation and general metacognition are **c**onditions that affect how the task is defined. This process is multidimensional as it involves an appreciation of the task conditions and the learner's own cognitive conditions (Winne, Jamieson-Noel & Muis, 2001).

The task conditions include the information and cues perceived by the learner in the environment as well as from within the task itself. Factors such as the time limit, presentation of the task's text features or the teacher's countenance or disposition could all be relevant to the task conditions. Cognitive conditions take account of the information the learner is able to draw from long-term memory to do with knowledge

they already hold about the task. Also relevant to cognitive conditions will be the learner's self-beliefs about the task and their affective reaction to it.

Operation processes such as searching, self-questioning, identifying similarities and differences, re-reading and other cognitive tactics and strategies are activated. The **p**roduct is the perception of what the task is. **E**valuation in Phase 1 is the learner's judgement about their level of understanding of the task. **S**tandards have to do with their understanding of the grading criteria against which products are monitored.

2.1.1ii Phase 2: Setting Goals and Plans

After defining the task, the learner proceeds to set goals to be achieved as part of carrying out the task and comes up with a plan about how to reach them. Tasks can have more than one goal, a mixture of goals or goals that are very different from the purpose for which the task was set by the teacher or examiner (Winne, Jamieson-Noel & Muis, 2001). The level of goal set is influenced by perceptions of efficacy. For instance, if the learner makes a judgement that he/she does not have the requisite knowledge to perform very well at the task, the goals set may be very low or even of a maladaptive nature such as self-handicapping.

Along with goal setting is the formulation of a plan to approach the task with. It involves drawing out tactics from the cognitive arsenal stored in memory. Metacognition plays a role in this regard to determine which options would be appropriate to engage with in order to achieve the goals set. At this stage, the situation might warrant the learner returning to Phase 1 to check the task again and perhaps to redefine it. Carrying out any of these actions is a reflection of the learner exercising metacognitive control.

Aspects of COPES play roles varying in dominance during this phase. The student's appraisal of the task **c**onditions coupled with the **o**perations during Phase 1 informs a **p**roduct that is a plan for coordinating the tactics and implementing them. **E**valuations at this stage involves the judgements made about the complexity of the task; the amount of effort required; and the learner's ability to carry out the plan. **S**tandards build on those from Phase 1 to include a projection of how much effort will be needed to meet external requirements.

2.1.1iii Phase 3: Engagement

Actual work on the task in order to achieve the goals set begin at this phase. The tactics generated in Phase 2 are activated and a plan of action pursued in order to find a solution to the problem. As work progresses, the learner constantly checks progress on outcomes against the expected goals set for the task. In addition to monitoring of performance, there is monitoring of properties such as effort.

The **c**onditions and **o**perations processes at play from Phases 1 and 2 are sustained and the **p**roduct is evident as implementation of tactics and strategies lead to answers and solution where viable. **E**valuation is then made with judgements about learning and performance; effectiveness of tactics used; and efficacy judgements.

2.1.1iv Phase 4: Large-Scale Adaptation

The learner chooses points within the task performance, usually at the end of the task, where the strategy and the entire approach to solving the task is evaluated. This is aimed at gaining some knowledge from the experience and that is stored in long term memory to be applied to make performing similar tasks easier in the future, more likely to lead to better outcomes and make the future experience a more pleasant one. As a result, the prominent COPES processes are **p**roducts and **e**valuations.

Figure 2.1 Winne and Hadwin's SRL model
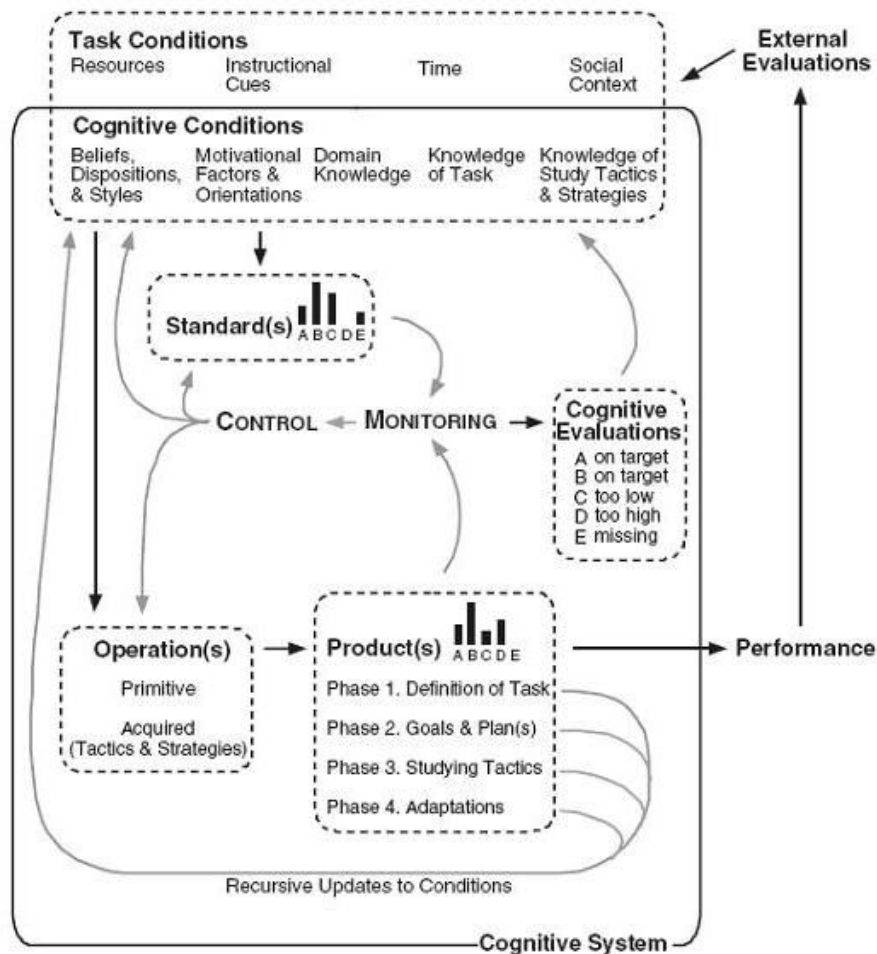
Source: Winne, P. H. (2001). Self-regulated learning viewed from models of information processing (p. 164). In B. J. Zimmerman & D. H. Schunk (Eds.), Self-regulated learning and academic achievement: Theoretical perspectives (2nd ed., pp. 153–189). Mahwah, NJ: Lawrence Erlbaum.

The model is recursive and weakly sequenced even though it is described as having four phases. Products of earlier phases inform and influence the conditions within which the operations take place during subsequent activities and stages.

Also, students may not need to pay equal attention to each and every phase. For instance, if a task is perceived as being familiar, Phase 1 could be skipped altogether and only a little attention given to Phase 2. The engagement phase (Phase 3) may be the one accorded greatest prominence.

2.1.2 Zimmerman's Model

Zimmerman's model is framed from a social cognitive perspective that views SRL as an interaction of personal, behavioural and environmental processes (Figure 2.2). The

three elements have a triadic reciprocal relationship. This perspective is shared by Bandura (Bandura, 1986). The triadic view includes behavioural skills needed to self-manage environmental contingencies. Furthermore, it entails knowledge and a sense of personal agency that enables the deployment of the relevant skills in appropriate contexts.

Figure 2.2 Zimmerman's triadic model of SRL
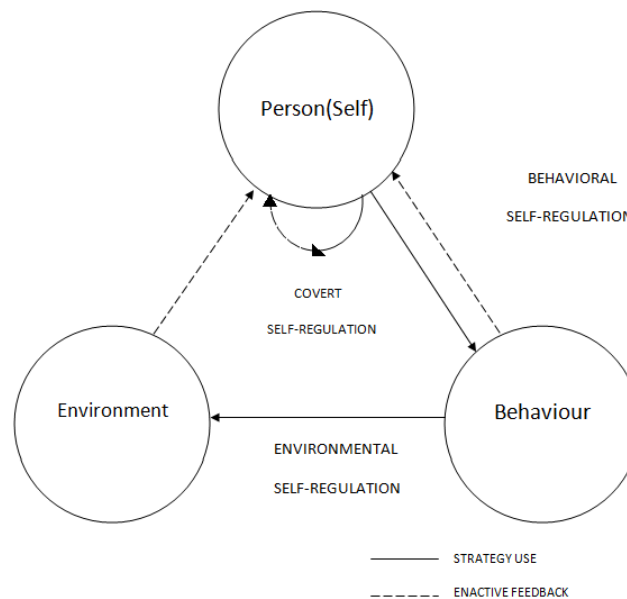
Source: Adapted from Zimmerman (2000).

The components that make up the triad change constantly during events; consequently, there is always a monitoring process that operate through feedback loops – behavioural self-regulation, environmental self-regulation and covert self-regulation. This makes SRL a cyclical process where self-oriented feedback from a previous performance is used to make adjustments during current tasks.

Behavioural self-regulation involves the individual making strategic adjustments to how things are done using feedback from self-observation of performance processes. For instance, when a learner self-observes their method of learning as not being effective, he/ she can make changes or adjustments to the study method being used. Environmental self-regulation refers to the process where the individual observes the prevailing environmental conditions during a performance; if the conditions are judged to be less than conducive, he/ she can make adjustments to the environmental conditions or outcomes. An instance is when a learner realises that trying to complete

an assignment at the dining table at home is not conducive due to the noise being made by siblings so goes into a room and shuts the door. Covert self-regulation refers to an individual monitoring his/ her cognitive and affective state during a performance; when there is a realisation there is a drop in levels, an adjustment is made to rectify it. For instance, if a learner realises he/she was beginning to be overcome by anxiety during a test, reminds him/herself about having solved harder problems during revision and quietly whispers, 'come on I know I can do this'.

A distinctive aspect of the social cognitive view is its dependence on the individual's beliefs and motives. The emphasis is not solely on traits, abilities or levels of competence. Neither is it on knowledge states and reasoning behind choice of cognitive strategies. The individual's sense of agency also plays a significant role as self-beliefs and affective reactions play a role in determining whether an action is carried out or not.

Due to the importance attached to the influence of perceived efficacy in explaining variations in the motivations of individuals to self-regulate their behaviour (Bandura, 1997; Pajares & Miller, 1994; Zimmerman, 1995), self-efficacy is an important component of the social cognitive view of SRL. Self-efficacy, which will be discussed in greater detail later in this chapter, has been defined as:

"beliefs about one's capabilities to organize and implement actions necessary to attain designated performance of skill for specific tasks" (Zimmerman, 2000 p 14).

SRL, according to theorists within a social cognitive framework, involves three types of sub processes: self-observation, self-judgment, and self-reaction (Bandura, 1986; Zimmerman, 1989). The sub processes are all performance related and assumed to have a reciprocal interaction with each other.

The processes and their accompanying beliefs and motives are operationalised as falling into three phases: forethought, performance/ volitional control and self-reflection as shown in Figure 2.3.

Figure 2.3 Zimmerman's Cyclic Phase Model of SRL
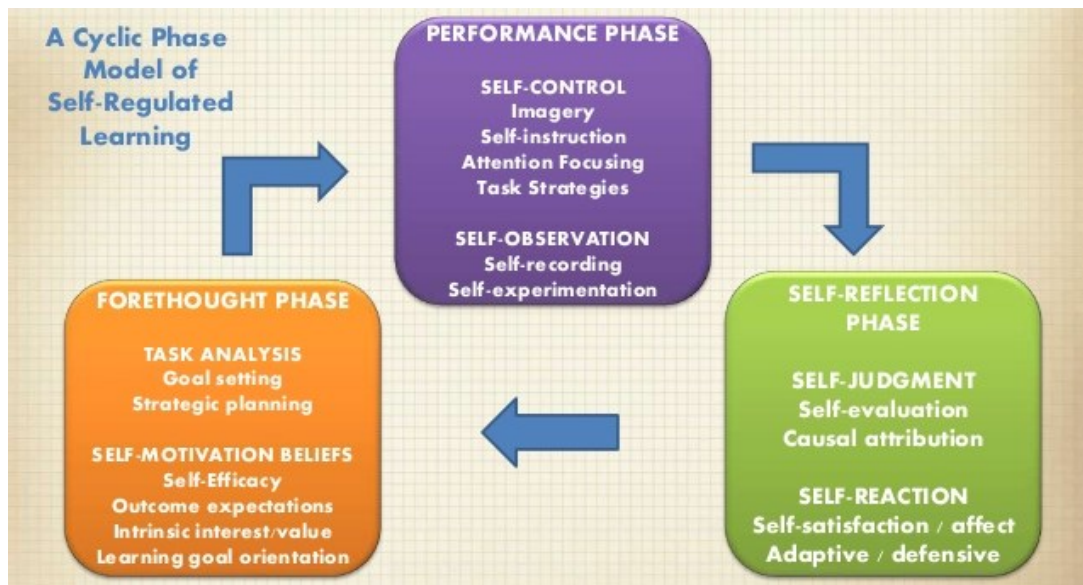
Source: Adapted from Zimmerman (2002)

2.1.3 Pintrich's Model

The model by Pintrich (2000) tried to capture the essence of most of the prominent models created by various researchers in the field of SRL. As mentioned in Chapter 1, Pintrich identified common assumptions possessed by most of the existing models and created a model that captured the salient components of those in existence, but then advanced the knowledge and understanding of the concept by elucidating the motivation/affective dimension and highlighting its influence – direct and mediating – on performance.

In this model, SRL is organised using a taxonomy that focuses on the phases and areas of self-regulation. The phases are: forethought and planning, monitoring, control and reflection phases. The various areas in which self-regulation can occur fall into four broad categories: cognition, motivation, behaviour, and context. The four phases that make up the rows of the table are shared by many models of regulation and self-regulation (e.g. Winne & Hadwin, 1998; Zimmerman, 1989). In each of the phases, activities of self-regulation are listed in the four separate areas.

The first three areas in the columns in Table 2.1 (under areas for regulation) represent those aspects of the individual's own (self) cognition, motivation and affect, and behaviour that he/she can attempt to control and regulate. These control or regulatory

actions are 'self-regulated' as the individual's (the personal self) focus is to attempt to control or regulate his/her own cognition, motivation, and behaviour. Others in the individual's environment such as teachers, parents or peers, may attempt to 'other' regulate his/her cognition, motivation, or behaviour as well, by providing guidance or scaffolding the individual in terms of what, how, and when to do a task. The last column looks at contextual variables; it represents the various aspects of the task environment, and general classroom or cultural context where the learning or task performance is taking place. (Pintrich, 2000; Puustinen & Pulkkinen, 2001).

Phase 1 is about planning and goal setting. This involves activation of perceptions and knowledge of the task and context and the self in relationship to the task. The self-regulatory activities taking place during the forethought phase would include, among other things, activation of prior knowledge about the task and metacognitive knowledge activation (cognitive area), efficacy judgements about the task and adoption of a goal orientation (motivation and affect area), time and effort planning (behaviour area) and perceptions of task and context (context area).

Phase 2 concerns various monitoring processes that represent metacognitive awareness of different aspects of the self or task and context. Monitoring consists of awareness and monitoring of cognition, motivation, affect, time use, effort and task and context conditions; it helps the learner to identify any situations that could hinder performance.

Phase 3 involves efforts to control and regulates different aspects of the self or task and context. Control activities refer to the selection and adaptation of strategies for managing learning, thinking, motivation and affect; for the regulation of effort and for task negotiation.

Finally, Phase 4 represents various kinds of reactions and reflections that the learner makes on the self, the task or context. Reflection includes cognitive judgements, affective reactions, making choices and task and context evaluation.

Pintrich (2000) conceded that academic learning and performance do not always necessarily follow these phases in a time-ordered sequence. Earlier phases do not necessarily have to occur before later ones as it is possible for different processes to occur simultaneously, and feedback from one phase could lead to a move backwards

to a previous phase or vice versa. He also suggested that learning could take place in more tacit or unintentional ways without the learner consciously applying any of the processes and activities involved in SRL.

Table 2.1 Pintrich's Model of SRL

| Phases | Areas for regulation | | | |
	Cognition	Motivation/affect	Behaviour	Context
1. Forethought, planning, and activation	Target goal setting	Goal orientation adoption	(time and effort planning)	(perceptions of task)
	Prior content knowledge activation	Efficacy judgements	(planning for self-observations of behaviour)	(perception of context)
	Metacognitive knowledge activation	Ease of learning judgements (EOLs); perceptions of task difficulty		
		Task value activation		
		Interest activation		
2. Monitoring	Metacognitive awareness and monitoring of cognition (FOKs, JOLs)	Awareness and monitoring of motivation and affect	Awareness and monitoring of effort, time use, need for help	Monitoring changing task and context conditions
			Self-observation of behaviour	
3. Control	Selection and adaptation of cognitive strategies for learning, thinking	Selection and adaptation of cognitive strategies for managing motivation and affect	Increase/ decrease effort	Change or renegotiate task
			Persist, give up, Help-seeking behaviour	Change or leave context
4. Reaction and reflection	Cognitive judgements	Affective reactions	Choice behaviour	Evaluation of task
	Attributions	Attributions		Evaluation of context

Source: Pintrich, P. R. (2000). Phases and areas for self-regulated learning, Handbook on Self-Regulation (p. 454).

An important contribution of this model to the SRL literature is its acknowledgement of the importance of the motivational orientation of a person's learning and performance – an aspect not accorded as much prominence in other models. Pintrich (2000) operationalised the role of motivation in SRL specifically through the way in which goal orientations (mastery and performance orientation in this case) are related to SRL.

Furthermore, in addition to developing the model, Pintrich and colleagues developed a tool for measuring SRL (a self-report questionnaire) - the motivated strategies for learning questionnaire (MSLQ) – a tool that is one of the most widely used in SRL research (Panadero, 2017). The MSLQ is able to assess motivational orientation (e.g. self-efficacy, intrinsic value and test anxiety), and the use of learning strategies (cognitive, metacognitive and regulatory or resource management strategies). (see Pintrich & De Groot, 1990; Pintrich, Smith, Garcia & McKeachie., 1993). However, the MSLQ is aimed at college students and has no utility with younger learners. Also, the theorising around motivational orientation has often produced contradictory results in research studies (Puustinen & Pulkkinen, 2001).

2.2 The influence of sociocultural theory

Sociocultural theory has provided some insight into how parents, families and communities could influence how children develop including how they develop cognitive and SRL skills. According to this theory, learning takes place as people participate in shared endeavours with others with an interdependence between social and individual processes as they come together to co-construct knowledge (Rogoff, 1994). Sociocultural theory is influenced heavily by the ideas of Vygotsky (1934).

Bodrova and Leong (2007) illustrate this using Vygotsky's 'tools of the mind' metaphor. Tools are instruments/ implements that help to perform actions and do things beyond the individual's capabilities. People create physical tools to help them achieve this. Similarly, people have mental tools that enable them to do mental things such as remembering, thinking and problem solving. These 'tools of the mind' as Vygotsky calls them, actually change the way the individual's mental processes work. These tools, they argued, are learnt from adults. SRL skills are examples of such tools.

Bruner offered a more fundamental view on the development of the mind; he suggested that the mind's existence can be credited to culture. Reality in the human

mind is represented by a symbolism that is shared by the members of that cultural community who conserve it, elaborate and adapt it, then pass it on to succeeding generations. Learning and development of the mind, is therefore a product of the culture and its sociocultural framework (Bruner, 1996).

"on this view, learning and thinking are always situated in a cultural setting and always dependent upon the utilisation of cultural resources. Even individual variation in the nature and use of mind can be attributed to the varied opportunities that different cultural settings provide, though these are not the only source of variation in mental functioning" (Bruner, 1996 p 4)

In the quote by Bruner above, he suggests variety in culture could account for differences in cognition and it is therefore worth investigating how cultural elements wield such an influence.

Another perspective about the role of sociocultural theory was explicated by Wigfield, Klauda and Cambria (2011). They showed how sociocultural theory and social cognitive theory could both be active influences on SRL processes. They elucidated on the first phase of SRL in particular as outlined by Pintrich and Zusho (2002). The first phase was identified as the forethought and planning phase; the learner plans their course of action at this stage. They identified language as an important element whose development influences the development of forethought and planning. They argued from a sociocultural and social cognitive perspective suggesting that children develop speech patterns similar to those of significant models around them by internalising their language into thought over time (Vygotsky, 1934/ 1987).

Sociocultural theory – the concept that learning takes place through a cooperation between the learner and significant others in their social context has had an important impact on the conceptualisation of SRL.

2.3 Synthesised model of SRL – this Research

After examining the elements considered as important components of SRL by the various models discussed, a model of SRL was created for this research that took account of those components.

Existing models of SRL lack a means through which the influence of cultural elements can be identified and assessed. This necessitates the need to address this

shortcoming in SRL research through the model created for the present research. This is coupled with the fact that the existing models reviewed in the previous sections emphasise particular aspects of SRL over others thereby sacrificing effectiveness on one or more of criteria such as completeness, clarity or specificity of process. 'Completeness' is about the extent to which a balanced emphasis is placed on the major components of SRL – metacognitive awareness, cognitive strategy use, and motivational. 'Clarity' is how well the models explain the relationships between the components. 'Specificity of process' describes the extent to which a model specifies the processes it expounds and the consistency at which the processes have been supported by subsequent research.

For instance, according to Puustinen and Pulkkinen (2001), looking at the definitions of SRL from the various models points out two themes – a goal oriented and a metacognitively weighted definition. Pintrich's and Zimmerman's models emphasise a goal oriented process that involve self-generated monitoring and regulating the learner's cognitive, motivational and social factors. Conversely, Winne and Hadwin's model define SRL as a metacognitively direct process aimed at adapting the use of cognitive strategies during learning tasks. All the models do assume the presence of motivational and metacognitive processes but differ in the relative weight given to the component parts and the level of detail given to specific components and their interrelationships.

As a result, Wine and Hadwin's model falls short on completeness and clarity because the emphasis on metacognitive processes loses sight of motivational components and the relationships are not clearly outlined. Furthermore, its recursive nature means there are no clear distinctions between phases and sub processes (Panadero, 2017).

Zimmerman's and Pintrich's models fall short on specificity of process. While Zimmerman's model has progressively been updated in an attempt to specify the processes and sub processes better (see Zimmerman, 1989, 2000; Zimmerman & Moylan, 2009), it does not outline in detail how the metacognitive processes and sub processes operate. Similarly, Pintrich's model has not found conclusive support for how the goal-orientation processes operate (Puustinen & Pulkkinen, 2001).

The model synthesised for this research also included a methodological advancement that sets out a way to operationalise the components and how their relationships could

be influenced by cultural differences. The components (variables) in this model fall into three categories: metacognitive knowledge, regulation of cognition and motivation (TPB); self-efficacy is included as a substitute for perceived behaviour control in TPB; and 'agency' as an important product of self-efficacy. Also included in the model are: perseverance and effort, and a performance measure (the rationale for including these will be discussed later in this chapter).

2.3.1 Metacognitive Knowledge

John Flavell, who is acknowledged by many writers (e.g. Livingston, 1997; Sae-Joo, Sanrach & Chaijaroen 2011; Schneider 2008) as a pioneer in metacognitive research described metacognitive knowledge (MK) as one's knowledge or beliefs about the factors that affect cognitive activities (Flavell, 1979). MK is an understanding of the cognitive resources that a learner possesses and deploys to perform a particular task. It creates an awareness of their strengths and weaknesses in relation to and contingent upon their internal and external conditions. The learner displaying MK therefore, has the knowledge about what a task entails and the cognitive resources and strategies at their disposal. The learner also has an understanding about when and why to use any of the resources or strategies.

Three facets of knowledge have been identified as elements of MK: declarative, procedural, and conditional knowledge (Harris, Graham, Brindle & Sandmel, 2009; McCormick, 2003). Declarative knowledge refers to the knowledge an individual holds about himself/ herself as a learner; it includes what the person knows about their own strengths and weaknesses regarding a task, knowledge skills and strategies. Pressley and Harris (2006) have argued for the inclusion of knowledge about the learner's affective state. It therefore can be regarded as 'knowing things'' and 'knowing what'. Flavell (1979) identified three types of declarative knowledge: knowledge of the person, the task and strategy or actions (Harris et al., 2009).

Procedural knowledge is the knowledge about how to carry out procedures such learning strategies or actions in order to make use of declarative knowledge and achieve the learning goals. It is knowledge about "how to do things." Successful learners have relatively better and more effective procedural knowledge such as strategies for carrying out the calculation needed to solve a maths problem.

Finally, conditional knowledge refers to the knowledge of when, where and why to apply various strategies, skills or actions – procedural knowledge. To wit, conditional knowledge is knowing the conditions under which to deploy declarative and procedural knowledge to achieve optimum results.

"Effective performance among learners depends upon the application of declarative, procedural, and conditional knowledge" (Mahdavi, 2014)

Flavell (1979) described three categories of the knowledge factors (declarative knowledge): 1) person variables 2) task variables, and 3) strategy variables. A fourth category has been argued by Pintrich (2000) - environment variables.

2.3.1i Person variables refer to the knowledge the learner has about their strengths or weaknesses. It includes the learner's knowledge of themselves as thinker or learner, and what they perceive about other people's thinking processes. Flavell gave examples of knowledge such as a person knowing that he learns better by listening than by reading. This is very important for the learner because knowledge about a weakness in a particular task situation enables them to use adaptive strategies to redeem it. Such knowledge one holds about oneself as a learner could enable optimum performance.

2.3.1ii Task variables include all the information and assessment a learner holds or perceives about a task (Flavell, 1979). Tasks in academic settings are rarely the same in all situations. The knowledge a learner has about the nature, requirements and demands of different tasks is what constitutes knowledge of task. Such information determines the individual's approach to the task.

2.3.1iii Strategy variables involve identification of goals related to the task and an appraisal of the requisite cognitive processes and actions for their achievement. It is the knowledge a learner has about strategies for learning, thinking and problem solving (Pintrich, 2002). This involves the strategies for reading and understanding material, learning or memorising material or how to go about the different approaches to solving different types of problems. For instance, a learner may possess the knowledge that solving multiple choice questions requires a different approach to writing essays.

2.3.1iv Knowledge of environment is the extent to which the learner monitors and is aware of the conditions that positively or negatively impact their performance. According to Pintrich (2000), there are context dependent factors that a learner must have knowledge of in order to be successful. They are the situational or conditional knowledge a learner holds about solving a problem in a particular context. An instance is where a learner decides to shut the window to cut out traffic noise while solving a maths problem - the learner knows they do not operate optimally when there is a distracting background noise.

2.3.2 Regulation of Cognition (RC)

Pintrich (2000), describes RC as the different activities and strategies the learner uses in order to plan, monitor and regulate their cognition for task performance. This is informed by MK since the learner activates prior knowledge they have about themselves as learners and the task conditions. A key aspect of regulation of cognition is the process of the actual selection and use of the cognitive strategies by the learner in order to successfully carry out a task (Pintrich, 2000 & 2004). There are four components of RC. They are described below:

2.3.2i Cognitive planning: the learner sets goals for the task that will be the criteria against which to monitor their performance and cognition. This involves the activation of prior knowledge. Planning also guides the learner's deployment of cognitive strategies.

2.3.2ii Cognitive monitoring: this relates to the learner's metacognitive awareness. The learner continuously monitors their performance in relation to their use of cognitive strategies; their behaviour and actions; motivation levels and any changes in the context at any point of the task. Monitoring enables the learner to be alerted to diminishing progress towards the goal or any unexpected outcomes.

2.3.2iii Cognitive control: the learner's feedback from monitoring is then acted upon by making the requisite changes including changes to the plan or strategy being used, or changes to their level of motivation or effort. When needed, the learner also at this stage makes changes to the task context by seeking help or modifying the environment in some way.

2.3.2iv Cognitive reflection: good self-regulators evaluate their performance and feed that into metacognitive knowledge and other elements of self-regulated learning. This involves making cognitive judgements about the effectiveness of strategy use in relation to the task outcomes. Success or otherwise of the strategies used and the knowledge gained about themselves and the task situation is added to the metacognitive knowledge repertoire.

2.3.3 Motivational Dimension (TPB)

The affective and motivational dimension is an important component of SRL. However, the construct of motivation has often lacked the unity and coherence enjoyed by the other SRL constructs. This according to Schunk (2000) is because it lacks a clear definition and often a specification of how it operates within larger theoretical frameworks. Motivation constructs within SRL certainly fit this picture.

There are many different approaches (and sub approaches) to conceptualising motivation within SRL. For instance, an approach in terms of 'interest' looks at a learner's liking or attraction towards a particular task. Another approach, value, looks at the degree to which a task can fulfil needs, goals or to establish an aspect of the learner's self-schema. Yet, another approach considers the learner's reasons for engaging in an activity - goals. Others have approached motivation in terms of the learner's perception of the causes of personal outcomes - attributions (Conley & Karabenick, 2006; Schunk & Zimmerman, 2008).

Schunk (2000) notes that not only are the different approaches problematic; different researchers rename and redefine motivation constructs to suit their theoretical models and research designs adding to the confusion. Furthermore, the myriad of approaches do not define what motivated behaviour looks like and how it differs from unmotivated behaviour.

This problem was highlighted by Ajzen and Fishbein (see Ajzen & Fishbein, 1980, 2005) in specifying the relationship between attitudes and behaviour in the theory of reasoned action (TRA) and later theory of planned behaviour (TPB). They noted the challenge of accurately predicting behaviour from attitudes could be overcome by specifying and focusing on attitudes to a named behaviour or set of behaviours (the multiple act criterion). The multiple act criterion will be discussed in greater detail in Chapter 3.

This theory as postulated by Ajzen and Fishbein (1980) has the concept of 'intention' as the antecedent to behaviour. They suggested intention as the cognitive representation of the individual's preparedness to carry out an action. The interesting aspect of the model as shown in Figure 1, is the constituent components that form the intention. The original model (TRA) consisted of behavioural beliefs and normative beliefs only. This only looked at the volitional aspects of behaviour. Behavioural beliefs are the attitudes the individual holds towards the behaviour. Attitudes (AT) are the expected outcomes associated with performing a behaviour, with value being the value attached to those outcomes. Normative beliefs are the individual's subjective norms (SN) and expectations held about whether important referent individuals or groups (friends, family, parents, teachers, peers, religious leader etc.) approve or disapprove of performing a given behaviour and the value attached to adhering to it (motivation to comply). The strength of each normative belief is multiplied by the person's motivation to comply with the referent in question. This is aggregated to give the subjective norm value (Ajzen, 1991). Similarly, the value of attitudes is determined by the individual's salient beliefs about the consequences of performing the behaviour combined in a multiplicative fashion with his/ her evaluation of those consequences (Ajzen, 1991).

In order to deal with the fact that some of the determinants of behaviour were non-volitional, a third component was added - perceived behaviour control (PBC). This introduced a belief in the ability and freedom to perform the behaviour i.e. its controllability within the theory; this expanded model being called the Theory of Planned Behaviour (TPB) (Ajzen 2002).

In the SRL context, these will be learning-related behaviours, but unlike the attitude/TRA context, where behaviour is under free choice, performance alone does not distinguish motivated learning behaviours since learners are generally acting under a degree of compulsion; instead, it is persistence or effort that defines motivated behaviours. Following through on the TRA account, it becomes possible to define motivated behaviour in learning contexts as the deliberate application of effort or persistence, influenced by a) attitude to the effortful behaviour, based on expected outcomes and the values associated with these, and b) subjective norms (i.e. the perception of the expectancies and values held by important others about the application of effortful behaviour) - which as will be seen later is a useful addition to

any SRL framework when it comes to trying to theorise about the nature of cultural influences. There is a wealth of extant literature attesting to the general viability of this approach to motivation in other contexts, so its applicability to learning behaviour is likely to be high (see Ajzen & Klobas, 2013; Bagozzi, Lee & van Loo, 2001; Godin & Kok, 1996).

Both the TRA and TPB are 'expectancy-value' theories whose characteristics make them appropriate to a learning context. Expectancy is the learner's belief judgement he/she has the capability to perform a task successfully. A learner would generally not apply effort to a task they expect to fail at. Values on the other hand, are the beliefs about the reasons a learner may have for engaging in a task (Schunk, Pintrich & Meece, 2008). The strength of a learner's motivation, in this theory, is the product of expectancy and value.

The triad of components influence behaviour indirectly as they are mediated by intention. The varying strengths and nature of the influences of each of the components determine the nature and extent of the intention towards behaviour. Favourable AT, SN, and PBC will lead to a favourable intention to perform the behaviour. Though the components are mediated by intention, PBC could also be a proxy for actual control which could have a direct influence on behaviour (Manning, 2009).

SNs are directly mediated by intention. SNs do not influence behaviour directly; rather indirectly through intentions. Two types of SN are delineated- injunctive norms (IN) and descriptive norms (DN). IN are those social pressures to behave in a particular manner that come with the perception of what people expect an individual to do or act while DN comes from observing vicariously how others behave and act within one's community that places some social pressure on the individual to follow suit (Manning, 2009)

Figure 2.4: Conceptual model of the Theory of Planned Behaviour
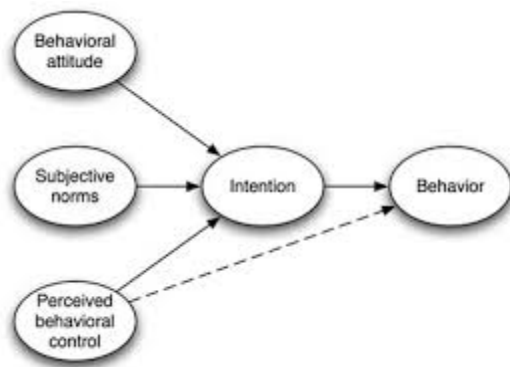
Source: Ajzen I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes,* 50, p. 179-211.

The successful extension of the TRA into the TPB via the inclusion of PBC signals a further important variable to include within the SRL motivational dimension. However, again in the learning context, the emphasis is not on belief in the actual capacity to perform the effortful behaviour since it is not under volition anyway, but to do so successfully, making it worthwhile putting that effort in. This means that self-efficacy (SE) is a more appropriate variable than PBC.

2.3.3.1 Self-efficacy

SE is therefore incorporated into the model of TRA in this research as a replacement for PBC. Self-efficacy, according to Bandura (1977, 1985), is one of the most important determinants of performance success. He defined SE as an individual's conviction in their ability to successfully execute the behaviour needed for a successful outcome on a task. SE is therefore very important in learning contexts especially with children since they are still at the formative stages of discovering themselves as learners.

Four sources of SE have been discussed in learning contexts in extant research (e.g. Bandura, 1977, 1993, 2003; Britner & Pajares, 2006; Usher & Pajares, 2008, 2009).

- Experiential- this refers to the learner's own experience of previous attainments. For instance, when a learner is successful at a task, a judgement of competence is made that develops experiential SE
- Received- is when a learner is told by someone 'you can do it' especially from someone they respect and whose opinion matters to them. In school settings, teachers' feedback is very important.

- Modelling- this is when a learner sees or watches someone do it (someone just like them) through vicarious learning. Observing someone like them succeed or fail at a task contributes to shaping their own sense of SE
- Physiological- the emotional state (arousal, anxiety, stress, fatigue and mood) a learner experiences prior to or during a learning task gives the individual an indication about their level of SE. A strong positive arousal is interpreted by learners as SE.

However, only the sources: experiential, received and modelling are relevant to this discussion since they are the sources that fit in with the TRA/TPB framework.

The positive relationship between achievement and SE in academic contexts is well established among researchers (e.g. Deary, Strand, Smith, & Fernandes, 2007; Garne & St Pere, 2008; Marsh, 1990). The challenge then, has been to unravel how SE develops and is established in learners. Bandura (1997) argued that experience of personal success and achievement produced the strongest sense of SE although his argument was framed in a general sense. The predominance of experience over the other sources in predicting SE has been corroborated by Loo and Choy (2013) in an academic context.

Nevertheless, other sources of SE, besides experiential SE, have been reported as having similar influences in academic contexts. For instance, Chan and Lam (2010) reported a definite relationship between different forms and types of feedback on students' SE. They found that even in the face of failure, giving the right feedback was able to prevent a reduction in positive SE. This gives an indication performance feedback does have an effect via received SE. Feedback appears to have an influence on the development of 'received' SE since it is acquired from relevant referents feeding back to the learner that they could 'do it' and that they are good enough to succeed at a task. In academic settings, teachers and peers are the relevant referents whose feedback give an immediate received SE.

Coffee and Rees (2011), in addition to establishing a relationship between feedback and SE, reported the importance of feedback in influencing attribution. Experiential SE as explicated by Bandura (2003) is developed when a learner is able to attribute success and performance to be due to their effort and actions. Coffee and Rees'

finding reveals the crucial role the nature of feedback plays in developing attribution of one's success to effort.

Furthermore, Schunk (1987) explicates the importance of models in learning contexts. Models who struggle through a problem till they solve it successfully - coping models - are very influential in helping observing learners boost their confidence that they too 'could do it'. The impact of an adult model on a child's SE beliefs was also highlighted by Zimmerman and Ringle (1981). They reported that a control group of pupils with no adult model during a problem-solving exercise reported lower levels of SE; likewise the pupils who had adult models who feigned verbal pessimism. On the other hand, the children who had positive adult models reported high SE after the same puzzle exercise.

The variety of SRL variables that SE has positive relationships with means there could be mediating variables between SE and its influence on SRL. However, Molla (2015) in a study with primary school children in Ethiopia reported SE as the only and most significant variable influencing academic achievement by a regression analysis relative to other elements of SRL such as cognitive strategy use.

Zimmerman (2000) argued that "self-efficacy beliefs provide students with a sense of agency to motivate their learning through use of such self-regulatory processes as goal setting, self-monitoring, self-evaluation, and strategy use" (p.87). This creates a cycle of improvement since the experience of success generated by persistence and concentration feeds back to metacognition and motivation (SE and expectancy).

Agency is therefore considered as having a subsuming relationship with SE. Self-efficacy affects human agency because how well an individual thinks he/she can do something successfully affects the choices he/ she makes (the choices are controlled by the sense of agency) (Bandura 1982, 92, 2008; Weibell, 2011; Zimmerman, 2000).

2.3.3.2 Agency

Agency, according to Bandura (1977), is exercised as a result of perceived self-efficacy. As will be discussed subsequently, it is a social product hence it should be a relevant addition to a model that follows a social cognitive/ socio-cultural framework. "Agency refers to a person's ability to control their actions and through them events in the external world" (Haggard & Tsakiris, 2009 p242). Winne (2011) argued that a

sense of agency by a learner was a prerequisite for viable self-regulation. This is because for a learner to engage in self-regulation, they must of necessity expect that what they do matters; that their actions influence the outcome.

 A sense of personal agency is developed, according to Bandura, through a developmental progression. It is socially constructed as it starts with a child perceiving causal relations between events. This progresses to an understanding of causation through an action, and ultimately realising the individual is the agent of the action (develops a sense of efficacy) (Bandura, 1997).

There are three different modes through which agency is exercised: personal, by proxy and collective (Bandura, 1977). Personal agency is when the individual exercises personal actions to cause outcomes in spheres and events they have direct control over. This was aptly stated by Bruner as: "Selfhood . . . derives from the sense that one can initiate and carry out activities on one's own" (Bruner, 1998 p. 35).

Yet, there may be instances where the individual is unable to exert an influence directly; in which case, the individual is compelled to exert their influence through others – by proxy. In the spheres of functioning where an individual is unable to exert direct control and influence due to certain constraints, influence is channelled through someone else who may possess the requisite resources or ability to achieve the desired outcomes. For instance, school children may influence their participation in a school project by getting their parents to speak to their teachers in order to achieve a preferred outcome (Bandura, 2009).

Groups can also be a channel through whom agency is exercised. Bandura acknowledged that "People do not live their lives in individual autonomy. Indeed, many of the outcomes they seek are achievable only through interdependent efforts" (Bandura, 2000 p. 75). Human inter-dependence is a product of people living in groups and communities; since that results in a degree of shared beliefs, values and norms, there is also an exercising of collective agency.

"People's shared belief in their collective power to produce desired results are a key ingredient of collective agency. A group's attainments are the product not only of shared knowledge and skills of its different members, but also of the interactive,

coordinative, and synergistic dynamics of their transactions" (Bandura, 2000 p. 75-76).

SE beliefs – both personal and collective - according to Bandura (1997), are central and pervasive mechanisms in human agency. Personal agentic behaviour is in the entity who initiates an action for a specific purpose and outcome in mind. It views individuals as agents proactively engaged in their own development who by their actions can make 'things happen' (Pajares, 2002). A sense of agency is built on the expectation by the individual that they can cause an outcome by the action he/she takes. This is because "unless people believe they can produce desired effects and forestall undesired ones by their actions, they have little incentive to act or to persevere in the face of difficulties" (Bandura, 2009 p 9).

The theory of planned behaviour has consistencies with the conception of personal agency as postulated by Morris, Menon and Ames (2001). In a collectivist culture, with the disposition to maintain face, a relatively stronger influence of subjective norms leads to agentic behaviour that is referenced in the collective. As the external influence exerted through the subjective norm and received SE is weighted more strongly, individual personal agency should be much more residual in nature. On the other hand, where attitude and experiential SE are weighted more strongly, this should manifest in a more developed sense of personal agency, where you see what you do as being determined by personal choice.

Since subjective norms are such an important determinant of behavioural action according to Ajzen, a collectivist oriented culture like the Chinese could potentially engender a more prominent influence to that element as opposed to an individualist culture such as the home culture within the UK.

2.3.4 Perseverance and Effort

Duckworth, Peterson, Matthews and Kelly (2007) described perseverance and effort in one word – grit. They further explain it as perseverance and passion for long-term goals and the processes of perseverance and effort could help explain why individuals may accomplish more than their peers of similar intelligence. This is because they suggest grit is essential for high achievement and may be as important as intelligence. Their arguments are captured in this quote:

"Grit entails working strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress. The gritty individual approaches achievement as a marathon; his or her advantage is stamina. Whereas disappointment or boredom signals to others that it is time to change trajectory and cut losses, the gritty individual stays the course" (Duckworth et. al., 2007 p1087-1088).

Pintrich and Degroot (1990) discussed persistence [perseverance] as an important component of SRL in academic performance. They explained that students who persist at a difficult task are able to maintain cognitive engagement with the task, consequently resulting in better performance. Students' own beliefs about their ability to perform a task (self-efficacy) was linked to their metacognition, their use of cognitive strategies and their effort management (Pintrich & Degroot, 1990). On the whole, students who believed in their ability to perform a task (SE) are more likely to persist in the face of challenge than students with poor self-efficacy; they were also more likely to persevere at challenging and boring academic tasks (Fincham & Cain, 1986; Lee, 2014; Paris & Oka, 1986; Schunk, 1985).

Wigfield, Eccles, Roeser, and Schiefele (2008) take this further by arguing that persistence [perseverance] was an indicator of the learner having the ability to self-regulate. They suggest the quality of persistence occurs during the monitoring and control phases of self-regulation (Pintrich & Zusho, 2002). They defined persistence as "willing continuation in a challenging learning or problem-solving situation".

Similarly, perseverance and effort have been described as key 'noncognitive' skills and traits that contribute to academic success by many researchers (e.g. see Cunha, Heckman, Lochner & Masterov., 2005; Duncan, Dowsett, Claessens, Magnuson, Huston, Klebanov, Pagani, Feinstein, Engel, Brooks-Gunn, Sexton, Duckworth & Japel, 2007; Green, 2002; Heckman & Rubinstein, 2001); even though the description as 'noncognitive' has been criticised by Duckworth and Quinn (2009) as unhelpful or outright inaccurate.

In this fusion of SRL and TPB, the influence of attitude, subjective norm and self-efficacy is on perseverance and effort, which influences actual performance along with MK and RC.

2.3.5 Performance

Including task performance in the model is important for several reasons. Firstly, the prominent SRL models reviewed from a social cognitive theoretical framework all described their elements and processes in relation to specific academic tasks. The model of SRL formulated for the present research adheres to that principle.

In addition, as will be discussed in Chapter 3 under measurement of SRL, it is necessary to frame the components of the model around an authentic academic task so the framework of SRL and its measures would be applied in an 'online' fashion. This is coupled with the fact that the definition of the key components required a performance task to make them tangible. For instance, SE is defined in relation to a belief in having the requisite skills and resources to successfully accomplish a task; that is predicated on there being a task for the individual to use as a point of reference. Similarly, the multiple act criterion (Ajzen and Fishbein, 1980) requires named behaviours as a point of reference; in this case it is behaviours related to the task performance.

A final reason for the importance of having a performance measure is that it frames the research in an authentic academic context. Very few studies have been conducted on the role of culture in a TPB framework in an academic context and it is less so in the primary phase of education. That coupled with the novel approach taken in the present research by fusing SRL and TPB has the potential to be ground-breaking in the field.

2.4 How Culture Maps into Model

The key point is that the TPB framework as it is classically described only tacitly allows for variation in the degree of effect of the three main components on intention, though in fact the literature plainly demonstrates that their relative strength of influence does vary from context to context. However, in the context of cultural influences on learning, it becomes necessary to capture this difference more explicitly, since the dimension of cultural variation – collectivism versus individualism – specifically predicts differences in the weighting attached to personal attitude, experiential and received self-efficacy and subjective norms.

2.4.1 Collective versus individualistic cultures

As intimated in earlier discussions, the dimension of culture – individualism versus collectivism (Hofstede, 1981; Triandis, 2001) – was used as an initial basis to delineate cultures in the present research. The difference between the two groups is captured by Darwish and Huber (2003) as:

"Individualism is defined as a situation in which people are concerned with themselves and close family members only, while collectivism is defined as a situation in which people feel they belong to larger in-groups or collectives which care for them in exchange for loyalty—and vice versa. Collectivism can also be defined as a cluster of attitudes, beliefs and behaviours toward a wide variety of people" (p47, 48).

Darwish and Huber (2003) gave examples of typical individualistic societies as: Australia, Great Britain, Canada and the US; and collectivistic societies as: China, Hong Kong, India, Japan, Pakistan and Taiwan.

Similarly, Gorodnichenko and Roland (2010) reviewed various studies that measured individualism-collectivism and gave these examples: United Kingdom, the USA, Australia, Canada, Sweden and Netherlands as consistently among the most individualist countries, while Pakistan, African countries, East Asia, Malaysia, Peru and Native Americans as among the most collectivist.

Singh, Huang and Thompson (1962) did a study that compared the values held by individuals from America, China and India. They reported from their study that those from China scored highest in society-centred orientation, while the individuals from America scored highest in self-centred orientation. This corroborates the delineation of those societies given by Darwish and Huber. This earlier study of cultural differences has been supported by more recent studies in the dimension of individualism and collectivism (e.g. see Gorodnichenko & Roland, 2010; Ma & Schoenemann, 1997; Markus & Kitayama, 1991; Masuda, Ellsworth, Mesquita, Leu, Tanida & Van de Veerdonk, 2008)

2.4.2 Self-determination theory – A viable alternative to TPB?

There are several alternative motivation theories to TPB. Arguably, the most influential is Self-determination theory (SDT), having become one of the most widely used motivation theories in education research. This is because it considers the multi-

dimensional nature of the construct by taking into account the internal and external factors that influence the strength of motivation in the learner (Kong, 2009; Leal, Miranda and Carmo & Souza, 2013; Nukpe, 2012; Stirling, 2014).

SDT is a meta-theory that delineates intrinsic and a variety of sources for extrinsic motivation. Situations that support the individual's psychological needs i.e. sense of autonomy, competence, and relatedness are suggested to promote the most volitional and optimum forms of motivation and engagement for activities, including enhanced performance, persistence, and creativity. According to Deci and Ryan (1985), the proponents of SDT, different types of motivation can be distinguished according to the differing reasons or goals that cause an action. On one hand, intrinsic motivation (IM) is when an action or behaviour occurs because it is inherently interesting or enjoyable – doing it for its own sake; on the other hand, extrinsic motivation (EM) refers to behaviours that occur because they lead to a separable outcome.

IM has become a subject of interest to education and educators because it has been found to result in high quality learning and performance, and importantly, is malleable (Hattie & Timperley, 2007; Ryan & Deci 2000; Ryan & Stiller, 1991; Valerio, 2012).

EM had been characterized as deficient and contrasting with IM in the classical literature (eg see Centers, & Bugental, 1966; deCharms, 1968; Weinberg, 1978). However, SDT suggested there are different types of EM some of which could indeed be positive and enhancing of performance. A learner may be driven by EM to perform a task with a disposition that is autonomous, agentic with a self-acceptance of its goals and values. The mechanism through which EM is internalised to make it autonomous is explicated by SDT (Deci & Ryan, 1985) as through the processes of internalization – taking in a value or regulatory process, and integration – transforming the values and regulation into his/ her own so it is assimilated into the individual's sense of self. This is potentially relevant when considering how cultural differences could wield an influence.

In considering a theory of motivation to include in the model of SRL constructed for the present research, TPB was preferred over SDT for several reasons.

Firstly, through the process of internalization, as espoused by SDT, EM is converted into IM that may not be much different from classic IM. Therefore, in terms of

measurements, it might be more difficult to measure EM. TPB measures SN more directly.

Furthermore, TPB allows for a mix of internal and external influences on motivational intention via a separation of ATT and SN. SDT does that to an extent but TPB arguably keeps those elements separate and distinguishable.

Within the TPB framework, these affective influences operate on motivational intention, not directly on behaviour. The point is behaviour itself is affected by circumstance and by perceived control which in maths learning is not under volition hence manifests through effort. Applied effort is affected by a form of control variable (SE) as argued; this is supported by Ajzen (2002) who suggests "…a case is made that measures of perceived behavioural control need to incorporate self-efficacy" p665 (Also see Kraft P, Rise J., Sutton S., and Røysamb E., 2005; Schwarzer, 2014).

In sum, the TPB, it can be argued, allows a relatively more differentiated approach to the different elements affecting motivated behaviour. It does that both theoretically and practically. That greater differentiation makes it easier to test and measure how culture might interact with the elements, providing the basis for a clearer model. Furthermore, it allows a greater elucidation of how the affective elements might interact with the more cognitive elements of SRL.

2.4.3 Empirical Studies on TPB, SE and Agency within Cultural Categories

A considerable amount of literature has been published relating TPB to cultural variation. These studies have explored and evidenced the influence of how people relate to each other and their sense of value in the two cultures in relation to subjective norms, attitudes and sense of efficacy.

For instance, the theory of planned behaviour was applied to research on the intention to quit smoking among Spanish and Norwegian students by Rise and Ommundsen (2011). They reported that a relatively more collective culture like Spain had subjective norms predicting intention to quit smoking more strongly than attitudes. The reverse was true of the individualistic Norwegian students. They concluded there was evidence of the moderating role of culture within the theory of planned behaviour.

Another study by Kam and Middleton (2013) into parent-child communication and its influence on drug taking behaviour among Latino-American and European-American

youths yielded similar results. Latino-American culture, they reported, was more collective and dominated by the concepts of 'familismo' - the family being at the centre of everyday life and living by obedience and loyalty to familial values -; and 'respeto' - having an expectation of deference to family values and mandatory respect for authority figures. Consequently, subjective norms were prevalent in counteracting the youth's disposition to drug taking behaviour.

Similar conclusions were drawn by Hagger, Chatzisarantis, Barkoukis, Wang, Hein, Pihu, Soos and Karsai (2007). In a physical activity context, they found that participants from a collectivist cultural background were influenced to a greater extent by the subjective norm construct relative to those from an individualistic culture. They also found a predominance of attitudes and perceived behaviour control (PBC) among the individualistic cultural background participants.

Although extensive research has been carried out on the moderating role of culture within TPB, very few studies exist which adequately cover its applicability within an authentic academic task context (eg see Ajzen & Madden, 1986; Kyle, White, Hyde, & Occhipinti, 2014; Sideridis & Kaissidis-Rodafinos, 2001).

Subjective norms and attitudes have also been found in empirical studies to influence individuals' sense of SE and agency. Due to people being the products of their social environment, their conceptions and agentic dispositions are influenced by their cultural environment.

This argument is summed up thus,

"American culture privileges a conception of agentic individual persons, whereas Chinese culture privileges a conception of agentic collectives (i.e. families, groups and organisations)" (Morris, Menon, & Ames, 2001 p172)

Crucial to an individual's sense of agency is their self-efficacy beliefs that prompt and enable their exertion of a level of control over their thoughts, feelings and actions. As Bandura (1985, p25) puts it, "what people think, believe and feel affects how they behave".

Morris, Menon and Ames (2001) present a model explaining how cultural representations of agency manifest in the consequences and behaviours displayed by

members of a society. A public representation of agency through texts and institutions is elucidated further by contrasting the American and Chinese culture. While the American (Western) texts are underpinned by the Judeo-Christian writings with emphasis on the individual soul and rights of the individual; the classical texts in Chinese culture like those of Confucius subordinate the individual and emphasises the collective good of the group, such as families and the community as a whole.

This was illustrated by Morris and Peng (1994) who found news reports of murders in the US focusing on an individual cause while a similar event will be reported by the Chinese as having a social cause. Public institutions also promote a similar trend since texts and institutions are closely inter-related.

This dichotomy of views is captured in the arguments around autonomy in the research literature. The definition of autonomy which is akin to volition is argued as playing a pivotal role in motivation. This is argued to be the case across different cultures. (Chen, Dong, & Zhou, 1997; Chirkov & Ryan, 2001; Ryan & Deci, 2000)

However, the universality of the pivotal role of autonomy claim has been challenged particularly by Iyengar and Lepper (1999). They found that the concept of autonomy had differing implications among Anglo American students and their Asian American colleagues. The Anglo American students, they reported, found decisions taken by themselves as more motivating while conversely, the Asian American students found decisions taken by 'in-group' others like mothers more motivating. The lack of choice (volition), they argued, did not lower their level of motivation. This they explained using self-construal theory (Markus & Kitayama, 1991). According to the theory, Western self-construal is independent while Eastern self-construal is interdependent. Therefore, a Western student stands to be motivated when they make independent (and volitional) decisions since they perceive themselves as unique individuals and want to stand out assertively in a group. The Asian American student according to Iyengar and Lepper (1999) will therefore be more motivated in situations that emphasise conformity to their group and less so when they have to be autonomous.

Bao and Lam (2008) used self-determination theory to attempt to expatiate on this. According to self-determination theory:

''the issue of autonomy concerns the extent to which one fully accepts, endorses, or stands behind one's actions'' (Chirkov, Ryan, Kim & Kaplan, 2003, p. 99).

It is therefore possible to feel highly autonomous even when following a choice made by others because as in the Asian American students, once they concur entirely with the in-group decision, it is internalised as an autonomous one (Bao & Lam, 2008; Iyengar & Lepper, 1999). Consequently, a sense of agency is developed by individuals in an individualistic society through a personal autonomous experience (personal agency) while in a collective society, it is sourced from the collective ideal (collective agency). In either case, agentic behaviour operates autonomously albeit developed from contrasting sources.

The implication is that the cultural dimension of individualism-collectivism impacts on SRL through its influence on the development of SE - identified as a key component of SRL skills (Bandura, 1985, 1997; Bong & Skaalvik, 2003), since individualist and collectivist cultures produce varying manifestations of the self.

In individualistic cultures, children are appraised on their individual performance therefore performance outcomes are of utmost importance. The source of self-efficacy will therefore be experiential and based on self-appraisal (Oettingen, 1995; Oettingen & Zosuls, 2006). This is in contrast to a collectivist culture where the in-group members are very influential in developing self-efficacy through vicarious modelling (vicarious self-efficacy) and feedback (received self-efficacy).

Due to the hypothesised relative differences in the nature of acquisition of SE in individualistic and collectivist cultures, performance may relatively have a stronger influence in individualistic culture since SE acquisition is experiential.

Li (2006) writes about a concept esteemed in Chinese culture - learning virtues. These comprise personal resolve, diligence, endurance of hardship, perseverance and concentration. These so-called learning virtues are elements that enhance self-efficacy beliefs as argued by Pajares (2002). Cultural norms and values are inculcated in the growing children therefore they behave and act accordingly as a matter of course. All the symbols, agents and transmitters of culture and norms of expected behaviour model these virtues and a Chinese child behaves in that particular way (which incidentally promotes academic excellence); since they defer to the collective,

they are driven by vicarious SE and received SE because that is what they are surrounded by.

According to Bandura (2001), the concept of human agency is extendable to collective agency by the precepts of social cognitive theory. According to this theory, if people have a strong shared belief in their collective ability to achieve results, it produces collective agency that is as powerful as personal agency. The interaction of the group-level dynamics leads to an emergent efficacy drawn from the collective. Beliefs of efficacy drawn from the collective, according to Bandura, function in a way similar to personal efficacy beliefs and manifest through similar means. Bandura further argued that evidence from research showed that:

"the stronger the perceived collective efficacy, the higher the groups' aspirations and motivational investment in their undertakings, the stronger their staying power in the face of impediments and setbacks, the higher their morale and resilience to stressors, and the greater their performance accomplishments" (Bandura, 2001 p14)

Since culture is a social construct, different cultures will produce different strengths and manifestations of SE whether collective or personal. Culture is likely therefore, to have a big part to play in SE and the performance of individuals.

2.4.4 Models of SRL- Collective versus Individual Cultures

As discussed and corroborated by extant research in the preceding discussion, the extent of development of the components in the SRL skills model and the interaction between the components are likely to vary according to the cultural dimension - individualistic or collectivist.

In collectivist cultures, such as that of China, since the individual sees themselves as part of a closely knit collective, they are guided by the expectations of the group. Individuals are steeped deeply in the roles, obligations and orientations within their social network. In such a culture, the boundary between the self and others is relatively less distinct. Individualistic cultures, on the other hand, such as that found among white Britons, are characterised by individual autonomy and relative independence from others within the society. The self is characteristically distinct and effort to promote individuality is generally regarded positively (Hamamura & Heine, 2006).

This distinction in how collectivist and individualistic societies work towards becoming a 'good person' has implications for SRL skills. Since SRL skills direct one's cognitions, motivations and behaviour and are prerequisites for the attainment of goals and achievement (Pintrich & Degroot, 1990); and social norms and goals which direct psychological processes are influenced by culture, SRL patterns should also vary in accordance with this cultural dimension. The two models presented below, which are derived from a synthesis of existing literature and the application of differential emphases on self-esteem and face, capture the nature of the hypothesised differences between collectivist and individualistic cultures respectively.

The interaction between the various components is similar (but clearer because it actually operationalises how they influence performance) to the cyclical three phase model of SRL presented by Zimmerman (2008). The models demonstrate how motivation variables correlate with the cognitive ones during the forethought phase leading to actual task performance; then evaluation feeding back into motivation and affect and the cognitive variables. The dimensions of the models are explained in more detail below.

The model of SRL theorising how the elements interrelate in collective culture is shown in Figure 2.5. The model for individualistic culture is shown in Figure 2.6. The figures show the key variables and both the nature and direction of the relationship between them. These 'parameters' are numbered for ease of reference in the explanatory text that follows.

Figure 2.5: Model of SRL for Collectivist Cultures
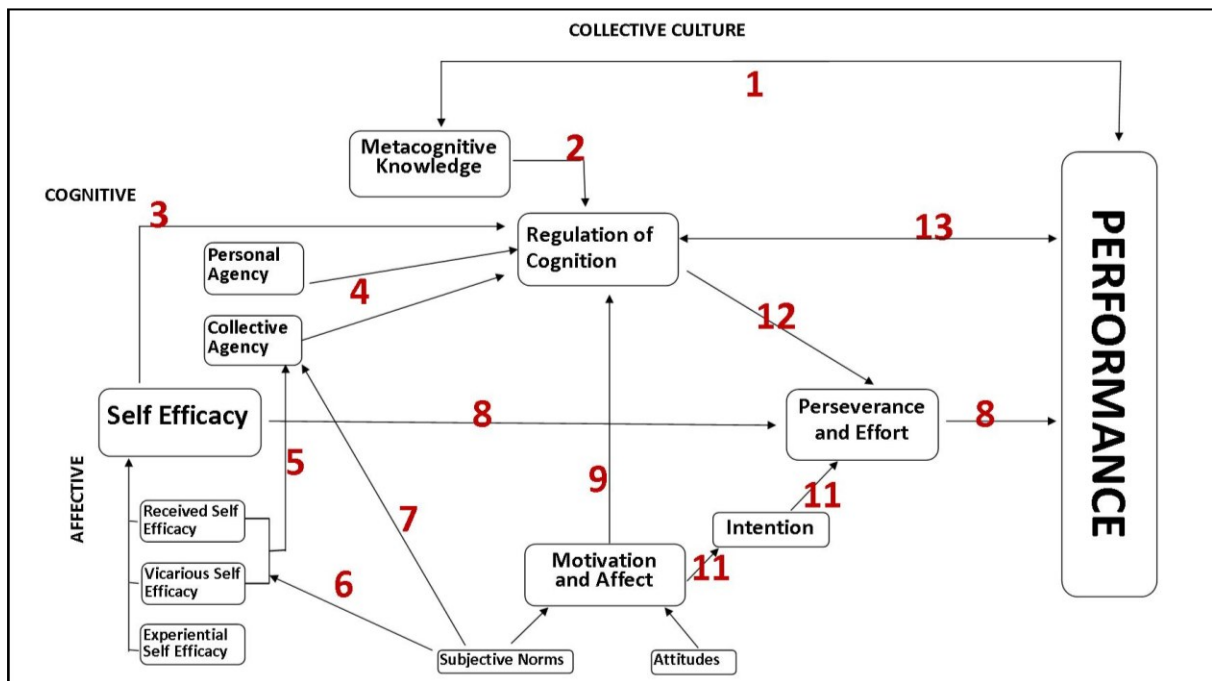
Figure 2.6: Model of SRL for Individualist Cultures
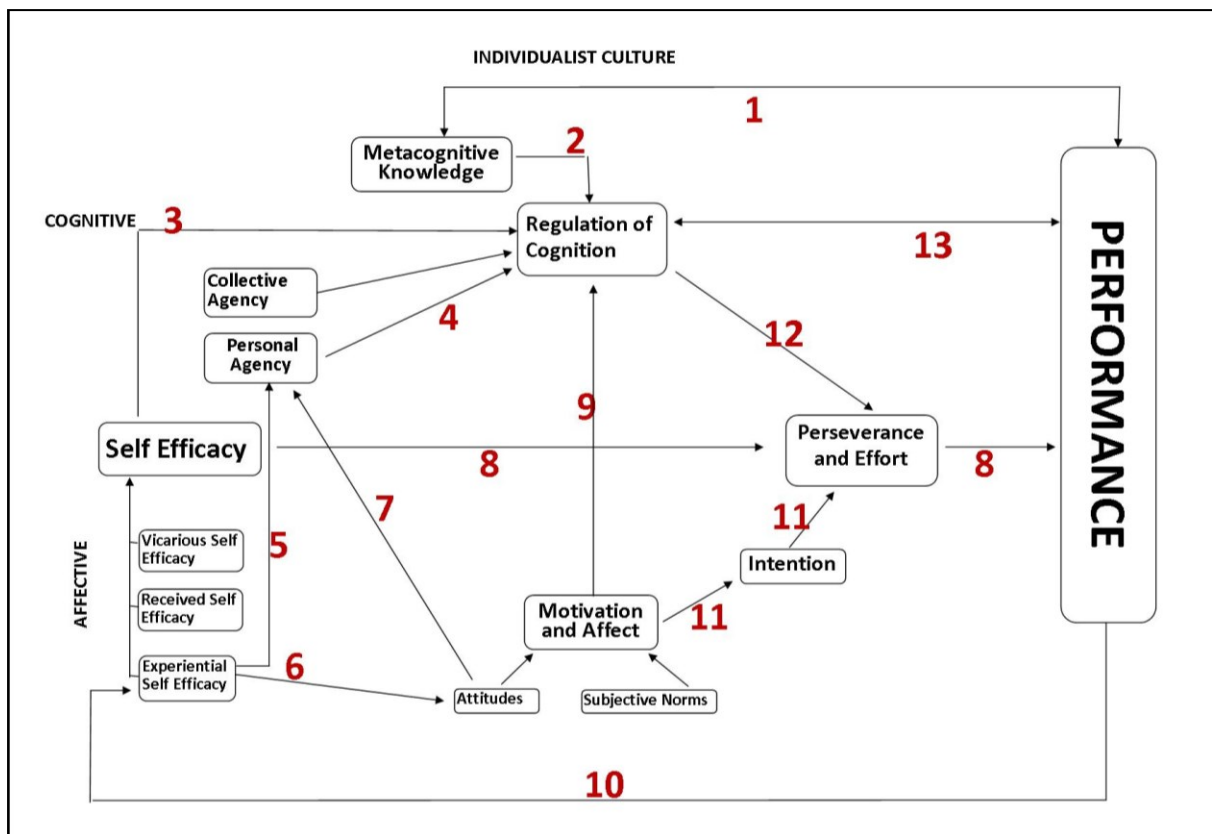
2.4.5 Models Explained

What follows is a description of the hypothesised relationships between the variables in the two cultures broken down according to the numbered parameters in the figures and where available, the evidence for them. It also explains the nature of the parameters.

1 MK and Performance

There is a dialectic relationship between MK and performance. MK is informed by prior experience therefore the experience gained from performing a task contributes to MK. On the other hand, MK influences performance as the task progresses. MK has been explained as involving three forms of knowing - declarative (knowing that) and procedural (knowing how) (Papaleontiou-Louca, 2008) and conditional (knowing when) (Harris, Santangelo & Graham, 2010). They all reported the strong relationship between MK and performance. A learner having a good understanding of how they learn best and the best strategies to suit the learning conditions coupled with the steps he/ she needs to take under the prevailing conditions is able to perform better than one who does not have those resources.

For instance, Hauck (2005) studied the influence of MK on the performance of foreign language students in a computer assisted language learning context. She found that learning related exercises that improved learners' MK led to an improvement in their subsequent learning and performance. Her findings led her to recommend an inclusion of MK enhancement strategies alongside the language learning programme.

Furthermore, in a study of MK between disabled and non-disabled students by Hall and Webster (2008), they found the individuals from both groups who had high MK also had corresponding high academic success as opposed to those with lower MK and consequently poorer academic success.

As discussed in previous sections, based on the predictions of the potential influence of culture on SRL variables, it is expected that there will be no differences between the two cultural groups in the MK-performance relationship.

2 MK and RC

MK directly influences cognitive planning within RC. This is because planning involves the activation of prior knowledge; it determines the cognitive resources that a learner

deploys to perform a task since its activity is an awareness of the strengths and weaknesses in relation to and contingent to their internal and external conditions. This is supported by Flavell (1979) who showed a relationship between metacognitive knowledge and metacognitive control in his model of metacognition.

According to Pintrich (2002), MK is important for academic performance because it influences other cognitive processes such as regulation and control. The influence of MK is therefore likely to be mediated by RC in academic performance. This observation is supported by Efklides (2014) who admitted it is sometimes difficult to distinguish between aspects of the two processes. This is because, for instance, the monitoring and control function of RC relies on input from MK functions such as knowledge of strategy and task variables.

The two processes, although different, are inextricably linked. It is predicted culture has no influence on this relationship so both models from the dimension of culture are expected to be similar for these variables.

3 SE and RC

SE - the belief by the learner that they have the requisite ability and resources to successfully carry out a task influences RC. This is supported by Wigfield, Klauda and Cambria (2011) who gave an exposition on the phases of self- regulation as outlined by Pintrich and Zusho (2002).

The first phase was identified as 'forethought and planning'. At this foremost phase, the learner plans their course of action and sets goals. A high level of SE during forethought and planning leads to the learner setting high and ambitious goals. This in return causes the learner to deploy all the strategies within their cognitive arsenal to enable them to achieve their goals - albeit high and ambitious (Pajares, 2008; Zimmerman & Cleary, 2009).

Wigfield, Klauda and Cambria (2011) argued that SE is an important predictor of cognitive strategy deployment and use in learning contexts. This is supported by many researchers in the field (e.g. Miller, Greene, Montalvo, Ravindran & Nichols, 1996; Nolen, 1988; Wolters & Pintrich, 1998)

Furthermore, Pajares (2008) reported that students with high SE used more cognitive and metacognitive strategies than students with low SE and Zimmerman and

Martinez-Pons also found a positive relationship between students' SE in mathematics and their SRL strategy use.

4 Agency and RC

Bandura (2001) suggests a link between personal agency and cognitive regulation. He used the phrases 'purposive assessing', 'intentional mobilization' and 'deliberative processing' to describe how an individual processes information, selects and regulates a particular course of action.

Winne (2011) observed that a sense of agency by a learner was a requisite for viable self-regulation. This is because for the learner to engage in self-regulation, they must of necessity expect that what they do 'matters' - that their actions influence the resultant outcomes. Winne (2011) therefore suggested there was a positive relationship between agency and regulation of cognition.

In individualistic culture, personal agency is hypothesised to be the predominating influence on RC while collective agency will be the predominant factor in collective culture. However, they are parallel influences; culture only determines the relative dominance of one over the other.

5 SE and Agency

SE influences agentic behaviour. By conceptual definition, agency and SE are inextricably linked. For instance, Willey and Gardner (2016) define agency as: "agency is having a sense of power, and the ability to take actions that the individual believes will contribute to their progress towards a particular goal or intention" (p2). When this definition of agency is considered with that of SE which is '…the belief that one has the resources to successfully carry out a task', their relatedness becomes apparent. Willey and Gardner reported a positive correlation between SE and agency.

A similar result was reported by Kártyás (2016) who investigated the relationship between SE and agency in a sample of Hungarian adults. The positive relationship found affirmed the researcher's argument that the two concepts could be used synonymously. This provides evidence of the positive relationship between the two variables in the models. The expected point of departure is the source of SE that is predicted to be dominant in each culture.

In collective cultures, the predominance of received SE and vicarious SE should lead to collective agency. In individualistic culture, experiential SE being predominant should influence personal agency.

6 SE and Motivation

Self-efficacy is considered as one of the main sources of motivation in SRL (Bandura, 2004; Schunk, Pintrich & Meece, 2008).

Since culture has an influence on how and to what extent SE develops in an individual, the relationship between SE and motivation is likely to be influenced by culture - whether individualistic or collectivist.

In individualistic culture, the relationship will be in the direction of experiential SE influencing attitudes.

However, in collectivist culture, received and vicarious SE are influenced by subjective norms.

7 Agency and Motivation

A heightened motivation and affect through attitude in individualistic society will serve as a strong motivator leading to a high sense of personal agency. This has been corroborated by research by Walls and Little 2005, who used a structural equation model of four different motivational styles to find their effect on two aspects of agency - personal and effort. The model reflected an overall fit supporting the hypothesis agency plays a mediational role between positive school adjustment (attitude) and motivational self-regulation.

Due to the prevailing influence of self-determined action in personal agency, this will be prevalent in individualistic culture relative to a collective one. In a collective culture, the influence of subjective norms should lead to the prevalence of collective agency.

8 SE and Perseverance & Effort

Pajares (2008) reported that students with high SE worked harder and persevered for longer than students with low SE. Furthermore, Collins (1982) reported similar results from his study of students who varied in maths ability and maths SE. Regardless of the students' level of ability in maths, those who had high SE performed much better and persisted in difficulty than those with low SE.

Pintrich and Degroot 1990 discuss persistence as an important component of SRL skills in classroom academic performance. They explain that students who persist at a difficult task are able to maintain cognitive engagement with the task, consequently resulting in better performance.

Due to the influence of culture, it is predicted for received and vicarious SE to be predominant in collective culture in its relationship with perseverance. In individualist culture, it is predicted for experiential SE to predominate.

9 RC and Motivation

Kouneiher, Charron and Koechlin (2009) reported a relationship between motivation and cognitive control - one of the main component processes of RC at the neural level.

Students' high motivation towards performing a task creates a propensity to use their cognitive skills. Wolters and Pintrich (1998) found that students' high task value rankings (motivational element) significantly predicted their use of cognitive and self-regulatory strategies. McInerney (2008) in describing the influence of motivation on SRL, reported collective culture having parental and family influences being prevalent relative to individualist culture.

It is predicted that motivation will have a relationship with RC in both cultures. The difference is expected to be the driving force of motivation – SN in the collectivist culture and ATT in the individualist.

10 SE and Performance

In individualistic cultures, children are appraised on their individual performance therefore performance outcomes are of utmost importance. The source of SE will therefore be experiential and based on self-appraisal (Oettingen, 1995; Oettingen & Zosuls, 2006). This is in contrast to a collectivist culture where the in-group members are very influential in developing SE through vicarious modelling and feedback (received SE)

Due to the relative strengths of the nature of acquisition of SE in individualistic and collectivist cultures, performance may relatively have a stronger influence in individualistic culture since SE acquisition is experiential and hypothesised to be relatively insignificant in collective culture. Therefore, it is predicted there will be a

relationship between experiential SE and performance in the individualistic group but not in the collectivist group.

11 Motivation and Perseverance & Effort

That motivation is an important factor in determining whether an individual perseveres at a task is well established. (e.g. Gao, Lee, Xiang, & Kosma,, 2011; 2; Vollmeyer & Rheinberg, 2000).

Zimmerman (2011) argues that high motivation helps students to self-regulate their learning because it increases their effort and persistence at difficult or time-consuming tasks.

Schiefele and Rheinberg (1997) also argued that motivation can affect persistence and frequency of learning activities. In the TPB, motivation is framed in intention that mediates perseverance and effort.

Both collective and individualistic culture should display the motivation that influences perseverance and effort. The only predicted difference will be in the driving force behind such motivation. Individualistic culture will be driven by attitude while collectivist will be by subjective norms according to the TPB.

12 RC and Perseverance & Effort

According to Wigfield, Klauda and Cambria (2011), persistence is an indicator of the learner having the ability to self-regulate. They suggest the quality of persistence takes place during the 'monitoring and control' phases of self-regulation. Appropriate regulation aids perseverance and effort by allowing it to be productive.

13 RC and Performance

There is an established body of knowledge supporting the positive relationship between RC and academic achievement. Research by Zulkiply, Kabit and Ghani (2008) has shown that metacognitive regulation (RC; Pintrich, 2002) had a direct influence on academic performance. Pintrich (2000) describes RC as the different cognitive strategies a learner uses for task performance.

> "One of the central aspects of the control and regulation of cognition is the actual selection and use of various cognitive strategies for memory, learning, reasoning, problem solving, and thinking" (Pintrich 2000)

This has been supported by a study in Russia by Morosanova, Fomina and Bondarenko (2014) who studied 14 to 16 year old students' self-regulation and how it predicts mathematical achievement. They found that conscious self-regulation (or RC) had a direct effect on maths performance and achievement; also, RC had a significant mediating effect between general intelligence and both formative and summative maths performance.

From the preceding discussions about the potential interaction between SRL and culture, it is expected that cultural variables will not have an influence on the relationship between RC and performance. The predicted relationships are consequently expected to be the same for both models – individualistic and collectivist.

In this chapter, there has been a focus on the construct of SRL and some of the prominent theoretical models built on the basis of social cognitive theory. There has also been an expatiation of a model of SRL created for the current research. The new model featured the proposed conceptual advancement in SRL – fusion of SRL and TPB – that enables the operationalisation of how cultural variables could exert an influence within the SRL framework. The next chapter will begin a series of chapters that present studies based on clear hypotheses that investigated the models of culture to test out the predictions made about how culture could influence SRL variables.

The description of the parameters above constitutes specific hypotheses about the relationships between the variables; the overarching hypothesis is that culture impacts on the nature and operation of the motivational dimensions of SRL, not the cognitive ones. A summary of the hypotheses is presented in Table 2.2 below:

Table 2.2 Summary of Hypothesised relationships

	Group	Hypotheses
Hypothesis 1	Chinese	In collective cultures, Motivation is influenced by the perceived values of important others – what is termed the Subjective Norm
	White British	In individualist cultures, the Motivational construct is influenced primarily by Personal Attitudes
Hypothesis 2	Chinese	There is a relationship between Subjective Norms and Collective Agency in collective communities
	White British	There is a relationship between Attitudes and Personal Agency
Hypothesis 3	Chinese	Received and Vicarious SE is related to Subjective Norms
	White British	Experiential SE is related to attitudes
Hypothesis 4	Chinese	In collective communities, RSE and VSE has a greater influence on Perseverance and Effort
	White British	In individualistic communities, ESE influences Perseverance and Effort.
Hypothesis 5	White British	In individualistic communities, ESE is more strongly related to the experience of past performance.
Hypothesis 6		In general, cultural differences relate to the influence of the affective variables but not the cognitive ones

Chapter 3

Study 1

3.1 Introduction

This study examines the way(s) in which culture affects the guiding influences on SRL skills. Since the potential impact of culture has been outlined through clearly defined hypotheses, it was necessary to collect quantitative data on each of the variables in order to enable a statistical analysis to test the viability of the hypotheses in the first instance. Therefore, Study 1 was conducted to test the models proposed for the two cultures – individualist White British and collectivist Chinese.

This chapter outlines the design and conduct of the study, including the main findings. It starts with a discussion about the challenges surrounding measurement of SRL and a description of the tools used and how they were developed. This is followed by an outline of the study design and the actual process of data collection. The chapter concludes with a presentation and discussion of the main findings.

3.1.1 Measuring SRL

Research into SRL and its impact on learning and performance emerged over three decades ago. The interest was in how learners developed into owning and becoming 'in charge' of their own learning processes (Zimmerman, 2008). Research sought to unravel how learners translate academic aptitudes into academic performance.

As improvements were made to theoretical paradigms and methodologies, research in SRL has evolved accordingly (Boekaerts, Pintrich & Zeidner, 2000). For instance, some of the early efforts at SRL research focused on processes such as strategy use and imagery. Learners were trained in the use of an SRL process and tested to see if there were subsequent improvements in performance. However, it was found that there was little application of the skills learnt in the experimental conditions in real classroom contexts (Zimmerman, 2008). The challenge in measuring SRL is that many of its facets are not readily visible and observable (Winne & Perry, 2000). It became apparent theoretical and methodological improvements were needed.

Most of the earlier measurement instruments developed were questionnaires and used mainly with college students (e.g. see Index of Reading Awareness - Jacobs & Paris, 1987; Learning and Study Strategies Inventory [LASSI] 1st Edition - Weinstein,

Schulte & Palmer, 1987; Motivated Strategies for Learning Questionnaire [MSLQ] - Pintrich, Smith, Garcia, & McKeachie, 1991; Metacognitive Awareness Inventory [MAI] - Schraw & Dennison, 1994)

One of the defining moments in SRL research was at the American Educational Research Association (AERA) annual conference in 1986 where a unified rubric of SRL was established. Zimmerman (2008) describes this landmark event thus:

"It sought to integrate under a single rubric research on such processes as learning strategies, metacognitive monitoring, self-concept perceptions, volitional strategies, and self-control by researchers such as Monique Boekaerts, Lyn Corno, Steve Graham, Karen Harris, Mary McCaslin, Barbara McCombs, Judith Meece, Richard Newman, Scott Paris, Paul Pintrich, Dale Schunk, and others. An outcome of the 1986 symposium was an inclusive definition of SRL as the degree to which students are metacognitively, motivationally, and behaviourally active participants in their own learning process (Zimmerman, 2008 p167)".

Subsequently, a variety of measurement instruments were developed by researchers of SRL that assessed it as a metacognitive, motivational and behavioural construct.

SRL has been studied using a variety of measures, such as self-report questionnaires (Pintrich, Smith, Garcia, & McKeachie, 1993); structured interviews (Zimmerman & Martinez-Pons, 1988); teacher rating scales (Cleary & Callan, 2014; Zimmerman & Martinez-Pons, 1986); behaviour traces – logged data on how a learner carries out their learning activities using specialised software and its tools on a computer, (Winne & Perry, 2000); direct observations (Bryce & Whitebread, 2012; Corno, 2001); diaries (Randi & Corno, 1997) and think-aloud (Moos & Azevedo, 2008).

3.1.1.1 Learning and Study Strategies Inventory (LASSI)

One such instrument was the (LASSI; Weinstein, Schulte & Palmer, 1987). LASSI is a self-report inventory (80 items) that assessed the strategies used by learners for enhancing their study practices. It involves 10 scales that assess: skill, will, and self-regulation strategies. This presents with a system of classification that corresponds with a metacognitive, motivational, and behavioural definition of self-regulation. The list of subscales is presented below:

(1) attitude and interest,

(2) motivation, diligence, self-discipline, and willing- ness to work hard,

(3) use of time management principles for academic tasks,

(4) anxiety and worry about school performance,

(5) concentration and attention to academic tasks,

(6) information processing, acquiring knowledge, and reasoning,

(7) selecting main ideas and recognizing important information,

(8) use of support techniques and materials,

(9) self-testing, reviewing, and preparing for classes, and

(10) test strategies and preparing for tests. (Winne & Perry, 2000)

Scales classified as skill (or metacognition) include Concentration, Selecting Main Ideas, and Information Processing. Scales classified as will (or motivation) include Motivation, Attitude, and Anxiety. Scales classified as self-regulation (or behaviour) include Time Management, Study Aids, Self-Testing, and Test Strategies (Zimmerman, 2008).

Students respond to items in each subscale using 5-point ratings that range from 'not at all typical of me' to 'very much typical of me'. There is an elaboration of each of the options with a sentence in instructions to students. For instance, "By fairly typical of me, we mean that the statement would be true of you about half the time."

The LASSI has gone through revisions down to the current version – the 3rd edition. The 3rd edition has a reduced number of items from 80 to 60. Each scale consists of 6 items as opposed to 8 items from the earlier editions. Furthermore, the Study Aids Scale is replaced with a new scale - Using Academic Resources (UAR) - which is consistent with the current conceptualisation and research in SRL and student learning assistance (Weinstein, Palmer & Acee, 2016). UAR assesses learners' help-seeking choices and behaviours. For instance, what choices do they make if they encounter difficulties in a coursework or assignment and therefore need help? Do they seek help from a writing centre; seek help from a tutor; or consult a peer? On the other hand, do

they make a choice to avoid seeking help? A further new item was added to the Motivation Scale to address students' effort to reflect current conceptions of the motivation components of SRL.

3.1.1.2 Motivated Strategies for Learning Questionnaire (MSLQ)

Another questionnaire developed to measure SRL that was widely used is the MSLQ (Pintrich, Smith, Garcia, & McKeachie, 1993). It is an 81-item questionnaire composed of two major sections: Learning Strategies and Motivation. The Learning Strategies section is further divided into a Cognitive-Metacognitive section, which includes rehearsal, elaboration, organization, critical thinking, and metacognitive self-regulation; and a Resource Management section, which includes behaviours such as managing time and study environment, effort management, peer learning, and help seeking (Zimmerman, 2008). The motivation category has a value section with three subscales - intrinsic goal orientation, extrinsic goal orientation, and task value. There is also an expectancy section that consists of three subscales - control of learning beliefs; self-efficacy for learning and performance; and test anxiety (Winne & Perry, 2000). The three sections - the motivation, cognitive-metacognitive, and the resource management strategy section - correspond to the three elements in the definition of SRL: motivation, metacognition, and behaviour. Students respond to questions on these scales using a 7-point rating scale that range from 'not at all true of me' to 'very true of me'.

3.1.1.3 Self-regulated Learning Interview Scale (SRLIS)

A third instrument – an interview protocol - that was used to assess SRL as a metacognitive, motivational, and behavioural construct is the Self-Regulated Learning Interview Scale (SRLIS; Zimmerman & Martinez-Pons, 1986, 1988). Like the others discussed previously, the SRLIS was developed for use primarily with high school and college students. The SRLIS is a structured interview protocol where students are presented with six problem contexts to which they are asked to respond, such as preparing for a test or writing an essay. The answers given by the student to these open-ended questions are then transcribed and coded. They are assigned to one of 14 categories of self-regulation that focus on motivation, metacognition, or behaviour. Included among the motivation categories are self-evaluation reactions and self-consequences. Included among the metacognitive categories are: goal setting and

planning, organizing and transforming, seeking information, and rehearsing and memorizing. Included among the behavioural categories are: environmental structuring; keeping records and monitoring; reviewing texts, notes, and tests; and seeking assistance from peers, teachers, and parents (Winne & Perry, 2000). To score the interviews, first, a dichotomous score is assigned that describes whether a student uses a class of SRL. Then students' answers to each learning context were recorded for their frequency, and students are also asked to rate their consistency in using a particular strategy using a 4-point scale: seldom, occasionally, frequently, and most of the time.

Each of these instruments measured processes that can be classified as self-regulatory according to the three defining SRL criteria, but some of the names of these processes varied. For example, both the LASSI and the MSLQ listed anxiety as a component of motivation, whereas the SRLIS interview would have coded anxiety responses as a form of self-evaluation reactions. These variations in names are probably due to differences in the assessment instruments. The LASSI and the MSLQ were both retrospective reports, whereas the SRLIS involves prospective answers to hypothetical learning contexts (Zimmerman, 2008).

3.1.1.4 Metacognitive Awareness Inventory (MAI and Junior [Jr] MAI)

This is a self-report instrument developed by Schraw and Dennison (1994) that has 52 items. It has components grouped under eight processes each comprising of multiple items. Metacognition is conceptualised under two main processes – knowledge and regulation of cognition; the eight processes are subsumed under those two main processes. The knowledge of cognition scale measures awareness of one's strengths and weaknesses; knowledge about strategies, and why and when to use them. The regulation of cognition scale assesses knowledge about planning, implementing, monitoring and evaluating strategy use (Sperling, Howard, Staley & DuBois, 2004). The two main processes used in the MAI were in agreement with the prevailing conceptualisation of metacognition (Brown, 1978, 1987; Flavell, 1987).

The MAI has been used with some success by many researchers (Balcikanli, 2011; Kallio, Virta, Kallio, Virta, Hjardemaal & Sandven, 2017; Sperling, Howard, Miller & Murphy, 2002 [JrMAI], 2004; Young & Fry, 2008) although contradicting reports about its reliability and validity has also been reported (e.g. see Harrison & Vallin, 2017; Teo

& Lee, 2012), while others such as Berger and Karabenick (2016) have questioned the effectiveness of self-report measures of metacognition altogether.

Sperling et al. (2002) developed the Junior version of the Metacognitive Awareness Inventory (Jr. MAI) based on the MAI. It was specifically for use with younger students from grades 3 to 9. A 12-item version 'A' was to be used by those in grades 3-5 and an 18-item version 'B' was to be used by students in middle school (grades 6 to 9).

3.1.1.5 Think/talk Alouds

There was a long time after the turn of the 20th century where stimulus- response protocols were the main means of research used by psychologists. However, there developed a need to unravel the cognitive mechanisms and processes that underpinned the behaviours being observed.

One means many researchers resorted to for a more detailed understanding of those internal cognitive mechanisms was the use of verbal methods. (Ericsson & Simon, 1993) They also posited that the verbalisations are generated through the cognitive processes that underpin the observable behaviours and actions. The subject simply expresses out loud those thoughts that occur naturally as they think through solving a problem or carrying out a task. Talk aloud protocols reveal the aspects of thinking and reasoning that are consciously available in working memory. It provides observations in a sequence over a period of time. Therefore, changes in working memory that occur during a problem-solving task can be tracked over the duration of the task until completion. Furthermore, not only does the talk aloud protocol shed light on the internal cognitive mechanisms of an individual's problem solving, it shows the strategies used by different people to solve the same problem (Van Someren, Barnard, & Sandberg, 1994).

Since those verbalisations are generated from the short-term memory, argued Ericsson and Simon 1993, they are untainted by the individual's perceptions that sit mainly in the long term memory. The 'talk alouds' are furthermore insulated from the individual's interpretations and personal biases as the verbalisations are purely the outpouring of the cognitive processes taking place during a task performance (Van Someren, Barnard, & Sandberg, 1994).

Furthermore, according to Kelly and Capobianco 2012, when studying cognitive strategies used by children, it is critical to allow them to communicate their thoughts in a natural way so as to eliminate the risk of the researcher imposing upon the child's natural cognitive strategies.

However, there were doubts about the reliability and validity of the data gathered through such means. Some subjects may struggle with the demands of focusing on the task and at the same time talking out aloud about what they might be thinking. Also, verbalisations from this protocol are often incoherent (Ericsson & Simon, 1993). Another criticism of the method is that an individual can only verbalise those thoughts they are aware of consciously. Hence, whatever the individual does that occurs automatically may end up being missed.

Moreover, the need for the subject to verbalise may influence the strategic use of knowledge either negatively or positively. This may potentially tarnish the integrity of the cognitive strategies deployed and observed during the task performance.

Methodological improvements in the 1980s and 90s have led to an increasing use of such methods in psychological research. (Austin & Delaney, 1998). For instance, Wulfert, Dougher, and Greenway (1991) first trained participants in how to talk aloud during a problem solving task before actually proceeding to collect data. However, Gibson (1997) cautioned against researcher modelling and coaching about how to carry out think alouds as it could 'lead' the participants into using particular strategies. The protocol is meant to capture those processes that occur naturally and that must be guarded robustly. It however does not debar the researcher from providing a brief and appropriate orientation so as to eliminate the 'cold start effect' (Gibson, 1997).

This technique often uses a two-step process. In the first step, the researcher first collects real-time data asking the participants to think aloud. There is very little distraction through probing or prompting. In the event of a prolonged period of silence, the researcher could simply prompt using a neutral statement such as "keep talking". Sugirin (1999) chose to use a 'keep talking' sign for a neutral prompt to remind participants to verbalize all thoughts instead of addressing them in speech as it might interfere with the thinking taking place in working memory.

When the first step of talking aloud is complete, there is a retrospective analysis; the researcher asks follow-up questions to clarify any aspects of the first step.

The think aloud method has clear advantages over other verbal methods as it avoids the problem of interpretation by the subject. It also treats the verbal protocols that are available to everyone who might want to verify them as data, hence makes it a very objective method.

Pettigrew (2005) reported research in UK schools with children aged 7 -14 about their interaction with computer software using a 'talk aloud' protocol to generate data. One main finding was that the children found concurrent verbalisation easier than retrospective cognitive 'talk-throughs'.

Baauw and Markopoulos (2004) also compared talk aloud protocol with post task interviews as a data collection tool on usability of computer software. They found that the children, aged 9-11years, reported more problems during the talk alouds than post task interview. They also found boys reported fewer problems than girls did. Interestingly, they reported the boys had a similar number of problems with talk alouds as during the post task interviews. They also found no significant differences between the two methods and observations.

Think aloud protocol has been used successfully analyse children's interactions with reading texts. Sainsbury (2003) reports remarkable success with seven year olds. Since the interest was in unravelling the internal cognitive processes children use in interaction with reading texts, think aloud protocol was the most viable tool available. After training the children about how to 'think aloud', they proceeded to the actual text where the children thought aloud their impressions of the text as it went on. The researcher observed think aloud opened a window into the reader's understanding and yielded information that would not otherwise have been gathered through any other method (Sainsbury, 2003).

3.1.1.6 Observation

A prominent advocate of using an observational approach to measure metacognition and SRL in young children is Whitebread, Coltman, Pino Pasternak, Sangster, Grau, Bingham, Almeqdad and Demetriou (2009) because although there were various

observation instruments used by early years researchers, none existed specifically for the purpose of SRL assessment with young children.

Observational tools, it is argued, allows researchers to make more valid assessments of metacognition and SRL in children as young as 3-5 years (Whitebread et. al., 2009). It overcomes the difficulties associated with a reliance on children's verbal abilities that plague other SRL measures. It also overcomes the difficulties that arise as a result of children's limited working memory capacities.

Observation enables an ecologically valid assessment taking account of contextual factors in children's performance as it takes place in naturalistic settings. An advantage of observation methods is that it records what a learner actually does, rather than what he/she remembers or believes happened. Also, it allows the researcher to see the links between a learner's behaviour and the context of the task; non-verbal behaviour could also be assessed. Furthermore, as previously stated, they do not rely on the learner's verbal ability.

Key to an observational approach is the development of a coding system that sets the criteria by which SRL components are assessed. The approach enables SRL to be assessed as an event as data is collected during actual learning or problem solving (Cazan, 2012).

3.1.1.7 Computer Based Learning Environments (CBLEs)/ Traces

A computer based research tool – nstudy has been developed by Winne and colleagues to collect trace data on learner's metacognition (Beaudoin & Winne, 2009; Winne, Jamieson-Noel & Muis, 2001).

It is premised on the idea that learners do not behave randomly and that mental operations (cognitive and metacognitive events) generate observable behaviour; nstudy provides the opportunity to trace those cognitive events.

Nstudy is a web based software application. It is designed to enable students to study information online, at the same time producing trace data about their cognitive and metacognitive events. As a learner navigates the pages of the software, it keeps traces of their activity that provides insight into their thinking, how they regulate and react to changing contexts by recording extensive, fine-grained, time-stamped data. The data

about how a learner interacts with information is then collated to tell researchers how the student learns or thinks about their learning (Winne, 2010).

It gathers records of a learner's behaviour (traces) providing information about their cognition and metacognition. Traces of cognitive events are logged whenever a learner carries out an action such as opening a file or bookmark to a page, information logged would include the title of the window containing the item clicked, the time, title of item and the next piece of action after that.

An instance of a logged cognitive event is when a learner makes a choice to bookmark a page. This indicates the learner is forecasting that the information will become useful in future. It traces cognitive strategy use, planning and monitoring.

Winne (2010) argues that an advantage of nstudy over the other tools for measuring SRL is that it takes into account the fact that SRL is contextual. Nstudy's strength is in its ability to generate traces that are approximately simultaneous with the cognitive event in operation as the learner applies information from working memory. Traces generated are live to the conditions the learner encounters and a learner is also able to modify the conditions as they monitor the conditions – nstudy is able to log traces of such.

A property of SRL that makes it a challenge to conceptualise and to measure it is that it has properties of both an aptitude and an event (Winne & Perry, 2000). An aptitude can be described as a relatively enduring attribute of a person that predicts future behaviour. For instance, if a student answers a simple question about whether he/she often adapts the way they study to fit the context of school tasks and they answer with a 'Yes', a prediction might be made that they would approach studying for a multiple-choice test in future in a different way from how they prepare to write an essay. An event can be likened to 'a snapshot that freezes activity in motion, a transient state embedded in a larger, longer series of states unfolding over time' (Winne & Perry, 2000).

In general, most measures are derived from the two conceptualisations of the construct of SRL: as an aptitude or an event. These have led to two corresponding ways of measuring them - aptitude measures or event measures (Winne, 2010; Winne & Perry, 2000). These ways of conceptualising SRL have evolved over time as the

construct of SRL has developed in its definition and operationalisation. According to Boekaerts and Corno (2005), SRL as a construct was initially viewed as a set of stable characteristics of an individual hence was measured using a de-contextualised trait-like approach. This is because traits are seen as being stable over time. Even though an individual's behaviour would be expected to fluctuate from one situation to the other, there is a noticeable core attribute that is consistent enough to define an individual's true nature – the so called 'unchangeable spots of the leopard' (Matthews, Deary & Whiteman, 2003). Measures such as teacher rating scales, structured interviews and self-report questionnaires were used to tap into those stable traits. The static view of SRL was challenged leading to a more contextualised dynamic view of SRL. Endedijk, Brekelmans, Sleegers and Vermunt (2015) further divide the measures into 'online' or 'offline' in relation to *when* SRL is measured – online measures are done during specific task situations while the reverse is true for offline.

Aptitude measures (essentially traits) are based on how aptitudes are conceptualised: any measurable characteristic of an individual that is a requisite for successful goal achievement. This implies a difference in individuals' preparedness and dispositions to learning. Aptitudes therefore account for observed differences in how learners interact with situations and contexts (Snow, 1991; Winne, 2010). The measures most commonly take the form based on traits as mentioned previously. A researcher may choose to use one of these tools for conceptual reasons; however, choice may sometimes be bolstered by pragmatic considerations. For instance, the popularity of self-report questionnaires has been attributed to their relative ease of administration and scoring, their efficiency in terms of time and financial resources, and the wide availability of questionnaire measures (Jamieson-Noel & Winne, 2003; Pintrich, Smith, Garcia & McKeachie, 1991). Furthermore, the use of rating scales with questionnaires enable the data to be analysed quantitatively.

Table 3.1 Classification of the different types of instruments to measure SRL

		On-line	Off-line
Aptitude			General self-report questionnaires
			General oral interviews
			General teacher judgments
Event		Think-aloud methods	Stimulated recall interviews
			Portfolios and diaries/logs
		Eye-movement registration	
		Observation and video-registration of behaviour	Task-based questionnaire or interview
		Performance assessment through concrete study tasks, situational manipulations or error detection tasks	Hypothetical task interview
		Trace analysis	

Source: Endedijk et al. (2015)

In a review of aptitude measures of SRL, Endedijk et al. (2015) classified all the aptitude measures as offline measures (see Table 3.1). Inherent in this is the wide criticism of aptitude measures. Self-report questionnaires, for instance, have been criticised in recent years because respondents are required to report their behaviours, cognitions, or beliefs retrospectively (Zimmerman, 2008). There is a large body of extant research that questions the reliability of a person's memory of their own thoughts, behaviours and cognitions (see Nisbett & Wilson 1977; Veenman, 2005; Whitebread et al, 2009) in particular. For example, research has shown that questionnaires measuring SRL are often inconsistent with direct observations of how students actually regulate their thoughts and behaviours (Winne, 2010). This is

because it is not clear which situations students may have in mind or what they are actually referring to when they complete the questionnaires.

An event based conceptualisation of SRL defines it in terms of the actual actions learners perform during a task context. It is a situated approach that focuses on the occurrences of behaviours during the performance. Attention is paid to events preceding specific actions thereby framing them as contingent upon these. The cognitive operations of a learner in this case are therefore inferences from those external manifestations (Winne, 2010). A variety of measures (event measures) have been developed by researchers in the quest to measure SRL better, as a dynamic, contextualised process. They include 'think aloud', direct observations and behaviour traces. Nevertheless, Winne (2010) argues that none of the more popular measurement instruments such as think aloud or direct observations could adequately capture all aspects of the learner's internal and external environment that shape learners' SRL— the learner's beliefs, thoughts, feelings, and other key latent variables.

Direct observations (online) may therefore be valuable when combined with a measure such as an interview protocol that is grounded within the same task context bridging the online/offline gap. It should allow a researcher to triangulate and cross verify leading to more valid results.

3.2 Design Considerations

A decision was made early on to use a three-stage prospective design for this study in order to viably test the hypotheses. Subsequent work was to decide on the specific approaches and instruments to be used to implement the design. Design considerations were made within the constraints and challenges of measuring SRL outlined in the previous section.

This design (prospective design) has been criticised as suffering from problems of attrition and self-selection bias (see Tolmie, Muijs & McAteer, 2011). Nevertheless, the design is appropriate for this study as it affords the temporal ordering of variables; this is required to test some of the hypotheses as mentioned above hence making it essential for the viability of this research.

Data contextualised around a maths problem solving task (variables: Regulation of Cognition [RC], Metacognitive Knowledge [MK], Perseverance and Performance) was

collected at Time 1, data on the other variables (Received, Vicarious and Experiential Self-Efficacy; Personal and Collective Agency; and Attitude, Subjective Norms and Intention) at Time 2, and further data on the same maths task at Time 3 (same as at time 1). The time points were intended to be spaced a week or so apart. This design was used to make it possible to examine the time-lagged predictions regarding a) the impact of past performance on SE (Hypothesis 4) as well as on MK and RC; and b) the impact of different types of SE on subsequent Effort and Performance (Hypothesis 5). The other hypotheses were tested using the data from Time 2.

With the SRL measurement challenges in mind, this study was designed to ameliorate or overcome some of the issues and deficiencies raised. A combination of tools was used as it was essential to access the various aspects of SRL. Such a combination of carefully selected instruments made it possible to tap into the learner's thinking, feeling and behaviour (Boekaerts & Cascallar, 2006).

The cognitive-behavioural components (RC, MK and Perseverance) were measured as directly as possible. The interviews were done immediately before and after the problem-solving task in order to collect data on MK and RC respectively. This was to facilitate an assessment of SRL in an authentic academic task context giving it greater ecological validity. This approach has been used successfully by Zimmerman (2008) in measuring the impact of SRL skills training for teachers. In keeping with the accepted view of SRL as contextual, Zimmerman ensured all of the scales were adapted to focus on the domain of mathematics.

Clearly, as it is not possible to find a single tool with a capability to capture every facet of SRL (Cascallar, Boekaerts & Costigan, 2006), a pragmatic approach was adopted since the research problem, sample and other contextual issues of a research project determines the choice of instruments used (Boekaerts & Cascallar, 2006; Pintrich, 2004). The different methods were needed as SRL is a complex multivariate concept whose constituent variables need to be measured in different ways (Pino-Pasternak, Whitebread & Tolmie, 2010; Winne, 2010).

For instance, the use of think-aloud was initially considered as a data collection tool in order to capture Regulation of Cognition (RC) as a contextualised event, yet that proved to be unviable. It had to be discounted after the tool was piloted, as the participants (9 and 10 year olds) struggled to verbalise their thoughts at the same time

as solve the problem. An attempt was made to solve this problem by training the participants in how to 'think-aloud' yet the time invested did not lead to the desired improvements. Think-aloud had been used successfully with a similar age group as in this study (Baumann, Jones, & Seifert-Kessell, 1993; Henjes, 2007), yet it took several weeks of modelling and training for the children to be successful at it. This would have been impractical and unrealistic to achieve in the present research.

Similarly, methodological advances in the field of SRL research have been led by the web based protocol – nstudy (Winne, 2010) that collects trace data about SRL in a contextualised authentic learning task – but that was not considered as it was not suitable for the target age group. This is because the nstudy was designed to be used with college students and couldn't be adapted for use with younger learners.

Consequently, a variety of methods were used coupled with giving them a specific task context. Perseverance was measured through observation as reliance on a child's retrospective reporting of a task specific situation through a questionnaire falls foul of the criticism by Zimmerman (2008) – the inadequacy of reliance on anyone [let alone children] to report their specific behaviours, cognitions, or beliefs retrospectively. Yet it was appropriate to measure a variable such as subjective norms through a questionnaire as it is a more generalised disposition within the context of maths problem solving. This approach of using a variety of methods has been used successfully by Perry (1998) to measure SRL in a classroom context. Therefore, in the present study, a task based interview and observation protocol gathered data on the cognitive variables and perseverance while the motivation and affective variables were measured through a questionnaire.

A task based (maths task) observation and interview protocol was chosen as it has been successful in studies involving much younger participants (Pino-Pasternak, Whitebread & Tolmie, 2010; Whitebread & Basilio, 2012). The focus here was on mathematics performance and learning, since core mathematical skills such as reasoning, problem solving and systematic thought are prevalent across the curriculum (Best, Miller, & Naglieri, 2011; Linder, Ramey & Serbay, 2013).

Furthermore, mathematics problem solving such as the one used is relatively language neutral and culturally invariant. This is of particular importance since as observed in the OECD (2013) [PISA] assessment framework, test materials essentially

must fulfil the criteria of invariance in order to lend the results to cross cultural comparison. This is important to this study as it involves comparing two cultures. In the absence of that, language and task choice wield the potential to become confounding variables.

The case for using observational methods in measuring metacognition and self-regulation has been championed by Whitebread and colleagues (see Whitebread et al, 2009). They argued that using observational methods accesses aspects of children's (particularly young children) self-regulation that other methods do not reach. For instance, overly relying on children's verbal abilities and working memory failed to capture the reality of children's metacognition and self-regulation.

This study therefore adapted those methods in its measurement of variables such as MK and RC. The interviews, for instance, were done within the context of the maths problem solving task. The use of interviews was appropriate in this instance because the sample were a bit older (8-11year olds) than Whitebread's sample (pre-schoolers) and therefore more verbally capable; as noted above, think aloud was found to be too distracting. MK was assessed through the interview immediately before the task. The utility of interviews in researching MK could be because as it is part of long-term memory, a relatively stable knowledge base (Flavell, 1979; Kostons & van der Werf, 2015); it means that learners are able to recall and talk about it. The proximity of the interview to the task meant they could talk about MK in relation to the authentic problem solving task. It was also useful to this study due to its utility in domain specific contextualised events.

Data on RC was collected using a combination of observation during the actual task performance, and interview immediately after the task performance so the responses were made with reference to the task just performed. Using interviews as a tool to measure RC has been used successfully by Pino-Pasternak, Whitebread and Tolmie (2010), alongside other assessment tools. Zimmerman and Martinez-Pons (1986) also used interviews successfully to assess metacognitive processes akin to regulation of cognition. This approach comes close to the utility of an 'online' measure such as think aloud and yet practicable to implement with the target age group since it focuses on the specifics of the task.

Measurement of the affective components (the three sources of self-efficacy; collective and personal agency; subjective norms, attitudes and intention) was done using a self-report questionnaire. An 'offline' method such as a questionnaire has its utility in allowing the researcher to capture more tacit aspects of the learners' SRL (the affective), enabling them to deliberate more and to recollect their disposition during the task (Howard-Rose & Winne 1993), as these dimensions are conceptualised as being more static in character. This should be particularly effective if a strategy such as a three stage prospective design is adopted that brings the 'offline' measures in close proximity to the 'online' measure thereby focusing the questionnaire on the specific task context. This was fostered by ensuring the entire exercise had a one-point framing – there was only one researcher who was presented as being there to study how the children did their maths learning. This enabled the entire process from Stage 1 to Stage 3 to be kept within that frame which was contextualised around maths problem solving.

3.2.1 Multiple act criterion

Attitudes are hypothetical constructs that are impossible to observe directly. Attitudes can only be inferred from observable behaviour that is performed by the individual. Attitudes therefore are considered to be predictors of behaviour. A challenge for researchers, however, has been the poor correlations between attitudes and behaviours. For instance, Wicker (1969) reported that the average correlation between attitudes and behaviour was 0.15 after reviewing 42 experimental studies that assessed attitudes and related behaviours. The findings indicated a weak relationship between attitudes and behaviour.

Fishbein and Ajzen (1975) reported a solution to the attitude-behaviour relationship problem. They suggested that attitudes could typically predict multiple-act criteria better than single-act criteria. They noted the challenge of accurately predicting behaviour from attitudes could be overcome by specifying and focusing on attitudes to a named behaviour or set of behaviours (the multiple act criterion). For instance, to investigate attitude to blood donation as a predictor to actual blood donations, behaviours related to blood donation could be identified and attitudes to those specific behaviours assessed (multiple act criterion). Behaviours to be considered could include: registering as a blood donor, reading literature on blood donation, leading

healthy lifestyles to make the individual eligible for donation and having a target time frame in which to visit the clinic in order to make a blood donation.

This was illustrated by Zanna, Olson and Fazio (1980) who reported an investigation that used a self-report of religiosity to predict religious behaviour. They used a multiple act criterion by outlining behaviours of a religious nature. Their findings gave a better correlation between attitudes to religion and actual religious behaviour. The correlation was remarkably better than in a similar study that used a single criterion.

By focusing the measuring scales around 7 target behaviours – the multiple act criterion (Ajzen & Fishbein (1980) – it provided a cohesive thread that linked them all together.

This afforded the opportunity to capture SRL as a dynamic, contextualised process, yet retain the utility of a measure such as a self-report to capture data for quantitative analysis. Data that lent itself to quantitative analysis was important to this research since it was designed to test the clearly defined hypotheses by statistical means.

3.3 Development of Test Materials

In order to test the levels of SRL skills and affective components in the participants, instruments had to be developed and validated to measure the variables. All the measures were developed within the context of maths problem solving so a specific maths task was used.

3.3.1 Task

The task (Appendix 1) was a maths problem sourced from the nrich.org website (the NRICH Project, developed in conjunction with the University of Cambridge, aims to enrich the mathematical experiences of all learners). In the task, the children were asked to explore all the numbers they could make using 6 beads on a hundreds, tens and units abacus in 10 minutes. They were also told there were 28 possibilities.

On the task sheet, the main task was preceded by a worked example of a similar task; the example had only 3 beads on a tens and units abacus. This showed pictorially what an abacus looked like and how the beads were placed on the place values – tens and units - to make the target numbers of 3, 30, 21 and 12.

The task was broadly suitable for Key Stage 2 children. It had a one-star rating which means it is within the curriculum demands for children at that stage but requires some initial investigation and planning (Nrich).

The task was piloted with children from Years 4 to 6 across different ability levels and there was satisfaction it was accessible to all children and provided adequate challenge for the high ability children.

Building the study around the task enabled it to be grounded in a context that was familiar to the participants (children) that gave them a meaningful and familiar point of reference for all the other activities they had to perform as part of the study.

3.3.2 Cognitive Behavioural Measure

3.3.2.1 Interview

The interviews were used to measure the two variables - MK and RC. Interview questions were developed to tap into the components of MK namely: Knowledge of Person, Task, Strategy and Environment (Flavell, 1979; Pintrich, 2000); and components of RC namely: Planning, Monitoring, Strategy Use and Strategy Change, and Evaluation. Initial questions were drafted to solicit responses that were modelled on descriptions of behaviour from a study by Pino-Pasternak, Whitebread and Tolmie (2010) into children's SRL.

For instance, a behaviour descriptor for 'knowledge of person' variables – is able to justify own preferences in relation to learning tasks – led to a number of questions and follow ups such as: what is your favourite subject? Why? / can you please tell me more? What do you feel about solving maths problems? Which area of maths do you like best? Why?

The first draft of questions was piloted initially with two 9 year olds and one 10 year old child. The sessions were videoed for review later. Feedback was also sought from the children about their experience of the interviews and comprehension of the questions asked. The feedback received led to tweaking of some of the questions so the children could understand them better. The questions were piloted again with another group of children – an eight year old and a ten year old.

Aspects that were improved during piloting include the clarity of questions for participants. For instance, a question on the 'knowledge of environment' element of MK: Does where (or the place) you work on problems like this matter? Please explain; was supplemented with the question: if you could design your own classroom or learning space, what would you make it like? Why? This was because some participants needed further prompting or explanation to give a more detailed response with the first question. The pilot stage also served as a training and valuable practice activity in how to conduct interviews for the researcher.

Even though the questions were designed in a structured interview format, the administration allowed for follow-up questions that enabled more in-depth information to be generated in the event where the participants gave short closed answers or failed to demonstrate sufficient understanding of the question (Akturka & Sahin, 2011). For instance, a question for the knowledge of person component of MK: 'how do you feel about solving maths problems?' had the potential to yield a host of answers. The researcher could then probe deeper in order to ascertain the true feeling they had about solving maths problems.

Using interviews to measure MK for instance, has been acknowledged as being able to provide more detailed insights than some of the other methods such as questionnaires (Händel, Artelt & Weinert, 2013). MK was measured immediately before the actual task performance (after perusing the task problem).

RC was measured by a retrospective interview immediately after the task performance. The interview for RC followed a format similar to that of MK. Since the questions were designed to tap into RC, conceptualised as all the activities the participants engaged in as they controlled their cognitive performance during the maths problem solving task, they were encouraged (and prompted if necessary) to refer to their work as they answered the questions.

The final interview schedule for MK and RC is shown in Appendix 2.

3.3.2.2 Observation

Perseverance and effort (PE) was measured solely through observation. In previous studies, perseverance has been measured mainly through the administration of a series of tasks or activities; also through the use of surveys of parents, teachers and

self-reports (Duckworth, et al. 2007; Duckworth & Quinn 2009; Lufi & Cohen 1987). Among primary school age children, an often used approach to measure perseverance has been to give them progressively more challenging tasks or activities to complete and find out whether or not they continue to work through challenges (Duckworth, et al. 2007; Duckworth & Quinn 2009; Lufi & Cohen 1987). Even though this approach can be relatively successful in measuring perseverance, these tests could be time-consuming and are not designed to be administered to children repeatedly or to assess changes in levels of perseverance over time.

Perseverance is an observable behaviour that has been described as the outward display of motivation (Connell & Wellborn, 1991; Deci & Ryan, 1985, 2000). This was conceptualised as behaviours related to engagement or disengagement during a learning situation including show of enthusiasm, focus on task, or persistence in the face of challenge (Jimerson, Campos, & Greif, 2003; Skinner, Kindermann & Furrer, 2008). In this study, perseverance was a composite variable conceptualised as: engagement – the proportion of time allocated to performance of the task that was spent on 'on task' behaviours; and level of perseverance – the ability to stick to the task in the face of challenge (Duckworth, et al., 2007; Skinner, Kindermann, & Furrer 2008). Perseverance is characterised by behaviours that are energized, focused and enthusiastic and persevering learners show emotionally positive interactions and engagement with academic tasks (Skinner, Kindermann, & Furrer, 2008). They further argued that perseverance leads to effortful engagement with tasks and persistence in the face of challenge. Manifestation of engagement should be obvious by observing on-task versus off-task behaviours. These behaviours are clearly observable particularly the reverse behaviours of disengagement, disaffection, withdrawal and quitting; are more discrete. As a result, Skinner, Kindermann and Furrer (2008) reported successful use of observational methods to measure learner engagement.

The observation protocol was developed and fine-tuned through a series of pilot trials. Piloting was done in two stages: the first was with two 9 year olds and one 10 year old child who also participated in the pilot trials of the other test materials. The sessions were videoed. The children gave feedback about their experience of the process. There was another pilot session with another group of children – an eight year old and a ten year old. It enabled the researcher to find out which aspects worked and were viable and which aspects were not. Piloting was a valuable opportunity to rehearse

with using equipment such as video and audio cameras in relation to setting a camera up, finding the right angles and handling distractions or technical problems.

The observation method was also used to supplement the measure of an aspect of RC; the component - monitoring - was also measured from observation. This was because monitoring leads to adaptive behaviours that are clearly observable such as finding out an error has been made and efforts made to correct it; seeking clarification when they realise they may not have a sufficient understanding of the task; or reacting to a realisation they may have missed an important piece of information provided in the task – what Flavell (1979) called the 'quality control' aspect of metacognition. For instance, in the event where a participant failed to correct an error (lack of monitoring) during the task itself, that was taken as a more valid measure of monitoring or the lack of it over the response given during the interview to assess RC. If a participant gave a sufficient verbal response during the interview indicative of monitoring, yet failed to correct mistakes during the task performance, the failure to correct mistakes was taken as a lack of monitoring and any tally coded from the interview was struck off. This is in line with the argument by Greene and Azevedo (2007) that monitoring strategy must go hand in hand with altering of strategy when it turns out to be ineffective. Therefore, there is merit in conceptualising and measuring monitoring in an 'online' way by coding evidence of monitoring only when there is evidence for it from observation during the task performance.

3.3.3 Questionnaire

The affective variables were measured using a questionnaire. A measuring scale was constructed to measure eight of the variables in the study namely: self-efficacy variables comprising received, vicarious and experiential self-efficacy; the motivation variables comprising subjective norms, attitudes and intention; and agency variables comprising collective and personal agency. The items were on a seven point Likert scale.

A construct such as self-efficacy has been measured successfully in many studies using questionnaires (see Bandura, 2006; Chen, & Usher, 2012; Usher & Pajares, 2006, 2009). Usher and Pajares have used a questionnaire to study the sources of self-efficacy in a maths learning context. That scale was adapted for use in the present

study as this study was interested in the sources of SE from the two cultural backgrounds.

Construction of items for the motivation and affect variables was based on the description of questionnaire creation in the appendix of Fishbein and Ajzen (2010). There were items each measuring: Personal Attitudes, Subjective Norms and Intention.

The scale for Personal and Collective Agency focused on the extent to which the children regarded themselves as having a choice in their level of performance and whether the decision about the degree of commitment they showed in their learning was their own. Specifically, the level of choice learners from the two cultural backgrounds exercised in how hard they work in maths was measured. The level of choice was captured as either personal agency (PA) or collective agency (CA).

The questionnaire had 56 questions altogether with 7 questions on each of the variables. This was because the measuring scale focused on measuring the level of response to seven target behaviours on each of the variables to be captured through the questionnaire. The target behaviours fulfilled the multiple act criterion which according to Ajzen and Fishbein (1980) gives better measures of attitudes and behaviour. The behaviours were: Feedback, Speed, Grades, Concentration, Time spent, Accuracy and Level of Difficulty. The behaviours were selected because they were judged to be relevant behaviours that could potentially determine a child's attitude in relation to a learning task. Some of these behaviours have been used by various researchers in similar contexts so they were included and their relative contribution towards creating reliable measurement scales was ascertained through the process of piloting (e.g. see Murphy, Kerr, Lundy, McEvoy, Simon & Neil, 2010 [grades, time spent, level of difficulty, feedback; OECD, 2013 [time spent, grades, feedback]; Seacrest, 2011 [level of difficulty, accuracy, grades, time spent]; TIMMS, 2007 [speed]).

The development and piloting of the questionnaire was done in stages. At the initial stages, two year 4 children and a year 6 child from a primary school in Medway, Kent were given a statement on each of the target behaviours; for instance:

'I will work hard in order to get better grades in maths'

(Target behaviour: grades; variable: intention)

'For me, getting good feedback in maths is important'

(Target behaviour: feedback; variable: attitude)

The children read through the statements and explained what they understood by them. In the event where the children's understanding of the question was different from what was intended by the researcher, a discussion was had about how the question could be worded to give the desired meaning. After that, the questionnaire, focused on 7 target behaviours was put together and given to a group of 30 year 4 children, also in a Medway school, to complete. After completing the questionnaire, the children were asked if they understood the questions and whether the questions made sense. Any feedback was noted and the questionnaire edited as necessary.

The questionnaire at this stage was then piloted with a large group of children (30 year 4, 30 year 5, and 27 year 6) in a primary school in Southwark, London. The children fed back to their teachers what they thought about the questions in terms of clarity and whether they made sense. A reliability test – Cronbach's Alpha – was computed. The test's reliability was good overall but a few subscales needed improving so further tweaks were made to the wording of questions. It was piloted again with 30 year 5 children and 30 year 6 children in a primary school in Medway, Kent with the following alphas (Table 3.2) which assured the reliability of all the subscales and the questionnaire as a whole.

Table 3.2: Reliability test results of Questionnaire (Pilot)

Variable	Cronbach's Alpha
Experiential Self Efficacy	0.77
Vicarious Self Efficacy	0.82
Received Self Efficacy	0.67
Attitude	0.84
Subjective Norm	0.83
Intention	0.75
Collective Agency	0.76
Personal Agency	0.78

The final version of the questionnaire is shown in Appendix 3. The questionnaire was a collation of the scales developed to measure the variables; then a random number generator was used to determine the order for the different items.

Once the piloting process had been completed, the process of actual data collection could commence with participant identification and recruitment.

3.4 Method

This section describes the process of sample selection and the resultant constitution of the participants involved in the study. A key element is the challenge of ensuring invariance between the groups. This was to ensure any differences observed would be only attributed to the difference in cultural background of the children. The groups were matched by school characteristics, year group and maths national curriculum level as much as was practically possible. The actual procedure of collecting data is also outlined along with the ethical considerations of working with children.

3.4.1 Sample

As this was a cross cultural study, samples were drawn from the two cultural groups about which hypotheses were drawn - collectivist Chinese and Individualist White British cultural backgrounds.

Since the cultural frameworks which led to the hypothesised differences will be operating from early in development, they should be apparent from the point at which SRL processes begin to be consolidated and to have a clear impact on behaviour, during the late primary school years (Whitebread & Basilio, 2012). Participating children were therefore chosen in years 4 to 6 (8-11 years) and those in the two cultural groups were drawn as far as possible from the same UK primary schools, in order to control for variation at that level.

3.4.2 Cultural Backgrounds

The cultural background of the children (both White British and Chinese) was determined by the data held by schools on children's cultural background as submitted by parents/ carers in the official records.

A sample from children whose parents have Chinese cultural backgrounds was chosen because the Chinese culture has been reported as prominently collectivist in

a large number of research studies. (E.g. see Basu-Zharku, 2011; Huang, Yao, Abela, Leibovitch & Liu, 2013; Hui, Triandis & Yee, 1991; Hui & Villareal, 1989). Furthermore, individuals from a Chinese cultural background are reported to be more likely to identify with their 'ancestral' culture relative to those from other cultures in the UK (Chan, 2006; Parker, et al, 2008; Parker & Song, 2009).

By cultural background of Chinese parents, it is meant parents being born and growing up in the country of origin but settled in the UK for a minimum of one year, or born in the UK to parents who originated in China, Hong Kong or Taiwan. This is because as new immigrants encounter a host culture, there is a period of cultural shock or 'acculturative stress' that could be unsettling for the immigrant family (Berry, 1997). Therefore, a bedding in period of a year was deemed to be necessary to ensure the children participating in the study would have had a period and level of familiarity with British culture outside the home.

White British cultural background children were chosen as the comparator group because in terms the cultural dimension used as basis for this study, they present the contrasting background to the collective – individualist. Markus and Kitayama (1991) suggest White British culture is individualist while Chinese culture is collective, corroborating the findings of Hofstede (1980).

The government (DFE) school statistics for 2013/ 2014 academic year was accessed to give an idea of the population and distribution of Chinese background children in primary schools in England. The schools were then contacted starting from those with the highest concentration of Chinese background children in key stage 2. Emails were sent and followed up with phone calls. The emails had a letter soliciting the support of the school, and a brief on how data collection was going to be done (Appendix 4). The search started with schools in London and the South East and extended to primary schools as far afield as the North East and North West of England.

When a school agreed to participate in the research, it was followed by identifying the appropriate Chinese background children. A meeting was arranged with the teachers of the classes of the identified Chinese background children. Their maths national curriculum levels were then matched with White British children in the same class or year group by consulting the teachers' assessment data (see Table 3.3). Where the children could not be matched in the same school, counterpart matches were drawn

from schools that were matched in terms of catchment area, performance and demographics as much as was practically possible. Matching was done as far as possible by year group and maths national curriculum levels. Letters (In English or Mandarin translation) were then sent out to the parents/ guardians of the target children. Attached to the letter were a parent questionnaire and the actual consent form (Appendix 5). The consent form required parents an 'opt in' for their child to be videoed that is separate from giving consent to participate in the research.

The initial design aimed at testing 50 children from each cultural background group in order to provide sufficient numbers for the intended analyses. However, challenges with recruiting children necessitated settling for a figure of 35 children from each group (see Table 3.3). The children were matched by year group and maths national curriculum (NC) levels as much as was practically possible. The table shown below also shows the maths attainment of the participants by year group; it provides information on those below the expected attainment, expected attainment and those whose attainment is above the levels expected for their year group.

Table 3.3 Participant Statistics

	Chinese	**White British**
N	**35**	**35**
Boys	15	18
Girls	20	17
Age range (months)	98-142	106-142
Year 4	**19**	**14**
Average age (months)	*107*	*110*
Year 5	**5**	**8**
Average age (months)	*118*	*117*
Year 6	**11**	**13**
Average age (months)	*131*	*135*

Table 3.3 shows the main dimensions of the sample's characteristics. The sample had 57% girls and 43% boys from a Chinese cultural background. The White British group had 49% being girls and 51% boys. The association of gender with the cultural composition of the two groups was not statistically significant (χ^2= .516, df = 1, p= .473).

Furthermore, in the Chinese background group, the year group composition was 54% year 4, 14% year 5 and 32% year 6. The White British background group was made up of 40% year 4, 23% year 5 and 37% year 6. Likewise, the association of year groups with the culture categories were also not significant. (χ^2= 1.617, df = 2, p= .446)

Table 3.4a and 3.4b shows the constitution of the two groups by NC levels and maths attainment levels by year group. Invariance between the two groups was satisfied as the association of NC levels with the cultural composition of the two groups was not statistically significant (χ^2= 4.698, df = 9, p= .86). An analysis of the two cultural groups by combining all the year groups to determine the numbers who were: below expected, at expected and above expected maths achievement levels across the year groups (Table 3.4a) was undertaken. The results showed there was no significant association of maths achievement level with each cultural group (χ^2= 1.534, df = 2, p= .464). Another consideration was about whether the participants were below, at expected or above expected attainment levels for their year group. The association of maths attainment level with the cultural composition of the two groups was not statistically significant in all three year groups (Year 4 [χ^2= .206, df = 2, p= .902]; Year 5 [χ^2= 1.593, df = 2, p= .451]; Year 6 [χ^2= 2.637, df = 2, p= .267]) Furthermore, the association of maths attainment level for year group with the cultural composition of the two groups was not statistically significant (χ^2= 1.617, df = 2, p= .446).

Table 3.4a Maths achievement of Two Groups (all year groups)

Maths Achievement	Chinese	White British
Below expected	3	6
Expected	14	15
Above expected	18	14
Total	**35**	**35**

Table 3.4b Maths NC Levels of Two Groups

NC Level	Number (Chinese)	Number (White British)
2a	1	0
3c	2	2
3b	4	5
3a	6	11
4c	9	7
4b	3	3
4a	2	3
5c	3	2
5b	0	0
5a	4	1
6c	1	1
Year 4 Maths attainment		
Below expected	3	2
Expected	8	7
Above expected	8	5
Year 5 Maths attainment		
Below expected	0	2
Expected	3	3
Above expected	2	3
Year 6 Maths attainment		
Below expected	0	2
Expected	3	5
Above expected	8	6
Total	**35**	**35**

The geographical distribution of the participants successfully recruited is summarised in Table 3.5. A chi square test was done to test the association of geographical area with the cultural composition of the two groups. The results (χ^2= 9.06, df = 3, p= .029) showed a weak association existed. This was inevitable due to the challenges involved with recruiting participants for the research.

Table 3.5: Geographical Distribution of Participants

	Chinese	**White British**
Manchester	5	4
Coventry	5	0
London	15	11
Medway	10	20
Total	*35*	*35*

There were 8 children in total whose parents consented to them taking part in the study but not to be videoed. In those cases, audio recording was done with a written running record of their demeanour and behaviour during the task performance. A pupil profile was also completed by the school on each pupil to give some background information on each participant.

3.4.3 Ethical Considerations

This study was guided by the ethical guidance issued by the British Psychological Society and was approved using the UCL Institute of Education procedures.

All the requirements of working with children including: concerning consent, confidentiality, right to withdraw and safeguarding were observed. Due to the sensitive nature of videoing children, consent for that was sought separately from consent to participate in the research.

The study was conducted with an awareness collecting data would involve taking a child out of class therefore creating the possibility of them missing parts of lessons.

Therefore, class teachers were consulted and sessions were planned in order to find the least obstructing time for lessons, and a plan for the child to catch up with any missed work so their learning didn't suffer.

3.4.4 Procedure

The study had a three stage testing sequence as described in section 3.2. It therefore involved three sessions with the participants hence a three session access to the participants was always booked in advance with the schools before data collection was commenced. Stages 1 and 3 were either video recorded or audio recorded (with a running record) in order to allow for analysis later. Stages 1 and 3 lasted approximately 30 minutes working one to one with each child in an out of class setting. Stage 2 was done in a group in certain cases but with the children kept separate so they did not influence each other's choices.

3.4.4.1 Data Collection (3 STAGES)

The time points were spaced a couple of days or so apart; however, a few cases were spaced a day apart due to restrictions and difficulties accessing participants.

Before testing commenced with a participant, the researcher checked if a consent form had been completed and whether the child was happy to take part in the study. The researcher introduced himself to a participant as a teacher who works at a primary school in Kent and also a student at the UCL Institute of Education. The main aim of the research was presented to the participant as: "I am here to do some research (find out about) how you learn maths and solve maths problems". It was made clear to them even though their grown-up may have given consent, the child was not obliged to go ahead. The whole process was explained including the fact that there were three sessions and the child had to indicate they were comfortable to go ahead. They were also assured of anonymity and the right withdraw from the study at any point without needing to justify themselves.

Data collection was done wholly in an out of class context. This is because only a handful of individuals at the most were drawn from any particular class so doing it in a class context would have been disruptive to both the rest of the class and the research participants alike. Depending on the provision by individual schools, working spaces used ranged from offices, libraries, unused classroom spaces, to quiet corridors. Stages one and three required one to one work with each child but stage two was

done with individuals or small groups depending on the practicalities of the situation. For instance, a school in London insisted I did stage two as a group as the entire key stage were going out on a school trip later that morning.

3.4.4.1a Stage 1) Task

For this stage, participants were invited individually to the space allocated by the school for the research. When the participant had sat down and was settled, the process of the research was explained, and they were made aware of the video recording (and the red light on the camera that indicated recording was in progress) with an explanation it was to help the researcher to play it back later to find out what happened during the session – it saved the researcher from having to take a lot of notes during the session. The researcher always checked if they were happy to be videoed.

A copy of the maths problem solving task where they had to try and find 28 possible numbers to be made using 6 beads on a hundreds, tens and units abacus, (in colour) on an A4 sheet of paper was provided for each participant. Also provided was a plain or lined piece of A4 paper for the answers to be written on, with a pencil or a pen. A video camcorder was used with a tripod and electrical extension reel on hand to use when it was needed. A voice recording app on a smartphone was available for use when audio recording was necessary.

a) INTERVIEW – MK QUESTIONS

They were given the task instructions to peruse but told not to write anything. They were to let the researcher know when they had finished reading through the task instructions.

When the participant was ready, the video camera was turned on. This was followed by a series of questions (interview [Appendix 1]) designed to generate data regarding the variable - Metacognitive Knowledge. The funnelling strategy of questioning was used. This helps to develop rapport and trust between the interviewer and interviewee (Falbo, 2012; Holsten, Deatrick, Kumanyika, Pinto-Martin, Compher, 2012; Vogl, 2014). The interviews always started with questions related to something the child had just done as a way to get them to relax. For instance, if they had just returned from playtime, questions would start around what happened on the playground – games

played, whom they played with, or whether they enjoyed playtime or not. This progressed to more general aspects of their school life before narrowing it down to their maths learning which was guided by the prepared interview questions. This 'semi-structured' approach is recommended as best practice when interviewing children as it prepared the interviewer to appreciate the level of cognitive and language development of the interviewee so questions can be tailored to suit the needs of that particular child (Vogl, 2014). It also enabled questions to be asked in an open ended manner with room for follow ups to help clarify the children's responses since as stated by Morrisons (2013), children may be more prone to 'acquiescence bias' where they say "yes" or 'no' in response to anything that the interviewer asks about.

b) TASK PERFORMANCE - OBSERVATION

The participant was asked if they had any questions before they start or if they needed anything (as stated on task sheet). The participants were given 10 minutes to complete the task. An observation protocol was used during the task performance to collect data on Regulation of Cognition, Perseverance and Effort. Performance was also measured at this stage determined by how many permutations of numbers out the 28 possibilities they got right (at the end of the task)

c) TASK INTERVIEW - RC QUESTIONS

Finally, a supplementary interview was conducted to collect data on the variable - Regulation of Cognition – immediately after the task completion. This interview was done with reference to the task so the participant had to have the task sheet and answers in front of them during the interview. At the end of the session, the camera was switched off and the participant asked if they felt comfortable with the session and if they had a question or comment to make. The researcher thanked the participant for taking part in the session and reminded them they would be invited on another day to participate in the second stage of the research.

3.4.4.1b Stage 2) Questionnaire

A questionnaire with a 7 point Likert scale was administered to collect data on eight variables namely: Experiential Self Efficacy; Received Self Efficacy; Vicarious Self Efficacy; Intention, Attitude, Subjective Norms; Personal Agency; and Collective Agency; all measured in relation to performance of maths tasks. There was no time limit to completing the questionnaire and the participants could ask for the questions

to be read to them. In that case care was taken to read in a neutral tone and not to place any tonal emphasis on a word or phrase so as not to influence a response. Furthermore, clarification was given if a child didn't understand a word or question. In that case, only a neutral explanation of words or question was given taking care not to lead or bias a response in any way. For instance, a request about a question such as: "what does feedback mean?" is given the response: "feedback is what your teacher says about your work either what they write when they mark your work, or tell you about how well you did or how you could improve your work". Care was taken not to distress the children in any way; they were allowed to complete the questionnaires in their own time and were not prompted nor their attention drawn to any question that may have been left unanswered.

3.4.4.1c Stage 3 This stage was a repeat of the task performance as in Stage 1.

3.5 Scoring and Analysis

Video (or audio) data was coded using a pre-designed coding scheme (Tables 3.6a and 3.6b). Recordings of proceedings during Stages 1 and 3 were played back on a computer with headphones for observational coding.

3.5.1a MK and RC

The coding scheme (Tables 3.6a and 3.6b) was developed by analysing the videos of interviews and observations during the piloting of the test materials. This was done with guidance from the coding scheme used in Pino-Pasternak, Whitebread and Tolmie (2010). A great deal of inspiration was also drawn from the work of Whitebread and colleagues in their work measuring SRL using the method of observation (see Bryce & Whitebread, 2012; Whitebread & O'Sullivan, 2012; Whitebread et al., 2009).

Developing a coding scheme was of paramount importance as it enabled a collation of quantitative observational data in order to allow the statistical analyses needed in this hypothesis driven study. As depicted in the coding scheme in Tables 3.6 a and b, each of the components of MK and RC was clearly defined and given a corresponding description of what each looked like in terms of behaviour. There was also a subsequent breakdown giving examples of responses and actions that depicted those behaviours. As stated previously, the examples of behaviour were observed and noted during the piloting stage of the test material. Responses were coded for every unique response given that demonstrated the element being investigated. A unique response

was reckoned the first time a response was given on a particular aspect of a behaviour that described a component. For instance, the first offer of a response that depicted an example that fitted the behaviour description – able to justify preferences in relation to learning tasks [an element of the component Knowledge of Person variable - MK]; this response was coded as unique therefore any further iterations or variations of the same response example was not to be coded since they were not unique. Focus on unique responses was important to prevent coding repetitive answers about a particular element.

Measuring the cognitive elements of SRL involved coding the interviews to generate data on MK and RC; assessment of RC [monitoring] was supplemented via the task performance.

Coding focused on each of the components that made up MK and RC. The researcher played back the videos of the interview and tallied every unique response to each of the questions targeting the components that made up MK and RC using a data collection form (Appendix 6). Each of the components was targeted using a succession of questions supplemented with 'follow ups' to elicit clarifications and additional details. For instance, the following questions were all aimed at generating data on the variable - 'knowledge of task' (MK)

- What do you think makes a task difficult to do?
- Please explain to me what you are expected to do on this task?
- Do you think it is an easy or difficult task? Why?
  (Follow up: what about it makes it easy/ difficult?)
- Have you done any task like this before?
  (Follow up: In what way is it similar or different?)

The coder was alert to the fact that even though the questions were prepared to be asked in a structured and sequential order, the respondents often dictated the direction with the answers offered. Therefore, coding a particular response given was not restricted to the component being examined; answers given could capture a unique response pertaining to a component different from the particular one the question was meant to be targeting. For instance, when a respondent was asked 'what made a task difficult to do,' [knowledge of task variables] she described different task scenarios

including the environmental conditions that either contributed to a task being easy or difficult. A response such as: "… the task may not be difficult but if there is a lot of noise and distraction, it can make me make silly mistakes …" was coded as a unique response about the component – knowledge of environment variables under MK - even though the original question was targeted at knowledge of task variables.

Coding of the videos for MK and RC was done meticulously by listening to the questions and answers given, and matching them with the descriptions and examples on the coding scheme. Where a response was judged to be a unique response that falls under any of the components of the variable, a tally mark was awarded for that component.

At the end of each video, the totals for each component were collated and a total score for each variable computed. The cases that had audio recording only were processed in a similar way. The researcher listened to the interview through a set of headphones and tallied the responses in the same way on the same form as the video data.

The component of RC supplemented with the task performance (monitoring) was assessed by looking for evidence of successful monitoring [or the lack of it] on the task answer sheet (see Section 3.3.2.2). Successful monitoring was evidenced as ensuring 6 beads only were used each time, and there were not repetitions of numbers computed. Successful monitoring in both aspects led to an award of two tally marks. That was the case for both cases with video or audio recording.

Table 3.6a SRL Coding Scheme

Metacognitive Knowledge (MK)

Definitions	*Description of Behaviour*	*Examples*
Knowledge of Person Variables Knowledge that individuals have about themselves or others as learners	The child: Is able to justify his/her preferences in relation to learning tasks Is aware of own strengths and weaknesses Is aware of own knowledge repertoire	*"It is my favourite because I find … challenging and I like to challenge myself"* *I don't like … because I find it confusing"* *"I am good at solving problems like this"* *"It is not always easy for me to understand instructions"* *"At first I didn't get the instructions so I read it over again; then it made sense"* *"We haven't learnt how to solve this type of problems yet"* *"I like working with calculations because I find it easier to get the answer"* *"I don't like shapes because I don't get it"* *"I don't think I'm good at times tables"* *"I am good at place value so I'll be good at this"* *"The other children on my maths table are able to do their work quickly but I always need help"* *"I'm not very good at understanding the instructions of a task"*
Knowledge of Task Variables Knowledge that learners have about goals, relevant features, and level of difficulty of learning tasks	The child: Is able to explain in his/her own words the goal of a task Is able to describe relevant attributes of a task Identifies similarities and differences across tasks Accurately rates the level of difficulty of two or more tasks	*"you have to use 6 beads on a HTU abacus to find all the 28 different numbers you can make"* *"All problems give you clues for you to find the answer"* *"It is important to understand a task so you will know what to do"* *"If you don't understand the task, you will just mess it up"* *"This task is very confusing"* *"I think it is easy because it is about place value and place value tasks are easy"* *"this task is difficult because there isn't only one answer"* *"It's easier to solve a problem when someone explains it to you so you know what to do"*
Knowledge of Strategy Variables Learner's ability to define strategies and assess their effectiveness in relation to specific task demands	The child: Knows appropriate strategies to solve specific tasks Compares the suitability of different strategies Is able to assess the effectiveness of strategies used	*"I will need to use my place values"* *"I will need to start with the small/ large numbers"* *"I will start by putting all 6 beads on the hundreds, then work my way down like this …"* *"For a problem like this, it helps to draw the place value chart or your own abacus"* *"you need to think about other problems you have solved before for ideas"* *"you need to start from one place value like tens or hundreds and work your way through"*

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Knowledge of the Environment Knowledge of features of the environment that can facilitate or hinder opportunities for learning	The child: Knows about features of the environment that affect his/her learning Knows who he/she likes to work with and justifies choices Is aware of the type of assistance he/she needs from others	*"I like my classroom to be bright (dark) because…)* *"I will have display boards up so can refer to previous learning to help me when I'm stuck"* *"I like it when the task is printed and in front of me so I can keep checking it"* *"you need resources like cubes to help you"* *"1 like it when I can talk a little so I can speak to a friend when I get stuck"* *"I don't like too much noise though"* *"when people move around and bang the chairs, it distracts me"* *"when I can hear the noise of traffic on the road"* *"When the door keeps opening, it distracts me"* *"I like solving problems with my friends, they keep me determined to get it right"* *"the room needs to be quiet so I can concentrate"*

Table 3.6b Regulation of Cognition (RC)

Planning Steps taken by the learner in order to meet the goal of a task. Planning usually takes place before task engagement but planning steps can be reassessed as a result of monitoring	The child: Is able to formulate a step-by step approach in order to meet the goal of a task Adopts an organized/goal oriented approach when working on a task	*"I will read the instructions, and look at the examples carefully.* *(1) Child reads the whole text* *(2) looks at example* *(3) Goes back to text and looks for specific information* *(4) Asks for clarification if unsure about what task is about?* *"I will position the cubes on the abacus in their place value to makes the numbers"* *"knowing there are 28 possibilities made me know what to work towards"* "I thought of a way to do it using all 6 beads each time and then got on with it" "I always think of one way then start. If that way doesn't work, then I think of another way" "I like thinking about a lot of different ways of solving a problem; then I choose the best way"
Monitoring Ongoing assessment of the learner's efforts and strategies. Involves self-correction and might lead to changes in planning and strategy use	The child: Monitors understanding Monitors own progress on task Monitors current state of recall Detects mistakes Is aware of strategies used to solve specific tasks	*Child re-reads after failing to understand something* *"I know that I know this one but I can't remember now"* *"This is wrong"* *Discovers an error and corrects it.* *"Here I didn't need to look back, but here I had to read again"* *"I kept checking I had used all 6 beads each time"* *"I repeated a number I had already written so I changed it"* *"I knew I had repeated a number because I always looked back to check"*

Strategy Use & Strategy Change Learner's ability to apply cognitive strategies appropriate to solve the task and change strategies if they are not effective	The child: Uses self-directed speech to guide own performance Seeks help appropriately Changes strategies that are not efficient Transfer strategies across contexts	*"I need to draw my own abacus"* *Child monitors lack of understanding and seeks clarification* *After getting stuck, child sits back, looks and ponders, checks the abacus on task sheet example, decides to draw own abacus or place value grid.* *Child draws beads* *"I got the cubes and arranged them on the abacus"* *"I like working things out in my head so I kept making up the numbers in my head"*
Evaluation Learner's assessment of their performance after task completion	The child: Accurately evaluates the quality of his/her performance	*"I think I did very well"* *"I think looking at the example helped me to solve the problem quickly"* *"Starting with the big/ small numbers helped me do it quickly"* *"I think drawing my own abacus helped me"* *"Next time I will start with the big numbers and work my way down"* *"next time I will need to work faster"* *"I did a lot better than I was expecting"* *"when I saw there were 28 possibilities, I thought it was impossible but once I started it was easy"* *"At the beginning, I thought I couldn't do it but once I started I realised it wasn't that hard"*

Source: adapted from Pino-Pasternak, D., Whitebread, D. & Tolmie, A. (2010).

3.5.1b Perseverance

The task performance was also used to measure perseverance and effort. Two separate scores were generated as it has two components – engagement and level of perseverance:

➢ Perseverance *(engagement)* was measured as the percentage of the allocated time (10minutes) that was spent on task.

A stopwatch was used to measure the amount of time spent on the actual task relative to the allocated time. As discussed previously in the section on 'observation', since behaviours that show disengagement are relatively easier to observe (such as: playing with equipment, looking out of the window, asking questions not related to the task), the researcher focused on measuring how long such was displayed initially in seconds (see Table 3.7 for engagement coding scheme). The times were aggregated and a total amount of time spent on task calculated to the nearest tenth of a minute. This was used to calculate the percentage of time spent on task, giving the engagement score.

Table 3. 7 Engagement Coding Scheme

Definitions	Descriptions of Behaviour	Examples
Engagement versus *Disengagement*	Exertion of effort, persistence, attention and concentration	Child gets stuck at task, takes a step back to think for a moment, then returns to try again. Period of sustained activity on task. -reading -writing -checking problem -hands- on activity -Immersed in task
	Passive, giving up, lack of initiation, boredom, lack of attention, frustration	*Open show of frustration, dropping resources and sitting back away from task.* *Shift attention to something else not related to task* *playing with resources, asking question not related to task*

*Focus of coding perseverance and effort was on instances of disengagement because that was more discrete, observable and countable.

> ➢ Perseverance *(level)* determined the extent to which a learner either kept on going or gave up when the going got tough.

In addition to measuring engagement as a component of perseverance, a score was also given to capture the aspect of perseverance that showed the level at which a learner stuck to a task and kept trying in the face of challenge or difficulty. A scoring range of 0 to 4 was devised in order to capture gradations of perseverance level demonstrated by learners in the problem solving situation. The researcher observed each participant as he/she solved the problem and at the end allocated a mark from 0 to 4 according to which description of the perseverance level fits.

Perseverance level was scored as:

- Gives up at the first sign of difficulty – 0
- Gets into difficulty, stops briefly and goes back to try some more but not till the end (up till 9th minute) – 1
- Keeps on trying in the face of difficulty right to the end – 2
- Carries on searching till they find all 28 permutations – 3
- Completing before time is up – 4 (completes before final minute) – 4

Coding of perseverance and effort for participants with only audio data was done using the running records from the problem solving task. An excerpt from the running records is presented below:

> Reads question, looking intently at task. Mouths silently at words as she reads… 56secs switches to answer sheet …deep in thought 1.13 starts writing…….2.10 exclaims... ooohh 2.13 continues writing 4.00 switch back to task sheet... appears to read. Return to answer sheet... count how many numbers she has written… 4.48 starts writing again… 5.00 appears to cross out some numbers… 5.58 looks up at me (split moment) … write on 6.39 stop writing… back to task sheet… 6.48 back to answer sheet and writes… pauses intermittently in thought… 7.02 looks at me then sideways… appears distracted… looks out of window…. 8.23 says finished.

Coding the running records was done in a similar way to the video data. A stop-watch was used to measure the length of time spent on task (engagement) for the video data. Similarly, the running records was analysed and a stopwatch was used to provide a measure of the total length of time spent on task.

3.5.1c Performance

Actual performance on the problem solving task was also measured. At the end of the task, the number of correct permutations of numbers out of the 28 possibilities they got right was counted. Particular care was taken to ensure numbers had not been repeated. Due care was also taken to check each number had used all of the required 6 beads and no more than that.

3.5.1d Reliability

Reliability of video and audio coding was established through interrater checks. To establish interrater agreement, eight participants' (4 from each cultural background) video data [and 1 audio recording] were coded by an independent rater – a fellow PhD student from the Psychology department at IOE. The researcher and the independent rater met for a session where they discussed the coding scheme in order to ensure they both had a similar understanding of which behaviours were relevant and how to code particular observations with particular components of each variable.

The independent rater was then given access to the seven videos and one audio by sharing a link to the file storage site – dropbox. The same data collection sheet was used to tally and collate the data. The independent rater submitted the completed scores for comparison with the researcher's.

Inter-rater agreement can be established in different ways including use of percentages or a more popular technique – Cohen's kappa and its variants (Banerjee, Capozzoli, McSweeney & Sinha, 1999); the method used depends on the characteristics of the data as certain assumptions may need to be met (Agresti, 1992). Cohen's kappa was not appropriate for use in this study because it is only applicable if there is a fixed coding entity – in this case, deciding which category each response or event belonged to. It is not applicable to event sampling as was used in coding MK and RC because there was no fixed coding entity.

Therefore, agreement in this study was defined as the percentage of instances where both raters identified the same number of codable instances on the components that comprised the two variables, MK and RC, across the eight participants. The agreement rate was worked out thus:

Number of observations – number of disagreements

Agreement rate = --- X100

Number of observations

Average agreement across all components was 80% - generally regarded as an acceptable level (Hartmann, 1977; McHugh, 2012; Stemler, 2004) [see Table 3.8].

Further checks of reliability were done by checking the mean scores (Table 3.9) between the raters and the correlation (Table 3.10) between their independent ratings.

After reliability of the test material and coding of the interview and observational data was established through the interrater comparison, the process of coding the rest of the data began.

Table 3.8: Percentage agreement between 2 Raters

Variable	Components	Percentage agreement
Metacognitive Knowledge	Knowledge of Person	100
	Knowledge of Task	62.5
	Knowledge of Strategy	75
	Knowledge of Environment	75
Regulation of Cognition	Planning	62.5
	Monitoring	87.5
	Strategy Use & Change	87.5
	Evaluation	75
Perseverance and Effort	Engagement	75
	Perseverance	100

Table 3.9: Mean Scores of Raters

	Mean	Standard Deviation	N
MK Rater 1	9.00	2.268	8
MK Rater 2	9.75	2.252	8
RC Rater 1	5.50	2.268	8
RC Rater 2	5.88	2.416	8
Engagement Rater 1	96.55		8
Engagement Rater 2	96.65		8

Table 3.10: Correlations between Raters' Scores (Pearson r) N=8

		MK Rater 2	RC Rater 2	Engagement Rater 2	Perseverance Level Rater 2
MK Rater 1	Correlation	.867			
	Significance (1 tailed)	.0025			
RC Rater 1	Correlation		.665		
	Significance (1 tailed)		.036		
Engagement Rater 1	Correlation			1	
	Significance (1 tailed)			.000	
Perseverance Level Rater 1	Correlation				1
	Significance (2 tailed)				.000

The rest of the video and audio data and responses were then coded using the coding scheme. After each participant's responses were coded, the sum of responses for each sub-component was recorded, along with an overall total for each broad component. A data collation sheet (Appendix 6) was used for each participant to record the data.

3.5.2 Questionnaire

Scoring the questionnaire was based on the responses given to each statement on the 7 point Likert scale. The scale's response choices ranged from 'strongly disagree' - a mark of 1 -, to 'strongly agree' – a mark of 7. The scores on each item for each participant was then added to give their score on that particular variable. The minimum total score on a variable for each case was 7 and the maximum was 49.

Reliability of the questionnaire was established using Cronbach's Alpha. The alpha values of the subscales are shown in Table 3.11. The values are in the range: .67 to .84 which are in the acceptable range (Field, 2013; Nunnally, 1978; Panayides, 2013) within the context of this study. This range of alpha values were not dissimilar to those obtained from piloting the questionnaire: .67 - .84.

Table 3.11: Reliability test results of Questionnaire

Variable	Cronbach's Alpha
Experiential Self Efficacy	.76
Vicarious Self Efficacy	.84
Received Self Efficacy	.77
Attitude	.67
Subjective Norm	.79
Intention	.67
Collective Agency	.80
Personal Agency	.82

The variables and the different ways in which they were measured are summarised in Table 3.12 below.

Table 3.12 Summary of Variables and Measures

Variable	Type	Instrument
Experiential Self Efficacy	Behavioural	Questionnaire
Vicarious Self Efficacy	Behavioural	Questionnaire
Received Self Efficacy	Behavioural	Questionnaire
Attitude	Behavioural	Questionnaire
Subjective Norm	Behavioural	Questionnaire
Intention	Behavioural	Questionnaire
Collective Agency	Behavioural	Questionnaire
Personal Agency	Behavioural	Questionnaire
Regulation of Cognition	Cognitive	Interview + observation
Metacognitive Knowledge	Cognitive	Interview
Perseverance and Effort	Cognitive	Observation

The data generated from the participant questionnaire was entered into a spreadsheet along with the parent questionnaire and pupil profile ready for statistical analysis using the software: SPSS.

3.6 Results

The prime purpose of this study was to test the proposed models of SRL for the two cultural groups – Chinese and White British – in order to find out whether the variables interacted in the manner hypothesised as a result of the influence of culture. Of particular interest was to find out whether the influence of culture was predominantly on the motivational and affective variables.

As stated previously, it was essential to establish the invariance between the two groups in order to forestall the issue of culture being confounded by systematic differences in level of actual performance. Violation of the invariance principle could have implications for the results of this study. A student's *t* test (two-tailed) was used to compare the groups. At stage one, on average, children from White British cultural background performed marginally better (M=17.46, SE=1.22), than the children from Chinese cultural background (M=16.31, SE=1.03). This difference, -1.143, 95% CI [-4.323, 2.037], was not significant $t(68)$ = -.717, p= .476. The results for the task performance at Stage 3 had the Chinese group performing marginally better than the White British even though both groups did better than at the first attempt: Chinese (M=20.31, SE=1.09), White British (M=20.06, SE=1.19). This difference, .257, 95% CI [-2.964, 3.479], was not significant $t(68)$ = .159, p= .874. Furthermore, the improvement between Stages 1 and Stage 3 was significant for both groups - Chinese: [difference, 4.0, 95% CI (-5.157, -2.843), $t(34)$= 7.023, p<.001]; White British: [difference, 2.6, 95% CI (-3.764, -1.436), $t(34)$= 4.539, p<.001]. The t-test results satisfied the invariance condition paving the way for the remainder of the analysis.

Since this study is all about testing the relationships between the variables in the models, correlation analysis was found to be suitable. The original intention had been to use path analysis to test the magnitude and significance of the hypothesised causal connections between the variables in the hypothesised models. This was to help show which of the paths were more important and significant. However, the option of using path analysis was discarded since there were no exogenous variables in either of the models – a prerequisite for viable path analysis (Stage, Carter, & Nora, 2004). Exogenous variables have their causes lying outside the model hence have no arrows from one of the other variables in the model pointing to them; their value does not depend on the level of another variable in the model. At least one such a variable is required as a starting point in order to create path diagrams. Path analysis also requires a sample size larger than was available in this study - Klein (1998) recommends a ratio of 20 cases per parameter in the model.

Similarly, multiple regression was not feasible because difficulties in recruiting participants meant the sample size ended up being too small. Even though there is no unanimous stipulation among researchers about the minimum number of cases in a sample to use in regression analysis (see Cohen, 1988; Schmidt, 1971), there is

agreement a larger sample size would be required for multivariate regression analysis than was available in this study – 35 cases per group. Different sample sizes have been suggested depending on the number of predictor variables (v). Harris (1975) argued for a sample size of 50 + v; Nunnally (1978) suggested a sample size of 100 for v ≤ 3 and a much larger sample size of between 300 and 400 when v is around 9 or 10. Tabachnick and Fidell (1989) argued for a sample size of at least 5v; while Green (1991) stipulated an optimum sample size of 50 + 8v. An optimum sample size of about 100 has been suggested as a rule of thumb irrespective of the value of V by Combs, (2010). It is therefore clear the number of predictor variables in the models in this study would require a much larger sample size (see also Green, 2001; Tabachnick & Fidell, 2009).

Consequently, it was decided Pearson's product-moment correlations would be the appropriate analysis to use given its utility in measuring the strength of the linear relationship between two variables (Tolmie, Muijs & McAteer, 2011). This was an appropriate and effective analysis tool because the study was hypothesis driven, and correlation was well suited to test the strength of the hypothesised relationships which were assumed to be linear. The relationships were checked for linearity and they all appeared to satisfy that condition. The sample size was also adequate for analysis using this test (Bonnett, & Wright, 2000; Shieh, 2010). It was computed in each case to assess if the relationships between the variables were as predicted in the models. Each hypothesis was tested systematically by computing the correlation between the variables, and running partial correlation tests where appropriate to check the contributing influence of related variables.

Since this involved testing multiple hypotheses, due consideration was given to the issue of committing a type 1 error - observing at least one significant result purely due to chance. With 9 hypotheses, the probability of making such an error is calculated thus (Perneger, 1998):

P (at least one significant result) = 1 − P(no significant results)

$$= 1 - (1 - 0.05)^9$$

$$\approx 0.37$$

This implied there was a 37% chance of making a type 1 error. This would have necessitated the use of a Bonferroni correction in determining the appropriate significance value. The Bonferroni correction reduces the chances of committing a type 1 error by calculating a more robust significance value.

Using a Bonferroni correction to reduce the chance of observing a significant result purely by chance would have resulted in using a significance value of .005 ($\alpha/n=$ .05/9 [Tolmie, Muijs & McAteer, 2011]), thereby reducing the power of the tests and increasing the chance of getting a false negative - making a type 2 error (Boehringer, Epplen, Krawczak, 2000; Nakagawa, 2004; Perneger, 1998). The type 1/type 2 error trade off was carefully considered and a decision was made in favour of maintaining a significance level of .05 since as Perneger (1998) argues, inappropriate use of the Bonferroni correction potentially creates more problems than it solves. Even so, the results were treated with caution. Relationships were checked where possible using partial correlations. This provided some safeguard by checking that the identified relationships were not the spurious consequences of associations with other variables. Furthermore, all the tests computed were two-tailed; consequently, a more conservative assessment of significance was used. Adopting a hypothesis-driven approach provided a measure of control, in that it was not a trawl for relationships, but the focus was on assessing whether or not the predicted relationships were borne out by the data.

3.6.1 Hypotheses

The results of the correlational analysis are reported below hypothesis by hypothesis. The hypotheses for the two groups and the related outcomes are summarised in Table 3.13. Firstly, the hypotheses in relation to how the variables interact in the different cultural backgrounds are reported, followed by reporting on the hypothesis about whether cultural influence was predominantly on the affective variables. Also, any unexpected findings are reported.

Table 3.13 Summary of Hypotheses and Findings

	Group	Hypotheses	Summary finding
Hypothesis 1	Chinese	In collective cultures, Motivation is influenced by the perceived values of important others – what is termed the Subjective Norm	Hypotheses was supported by the results in the White British group. It was also supported in the Chinese group albeit with an unexpected observation (There was also a strong influence of attitudes).
	White British	In individualist cultures, the Motivational construct is influenced primarily by Personal Attitudes	
Hypothesis 2	Chinese	There is a relationship between Subjective Norms and Collective Agency in collective communities	Hypotheses were supported on the whole. Relationships were broader in the Chinese group than anticipated.
	White British	There is a relationship between Attitudes and Personal Agency	
Hypothesis 3	Chinese	Received and Vicarious SE is related to Subjective Norms	On the whole, the hypotheses were supported by the data in the Chinese group. Likewise, the White British but with an unexpected relationship (RSE also related with ATT).
	White British	Experiential SE is related to attitudes	
Hypothesis 4	Chinese	In collective communities, RSE and VSE has a greater influence on Perseverance and Effort	Hypotheses were supported by the data in the Chinese group but not in the White British group.
	White British	In individualistic communities, ESE influences Perseverance and Effort.	
Hypothesis 5	White British	In individualistic communities, ESE is more strongly related to the experience of past performance.	Hypothesis was not supported by the data.
Hypothesis 6		In general, cultural differences relate to the influence of the affective variables but not the cognitive ones	Data supported hypothesis. Influence of culture was found on motivational variables.

3.6.1.1 Hypothesis 1 states that in individualistic cultures, the motivational construct - the combined effects of Attitudes and Subjective Norms which feeds through Intention, is influenced primarily by personal Attitudes, while in collectivist cultures, it is influenced by the perceived values of important others – what is termed the Subjective Norm. It was hypothesised that the principal influence on intention would differ between the two cultures.

The model for the individualist group was largely supported by the data. Attitudes (ATT) had a singularly dominant influence on Intention in the White British group ($r=.73$, N=35, p<.01; Subjective Norms (SN) had no influence ($r=.09$, N=35, p=.60). In contrast, as hypothesised, the influence of the perceived values of important others - SN - was strongly correlated with Intention (INT) ($r=.52$, N=35, p<.01) in the Chinese cultural background group though Attitudes was also highly correlated ($r=.67$, N=35, p<.01). ATT had a bigger influence on INT than SN in the Chinese group which was unexpected. It also turned out SN and ATT were highly correlated in the Chinese group ($r=.64$, N=35, p<.001), but not in the White British ($r=.19$, N=35, p=.28). A subsequent partial correlation controlling for the effect of SN reduced the size of influence ATT had on INT in the Chinese group ($r=.51$, df=32, p<.01); controlling the effect of ATT produced a non-significant relationship between SN and INT in the Chinese group ($r=.16$, df=32, p=.38) which suggests that ATT is actually the primary influence for this group too, though it is probably rationalised as being collective.

Another statistic considered was the variance to check whether the unexpected results for the Chinese group might be accounted for by attenuation in the SN ratings; this was found not to be the case. As shown in Table 3.14, SN had a larger variance than ATT in both groups.

Table 3.14 Variance

	INT	ATT	SN
Chinese	32.01	27.95	38.78
White British	22.68	22.35	55.08

Another piece of data that was considered as a result of finding the relationships in the Chinese group was the means for the variables in the two groups. SN had a higher mean (M=39.26, SD=6.23) in the Chinese group than the White British children

(M=37.26, SD=7.42). This difference, 2.00, 95% CI [-1.268, 5.268], was not significant $t(68) = 1.22$, p= .226. Similarly, the difference observed between the two groups for ATT was not significant: Chinese (M=40.63, SD=5.29), White British (M=42.34, SD=4.73); the difference, 1.714, 95% CI [-4.106, .678], $t(68) = -1.43$, p= .16.

Subsequently, a paired sample t-test was computed to compare the means of SN and ATT within each of the two groups. The difference observed between the two variables – ATT and SN – in the Chinese group was not significant: 1.371, 95% CI [-3.071, .328] $t(34) = -1.64$, p=.11. On the other hand, the difference in means between SN and ATT in the White British group: 5.086, 95% CI [-7.842, -2.33], was significant $t(34) = -3.75$, p= .001.

On the whole, the hypothesis was supported by the results from the data albeit with some unexpected observations particularly in the Chinese group.

3.6.1.2 Hypothesis 2 predicts a relationship between attitudes and personal agency (PA) in individualistic communities; but in collectivist, between subjective norms and collective agency (CA).

In the White British group, the relationships were broader than was predicted. However, on the whole, in considering which one of SN and ATT had a stronger influence on PA, as hypothesised in the White British group, ATT was relatively, the more influential variable (ATT r=.26, N=35. p=.06; SN r=-.137, N=35, p=.22) albeit not significant. A partial correlation was run to check the relationship between ATT and PA controlling for SN. The relationship improved with an improved significance level (r=.3, df=32, p=.04). Checking the relationship between SN and PA controlling for ATT did not lead to any improvements (r=-.196, df=32, p=.27). ATT was also strongly correlated with Collective Agency (CA) in the White British group: (ATT r=.58, N=35, p<.001), but SN was not (r=.14, p=.41) which was unexpected and out of line.

In the Chinese background group, SN had a strong relationship with CA (r=.60, N=35, p<.001). A partial correlation controlling for ATT gave a relationship between SN and CA that remained strong and significant (r=.46, N=35, p=.004). ATT similarly had a positive relationship with CA (r=.44, N=35, p=.008); however, the relationship disappeared when the influence of SN was controlled for (r=.092, df=32, p=.604), suggesting that at least, here, SN was the primary influence. ATT also had a positive

relationship with PA in the Chinese group (r=.40, N=35, p=.02); but that reduced in strength and significance when the effect of SN was controlled further validating the role of SN as the primary influence (r=.27, N=35, p=.06). As noted for Hypothesis 1, SN and ATT were highly correlated in the Chinese background group.

The means for the variables - CA and PA - in the two groups were compared. CA had a higher mean (M=35.77, SD=7.09) in the Chinese group than the White British children (M=30.46, SD=9.95). This difference, 5.31, 95% CI [1.192, 9.437], was significant t(68) = 2.572, p=.012. Similarly, the difference observed between the two groups for PA was significant: Chinese (M=33.77, SD=9.77), White British (M=41.09, SD=6.25); the difference, 7.32, 95% CI [-11.238, -3391], t(68) = -3.73, p<.001.

Hypothesis 2 was supported on the whole by the data with CA more important for the Chinese group, with SN having the main influence. In the White British group, ATT was the main influence but its significant relationship was with CA.

3.6.1.3 Hypothesis 3 states that experiential self-efficacy (ESE) is related to attitudes in individualist communities; in collectivist communities, Received and Vicarious self-efficacy (RSE and VSE) is related to subjective norms.

In the White British group, as expected, there was a positive correlation between ESE and ATT (r=.47, N=35, p=.004). Also, there was a significant correlation between RSE and SN (r=.42, N=35, p<.05) and a weaker relationship between VSE and SN (r=.32, N=35, p=.06). As a result of these unexpected relationships [between RSE, VSE and SN in this group], a partial correlation was computed to control for the effect of ATT. The pattern remained albeit reduced marginally: RSE and SN (r=.39, df=32, p<.05); VSE and SN (r=.3, N=32, p<.05). There was no relationship between VSE and ATT (r=.14, N=35, p=.42), and between RSE and ATT (r=.19, N=35, p=.28); also no relationship between ESE and SN (r=.069, N=35, p=.69

In the Chinese background group, the predominating relationship was between RSE and SN (r=.44, N=35, p=.009), supporting the hypothesised relationship and a non-significant relationship between VSE and SN (r=.26, N=35, p=.13). There was also a significant relationship between RSE and ATT (r=.35, N=35, p=.04), and a non-significant relationship between ESE and ATT (r=.26, N=35, p=.13), and VSE and ATT (r=.17, N=35, p=.32).

The means for the variables – VSE, RSE and ESE - in the two groups were compared. VSE had a marginally higher mean (M=38.26, SD=7.81) in the Chinese group than the White British children (M=37.80, SD=6.99). This difference, .457, 95% CI [-3.079, 3.993], was not significant t(68) = .258, p=.80. Similarly, the difference observed between the two groups for RSE was not significant: Chinese (M=36.8, SD=5.91), White British (M=37.51, SD=7.24); the difference, .714, 95% CI [-3.865, 2.436], t(68) = -.452, p=.65. Finally, the difference observed between the two groups for ESE was not significant: Chinese (M=33.34, SD=6.23), White British (M=35.71, SD=7.45); the difference, 2.371, 95% CI [-5.647, .904], was not significant t(68) = -1.445, p=.15.

Subsequently, a paired sample t-test was computed to compare the means of VSE and ESE within each of the two groups. VSE was chosen instead of RSE for comparison with ESE because there was a larger difference between VSE and ESE than between RSE and ESE. The difference observed between the two variables – VSE and ESE – in the Chinese group was significant: 4.92, 95% CI [1.681, 8.148] t(34) = 3.089, p=.004. On the other hand, the difference in means between VSE and ESE in the White British group: 2.09, 95% CI [-1.278, 5.45], was significant t(34) = 1.26, p= .22.

On the whole this hypothesis was supported by the data with some unexpected relationships in both groups.

3.6.1.4 Hypothesis 4 In Individualistic communities, ESE influences Perseverance and Effort while in collectivist, RSE and VSE has a greater influence on Perseverance and Effort.

This hypothesis for the individualist White British group was not upheld by the data. ESE had no significant correlation with Engagement nor Level of Perseverance (r=-.048, N=35, p=.78; r=-.029, N=35, p=.87 respectively) at Stage 3. Neither VSE nor RSE had a relationship with Perseverance and Effort ([VSE and ENG: r=.111, N=35, p=.52; VSE and LEV: r=-.025, N=35, p=.89] [RSE and ENG: r=-.045, N=35, p=.8; RSE and ENG: r=-.154, N=35, p=.38])

The self-efficacy variables were related to perseverance and effort as predicted by the model in the Chinese cultural group. VSE had a significant relationship with engagement, r=.49, N=35, p=.003 and level of perseverance r=.33, N=35, p=.05. Similarly, RSE had a strong relationship with engagement r=.33, N=35, p=.05; RSE

with level of perseverance r=.46, N=35, p=.005. ESE had no relationship with ENG (r=.035, N=35, p=.84) nor with LEV (r=.108, N=35, p=.54)

The means for the components that made up Perseverance and Effort - Engagement and Perseverance Level - were compared for the two groups. As shown in Table 3.15, the Chinese group had higher Means and lower SDs than the White British.

Table 3.15 Means for Perseverance and Effort

	Group	Mean	SD
Engagement Stage 1	Chinese	96.62	11.52
	White British	89.91	17.28
Perseverance Level Stage 1	Chinese	2.09	.658
	White British	1.71	.789
Engagement Stage 3	Chinese	94.25	19.17
	White British	88.52	21.31
Perseverance Level Stage 3	Chinese	2.14	.845
	White British	1.95	1.13

As shown in table 3.16, the differences in means between the two groups were significant at Stage 1 but not at Stage 3.

Table 3.16 Significance of Mean Differences

	Mean difference	95% CI	*t*	p=
Engagement Stage 1	6.7	-.322, 13.73	(59.24) 1.909	.06
Perseverance Level Stage 1	.371	.025, .718	(68) 2.139	.04
Engagement Stage 3	5.73	-3.94, 15.39	(68) 1.183	.24
Perseverance Level Stage 3	.197	-.279, .673	(68) .826	.41

On the whole, the hypothesis was supported by the data with the Chinese group but not with the White British group.

3.6.1.5 Hypothesis 5 In individualistic communities, ESE is more strongly related to the experience of past performance.

The hypothesised relationship between performance and ESE in the White British group was not supported by the data at stage one ($r=.01$, $N=35$, $p>.05$) nor at stage three ($r=.018$, $N=35$, $p=.47$).

3.6.1.6 Hypothesis 6 In general, cultural differences relate to the influence of the affective variables but not the cognitive ones.

The preceding analyses support the presence of culturally-related affective variations, but confirming the hypothesis requires an examination of the cognitive relationships. The key relations to consider are between metacognitive knowledge (MK) and regulation of cognition (RC); and between the individual influences of MK, RC on performance.

The relationship between MK and RC was assessed. There was a strong correlation between the two variables in both cultural groups. In the Chinese background group, $r=.67$, $N=35$, $p<.01$ at stage one; and a very strong relationship, $r=.95$, $N=35$, $p<.01$ at Stage 3. The White British group showed a similar relationship. At stage one, there was a strong relationship $r=.74$, $N=35$, $p<.01$ at stage one; and a reduction in the strength of the relationship $r=.48$, $N=35$, $p<.01$ at Stage 3. Overall, there was a strong correlation between metacognitive knowledge and regulation of cognition. Higher levels of MK were correlated with increases in the level of RC in both cultural backgrounds.

Furthermore, the relationship between MK and Performance (Perf) was assessed. In the Chinese background group, there was a strong correlation between the two variables, $r=.55$, $N=35$, $p<.001$ at stage one; and a moderate relationship, $r=.32$, $N=35$, $p=.06$ at stage three. Overall, there was a strong correlation between MK and Perf. Higher levels of MK were correlated with higher levels of Perf. The results were similar in the White British group $r=.64$, $N=35$, $p<.001$ at both Stage 1 and 3.

The relationship between RC and Perf was similarly strong in both groups. At Stage 1, there was a strong relationship between RC and Perf ($r=.57$, $N=35$, $p<.001$), and Stage 3: ($r=.36$, $N=35$, $p=.03$), in the Chinese group; in the White British group at Stage 1: ($r=.66$, $N=35$, $p<.001$), and ($r=.38$, $N=35$, $p=.004$) at Stage 3.

The means for RC and MK were also compared between the two groups. As shown in Table 3.17, the White British group had higher Means than the Chinese on every count except on RC at Stage 1.

Table 3.17 Means for MK and RC

	Group	Mean	SD
MK Stage 1	Chinese	10.37	1.96
	White British	10.86	3.24
RC Stage 1	Chinese	6.86	1.40
	White British	6.60	2.65
MK Stage 3	Chinese	10	4.98
	White British	11.71	3.85
RC Stage 3	Chinese	6.43	3.28
	White British	7.94	2.76

As shown in table 3.18, the differences in means between the two groups for the variables - RC and MK - were not significant at Stage 1, and not significant for MK at Stage 3, but significant for RC at Stage 3.

Table 3.18 Significance of MK, RC Mean Differences

	Mean difference	95% CI	*t*	p=
MK Stage 1	.486	-1.767, .795	(55.92) -.76	.45
RC Stage 1	.257	-.758, 1.273	(51.55) .508	.61
MK Stage 3	1.714	-3.839, .410	(68) -1.610	.11
RC Stage 3	1.513	-2.973,-.052	(67) -2.068	.04

From the preceding analysis of the relationships between the cognitive variables and the affective ones in both cultures, in testing the hypothesis that culture influences the affective variables and not the cognitive ones, the data supports the hypothesis. It suggests the influence of culture was on the relationships between the affective and

motivational variables since that is where the differences observed were found, and none were found between the cognitive variables.

3.6.2 The Unexpected

An unexpected finding that emerged from the data was the pattern of relationships between the cognitive variables and the affective ones.

In the White British group, there was no significant relationship between any of the cognitive and affective variables. There was none between motivation (SN and ATT as predicted in the models, see Figure 3.1) and RC; none between self-efficacy and RC (as predicted in the models) or MK; and none between agency (CA and PA) and RC (also predicted in the models).

The Chinese group however, showed relationships not present in the White British group. The data showed a relationship between RSE and RC at Stage 1 (r=.37, N=35, p=.03). There was also a relationship between ESE and MK (r=.36, N=35, p=.04); and between RSE and MK (r=.41, N=35, p=.01) at Stage 1, but not at Stage 3.

However, as will be explained later, a relationship can be seen to exist between RC and Perseverance in both cultural groups (albeit only marginally significant in the Chinese group) at Stage 1 but not at Stage 3. (White British: RC and Level of Perseverance [LEV] r=.39, N=35, p=.02; RC and Engagement [ENG] r=.34, N=35, p=.04; Chinese: RC and LEV r=.30, N=35, p=.08). The relationship between MK and perseverance (LEV) was significant in the Chinese group (r=.34, N=35, p=.05) but not in the White British group at Stage 1 (MK and LEV r=.26, N=35, p=.13; MK and ENG r=.29, N=35, p=.09). At Stage 3, there was no relationship between MK and perseverance in the Chinese group but there was between MK and LEV in the White British group (r=.47, N=35, p=.004). It is notable that the Chinese group showed a lack of engagement (ENG) relative to level of perseverance (LEV); yet the White British group were high in both ENG and LEV.

Therefore, a relationship does exist between the cognitive variables and Perseverance. The implications of this will be discussed later.

A complete outline of the models and the associated correlations between all the relevant variables is shown in Figures 3.1 and 3.2. The models have been ordered in Stages 1 and 2 (A), and Stages 2 and 3 (B) to show the temporal ordering of the

predicted relationships between the variables. This ordering is shown for both cultural groups.

Figure 3.1: Collective Culture Correlations

A) Stages 1 and 2

KEY

BOLD : Correlation Significant at p<.01
NORMAL FONT: Correlation Significant at p<.05
ITALICS : No Significant Correlation

COLLECTIVE CULTURE

MK1 → PERF1 = .55

1

Metacognitive Knowledge

2 MK1 → RC1 = .67

ESE → RC1 = .12
RSE → RC1 = .37
VSE → RC1 = .26

COGNITIVE

3

RC1 → PERF1 = .57

13

Personal Agency

CA → RC1 = .05
PA → RC1 = .08

Regulation of Cognition

RC1 → ENG1 = .26
RC1 → LEV1 = .30

ESE→MK1=.36
RSE→MK1=.41

Collective Agency

SN → RC1 = .014
ATT → RC1 = -.067

12

Self Efficacy

ESE → ENG1 = .05
ESE → LEV1 = .43
RSE → ENG1=.31
RSE → LEV1=.60
VSE → ENG1= .60
VSE → LEV1=.40

8

Perseverance and Effort

ENG1 → PERF1 = .16
ENG1 → LEV1 = .46
LEV1 → PERF1 = .60

5

RSE → CA=.31
VSE → CA=.40

9

8

AFFECTIVE

Received Self Efficacy

7

SN → CA = .60

Motivation and Affect

11 **Intention**

11

INT → ENG1 = .14
INT → LEV1 = .27

Vicarious Self Efficacy

6

RSE→ SN = .44
VSE → SN = .26

ATT→ INT = .67
SN → INT = .52

SN → ENG1 = .13
ATT → ENG1 = -.03
SN → LEV1 = .22
ATT → LEV1 = .20

PERF1 → PERF3 = .86

Experiential Self Efficacy

Subjective Norms

Attitudes

PERFORMANCE

B) Stages 2 and 3

COLLECTIVE CULTURE

MK3 → PERF3 = .32
MK1 → PERF3 = .48
PERF1 → MK3 = .27

1

MK3 → RC3 = .95
MK1 → RC3 = .56
RC1 → MK3 = .27

Metacognitive Knowledge

2

COGNITIVE

ESE → RC3 = .16
RSE → RC3 = .13
VSE → RC3 = -.04

3

RC1 → PERF3 = .52
RC3 → PERF3 = .36

Regulation of Cognition

13

ESE→MK1=.36
ESE→MK3=.24
RSE→MK1=.41

Personal Agency

CA → RC3 = .04
PA → RC3 = -.09

RC1 → ENG3 = .25
RC1 → LEV3 = .44
RC3 → ENG3 = .005
RC3 → LEV3 = .26

Collective Agency

ESE → ENG3 = .03
ESE → LEV3 = .11
RSE → ENG3=.33
RSE → LEV3=.46
VSE → ENG3=.49
VSE → LEV3= .33

SN → RC3 = .098
ATT → RC3 = -.02

ENG1 → PERF3 = .15
ENG1 → LEV3 = .25
ENG3 → LEV3 = .59
ENG3 → PERF3 = .16
LEV1 → PERF3 = .39
LEV3 → PERF3 = .43
ENG1 → ENG3 = .34

Self Efficacy

8

12

Persverance and Effort

8

AFFECTIVE

9

Received Self Efficacy

RSE → CA= .31
VSE → CA= .40

5

INT → ENG3 = .33
INT → LEV3 = .36

11

Intention

Vicarious Self Efficacy

7

SN → CA = .60

11

ATT→ INT = .67
SN → INT = .52

Experiential Self Efficacy

6

RSE→ SN = .44
VSE → SN = .26

Motivation and Affect

Subjective Norms

Attitudes

PERF1 → PERF3 = .86

PERFORMANCE

140

Figure 3.2: Individualist Culture Correlations

A) Stages 1 and 2

KEY

BOLD : Correlation Significant at p<.01
NORMAL FONT: Correlation Significant at p<.05
ITALICS : No Correlation

INDIVIDUALIST CULTURE

MK1 → PERF1 = .64

1

MK1 → RC1 = .74

2

Metacognitive Knowledge

ESE → RC1 = -.17
RSE → RC1 = .04
VSE → RC1 = .05

COGNITIVE **3**

Regulation of Cognition

RC1 → PERF1 = .66
RC1 → PERF3 = .71

13

CA → RC1 = -.18
PA → RC1 = -.08

Collective Agency

RSE → CA = .36
VSE → CA = .05

SN → RC1 = .23
ATT → RC1 = -.1

RC1 → ENG1 = .34
RC1 → LEV1 = .39
RC1 → LEV3 = .49

12

Personal Agency

4

ESE → ENG1 = -.19
ESE → LEV1 = -.13
RSE → ENG1=.05
RSE → LEV1=-.25
VSE → ENG1 = .01
VSE → LEV1 = .17

9

Perseverance and Effort

ENG1 → PERF1 = .03
ENG1 → LEV1 = .68
LEV1 → PERF1 = .17

PA → ATT = .26

8

8

Self Efficacy

ESE → PA = .37

5

Vicarious Self Efficacy

Received Self Efficacy

Experiential Self Efficacy

AFFECTIVE

ATT → CA = .58

7

SN → CA = .51

INT → ENG1 = -.16
INT → LEV1 = -.03

11

Intention

11

ATT → INT = .73
SN → INT = ..09

SN → ENG1 = .29
ATT → ENG1 = .12
SN → LEV1 = .20
ATT → LEV1 = .05

6

ESE → ATT = .47

Attitudes

Motivation and

Subjective Norms

SN → RSE = .42
SN → VSE = .32

PERF1 → PERF3 = .89

PERFORMANCE

ESE → PERF1 = .01

10

141

B) Stages 2 and 3

KEY

BOLD : Correlation Significant at p<.01
NORMAL FONT: Correlation Significant at p<.05
ITALICS : No Correlation

INDIVIDUALIST CULTURE

1
MK3 → PERF3 = .64
MK1 → PERF3 = .64
PERF1 → MK3 = .56

Metacognitive Knowledge

2
MK3 → RC3 = .48
MK1 → RC3 = .46
RC1 → MK3 = .79

COGNITIVE

3
ESE → RC3 = -.13
RSE → RC3 = -.04
VSE → RC3 = -.09

Regulation of Cognition

13
RC1 → PERF3 = .71
RC3 → PERF3 = .48

RSE → CA = .36
VSE → CA = .05

Collective Agency

CA → RC3 = -.21
PA → RC3 = -.11

RC1 → ENG3 = .21
RC1 → LEV3 = .49
RC3 → ENG3 = .08
RC3 → LEV3 = .26

Personal Agency

4

SN → RC3 = .03
ATT → RC3 = .015

9

12

Self Efficacy

ESE → ENG3 = -.05
ESE → LEV3 = -.03
RSE → ENG3= -.04
RSE → LEV3=.15
VSE → ENG3 = .11
VSE → LEV3 = .02

Perseverance and Effort

ENG3 → LEV3 = .71
ENG3 → PERF3 = .09
LEV3 → PERF3 = .48

PA → ATT = .26

8

ESE → PA = .37

5

AFFECTIVE

Vicarious Self Efficacy

Received Self Efficacy

7

ATT → CA = .58

Experiential Self Efficacy

6

ESE → ATT = .47

Attitudes

SN→ RSE = .42
SN → VSE = .32

Motivation and

Subjective Norms

SN→ CA = .51

Intention

11

INT → ENG3 = -.08
INT → LEV3 = -.22

11

ATT→ INT = .73
SN → INT = .09

SN → ENG3 = .23
ATT → ENG3 = -.01
SN → LEV3 = .16
ATT → LEV3 = -.1

8

PERFORMANCE

PERF1 → PERF3 = .89

10

3.7 Discussion

This study (Study 1), sought to investigate which elements of SRL were impacted by culture by testing the models of SRL in children from a collective cultural background (Chinese) and children from an individualistic cultural background (White British), assessing whether the variables related with each other as had been hypothesised. In addition, any unusual patterns and relationships that emerged were discussed even though they were not hypothesised initially.

This section begins with a discussion of the major findings of this study in relation to the hypotheses drawn from the main research questions. After that, a discussion is provided about the unexpected findings in the study. Subsequently, limitations of the study are discussed. The section will end with a brief statement leading into the next study.

3.7.1 Hypothesised Relationships

In relation to the research question about whether culture influenced the relationships between the components of SRL skills, the data seemed to support it in the affirmative. In order to answer the question, data was collected on all the variables that comprised the models of SRL in the two cultures in 8-11 year old participants from the two cultural background groups.

An important observation was that, on the whole, the White British group was relatively more stable in their characteristics relative to their Chinese counterparts. They showed greater consistency in the results as predicted whereas the Chinese group, in addition to supporting the hypotheses on the whole, showed some unexpected relationships expected of the White British group as well.

Hypothesis 1: The data suggested that intention (INT) was solely a function of attitude (ATT) in the White British group, but of both subjective norms (SN) and ATT in the Chinese group – since the two were highly correlated, perhaps ATT was strongly influenced by SN, or rationalised as such. ATT was strongly positive in both groups, with a mean rating per item of around 6. SN was not far behind, but still significantly lower than attitude in the White British group, consistent with it being less important for this group.

In the Chinese cultural background group, being guided more strongly by the perceived expectations of the group, are predisposed to work towards maintaining the respectability they command in their social network – they strive to maintain 'face' (Ho, 1976). This way of asserting one's value within the culture - face - is prioritised (Hamamura & Heine, 2008) hence there is the constant drive to live to meet the expectations of the important referents.

According to McInerney (2011), an important influence on Chinese background children is the Confucian heritage with a deferential influence of family expectations and a fear of failure (see Chong, 2007). Fear of failure is driven by the desire to save face and that could be a powerful motivator since failure does not affect just the individual, but one's family or the entire community. The motivation to a learner from a Chinese collective background is therefore fostered by a sense of responsibility to the whole group – not to fail the family (McInerney, 2011). Inherent to that is the powerful influence of the perceived values of the community.

The Chinese group showed a high level of ATT influencing INT relative to SN which was unexpected. However, that may have a plausible explanation.   The definition of autonomy which is akin to volition is argued as playing a pivotal role in motivation. This is argued to be the case across different cultures. (Chang, Chen, Tu & Chi., 2016; Chen, Dong, & Zhou, 1997; Chirkov & Ryan, 2001; Ryan & Deci, 2000)

Yet, the universality of the pivotal role of autonomy claim – by considering it from an 'etic' viewpoint - has been challenged particularly by Iyengar and Lepper (1999). They found that the concept of autonomy had differing implications among Anglo American students and their Asian American colleagues. The Anglo American students, they reported, found decisions taken by themselves as more motivating while conversely, the Asian American students found decisions taken by 'in-group' others like mothers more motivating. The lack of choice (volition), they argued, did not lower their level of motivation. This they explained using self-construal theory (Markus & Kitayama, 1991). According to the theory, Western self-construal is independent whiles Eastern self-construal is interdependent. Therefore, a Western student stands to be motivated when they make independent (and volitional) decisions since they perceive themselves as unique individuals and want to stand out assertively in a group. The Asian American student, according to Iyengar and Lepper (1999), will therefore be

more motivated in situations that emphasise conformity to their group and less so when they have to be autonomous. Bao and Lam (2008) used self- determination theory to attempt to expatiate on this. According to self- determination theory:

''the issue of autonomy concerns the extent to which one fully accepts, endorses, or stands behind one's actions'' (Chirkov, Ryan, Kim, & Kaplan, 2003, p. 99).

It is therefore possible to feel highly autonomous even when following a choice made by others because as in the Asian American students, once they concur entirely with the in-group decision, it is internalised as an autonomous one (Bao & Lam, 2008; Iyengar & Lepper, 1999).

In the same vein, Riemer, Shavitt, Koo and Markus (2014) seem to support this argument in their work looking at attitudes in non-Western contexts. They argued that in non-individualist cultural contexts, attitudes (albeit of a different kind) still drive behaviour. This kind of attitudes, they opined, are significantly moulded by social norms. Attitudes are deeply rooted in preferences; however, preferences do not necessarily have to be personal because they can be normative as well. They therefore created a complementing model of attitude to the 'person-centric' model – the normative-contextual model of attitudes (Figure 3.3) – to capture the distinct features of attitudes in collectivist contexts that activate interdependent frames of thinking. In the normative-contextual model, the processes lead to the formation of attitude that is shaped and influenced by normative expectations and role obligations. The conceptualisation of attitudes, the data from this study suggests, may be appropriately done using an 'etic' view – viewing the construct of attitudes that translates across various sociocultural contexts with differences occurring only because the degree of impact of its core elements on the processes underlying attitudes to vary across cultures.

Conversely, attitudes can equally be conceptualised using an 'emic' view – construct of attitudes viewed solely from the point of view of the individuals within the culture. That will move the conceptualisation of attitudes away from a blanket interpretation of all cultures using a western individualist viewpoint and consider the alternative from a collective viewpoint in this case.
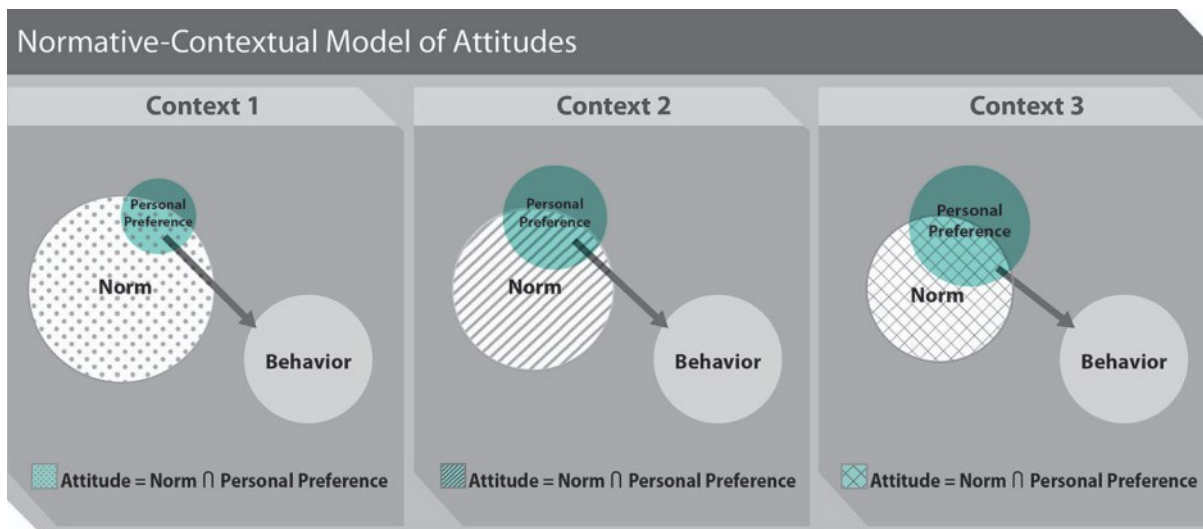
Figure 3.3 Conceptual representation of the Normative-Contextual (N-C) model of attitudes. (Source: Riemer, Shavitt, Koo & Markus, 2014; pg 624)

In the N-C model, behaviour is responsive to the particular context and norms. Consideration of the context is necessary and legitimized. Personal preferences and norms can be more or less important in certain contexts than in others (therefore the sizes of the circles change across contexts), but the imperative is to take account of and adjust to the relevant norms in the context (therefore the circle for norms is always larger than the one for personal preferences). Attitudes are depicted as the intersection of personal preferences and norms (the shaded areas where norms and personal preferences overlap) (Riemer, Shavitt, Koo & Markus, 2014).

The reverse is true for the White British group. They were driven primarily by ATT as hypothesised and that is consistent with extant research (see Markus & Kitayama, 1991; Vignoles, Owe, Becker, Smith, Easterbrook, Brown & Zinkeng, 2016).

This group, being from an individualist background, typically featured the characteristics of self-construal to demonstrate independence and uniqueness (Markus & Kitayama, 1991). This manifested in the dominance of personal attitudes relative to subjective norms in relation to INT (motivation).

The 'person-centric model of attitudes (Figure 3.4) is what pertains in a relatively individualist culture. There is less of an influence of social norms in this group and personal preferences are the foundation of attitudes and are the typical drivers of behaviour. Norms being exogenous to attitudes, and their importance varying from

one context to the other, have typically less importance than personal preferences. In individualist Western cultural contexts, where the person-centric model of attitudes is applicable, personal preferences are granted legitimacy and are of greatest importance in defining attitudes and, in turn, in influencing behaviour (Riemer, Shavitt, Koo & Markus, 2014). That may explain the absence of a relationship between SN and ATT, supporting the hypothesis.
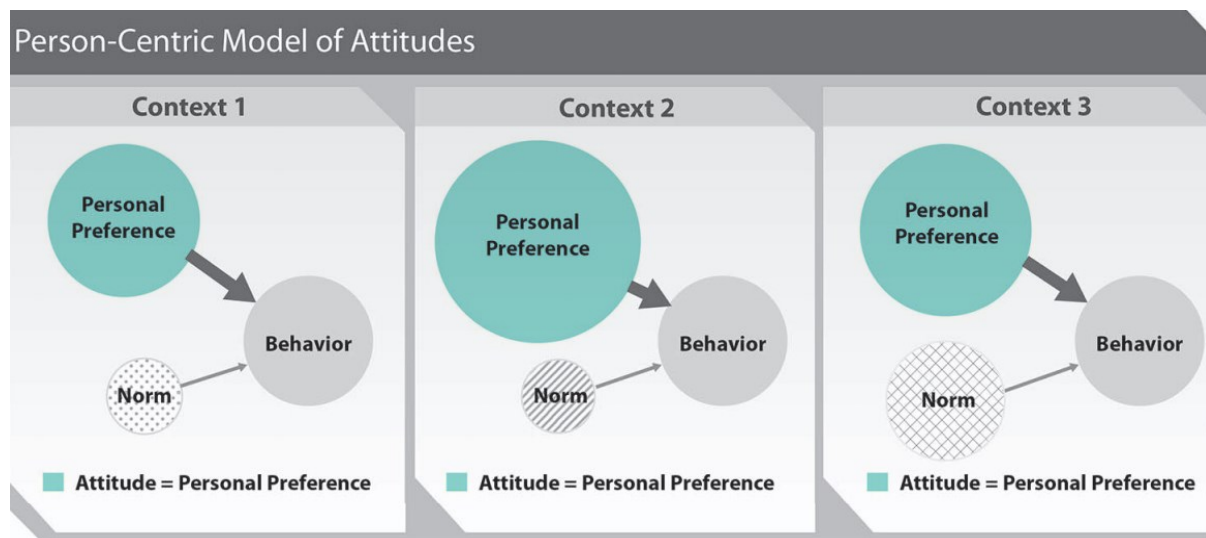
Figure 3.4 Conceptual representation of the Person-Centric (P-C) model of attitudes. (Source: Riemer, Shavitt, Koo & Markus, 2014)

Vignoles et al. (2016) conducted a large multi-national, inter-cultural study into 'selfhood' and its relationship with independence-interdependence. They corroborated aspects of Markus and Kitayama's (1991) study into self-construal. They reported that Western samples in their study tended to score significantly above average scores on the elements of: difference, self-expression, and self-direction – key features of independent self-construal. This could lend further support to the overarching role of personal preference and independence in the White British group and the dominance of ATT over SN.

The interplay of norms and personal preferences could be depicted in relation to which of the two has predominance in the two groups. Both personal preferences and norms do exert an influence on individual dispositions; nevertheless, due to the priming effect of culture, a collective oriented group such as the Chinese would have the

predominance of norms over personal preferences. The reverse could be true in an individualistic oriented group such as the White British.

This is represented conceptually in Figure 3.5.
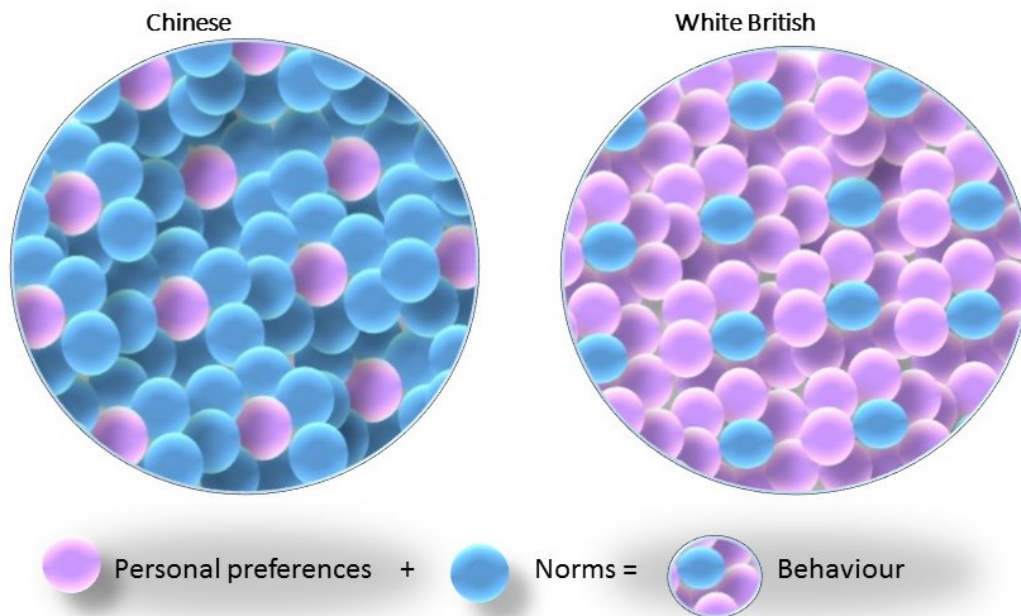
Figure 3.5 Conceptual representation of interplay between Personal preferences and Norms.

Hypothesis 2: Attitudes influence both personal and collective agency in the White British group, and the latter relationship is the stronger one – but personal agency is actually rated substantially higher, by nearly 2 scale points per item – perhaps suggesting that there is a cultural sanction for personal agency in this group, which boosts it regardless of attitude, attenuating the correlation. The relationship with collective agency is harder to explain, though it is apparently correlated with personal agency, so this may be in part some kind of spill-over effect. SN influences collective agency in the Chinese group, but there is a weak relationship between attitude and personal agency too, and the relative importance of collective agency is much less marked – again perhaps indicative of a kind of spill-over effect from the strong influence of SN. There is a very remote possibility the item wording for the scales not being distinguishing enough. However, this is very unlikely as the questionnaire design involved meticulous piloting and checks (see Section 3.3.3)

As stated in the results section (see Hypotheses 1 and 2; Sections 3.6.1.1 and 3.6.1.2), finding that some characteristics highly prevalent in a particular culture could exist to

a high degree in the other is not surprising. The results from hypothesis 2 suggest a strong relationship between ATT and CA in the White British group. The original hypotheses did not predict that relationship – the expectation was for ATT to have a strong relationship with PA. Similarly, ATT had a strong relationship with PA in the Chinese background group that had not been hypothesised about – the hypothesis expected SN to be correlated with CA.

Ogihara and Uchida (2014), studying the emergence and impact of individualism in Japan, credit the contribution of globalisation to the blurring of the hitherto distinct cultural lines between different parts of the world. In comparing the level of individualism-collectivism among American and Japanese undergraduates, they reported a significant individualistic orientation for Americans but the difference in collectivist orientation was not significant. However, they did admit to difficulties in their measures since self-report measures used gave different results to behavioural measures. Nevertheless, the suggestion globalisation was leading to blurring and merging of orientations could have some merit.

In this vein, it is not unreasonable to have found that attitudes had a significant relationship with collective agency in the white British group yet a non-significant relationship with personal agency as would be expected in a strictly homogenous demarcation of cultural orientations.

Furthermore, the education curriculum in the UK has been actively promoting ideals and skills such as teamwork and collaboration in all children. The DCSF document (DCSF, 2008) spells out skills of teamwork, collaboration and working cooperatively as some of the crucial skills schools must develop in children in order to be seen as delivering 'world class education' for the 21st century. Similarly, the SEAL curriculum whose primary objective was to develop key 'non-cognitive' academic skills furthered that agenda (Dfes, 2005). Hence, white British children even though are from a culturally individualistic background, may be developing strong CA traits as well. That may be a plausible reason for the group showing a strong relationship between ATT and CA as well as with PA.

Hypothesis 3: VSE, RSE and ESE seem to be of roughly equal importance in both groups, though they are more graduated in the Chinese, with VSE rated significantly higher than ESE. However, VSE and RSE are related to SN as predicted, save that

this is true of both Chinese and White British, and to the same extent; and ESE is related to attitude, but only in the White British group. The directional nature of these effects (SN to VSE/RSE; ESE to attitude) cannot be tested using these data, but in most other respects the data are consistent with the prediction, and with the dominant role of attitudes in the White British group.

A possible explanation for the graduated levels of self-efficacy sources could be the relatively lower levels of self-efficacy observed when collectivist East Asian cultures are compared with Western cultural backgrounds (King & McInerney, 2014; Klassen, 2004; Schunk & Pajares, 2009). Those studies measured self-efficacy as a single construct. The present study, in measuring the sources of self-efficacy (ESE, RSE and VSE), delineated its components that made it clear to see which aspects were more important to the groups. It showed the Chinese sample attached greater importance to RSE and VSE and less so to ESE.

The White British (individualistic) on the other hand, have been reported as having a relatively higher estimation of their self-efficacy relative to collective backgrounds (King & McInerney, 2014; Klassen, 2004). Their results reflected this as their scores on all three aspects were comparably high.

The high rating for attitudes and the relatively lower rating of ESE suggests, however, that attitudes are not solely experientially driven in the White British group (indeed the rating of attitude is too high to be likely to derive solely from performance via ESE, since this would be more mixed in all probability); and the VSE/RSE and SN relationships indicate a dimension of collective influence (cf. the collective agency effect discussed in Hypothesis 2) that was not hypothesised, even if the personal/attitudinal is more central.

Triandis and Suh (2002) reported that individuals in a collective culture tend to display the collective cognitive structures that are 'allocentric' that is different from the 'idiocentric' cognitive structures of individualistic cultures. However, they argue, that traditional collectivist allocentric samples that have acculturated to individualist cultures show this tendency (to be guided and defined by social ingroup) less, especially when they are highly educated. For instance, they reported a study that found that the least acculturated Cook Islanders of the South Pacific used about 57% social content in describing themselves - showing very high allocentric tendencies,

whereas Cook Islanders born in mainland New Zealand used about 20%, and New Zealanders used 17% social content - leaning towards idiocentric tendencies. The Chinese group, being relatively acculturated to British culture, may display idiocentric qualities such as displaying a degree of ESE.

An achievement of the present study has been to bring some clarity to the contentions among cross cultural researchers due to the dualisms in the field. One such contention has been argued by Bandura (2002) as inappropriately equating self-efficacy with individualism as opposed to collectivism. The difference, this study has clarified, is in which element or source of self-efficacy a particular culture attached importance to.

Hypothesis 4: Self-efficacy was only a predictor of perseverance and effort in the Chinese group, in both cases via VSE and RSE, as anticipated. In hindsight, the lack of impact of ESE in the White British group is not in fact inconsistent with it feeding into attitude and thence intention rather than directly into perseverance and effort. However, given the signs of collective influence in the White British corresponding to the Chinese group, the lack of impact of VSE and RSE on perseverance and effort in the White British is perhaps a little surprising, even if this was not hypothesised, and maybe confirms the peripheral nature of these effects – and probably also explains the apparent boost in effort exhibited by the Chinese group relative to the White British at Stage 1.

Nevertheless, Wolters and Hussain (2015), reporting on their study of grit and SRL, found that perseverance of effort (a dimension of grit) had a stronger relationship with the cognitive elements of SRL relative to the motivational elements (though there was still a relationship albeit weaker). That was indeed the case in this study as Figure 3.2 shows, level of perseverance (LEV) had a significant relationship with RC at both Stages 1 and 3. The sample used in Wolters and Hussain's study, though reported to be ethnically diverse, may have shown a trend similar to the White British sample in the present study. In academic outcomes, the influence of Grit (including perseverance and effort), they found, was mediated by the other elements of SRL.

As discussed in Hypothesis 2, it may not be strange after all that there was a significant relationship between ESE and Engagement in the Chinese cultural group – unexpected because the expectation was for VSE and RSE to be the dominant self-efficacy variables. However, a review of self-efficacy development in Hong Kong

schools (collectivist culture) by Tsang et al. (2012), reported the inclusion of experientially derived sources through mastery of learning material. This is because they recognised the importance of experiential self-efficacy in addition to the culturally sensitive sources.

Hypothesis 5: The lack of relationship of ESE to performance in the White British group is in some respects consistent with the apparent mismatch between levels of performance, ESE and attitude already noted. In retrospect, given how ESE was measured, it was perhaps overly optimistic to expect it to be influenced by the one brief experience presented by the Stage 1 task – it is more plausible that it should be a cumulatively derived construct. This is consistent with repeated studies about the process of self-efficacy development, particularly the experientially sourced type (Bandura, 2012; Mullen, Uwamahoro, Blount, & Lambie, 2015; Tsang, Hui, & Law, 2012); ESE is developed over a period of time.

Hypothesis 6: The lack of any notable difference between the Chinese and White British groups in the MK/RC/performance patterns of relationship, where much more evident differences were apparent for the affective variables is consistent with the impact of culture being predominantly on the latter. There may be subtler differences, nevertheless, with some signs that for the White British, the influence of MK persists to Stage 3, while falling off for the Chinese, perhaps consistent with the greater importance of individually-driven activity, where performance among Chinese becomes more 'automated' in line with collective influence (cf. the lack of Stage 3 relationships between RSE, RC, MK, perseverance and engagement, and the lack of engagement relative to perseverance). This is consistent with the model of culture and personality proposed by Church (2000). According to the model, even though traits existed in all cultures, they predicted behaviour less in collective cultures relative to individualist ones. In the Chinese group, collective influence played a more dominant role in their behaviour than any personal MK factors at Stage 3 relative to the White British.

This could also help explain why perseverance and effort increase to Chinese levels among White British at Stage 3, without any sign of affective influence – this is a direct effect of MK, as the increased correlation indicates. The model by Church (2000) throws light on this observation because it suggests the White British, by being

individualistic, were less influenced by situational determinants of behaviour. This is because the individualistic personality is primed to modify and make changes to the situational factors (by maintaining MK deploying more perseverance and effort in this case).

This in turn is consistent with the lack of affective-cognitive relationships among the White British group – understanding of the task itself elevates performance, and the affective/motivational constructs (including agency and self-efficacy) are in some sense subsidiary interpretations, the strength of attitude ratings notwithstanding. This could be given some credence by the fact some researchers have the opinion that attitudes are a function of behaviour, not vice versa – among overwhelmingly white Anglophone participants as attitudes have been poor predictors of related behaviours (see Durkin, 1995; Gilovich, Keltner & Nisbett, 2006; Hogg & Vaughan, 2014).

This study provided a possible insight into the elements of SRL that are impacted by culture. The data suggests the influence of culture was on the motivational variables. There were no significant differences observed in the relationships between the cognitive variables in the two groups but there were differences in how the motivation variables correlated. This is in agreement with the reported motivating power of the Confucian ideals such as the desire to maintain face (Ho, 1986), and the sense of responsibility towards the collective that creates a fear of failure (Chong, 2007; McInerney, 2011).

Culture wields the ability or potential to exert its influence on the motivational and affective elements of SRL because their very nature makes them susceptible to that. Considering expectancy-value theory of motivation (theory of planned behaviour in this case), culture is able to shape and determine the level of expectancy and value attached to academic tasks and their achievement.

Chinese culture esteems a concept that is valuable in learning contexts and could be a great motivator - learning virtues (Li, 2006). These learning virtues comprise personal resolve, diligence, endurance of hardship, perseverance and concentration. These so-called learning virtues are elements that enhance self-efficacy beliefs as argued by Pajares (2002). These are cultural norms that are inculcated in a child as they grow up and therefore they behave and act accordingly as a matter of course. All the symbols, agents and transmitters of culture and norms of expected behaviour

model these virtues and a Chinese child behaves in that particular way (which incidentally promotes academic excellence); since they defer to the collective and are driven by vicarious SE and received SE because that is what they are surrounded by.

Furthermore, as espoused by the theory of planned behaviour (TPB), the expectations held about whether important referent individuals or groups (friends, family, parents, teachers, peers, religious leader etc.) value the performance of the learning behaviour coupled with the strong motivation to comply leads to a relatively high degree of subjective norms (Ajzen, 1991).

As mentioned in the previous chapter, in the context of learning within which this study is set, motivated behaviour is defined by perseverance and effort. The motivational state of a learner which is the willingness to engage with a task and exert effort at a task is determined by the individual's level of subjective control - actions influenced by beliefs and perceptions (Boekaerts, 1992; Wolters, 2003); precisely, that is what this study was set to do by assessing motivation using the theory of planned behaviour – essentially assessing the beliefs and perceptions and attitudes influencing intention, that manifests as motivated behaviour through perseverance and effort. Beliefs and perceptions are largely determined by the culture in which an individual resides therefore it stands to gain that culture would operate through the motivation and affective elements of SRL as found through this study.

For the Chinese background group, the predominating determinants of belief and perception – and the culture for that matter – is their Confucian heritage (Ho, 1991; Leung, 2002). Particularly, the Confucian values in education is the driving force behind their outlook and predisposition in learning contexts. According to Leung (2002), there is an established Confucian (or Chinese) theory of education that laid a strong emphasis and importance to the value of education. This is channelled through the motivation/ affect of learners akin to subjective control as espoused by Wolters (2003).

3.7.2 Observed Non-Hypothesised Relationships

The finding about how the cognitive variables and affective variables related to each other was rather unexpected. In the Chinese background group, there was a relationship between self-efficacy variables and the cognitive variables; there was no such relationship in the White British group. Nevertheless, a relationship was found to

exist between the cognitive variables and perseverance and effort in both cultures albeit with its own nuances.

The differences observed in how the two groups fared in the relationship between the cognitive variables and the motivation variables of self-efficacy and SN or ATT could be reflected in the observations of Nisbett et al. (2001) and Zhang and Wei (2011). According to these researchers, Eastern ways of thinking (including Chinese) are influenced by the traditions of Confucianism and Taoism and that is contrasted with Western thinking primed by Aristotelian Greek philosophy. These historical philosophies, they posited, have shaped the dispositions, thinking and cultures of Eastern and Western people.

Zhang and Wei argued that the Chinese are characterised by cognitive processes that are dominated by holistic, cyclical and dynamic ways of thinking. Holistic thinking involves looking at the world in an integrative way – a view of the world that sees all things as interconnected in a certain way, hence reality is best understood as a whole. Believing in the inter-connectedness of all the elements, it follows on to expect constant change, movement and interaction between the various elements. Perception is therefore cyclical as a result (Choi, Koo & Choi, 2007). This they contrasted with the Western way of thinking that is analytical and linear. This may manifest differently in a problem solving context thereby leading to differences in cognitive-affective interaction.

Implications of the Chinese collective cognitive processes, Zhang and Wei (2011) found, was that the way the self is conceptualised (self-concept clarity) has implications for the individual's way of thinking – their cognition. People from a Confucian cultural background, by implication, tend to think about others' important to them, recognise the implications of their actions as not bearing on them alone but on all the inter-connected individuals within their field. This finding, built on the work of Nisbett et al., adds more substance to the postulations that even though all cultures possessed essentially the same cognitive processes, [as found in the present study], the choice of which particular process to use, how it is used, and what it is drawn upon for a particular problem may vary (Nisbett et. al., 2001).

This may offer some insight into why the Chinese background group showed a relationship between the cognitive variables and the affective (SE, SN and ATT) but

not in the white British group. Collectivist Chinese, they argued, tended to focus on the wider context and situation surrounding a task in an integrated way. An implication is that they were therefore more likely to draw on their sense of efficacy either vicariously acquired, or through experience or other sources. The Chinese live in a relatively complex social world with many role relations (with reference to significant others in their lives); consequently, their attention is more likely to be directed outside themselves and towards the social field (Nisbett et al., 2001).

In contrast, if an individual or group have few and less significant social relations and role constraints, it is more likely that they will focus primarily on the object (or task) and the goals pertaining to it (Nisbett et al., 2001). This observation may explain why the white British group showed no relationship between the cognitive and affective variables. When it got to the task, the focus may have been primarily on completing it successfully hence cognitive resource deployment was done analytically with a sole focus on the task and less on affective reactions and considerations.

Yet a relationship was found to exist when the cognitive variables were assessed with perseverance and effort (PE). Aligned to the postulations of Nisbett and colleagues could lie an explanation for this observation why there was no link between cognitive variables and SE/SN/ATT, yet existed between cognitive variables and PE, when it is reconciled with the arguments of Wolters (2003). Wolters had an inclusive view of motivation as being either a 'process' or as a 'product' or 'state'.

Motivation as a process, being the means to an end state of motivation is driven by the determining factors of SE and SN/ATT. Because of the unique way individualist culture views the world in an analytical and linear way (Nisbett et al., 2001), at the point of the task performance, the 'process' becomes irrelevant as the 'state' would have been formed by that stage. Therefore, the state the learner was in became the only source of motivation that came to the fore during the problem solving task. SE, ATT and SN (process) were relegated to the background and PE (state) was what was in the driving seat for an individualist White British learner. Consequently, the 'state' of motivation was the only aspect active in interaction with the cognitive elements when solving the problem.

The collective Chinese background child, by having a view of the world (task in this case), characterised by an integrated outlook with holistic and cyclical thinking, as

espoused by Nisbett, placed both the process aspects of motivation (SE, SN and ATT), and the state of motivation (PE) in the driving seat during the problem solving situation.

Even though relationships were found between the cognitive variables and perseverance variables, the Chinese group showed no relationship between engagement and the cognitive elements in contrast to the White British group. This suggests a more mechanical application of effort with the Chinese group. This is consistent with the hypothesised differences in how culture influenced motivation and metacognition.

3.7.3 Limitations

Difficulties in recruiting participants for the study resulted in the sample size being relatively small. It was therefore not possible to do the within group analyses that were intended. It would have been appropriate to have used a behavioural measure such as participation in Chinese cultural activities or language school to assess the levels of cultural orientation in the Chinese background children in order to find out its impact on the models as posited. This is an unfortunate miss and would be worth looking into for further research. In addition, there is a lack of analysis of directionality in the relationships

There was also a potential limitation in how the variables were measured. The affective variables were measured in a completely different way from the cognitive variables. However, there seemed to be no noticeable problem in this regard as there were differences observed between the Chinese group and the Whit British group.

Furthermore, as suggested by Ogihara and Uchida (2014), the impact of globalisation may have created a fusion of many of the cultural characteristics further threatening the integrity of delineation of cultures along the collectivist-individualist dimension; however, despite the limitations of using this approach, it did lead to fairly clear group differences being observed.

3.7.4 Next step

Due to the limitations of the individualist-collectivist dimension, as discussed in the previous section, it is of interest to utilise a key marker of cultural variation – filial piety – to investigate its relationship with the motivation variables. The second study will investigate whether a high degree of filial piety (associated with collective culture) correlates with a high value of the influence of significant referents (SN and RSE, VSE).

Chapter 4

Study 2

This chapter describes the development and execution of Study 2. It starts by outlining the definition and evolution of the key concept in this study - filial piety (FP) - and its application within the framework of the overarching aim of the entire research programme. This is followed by a description of how the questionnaire was developed and the process of data collection for Study 2. The chapter continues with an enumeration of the main findings and concludes with a discussion in relation to the research questions.

4.1 Filial Piety as an attribute of Confucian culture

The findings from Study 1 supported the notion that culture wielded its influence on self-regulated learning skills (SRL) by working through the motivation variables. This gives great justification to the long-standing interest in academic achievement and motivation by researchers in the field of cross-cultural studies, particularly of East Asian culture. This is no doubt because East Asian students are often found to outperform their peers in the West in standardized achievement tests such as PISA and TIMMSS (see Lau & Ho, 2015; Sabah, Hammouri & Akour, 2013; Sellar & Lingard, 2013; Zhang, Khan & Tahirsylaj, 2015). In trying to understand the higher performance of East Asian education systems, many researchers have found it natural to turn to an analysis of the motivational characteristics of their school children, supposing that curricular differences were insufficient to account for the gap (Jerrim, 2014).

Hong and Salili (2000) argue that the strong learning motivation of East Asian learners was related to their culture (see also Leung, 2014; Stankov, 2010). This is supported by the postulations of Ho (1981), that hard work in academic pursuits was accorded higher status in society than other careers in Chinese culture. In fact, among Chinese students, working hard to achieve academic goals is considered to be more crucial than relying on their intellectual ability (Zhu and Leung, 2011). This was echoed by Leung (2016), with a Chinese proverb "stupidity is overcome by hard work". This, he said, was an illustration of how Confucian ideology and thought contributes to a cultural disposition towards hard work, effort, and a preeminent value of education. Parental influence and the vicarious observation of the wider community in Chinese culture helps to inculcate students in these all-important virtues and attitudes toward

their learning. Children grow to internalise and adopt their parents' valuation of education, their expectations towards their school work (which tend to be very high), and vicarious and other means of feedback on their academic performance. Chinese parents' influence over their children's school achievement is thought to be connected with the traditional ideals and overarching power of FP – a key element of Confucian ideology (Lin & Fu, 1990). This is because in Confucian culture, children are morally obliged to pursue the virtue of respect and honour for one's parents, elders, and ancestors.

Furthermore, Ng (2003) attributed the differences in motivation of East Asian learners relative to other societies to their collectivist cultures (driven by Confucian teaching). In particular, parents and school teachers in Confucian society hold the views that "learning cannot be separated from achievement" and "learning and achievement are social obligations". Markus and Kitayama (1991) similarly argued that individuals from collective societies (such as Confucian East Asia) would typically derive their motivation from what would benefit others and the entire group, not just themselves, while people in Western individualist cultures tended to have motivations that would be typically more self-benefiting.

Confucianism is able to engender prioritising the wider social good in its members by focusing on known others outside the individual – family and especially parents – the motivation to engage in actions to benefit others becomes focused on real people, and that is a powerful driver.

Dong and Xu (2016) defined FP as:

"a traditional Confucian virtue in Chinese culture, which refers to a prominent, family-centred cultural value that adjusts children's attitudes and behaviours toward their parents to ensure parental well-being" (p46).

FP is a bedrock of societies with a Confucian Heritage. The roots of FP lie in the traditions of Confucianism which has for over 2,000 years been the driving force behind the development of virtues and morals concerning family roles and relationships (Chen, 1986; Littlejohn, 2010). According to Lum, Yan, Ho, Shum, Wong, Lau & Wang (2015), Confucian ideology has for centuries served as a guiding principle in shaping the family structure and intergenerational relationships between parents

and their children by defining the obligations and connection among them through an intricate value system. The moral concept FP "Xiao (孝)"is at the core of Confucian family values. The Chinese character for FP, Xiao is derived by combining two other characters namely: Lao (老) and Zi (子). The character Lao represents elders, including parents, other older family members and the ancestors; Zi represents the child. Symbolically, Lao is above Zi; similarly, the elder is considered in the society as always being above the child, which illustrates and emphasises the hierarchy within, and the child's duty to respect and show devotion to the parents and elders. This is a pattern of socialization within communities that are in line with the demands of Confucian societies.

It gives a prescription about how children should love and respect their parents and families as well as toward their ancestors. A consequence of this is that children in Confucian culture strive to fulfil their filial obligation through academic achievement as a means to repay and honour their parents (Chow & Chu, 2007).

An implication of the preceding review is that Confucian background learners strive and study hard as a way to undertake their filial obligation; it can therefore be postulated that FP is an important driver or possibly a predictor of academic achievement motivation. When a student obtains good results in a test or an examination, it serves to bring honour to their family and repay their parents. As a result, Confucian culture students study to fulfil a filial obligation, not simply for their own selves, unlike their Western counterparts.

Chow and Chu (2007) further argue that the high academic achievement observed in Chinese learners relative to other cultures could be attributed to this influence. However, within other cultures such as White British culture, there are learners with high academic achievement as well. Even though Chow and Chu (2007) tested the impact of FP on academic motivation using a 'Self Determination Theory' framework, and did find evidence of its positive correlation within the Chinese Confucian context, coupling this with self-determination theory makes it hard to explain why hard work and consequent achievement would occur in non-Confucian societies. Using the theory of planned behaviour (TPB) framework allows for this without problem – just by a different set of influences. This is because the TPB lends itself to a more clearly

defined means of how the cultural dimension of individualism- collectivism could operationalise FP through Subjective Norms (SN).

Drawing a sample from a broad cross-section of cultural backgrounds in the multicultural UK classroom as planned for this study was a methodological as well as a theoretical advancement. Sampling on the basis of specific culture was a challenging task, whereas sampling a broad cross-section permits a more general strategy: sampling more randomly and instead of requesting details on cultural background, simply asking participants to complete a measure of FP on the grounds that: a) this should capture a wider range of children with Confucian influences, and b) those with higher tendencies towards FP should exhibit the same pattern of associations as seen in the Chinese sample in Study 1.

Sampling a broad cross-section of children aged eight to eleven will therefore enable these hypotheses to be tested:

- FP is more strongly associated with SN than with attitudes (ATT),
- SN has a stronger influence on intention (INT) than ATT in those with high FP,
- Received self-efficacy (RSE) has a stronger relationship with SN in those with high FP; experiential self-efficacy (ESE) has a stronger relationship with ATT in those with low FP.

The agency measures (CA and PA) were dropped from this study so FP could be tested using a classical TPB framework (except PBC was substituted for SE). As the influence of culture was found to operate through the affective/ motivation dimension of SRL, it was deemed appropriate to focus this stage of investigation using the motivational framework adopted for the current research – TPB. Also, agency was conceptualised as deriving from SE by Bandura (2001) so could be assumed to be subsumed within SE.

From the results in Study 1 (Chapter 3), it is clear the distinctions made between the two cultures are not clear-cut and exclusive. The hypothesised differences were on a measure of degree and tendency, not an absolute black and white distinction.

4.1.1 Filial Piety in other cultures

It is possible the concept of FP, even though it is predominantly a Confucian trait, is present in other cultures to a degree. This is captured in the assertion by Gallois, Giles, Ota, Pierson, Ng and Lim (1999) that:

"the concept of filial piety is present in most of the cultures in the world, although its form, salience and importance may differ" (p. 195).

Similarly, Jones, Lee and Zhang (2011) reiterated the global nature of the basic form of filial relations. They posited that filial beliefs are rooted in Confucian beliefs about Hsiao – filial piety, whose main virtue is Shu (reciprocity). They further argued that reciprocity is not a phenomenon unique to Chinese or Confucian culture. Western theories about responsibility of children to aging parents, they claimed, have reciprocity at the core (e.g. social exchange, equity, social capital theories; see Liang et al. 2001)

Kuang et al. (2010) suggest FP is a natural, instinctual and spontaneous phenomenon. This they conceptualised as 'natural piety'. It is active and internal, they opined. They contrast natural piety with 'cultural piety' – the kind practiced by Eastern Confucian cultures. Cultural piety, they argued, is a result of cultural teachings and cultural factors.

Natural FP, because of its nature, can be found among all people regardless of race, culture, and religion; cultural FP on the other hand, varies dramatically with regard to race, culture, and religion (Kuang et al., 2010). Evidence from research on FP between American and Chinese undergraduate students by Kuang et al. (2010) supported this view. Natural and cultural FP can therefore be thought of as additive influences for those in Confucian societies.

Kuang et al. (2010) reiterated the finding of Kuang's (2005) filial piety research that provided a new insight to understand filial piety from a biological view. The study highlighted the interaction between biological aspect of human filial nature and the mind-body axis. She proposed three important points:

1. There is a hidden link between one's filial attitude/practice and one's performance/achievement in life.

2. Intentionally nurturing a positive filial attitude toward parents and the elderly optimizes human performance and facilitates achievement.

3. Ill-practice of filial piety blocks one's own prosperity.

Kuang's observation demonstrates how in Confucian culture, the members are taught that practicing FP has benefits for the individual therefore accentuating the impact of cultural piety. This proposition is consistent with the findings in Study 1 about the motivating influence of cultural norms and significant referents in academic achievement.

As natural piety is argued to be common in all cultures, its influence is not exclusive to a particular culture. Hence, children from Western individualistic backgrounds can be expected to show some traits of FP. Nevertheless, within Confucian cultures, there is the distinction between natural piety and aspects that are culturally promoted – cultural piety. Both groups of students (American and Chinese) in Kuang et al's (2010) study had a measure of filial piety – predominantly natural piety. The only difference was that the Chinese students had it to a higher degree – a combination of natural and cultural piety.

Therefore, it is practical to use the measure of FP to distinguish people from Confucian backgrounds and to show contrast in levels of FP. It is then reasonable to expect the distinct influence of cultural piety in Confucian culture to strengthen the relationships with SN and received self-efficacy (RSE).

4.2 Measuring Filial Piety

Measurement of FP has evolved over time in line with the changing definition and nature of the construct over generations (Lum et al., 2015). Classical measures assessed the levels of parental authority and obedience by the children. Ho and Lee (1974) defined and measured FP as:

"an authoritarian relationship that requires children's absolute submission to parents' wishes, as well as their duties to repay parents' sacrifices, preserve family honour, and continue the ancestral line".

Consequently, the emphasis on the earliest measures of FP was on the behavioural elements surrounding authority and obedience of parents and children respectively – including responsibility, sacrifice, repayment (Lum et al., 2015).

'Tender-heartedness' to parents was subsequently suggested as an important notion to be included in FP measures by Yang, Yeh and Huang (1989). This reflected the role and importance of emotional and affective elements in parent-child relationships. The Filial Piety Scale by Yang et. al. (1989) built on the traditional view of filial piety as dominated by parental authority and obedience of progeny to include the emotional and affective elements. Yang's scale was later revised into the Revised Yang's Filial Beliefs Subscale (YFBS-R) and Yang's Filial Affection Subscale (YFAS-R) to assess filial beliefs and affections – further promoting the conceptual development of FP to include kind-heartedness to parents by their children. Sung (1995) furthered the cause of this view by suggesting the inclusion of emotional measures of affection, harmony and respect.

Some measures were developed to assess attitudes of children towards responsibility of care for aging parents; others were to assess the expectations of parents towards their adult children, among others (Jones, Lee & Zhang, 2011). There was therefore no single measure for FP.

Furthermore, most of the scales were developed for use in specific populations (e.g. Dilworth-Anderson, Goodwin, & Williams, 2004 [specific to African Americans]; Hamon & Blieszner, 1990 [white Americans]; Ishii-Kuntz, 1997 [Chinese, Japanese, and Korean Americans]; Zhan, 2004 [Hong Kong]) while some had multicultural scope in development and use (Jones, Lee & Zhang, 2011 [took account of cultural background]; Kao & Travis, 2005 [Hispanics, Latinos]).

Conceptual advances led to the development of the Dual Filial Piety Scale (DFPS) by Yeh and Bedford (2003). The dual scale merged the traditional conceptualisation for FP (authority and obedience) with the subsequent emphasis on emotion and reciprocity (Lum et al., 2015). Authoritative FP is based on the child-parent relationship being driven by a sense of hierarchy and submission to their authority. It entails deference to parents in all decisions and compliance to the wishes of their parents instead of their own. Reciprocal piety is a sense of gratitude and love children develop for parents for raising them that makes them want to please them and to have a good relationship with them (Yeh & Bedford, 2004). This behoves children the duty to care and look after their parents in old age. This relatively contemporary view of FP, by focusing on emotion and reciprocity, promoted the idea of compassion to parents,

which showed the new emphasis on emotional and affectional elements of the relationship between parents and children.

Conceptualising of FP has therefore evolved over time to an understanding that reflects both its traditional and current views. For instance, Lum et al. (2015) outlined six traditional and contemporary dimensions of FP:

(a) conditional and unconditional care for parents, (b) care for oneself, (c) affection and consideration, (d) obedience and repayment, (e) honour and respect, and (f) family continuity.

Jones, Lee and Zhang (2011), who studied filial piety across five cultures in an earlier study, had identified three factors – respect, responsibility and care - as the key filial concepts, dimensions that were expanded upon by Lum et al. in their study.

4.2.1 Development of FP measure

Elements from the dimensions posited by Lum et al. (2010) and Jones, Lee and Zhang (2011) (respect, responsibility, care, honour) were adapted into a scale to measure the level of FP in a sample of 8-11 year old children from UK primary schools. The questions were built around these dimensions and kept to a maximum of 10 because of the intended age of the sample. An initial draft of 10 questions was presented to a focus group of 4 children – 2 nine year olds, 1 eight year old and 1 ten year old [two boys and two girls] – to peruse and give their comments about their comprehension of the sentences; half of the questions were framed negatively, chosen by drawing lots of 5 questions out of the total of 10. Their comments were taken on board to tweak the wording of sentences where necessary to arrive at a draft form of the questionnaire for piloting. An instance of wording that needed tweaking was:

It is important to follow the instructions of grown-ups in school because it brings respect to my family. **Original**

It is important to do what grown-ups tell me in school because it makes them respect my family and me. **Revised**

The phrase '…it brings respect' was changed to '… it makes them respect' because the children suggested the idea of their behaviour 'bringing respect' did not make as much sense as when phrased as it 'making the grown-up in school respect' their

family. In addition, they suggested it would be more effective if the 'and me' phrase was added so it included them as children too.

The draft questions were piloted with 57 children (27 aged nine and 30 aged ten) in a primary school in Medway, Kent. A reliability test was done using Cronbach's alpha. Alpha scores were low (.57); it turned out two items had very low item-total correlation (.096, .012). A 10 year old child was asked to read those questions and to feedback her understanding. It turned out the meaning of those items was ambiguous so further tweaks were made to them and their understanding checked with another 10 year old child. The following questions were settled on as a tentative final list:

1. It is important to do what grown-ups tell me in school because it makes them respect my family and me. (Family honour)

2. I always try to show good behaviour to avoid getting my parents and family upset. (Affection and consideration)

3. It is my duty to take care of my parents when I am older. (Care of parents)

4. My parents and family have no influence on who I am; I am who I am. (Obedience and repayment) negative

5. It is okay to disagree with my parents and family because I don't have to accept their point of view. (Honour and respect) negative

6. Spending time with my parents and family is not that important because I need to get on with my own life. (Affection and consideration) negative

7. It is important to respect elders in my family because that is what is expected of me. (Honour and respect)

8. What I do with my life has nothing to do with my parents and family. (Family continuity) negative

9. My parents react unfairly when I do something wrong. (Honour and respect) negative

10. I greatly value what my parents are doing to take care of me (Obedience and repayment).

4.2.2 Development of questionnaire

The questionnaire used in this study was then constructed by combining subscales that measured: filial piety (FP), the three sources of self-efficacy that were the focus of Study 1 – experiential self-efficacy (ESE), received self-efficacy (RSE), vicarious self-efficacy (VSE). There were also subscales that measured the three component variables under the theory of planned behaviour from Study 1 – subjective norms (SN), attitudes (ATT) and intention (INT). The seven variables were included in the questionnaire that had a 7 point Likert scale.

4.2.2a Self-efficacy and motivation

The three sources of self-efficacy and the three elements of the TPB framework used were measured using items that targeted specific target behaviours. Of the seven target behaviours on each of the variables captured through the questionnaire in Study 1, four were judged to be especially relevant to filial piety: Feedback, Grades, Concentration and Time spent. These four were chosen because they are behaviours that children perform or are concerned about in relation to pleasing their parents (see Chao & Tseng, 2002; Hong & Howes 2014; Huang & Gove, 2012; Sham & Woodrow 1998). As mentioned in Chapter 3, the target behaviours fulfilled the multiple act criterion which according to Ajzen and Fishbein (1980), gives better measures of attitudes and behaviour.

As the reliability of the individual subscales for SE and TPB had been established in the previous study, the items on all subscales (34 altogether) were combined into one scale for this study. A random number generator was then used to determine the order in which they appeared on the first draft ready for piloting and reliability analysis. It was piloted with 43 children (25 year 6 and 18 year 5) in a primary school in Medway, Kent.

4.2.3 Scoring and reliability

Scoring the questionnaire was based on the responses given to each statement on the 7 point Likert scale. The scale's response choices ranged from 'strongly disagree' - a mark of 1 - to 'strongly agree' – a mark of 7. The scores on each item for each participant was then added to give their score on that particular variable. The minimum total score on the filial piety variable was 10 and 4 for the others for each case; the maximum for filial piety was 70 for each case, and 28 for the others.

Cronbach's alpha was computed to determine the reliability of the questionnaire and the results are summarised in Table 4.1. The alpha values were deemed to be in the acceptable range (see Field, 2013; Gliem & Gliem, 2003; Kline, 1999; Nunnally, 1978) so the questionnaire was ready for actual data collection.

Table 4.1: Reliability test results of Questionnaire (Pilot)

Variable	Cronbach's Alpha
Experiential Self Efficacy	0.70
Vicarious Self Efficacy	0.81
Received Self Efficacy	0.68
Attitude	0.84
Subjective Norm	0.71
Intention	0.72
Filial Piety	0.64

The final version of the questionnaire is shown in Appendix 7.

4.3 Study 2 Method

4.3.1 Sample

The sample was recruited from children in Years 4 to 6 (Age 8 - 11 years) in UK primary schools. A convenience sampling approach was used as schools in a variety of locations were contacted and invited to participate with the aim of recruiting children from diverse backgrounds. As with Study 1, emails were sent to the schools and followed up with phone calls. Consent forms were then sent out in the relevant classes where the schools agreed to participate.

Altogether, three schools (one in Brixton, another in Greenwich [both in London]; and the third in Medway, Kent) agreed to participate so pupils in Years 4 to 6 were engaged for parental and personal consent to participate. The breakdown of the total sample is given in Table 4.2 below.

Table 4.2 Participant Statistics

| | | Child's gender | | |
		Female	Male	Total
Year Group of Child	Year 4	25	23	48
	Year 5	25	29	54
	Year 6	33	30	63
Total		83	82	**165**

The association of gender with year group was not statistically significant (χ^2= .516, df = 2, p= .772).

4.3.2 Ethical Considerations

This study followed the ethical guidance issued by the British Psychological Society and was approved using the UCL Institute of Education procedures.

All the requirements of working with children including: consent, confidentiality, right to withdraw and safeguarding were observed. A letter was sent home with each of the target children giving their grownups some information about the research project and solicited consent for their children's participation. The consent was an 'opt in' so parents had to indicate so expressly for a child to be allowed to participate.

The time chosen for the data collection exercise was discussed with class teachers so children were not deprived of valuable learning time. As the questionnaire was relatively short, some classes completed it as a gap filling exercise or an end of day calming down activity. It all cases, the priority was to ensure children were not taken away from valuable learning activities.

4.3.3 Procedure

All the questionnaires were completed in a classroom context. The researcher was present for most of the classes but there were two classes where the head teacher asked for the class teachers to be briefed and given instructions for administering so they could do it themselves in their own time. Teachers' briefing involved teachers being sent a copy of a 'data collection brief' (Appendix 8) that provided details about the procedure for administering and collecting data. This was followed by a phone call

with the relevant teachers at an agreed time to discuss the document and answer any questions they had.

4.3.4 Data Collection

Before testing commenced, the researcher (or teacher in the cases where the researcher was not present) checked if consent forms had been completed and whether the children were happy to take part in the study.

Data collection was done as a whole class activity in a classroom context. Any children who had not returned consent forms were asked to choose a quiet activity to get on with. There was no time limit to completing the questionnaire and the participants were given the option to ask for the questions to be read to them. In that case, care was taken to read in a neutral tone and not to place any tonal emphasis on a word or phrase so as not to influence a response. Furthermore, clarification was given if a child did not understand a word or question. In that case, only a neutral explanation of words or question was given taking care not to lead or bias a response in any way. For instance, a request about a question such as: "what does feedback mean?" is given the response: "feedback is what your teacher says about your work either what they write when they mark your work, or tell you about how well you did or how you could improve your work". Care was taken not to distress the children in any way; they were allowed to complete the questionnaires in their own time and were not prompted nor their attention drawn to any question that may have been left unanswered.

4.3.5 Reliability and Analysis

As with the pilot data, reliability of the questionnaire was established using Cronbach's alpha. The alpha values of the subscales are shown in Table 4.3. The values are in the range: .60 to .75 which are deemed acceptable by a good number of researchers (Bhatnagar, Kim & Many, 2014; Field, 2013; Gliem & Gliem, 2003; Nunnally, 1978; Panayides, 2013) within the context of this study [Nunnally for instance suggested alpha values of 0.5-0.6 was acceptable for behavioural research]. This range of alpha values were slightly lower than those obtained from piloting the questionnaire: .67 - .84 - probably because the sample in this case was larger and more diverse hence the alpha value dropped albeit not dramatically.

Table 4.3: Reliability test results of Questionnaire

Variable	Cronbach's Alpha
Experiential Self Efficacy	0.72
Vicarious Self Efficacy	0.74
Received Self Efficacy	0.67
Attitude	0.75
Subjective Norm	0.75
Intention	0.68
Filial Piety	0.60

4.4 Results

This study sought to investigate how levels of filial piety – whether high or low – related to the motivational and affective variables (ESE, VSE, RSE, SN, ATT and INT) of the original model of SRL from Study 1. Specifically, it sought to ascertain whether participants with high filial piety displayed the relationships observed in the Chinese cultural group Study 1; similarly, whether the relationships observed with low filial piety were similar to the White British sample from Study 1.

Consequently, filial piety was categorised into high and low by computing a median split. Dichotomising a continuous variable using a median split is popular in behaviour research and in other fields (Fernald, Marchman & Weisleder, 2013; Kim, Chen, Zhang, Simons-Morton & Albert, 2013; MacCallum, Zhang, Preacher & Rucker, 2002); yet its use has attracted criticism from several researchers who point to the potential to have misleading results due to proneness to Type 1 errors. McClelland, Lynch, Irwin, Spiller and Fitzsimons (2015) challenged the view that median splits made tests more conservative. They opined that, statistically speaking, conservatism simply meant increasing the chance of not rejecting the null hypothesis when it is actually false – a Type 2 error. However, they further argued that in the case of splitting data with a median split, what actually ends up happening is increasing the chance of both types of errors. This is because, they argued, sometimes the split data may turn out to be significant when the original continuous data would not be.

"If researchers pick the method that yields significance, then Type I errors will increase even as splitting, overall, reduces power". (McClelland, et al., 2015 p5)

Median split opponents also point to the problem of losing information about the variability of individuals. This results in individuals just below the median score being aggregated with those with very low scores as the 'low' group reducing the power of tests and increasing the likelihood of Type 2 error (Cohen, 1983; Fitzsimons, 2008).

Nevertheless, median splits have maintained their popularity because for the purposes of achieving certain theoretical research objectives, its use offers the most effective and pragmatic avenue (DeCoster, Iselin & Gallucci, 2009; Iacobucci, Posavac, Kardes, Schneider & Popovich, 2015). Furthermore, Iacobucci and colleagues (2015) posited through the results of their study that most of the criticism levelled against the use of median splits were not warranted. They replicated studies used as a basis to criticize the use of median splits and reported their results demonstrated using the dichotomisation was a legitimate statistical tool whose results yielded a valid basis on which to draw statistical conclusions.

The current study has a theoretical objective of testing relationships within a dichotomised framework of high versus low filial piety (see Iacobucci et al., 2015). Therefore, it was decided the median split was an appropriate way to create the two groups from the continuous variable – filial piety.

4.4.1 Comparing of means
The means of all the variables were compared in the two groups created using a t test (see Tables 4.4 and 4.5).

Table 4.4 Means for Variables: High and Low FP

	Group	Mean	SD
RSE	High Filial Piety	24.87	3.071
	Low Filial Piety	22.67	4.150
VSE	High Filial Piety	23.73	4.091
	Low Filial Piety	22.13	4.933
ESE	High Filial Piety	21.49	4.542
	Low Filial Piety	20.88	4.644
SN	High Filial Piety	25.35	3.183
	Low Filial Piety	23.30	4.134
ATT	High Filial Piety	25.22	3.102
	Low Filial Piety	23.58	4.558
INT	High Filial Piety	24.77	3.271
	Low Filial Piety	22.39	4.512
FP	High Filial Piety	61.02	3.781
	Low Filial Piety	49.51	5.092

Table 4.5 Significance of Mean Differences

	Mean difference	95% CI	*t*	P
RSE	2.2	-3.353, -1.046	(143.7) -3.77	<.001
VSE	1.59	-2.995, -.193	(162) -2.25	=.026
ESE	.62	-2.037, .805	(161) -.856	=.39
SN	2.06	-3.209, -.907	(149.98) -3.53	=.001
ATT	1.64	-2.835, -.443	(146.76) -2.71	=.008
INT	2.38	-3.606, -1.162	(149.55) -3.85	<.001
FP	11.51	-12.947, -10.076	(134.05) -15.86	<.001

The results from comparing the means of the two groups created by the median split were in line with what was expected for most of the variables. RSE and VSE were relatively higher in the high filial piety (HFP) group and the differences were statistically significant as expected. ESE was marginally higher in the HFP group but was not statistically significant.

Furthermore, SN, INT and FP were similarly higher in the HFP group which is to be expected for SN and FP. However, ATT was also higher in the HFP group and the difference was statistically significant; this was unexpected because the expectation for ATT was for it to be higher in the group with low filial piety (LFP).

Use of FP as a distinguishing measure for the two groups was therefore deemed to be appropriate for the purposes of this study. It produced groups that were different on most of the key variables as was hypothesised, with the exception of ESE. The difference observed for ATT in the two groups was statistically significant albeit contrary to what was expected. Also, as shown in Figures 4.1a and 1b, there was a reasonably good spread of scores for FP in the two groups created, particularly in the high FP. The distribution of low FP scores was deemed acceptable even though it was slightly negatively skewed.
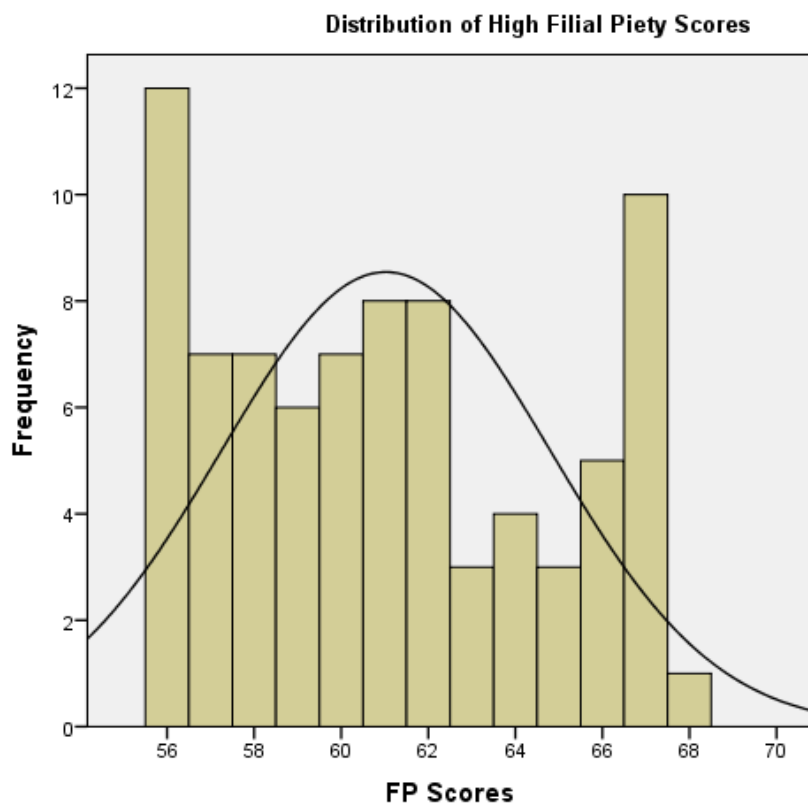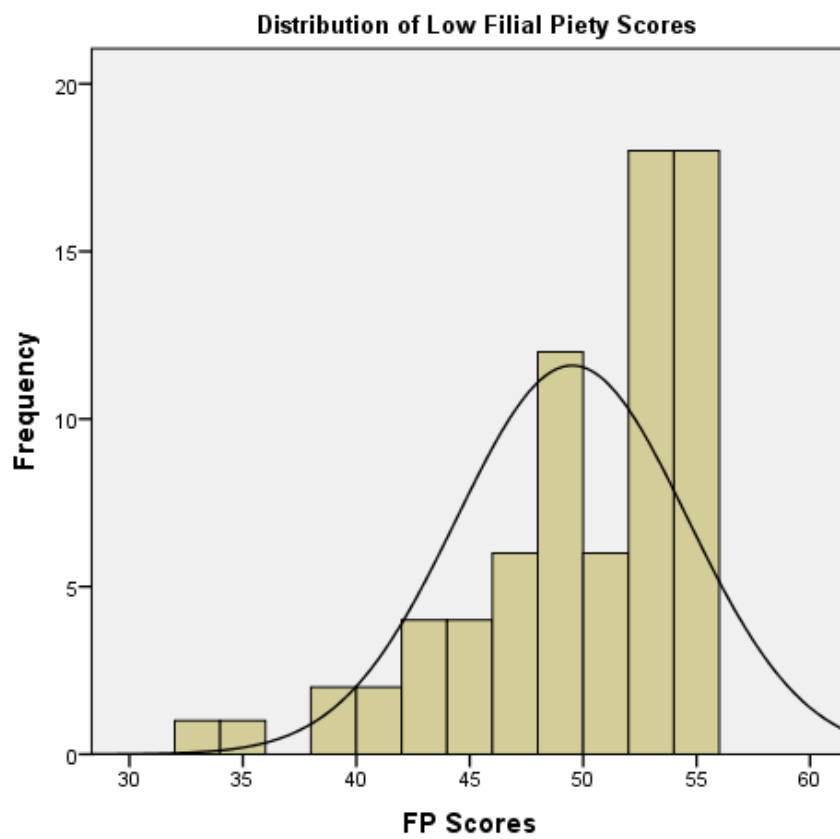
Figure 4.1a High FP distribution

Distribution of High Filial Piety Scores

Figure 4.1b Low FP distribution

Distribution of Low Filial Piety Scores

4.4.2 Correlation Analysis

With the differences between the two groups established, correlation analysis was used to check the relations between the variables in the two groups. Since a key assumption under which correlation analysis is conducted is that the variables must have a linear relationship, all the relationships to be tested were checked for linearity using scatter plots (Cohen, Cohen, West & Aiken, 2013). The scatterplots are shown in Appendix 9. That requirement was satisfied paving the way for analysis.

The results from the analysis are summarised in Tables 4.6 and 4.7.

4.4.2a High FP

The observation about which of SN and ATT had a stronger relationship with INT in the high FP group was similar to that found with the Chinese group in Study 1. Both SN and ATT were significantly related with INT but ATT unexpectedly had a stronger relationship with INT (hypothesis was for SN to be the stronger influence) (SN and INT $r=.609$, N=76, $p<.001$; ATT and INT $r=.68$, N=78, $p<.001$). There was a strong relationship between ATT and INT in the high FP group as reported, but the strength of the relationship drops noticeably when the influence of SN is controlled for in a partial correlation (ATT and INT $r=.433$, N=68, $p=.001$), suggesting ATT may be mediating the influence of SN on INT. From Study 1, it was concluded that ATT was being influenced by two variables – personal attitudes and SN – therefore SN was still the most important driver in this case. The results of the partial correlation seemed to corroborate that fact.

Furthermore, in the high FP group, as was the case with the Chinese group from Study 1, RSE had the predominant relationship with SN relative to the other sources of self-efficacy (RSE and SN $r=.612$, N=75, $p<.001$; VSE and SN $r=.4$, N=78, $p<.001$; ESE and SN $r=.359$, N=79, $p=.001$). RSE also had a strong relationship with INT ($r=.579$, see Table 4.6) and that is weakened when the influence of SN is controlled for (RSE and INT $r=.35$, N=68, $p=.003$) suggesting RSE may have a mediating influence between SN and INT.

Table 4.6 High FP correlations

	RSE	VSE	ESE	SN	ATT	INT
RSE		.388**	.371*	.612**	.466**	.579**
VSE			.301**	.400**	.507**	.542**
ESE				.359**	.372**	.309**
SN					.676**	.609**
ATT						.678**

*p<.05, **p<.001 (2 tailed)

4.4.2b Low FP

In the low FP group, both SN and ATT had a relationship with INT; however, ATT had a relatively stronger relationship (ATT and INT r=.721, N=82, p<.001; SN and INT r=.685, N=78, p<.001). Similarly, ESE had the strongest relationship with ATT (ESE and ATT r=.55, N=80, p<.001) along with VSE (VSE and ATT r=.547, N=82, p<.001), when compared to RSE (RSE and ATT r=.49, N=78, p<.001) which is the obverse for the high FP model. The ESE/INT and VSE/INT relationships are both explicable via their relationship with ATT which were both strong, whereas this seems less so for RSE/INT (RSE/INT relationship was stronger than RSE/ATT) – perhaps because this equates more with PBC in the low FP group; this was not too dissimilar to the relationships observed in the White British group in Study 1 (Study 1 showed stronger relationships between ESE and ATT, and between RSE and ATT). ESE had a stronger relationship with ATT relative to SN (ESE and SN r=.405, N=77, p<.001).

Table 4.7 Low FP correlations

|	RSE	VSE	ESE	SN	ATT	INT
RSE		.408**	.264*	.511**	.494**	.566**
VSE			.357**	.499**	.547**	.498**
ESE				.405**	.550**	.495**
SN					.608**	.685**
ATT						.721**

*p<.05, **p<.001 (2 tailed)

4.4.3 Path Models

In order to test the causal connections and magnitude hypothesised within the extended TPB framework used in this thesis in the two groups created, path models were drawn up and analysed using Path Analysis (PA). Using PA enabled a determination of the fit between the hypothetical models and the data. Path models were constructed underpinned by the extended TPB framework for high FP group (driven by SN); and low FP (driven by ATT).

4.4.3.1. High FP

As hypothesised based on how the influence of culture is operationalised within the modified TPB framework, the models tested had the dominant influence of SN and also featured the influence of RSE. The output diagrams are presented with the accompanying fit statistics.

Figure 4.2 High FP Path Diagram
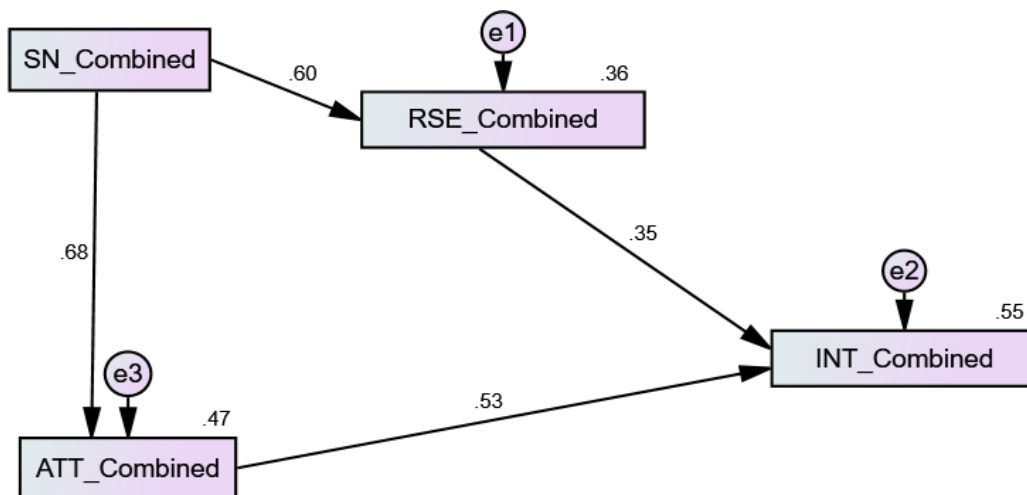
In section 4.4.2a, the results for the partial correlation suggested SN was the main driver of the relationships observed, whose influence on INT may be mediated by ATT and RSE. A path model was therefore constructed to test that observation. The chi-square goodness of fit index showed a good fit between the specified model and the data: χ^2 (2, N=81) =2.299, p= .317. The chi-square test employed here is for ascertaining a departure from fit, so a good fit is indicated by non-significant test results. The model showed SN as the driver of motivation (INT) that works through RSE (SN → RSE= .60, RSE → INT= .35) and ATT (SN→ ATT = .68, ATT → INT = .53). Furthermore, a good proportion (55%) of the variance in INT is explained by the model and that is important given there is a good fit between the model and the data.

4.4.3.1a High FP Alternate Model

An alternative model was constructed for the high FP model based on the TPB framework with RSE representing perceived behaviour control (PBC). This is an alternative configuration of the same variables, using a classic model (so therefore a strong alternative possibility). This was to check the fit of a model based on the original TPB framework to the data. However, the model did not have a behaviour measure as in the original TPB model due to insufficient data. This is shown in Figure 4.3 below:

Figures 4.3a,b TPB High FP Path Models
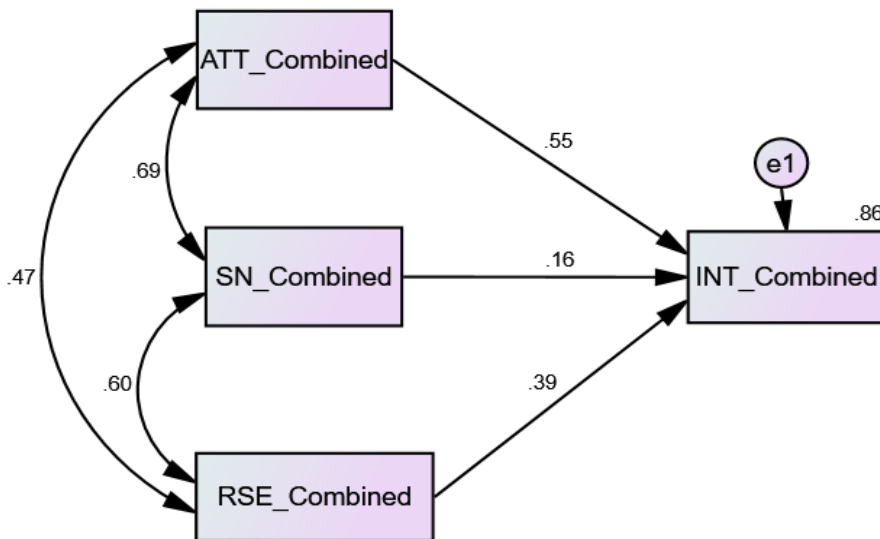
The chi-square goodness of fit index showed the model did not fit the data χ^2 (1, N=81) =159.215, p<.001.
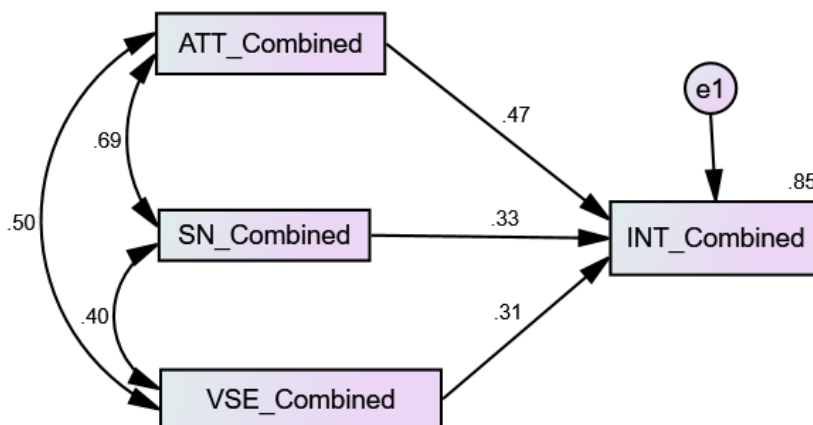
The chi-square goodness of fit index showed the model did not fit the data χ^2 (1, N=81) =170.55, p<.001

4.4.3.2 Low FP

A model for the low FP group was constructed to test the fit of the data to the hypothesised relationships. The extended TPB expectation for low FP was for ATT and ESE to be the dominant variables with ATT being the driver. The model constructed consequently had the influence of ATT on INT being mediated by ESE and SN.

The chi-square goodness of fit index showed the model did not fit the data: χ^2 (4, N=86) = 1405.5, p<.001; and the sizeable chi-square value indicates a very poor fit.

Figure 4.4 Low FP Path Diagram
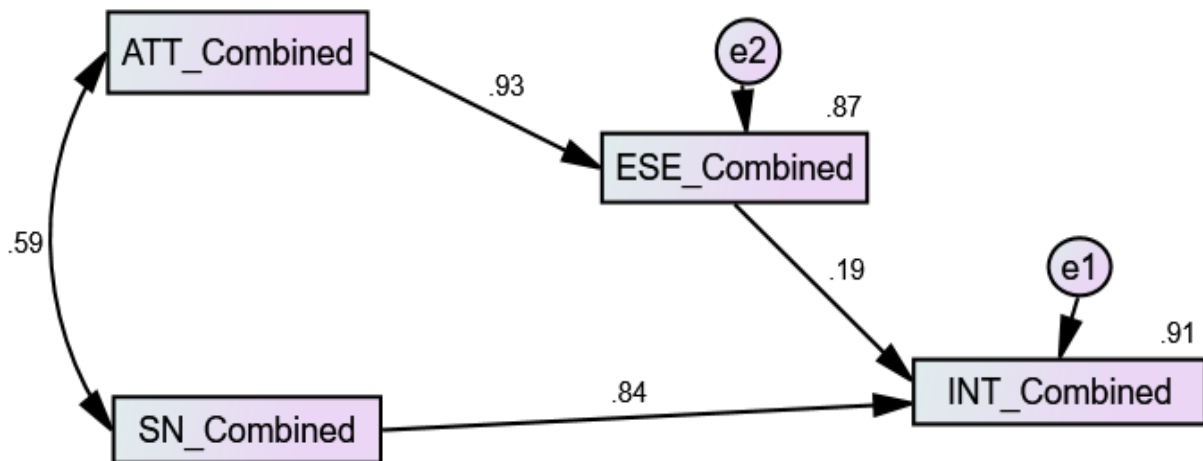
4.4.3.2a Low FP Alternative Path Diagram

As with the rationale employed in constructing the alternate model for the high FP data in 4.4.3.1a, the same variables were used in a different configuration to construct a path model based on the original TPB framework; it was tested to find out if there will be a fit between the TPB model and the low FP data. In this model, PBC was represented by ESE as hypothesised (although this model did not have a behaviour measure due to insufficient data), that ESE will be a stronger influence in low FP contexts. The model is presented in Figure 4.5

Figure 4.5 Low FP TPB Path Diagram
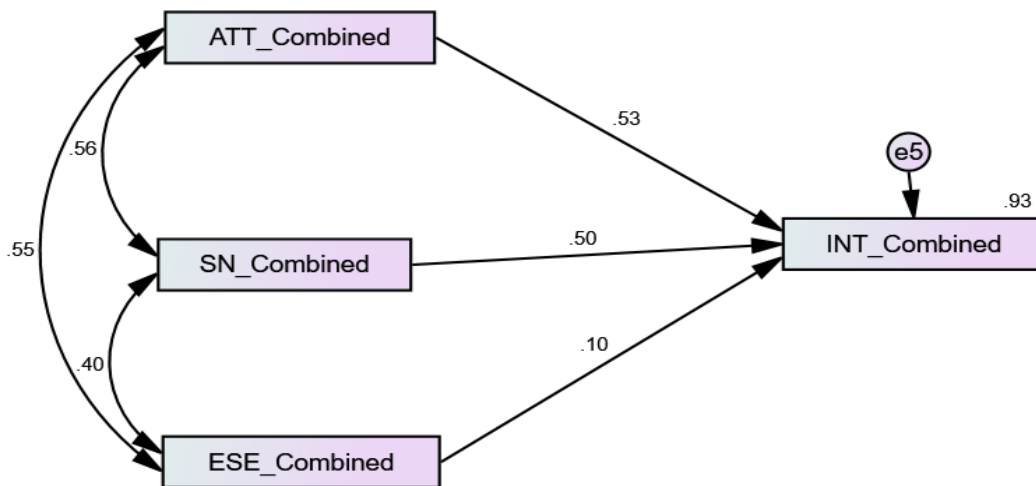
The chi-square goodness of fit index showed the model did not fit the data: χ^2 (1, N=86) = 365.353, p<.001; however this model was better than the hypothesised model. Given the correlation between VSE/ESE and INT in the low FP group, a related model with VSE included as a mediator between ATT and INT was constructed and tested; it produced a worse fit given its large chi-square value of 3061.

4.4.3.2b Low FP Alternative Path Diagram: Low FP with RSE

A final alternative model was constructed for the low FP group (Figure 4.6) to test the fit of the original high FP model (that was a good fit with the data), with the low FP data. This was to check the uniqueness of the model and data fit in the high FP data.

Figure 4.6

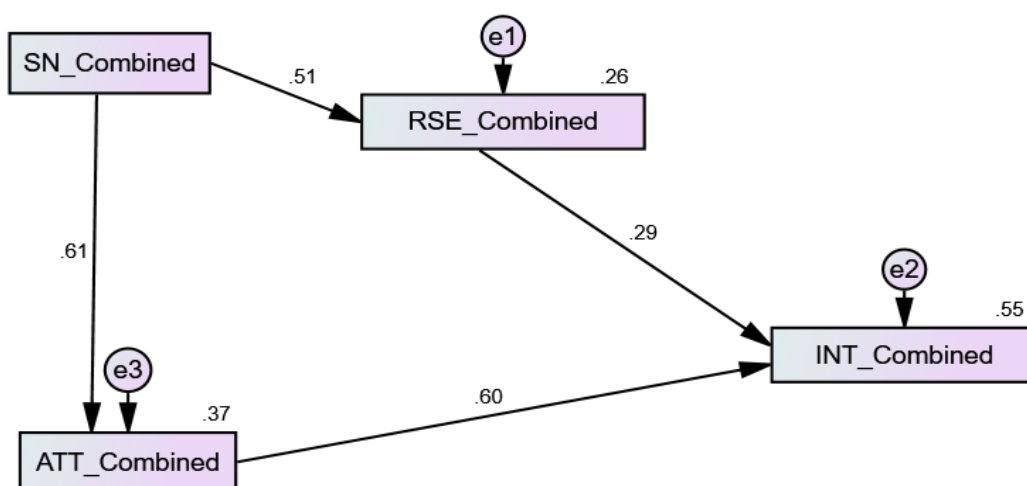The chi-square goodness of fit index showed the model did not fit the data: χ^2 (2, N=86) = 12.808, p=.002. However, this was the best fitting model of all that was constructed with the low FP data.

4.4.3.3 Summary results from path models

There was a good model fit for the high FP data but there was no fit for the low FP. The model that fit was the one where SN is the driver that works through RSE. When the model for High FP was applied to the low FP group, it did not fit but it gave the lowest chi-square value of all the models tested and therefore the closest to a good fit.

4.4.4 Three-way split models

There were further checks of the models in a three-way split of the data based on high, mid and low FP. This was a specific form of check on the data because one interpretation of the High FP model coming close to fitting the Low FP data is that the median split creates a mixed Low FP group; the three-way split enabled this to be tested. It is however acknowledged that these models were under-powered due to the reduction in sample size to about 40, so do not provide definitive conclusions. Nevertheless, it was worthwhile to find out if a similar pattern emerges in the three-way split data as was found with the two-way split.

4.4.4.1 High FP

The model constructed for the High FP data in the two-way split (Figure 4.2) was tested to find out if it has a good fit with the present data.

The chi-square goodness of fit index showed the model did not fit the data: χ^2 (5, N=55) = 366.234, p<.001; however it was the better fitting model of the two tested.

The output diagram is shown in Figure 4.7a.

Figure 4.7a High FP Model (Three-Way Split)
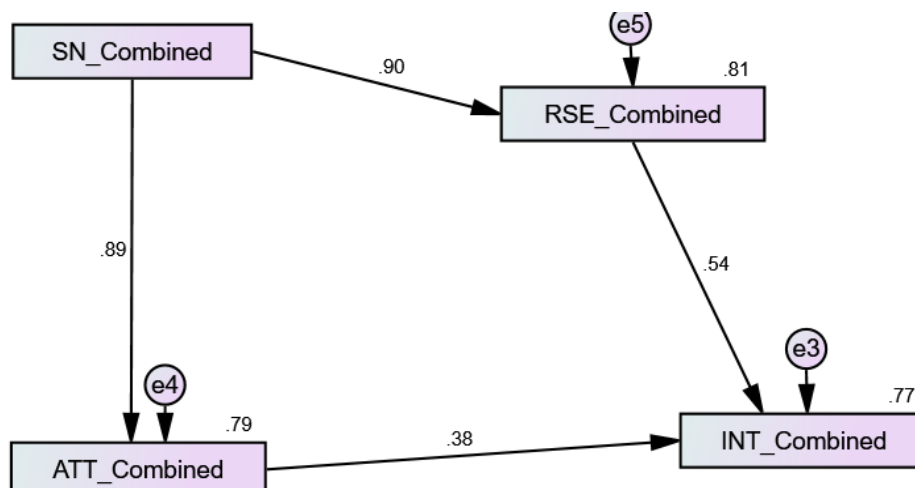
The obverse model constructed for the low FP model (Figure 4.4) was also tested with the present data.

The chi-square goodness of fit index showed the model did not fit the data: χ^2 (5, N=55) = 1163.130, p<.001; and the fit is much worse than the original High FP model. The output path diagram is shown in Figure 4.7b.

Figure 4.7b Obverse High FP Model (Three-Way Split)
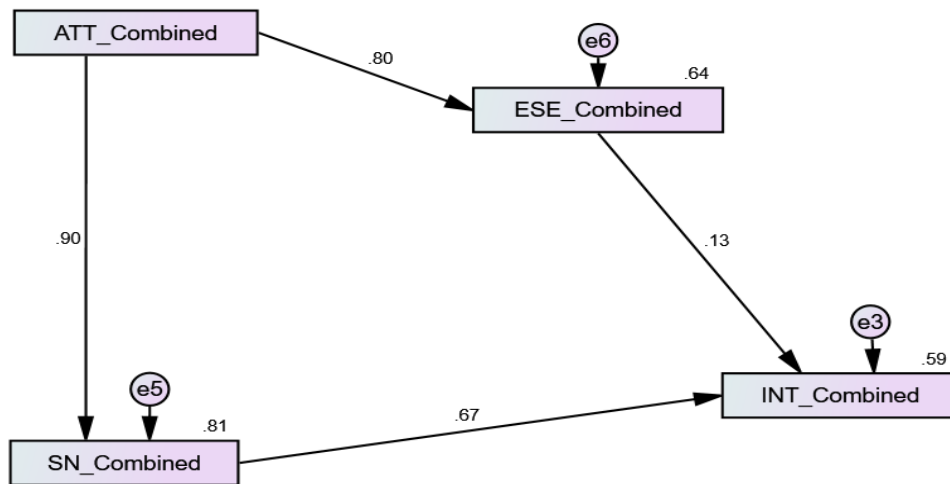
4.4.4.2 Mid FP

The two models tested with the three-way split high FP data were tested with the mid FP data. Firstly, the model with SN as the driver was tested. The output diagram is presented below in Figure 4.8a.

Figure 4.8a Mid FP Model SN (Three-Way Split)
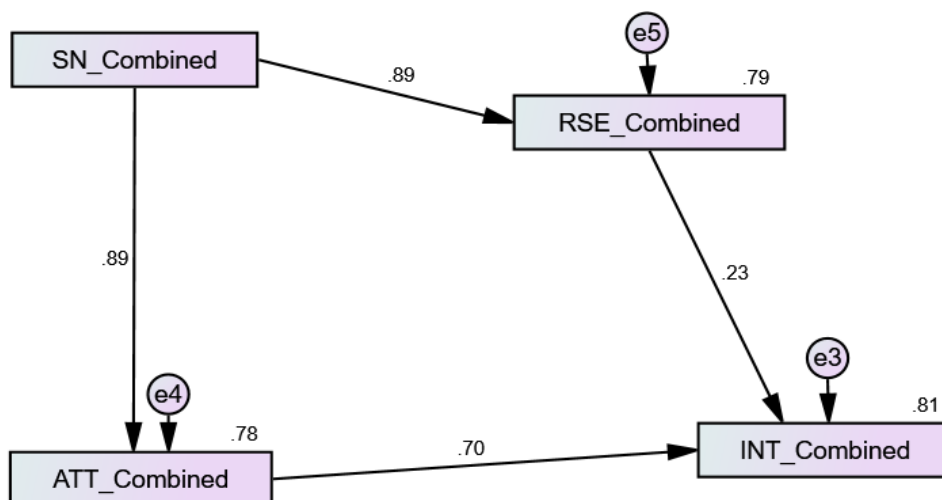
The chi-square goodness of fit index showed the model did not fit the data: χ^2 (5, N=53) = 655.726, p<.001.

After that, the model with ATT as the driver was also tested with the mid FP data. The output diagram is shown in Figure 4.8b

Figure 4.8b Mid FP Model ATT (Three-Way Split)
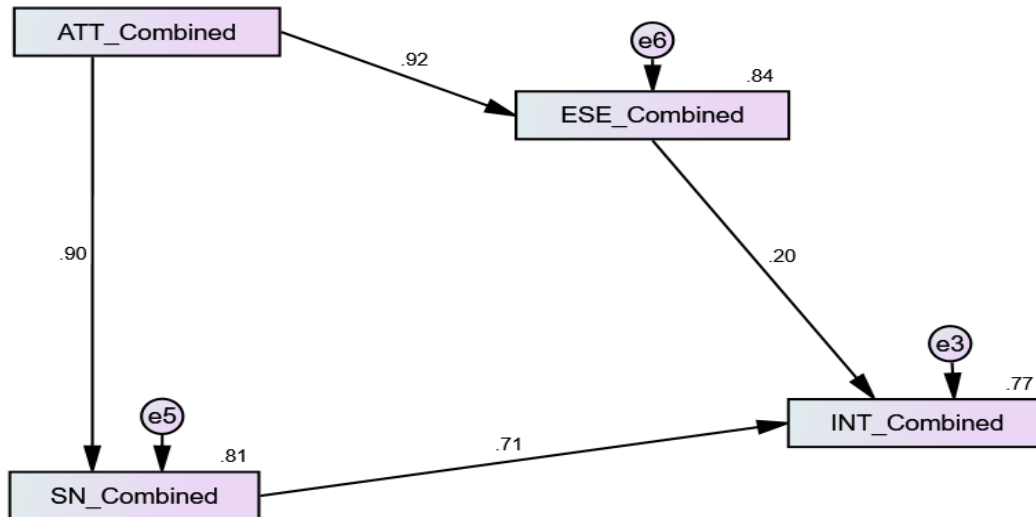
The chi-square goodness of fit index similarly showed the model did not fit the data: χ^2 (5, N=53) = 1375.592, p<.001; again, this was a worse fit than the original model.

4.4.4.3 Low FP

As with the other two groups, the low FP data from the three-way split was tested with the two models – one with SN as the driver, and the other with ATT.

The first model to be tested was the model that had SN as the driver. The chi-square goodness of fit index showed the model did not fit the data: χ^2 (5, N=47) = 945.695, p<.001. The output diagram is shown in Figure 4.9a below:

Figure 4.9a Low FP Model SN (Three-Way Split)

185
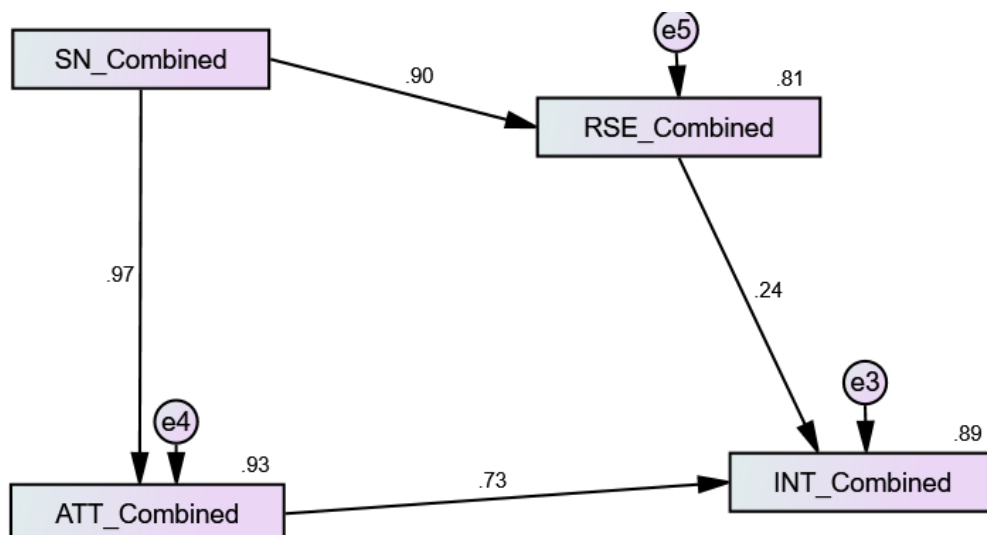
This is followed by testing the model with ATT as the driver with the low FP data from the three-way split. The output diagram is shown in Figure 4.9b.

Figure 4.9b Low FP Model ATT (Three-Way Split)
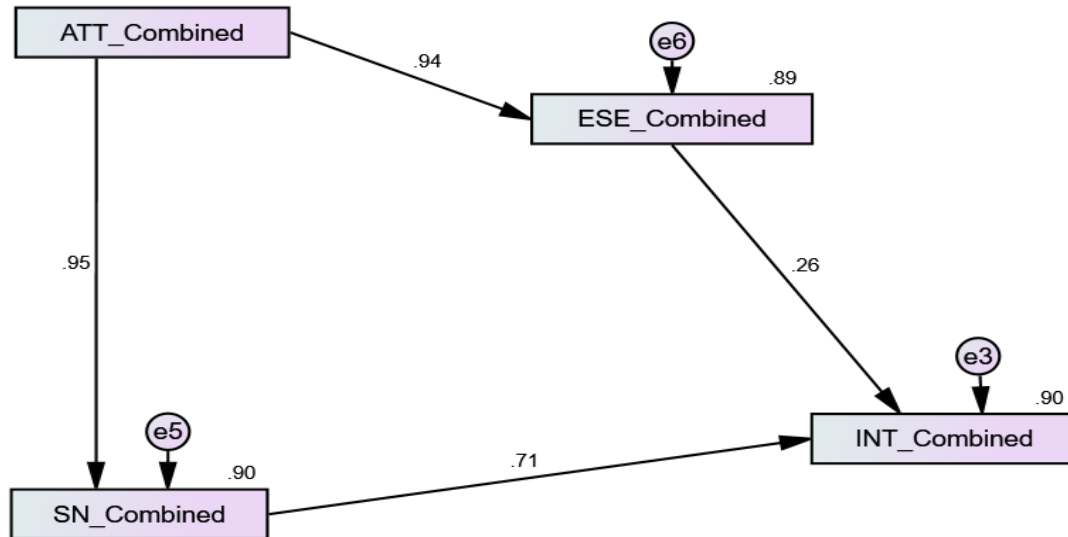
The chi-square goodness of fit index showed the model did not fit the data: χ^2 (5, N=47) = 704.254, p<.001; but unlike the other two groups, this is a better fit than the high FP model.

4.4.4.4 Summary from Three-way Split Models

In both high and low FP models, SN was an important influence; however, ATT was the driving variable in the low FP data and the ATT and ESE model was the better model compared with the SN and RSE model.

Furthermore, when the fit of the SN/RSE model was considered across all three groups, there was a progressive reduction in goodness of fit (chi-square index) from high FP [χ^2 = 366.234] through mid FP [χ^2= 655.726], to low FP [χ^2 = 945.695]. Since the chi-square index is a measure of departure from fit, the smaller the chi-square value, the better the fit between the model and the data.

The reverse was somewhat true of the ATT/ESE model. The chi-square goodness of fit index for low FP [χ^2 = 704.254] was better than that of high FP [χ^2 = 1163.130].

4.5 Discussion

Having identified FP as a plausible key marker of cultural variation on the basis of Study 1, this study investigated how levels of FP (high or low) were interrelated with the motivational and affective elements of SRL. The study focused on the affective

variables and not on the cognitive, because the findings from Study 1 suggested the influence of culture was on the affective and motivational variables, not on the cognitive variables.

A key consideration is the extent to which FP worked as a differentiation device. As noted in section 4.4.1, using the level of FP as the basis to split the data worked reasonably well. The two groups created were different (statistically) on all the variables except one. Furthermore, there was a good range of scores for FP. Therefore, it can be argued that dividing the sample up using a median split produced two distinctive groups. However, there were some signs (from the correlations) that the median split may not have sufficiently distinguished the groups to the extent that Study 1 had done. This point resurfaces in the path models and thus serve to confirm the relationships found there (Study 1). This is discussed in the ensuing sections, looking at the hypothesised relationships derived as a follow-up check from that study.

4.5.1 Hypothesised relationships

4.5.1a Motivation and FP

In the high FP group, both SN and ATT were associated with INT; the ATT/ INT relationship being marginally stronger. This is similar to what was observed in the Chinese group in Study 1; both SN and ATT had a strong relationship with INT with ATT having the stronger relationship. As found in Study 1, however, it appears ATT is driven by SN.

A similar observation was made by Kim and Park (2009) who tested counselling help seeking behaviour using a modified TRA framework in a sample of Asian Americans (representing collective culture). The study investigated whether the effects of Asian values (respect for those in authority, filial piety, collectivism, and conformity to norms) on willingness to see a counsellor were mediated by ATT and SN and the relative strengths of the mediation if present. Their results suggested SN was the main driver, having a direct relationship with INT yet being mediated by ATT as well. They argued that SN was still the driver of ATT. This is because they agreed with the description of ATT by Ajzen and Fishbein (1980), that ATT is a judgement of whether a behaviour is 'good or bad', a judgement that is influenced by the individual's values; therefore, such a judgement could be driven by an individual's SN if it has a strong influence on their disposition. The statistical mediation bears this out.

In the low FP group, the data suggested ATT had the dominant relationship with INT which is similar to the finding from Study 1 as well. The individualistic White British group from Study 1 shared similarities with the low FP group in the present study showing a strong influence of personal attitudes.

4.5.1b Self-efficacy and FP

On the whole, the relationships between the SE variables and SN/ ATT from this study were consistent with those observed in Study 1. RSE had a stronger relationship with SN relative to ESE in the high FP group, mirroring the observation in Study 1. Similarly, VSE was more strongly related to SN than ESE. This suggests the pervading influence of social norms and authoritarian piety places a great deal of importance on RSE as views of referents are held in high regard.

ESE also had a stronger relationship with ATT relative to the other SE variables in the low FP group, though both RSE and VSE had strong relationships with ATT too. A similar pattern was found in the White British group in Study 1 where both ESE and RSE had strong relationships with ATT albeit ESE was the stronger of the two.

4.5.2 Path models

The only model that had a good fit with the data was the high FP; the same model had the best fit with the low FP data although it was not a good fit. This could be due to several issues. Firstly, as noted from Figures 4.1a and 4.1b, the low FP data was negatively skewed so may lack the spread that the high FP data had. The negative skew also suggests a high number of values were close to the median value by which the original data was split. Consequently, there was the possibility the two-way split may not have sufficiently dichotomised the FP variable as expected (the low FP group in this case); hence the closest fitting model to the low FP data was the high FP model. The three-way split bore that out though the three-way split could not produce a model with a good fit with the data due to a reduction in power.

4.5.2a High FP Model

The high FP model with a good fit had SN as the driver. It can be expected for SN to be the driver in the high FP group because the construct of FP is founded and maintained by subjective pressure from the community on its members. This is

consistent with the observations from Study 1 and the correlations from the present study.

4.5.2b Low FP Model

There are three potential reasons why the low FP group may have been more Confucian than expected.

Firstly, the low FP group particularly may be influenced by the effect of context being more important. This is because ATT is influenced to an extent, by the values (determined by normative beliefs) of the individual since it involves making a value judgement about the behaviour under consideration (Ajzen & Fishbein, 1980; Kim & Park, 2009). Therefore, a lower level of SN influence makes it less stable and more susceptible to contextual influences. For instance, Ajzen (1991, p.188) states that: 'The relative importance of attitude, subjective norm, and perceived behavioural control in the prediction of intention is expected to vary across behaviours and situations'. Hence, it is feasible for both SN and ATT to have equal influences creating a confusion of different models or processes. If valuation of ATT due to positive outcomes has a collective influence, then SN may still be a partial driver. Furthermore, in this particular context, children from low FP backgrounds (individualistic) may still get subjected to a lot of educational pressures even though they are not from a Confucian background. This is due to a context in which parents encourage their children to take their education seriously. The pervading influence of the context and its inherent pressures create an element of SN as the driver.

Secondly, SN is able to have that influence in driving ATT because according to Ajzen (1991), ATTs are formed as a result of the beliefs individuals hold about the object of the ATT. In terms of ATT held towards a behaviour, the beliefs link the behaviour to a particular outcome or attribute. Naturally, the attributes or outcomes linked to the behaviour are valued either favourably or negatively. Thus, the individual instinctively acquires an ATT towards the behaviour. Behaviours that lead to favourable outcomes that meet with strong approval from parents and referents form strong ATTs because of this additional indirect influence; conversely an unfavourable negative ATT forms if the outcome is associated with undesirable consequences. This causes ATT and SN to become mixed up. With a measure of SN even in the low FP group, it could be an important influence in value of outcome or attribute.

Thirdly, Western culture (low FP, individualistic [Greek, Judeo-Christian, Roman influence]) historically has its own version of filial piety (natural piety) with parallels to Confucian FP. The low FP group may have been more mixed because lower FP does not mean the absence of FP and that included aspects of Confucian and non-Confucian FP. The low FP group therefore exhibit some element of FP while high FP is distinguished by having a particular type of FP (cultural FP) that focuses it. The low FP group may still have a sufficient level of FP to have affinity to SN - hence SN model closest fit in this group (Yuan & Wang, 2011). Plato was quoted by Yuan and Wang (2011) in illustrating the essence of Grecian influence in Western FP. Plato, in his writings, described the debt owed by offspring to their living parents to honour them, look after them in their old age as they were looked after as infants. Plato was also quoted as saying children were forbidden from speaking ill of their forbears else evil and severe penalties could be encountered as a result.

The influence of Judeo-Christian thought and teaching in creating a version of Western FP was also described by Yuan and Wang (2011). Referring to the Ten Commandments given by God (specifically the fifth commandment) in the Torah and the Bible, FP was demanded from children. Children are asked to 'honour your father and your mother, that your days may be long upon the land which the Lord your God is giving you'. There are similar references in other parts of the Bible such as Deuteronomy and Proverbs.

These illustrations point to forms of FP even in low FP Western cultures. The median split of FP levels worked to a good extent. However, due to the composite nature of filial piety – cultural FP and natural FP – splitting the data may need some refinement for that to work to its optimum. Separating cultural FP from natural FP when splitting data based on FP may be a more utilitarian approach. Such a separation may afford the opportunity to isolate the unique impact of each type of FP. This will be revisited in the final discussion.

Overall, filial piety was found to have relationships with the motivation variables as hypothesised. This observation is broadly in line with extant literature. For instance, virtue-related beliefs (filial piety) in learning has been found to influence academic achievement; yet the influence is mediated by SRL skills. The mediating influence of SRL is because filial piety determines effort deployment by increasing motivation and

self-efficacy (Bempechat, Li & Ronfard, 2016; King & McInerney, 2014). Bempechat and her colleagues (2016) further reported that learning beliefs that were culturally informed and internalized were able to have a positive effect on the SRL of children even from disadvantaged socio-economic backgrounds.

Following on from this, what is needed is a study in a purely Confucian context that tests the models in that setting.

Chapter 5

Study 3

This thesis has been about studying the influence of culture on the development of SRL skills. The results from Study 1 suggested the influence of culture to be on the affective and motivational variables in the model of SRL (Figures 2.5 and 2.6) This prompted a focus of these on a dominant element of Confucian culture – filial piety – in Study 2 but with a sample drawn from the UK. In this chapter (Study 3), the replication of Study 2 (previous chapter) in a purely Confucian context is described. This is to test the models based on the level of filial piety derived from Study 2 in an authentic Confucian context – Beijing. This, it is hoped, will generate some knowledge about how elements of culture wield the potential to drive high levels of academic achievement by exerting its influence through a key mediator – SRL. The results and its implication are also presented and discussed.

5.1 Confucianism in Beijing

That Beijing is authentically Confucian is beyond doubt as China is the cradle of Confucianism (Elman, Duncan & Ooms, 2002; Littlejohn, 2010; Yao, 2000) with Beijing, the capital city, being a location for some of the most historical sites in its antiquity. Formal state institutions such as the state, media, schools and families have for centuries propagated and embodied understandings about filial relations. For instance, Bregnbæk (2016) reports the practice in primary schools where children are made to memorise and perform a poem from the Tang Dynasty (618 – 906 AD) about a mother's sacrifice of her health to enable her son to study well in order to become an official of social significance. Performance of such a poem is an important event and the children are supposed to carry it out with emotion and seriousness, reflecting on what their parents are sacrificing to enable them to have the privileges in their own lives. A different version of the same story is reinforced in secondary school. The importance of FP in Chinese society is illustrated in the following proverb:

"Among hundreds of virtues, filial piety is the most important one" [bai shan xiao wei xian, a traditional Chinese proverb]. – (Wang, Laidlaw, Power & Shen, 2009 p21)

Consequently, inside China, it is applied by parents and elders as a persuasive force embedded in the culture to shape the values, attitudes, and behaviours of their children. It is a widely-held belief that FP retains an essential 'currency' among all

generations within contemporary Chinese society (Bregnbæk, 2016; Chan, 1997; Wang et al., 2009).

5.1.1 Level of FP influence in contemporary China

However, it has been argued by several researchers (e.g. see Bregnbæk, 2016; Wang et al., 2009; Yeh, 2003) that the influence of trends of modernization, urbanization, industrialisation and globalization rapidly occurring in China have impacted on the nature and influence of FP in contemporary Chinese society. This erosion or modification of FP has been observed both in mainland China, and in Hong Kong and Taiwan (Ng, Phillips & Lee, 2002). Ng and colleagues reported that not only did the older generation subscribe more strongly to the ideals of FP, they had modified their expectation to expect less of it from the younger generation thereby reducing any incidence of cognitive dissonance. They also reported a reduction in FP expectation among the older generation over a five-year period. This they attributed to the rapid changes in China due to industrialisation.

A number of reasons have been offered for the decline in filial standards in Chinese society. Bregnbaek (2016) suggests the socio-political upheaval of the Cultural Revolution in the late sixties through the seventies was partly to blame. During that period, Confucian ideas, Bregnbaek opined, were considered to be counter-revolutionary. Therefore, the state sought to replace loyalty to parents (FP) with loyalty to the state. There were reported cases where Red Guards (groups of militant high school and university students organised into paramilitary units as part of the Cultural Revolution, 1966-1976) were seen to publicly denounce their own parents to demonstrate their patriotism – replacing love for parents with the love for Mao Zedong, the new father figure. Another reason for the decline of FP was offered by Evans (2008). Evans argued that the actual bonds that existed between parents and their children had historically been broken as a result of the rules and conventions imposed by the state or the Chinese Communist Party in the fifties and sixties. Notably, the edicts of the state meant there were forced absences of parents due to having to work in labour camps; work on state farms; attendance at schools created for political indoctrination; working on long laborious shifts, and obligatory political meetings. That resulted in a situation where parent-child relations were dominated by separation and absenteeism.

The social, economic and political upheaval experienced in modern Chinese society notwithstanding, some researchers in the field have argued that FP remains an important influence on family relations. For instance, Kagitcibasi (2007) reported that the industrialisation and modernisation that has swept countries in East Asia have not succeeded in completely obliterating traditional values such as FP. A similar observation had been made by Zheng, Shi and Tang (2005); and Fuligni and Pedersen (2002), and more recently Jie (2012). They argued that family obligations still play a significant role in the way children related to their parents.

The influence of FP has remained strong in contemporary Chinese society because, according to Cheung and Kwan (2009), the extent of its influence is mediated by two separate features of modernisation – economic development and urbanisation – that have differing outcomes. The results from their research suggested that urbanisation, rather than economic development, was responsible for a decline in practice of FP in China. Consequently, communities that were relatively more urban in character had lower levels of FP

Beijing clearly is an increasingly modernised city with all the trappings of economic development and urbanisation. The present study seeks to test the models from Study 2 in Beijing to find out whether:

- The levels of FP resembled that of the high FP group from Study 2;
- The relationships between FP and RSE/VSE were similar to that observed in the high FP group in Study 2
- The relationships between FP and SN and INT (and indeed ATT) were like the observation in the high FP group in Study 2.

This will hopefully enable a comparison to be made between a sample drawn from a modernised Chinese city such as Beijing and a group high in FP/ a group low in FP in the UK. It will provide a strong test of the generalisability of the model of affective influences on SRL and academic performance identified from the two UK samples. This will also add to the debate about the extent of the decline or otherwise in FP in modern Chinese society, and shed light on how typical a high FP group is of an authentic Confucian community.

5.2 Study 3 Method

This section gives details about how the study was conducted. It includes information about the sample, nature of modifications made to material and the procedure and process of actual data collection.

5.2.1 Sample

The sample was drawn from an inner city primary school in Beijing. Contact with the school was made by an acquaintance who is an academic in a university in Beijing and who has a relationship with the school due to an earlier research project there into primary mathematics. All the participants were drawn from the same school. Most children in the school are from a lower middle-class background with a few described as working class. Official Mandarin (Putonghua) is the official and only language of instruction in the school. All the children were described as native Mandarin speakers. Mandarin (Putonghua) translations of letters were sent to parents of children aged 10 and 11 soliciting their consent for their children to participate in the research. The breakdown of participants is shown in Table 5.1 below:

Table 5.1 Participant Statistics

		Child's gender		
		Female	Male	Total
Age of Child (years)	10	20	29	49
	11	19	27	46
Total		39	56	**95**

5.2.2 Ethical considerations

The study was guided by the ethical guidance issued by the British Psychological Society and was approved using the UCL Institute of Education procedures. The ethical considerations were discussed with the headteacher of the school in fine detail to ensure every step of the process met every local requirement for working with children.

All the requirements of working with children including: consent, confidentiality, right to withdraw and safeguarding were observed.

5.2.3 Procedure and Data collection

The researcher relied on the acquaintance in Beijing (an academic who has conducted research with primary school children) to assist in collecting the data.

The material for data collection had been translated into Cantonese by a professional translator experienced in academic translation for an intended study in Hong Kong. The Cantonese translation and the English version were both sent to the contact in Beijing who employed the services of a translator in a local university to translate all the material into Mandarin (Putonghua). The translated material was sent to a colleague in Hong Kong University who is a native Mandarin speaker to cross check with the English version and verify the quality of the Putonghua version. It was agreed the translation was of a high quality.

A suggestion was made to change the layout and format of the questionnaire by presenting it in a table as that would make it easier for the children to follow and engage with. The researcher agreed to this suggestion as it would not compromise the study in any way. The agreed format is shown in Appendix 10.

As the researcher was not going to be present during the data collection, the data collection brief was emailed to the contact in Beijing and followed up with a phone call to clarify any issues that may arise. It was helpful that the contact was fluent in English so that made communication very easy.

The questionnaires were completed in a classroom context. The contact was present when the questionnaires were administered. Only the children who had returned consent forms were invited to take part. Before the data collection, the usual assent was sought from the children and they were assured they could withdraw at any time without having to justify themselves. The protocols were the same as that of Study 2.

5.2.4 Reliability and Analysis

Reliability of the questionnaire was established using Cronbach's alpha. The alpha values of the subscales are shown in Table 5.2. The values are in the range: .62 to .85 – in the acceptable range. These values were in a similar range as those from Study 2 (.67 to .84).

Table 5.2: Reliability test results of Questionnaire

Variable	Cronbach's Alpha
Experiential Self-Efficacy	0.78
Vicarious Self-Efficacy	0.85
Received Self-Efficacy	0.72
Attitude	0.78
Subjective Norm	0.81
Intention	0.80
Filial Piety	0.62

5.3 Results

This study (Study 3) aimed to test the relationships between the motivation variables and filial piety (FP) in an authentic Confucian context, and to compare the relationships to the observations in the UK (Study 2) to find out if they were identical to the high FP group in the UK. It also sought to test the models created for the groups in Study 2 with the Beijing sample to find out if the fit indexes were comparable and the extent to which they were.

Therefore, like in Study 2, the data was analysed using correlations to test the relationships and path analysis to test the models. The analysis began with a direct comparison of scores (means) from the Beijing sample with the two groups from Study 2.

5.3.1 Beijing compared with high FP and low FP

The three groups (high and low FP from the UK and Beijing) were compared by means of all the variables using a one way Anova (Tables 5.4 and 5.5).

Table 5.3 Means for variables across 3 groups

	Group	Mean	SD
RSE	High Filial Piety	24.87 a	3.071
	Low Filial Piety	22.67 b	4.150
	Beijing	20.95 c	4.817
VSE	High Filial Piety	23.73 a	4.091
	Low Filial Piety	22.13 a	4.933
	Beijing	23.63 a	4.627
ESE	High Filial Piety	21.49 a	4.542
	Low Filial Piety	20.88 b	4.644
	Beijing	19.05 c	4.887
SN	High Filial Piety	25.35 a	3.183
	Low Filial Piety	23.30 b	4.134
	Beijing	20.38 c	5.739
ATT	High Filial Piety	25.22 a	3.102
	Low Filial Piety	23.58 b	4.558
	Beijing	20.29 c	5.491
INT	High Filial Piety	24.77 a	3.271
	Low Filial Piety	22.39 b	4.512
	Beijing	22.99 b	4.249
FP	High Filial Piety	61.02 a	3.781
	Low Filial Piety	49.51 c	5.092
	Beijing	55.64 b	7.429

Subscripts are markers for significant differences

Table 5.4 One Way Anova for three groups

		Sum of Squares	df	Mean Square	F	p
RSE	Between Groups	654.497	2	327.249	19.137	.000
	Within Groups	4240.881	248	17.100		
VSE	Between Groups	135.567	2	67.783	3.241	.041
	Within Groups	5353.615	256	20.913		
ESE	Between Groups	288.116	2	144.058	6.511	.002
	Within Groups	5641.764	255	22.125		
SN	Between Groups	1091.713	2	545.856	26.185	.000
	Within Groups	5253.323	252	20.847		
ATT	Between Groups	1120.821	2	560.410	27.031	.000
	Within Groups	5328.164	257	20.732		
INT	Between Groups	246.611	2	123.306	7.445	.001
	Within Groups	4190.498	253	16.563		
FP	Between Groups	5124.935	2	2562.468	76.959	.000
	Within Groups	8224.269	247	33.297		

As can be seen from Table 5.5, there was a statistically significant difference between all three groups. To investigate more closely which of the groups specifically differed from the other, a Tukey's HSD post hoc test was computed.

The post-hoc Tukey's HSD tests showed that the Beijing sample differed statistically from both high and low FP groups on the variables: FP, RSE, ESE, SN, and ATT but was not statistically different from both groups in VSE and from the low FP group in INT. The means of the Beijing sample on RSE, ESE, SN and ATT were lower than that of both high and low FP groups. For VSE and FP, the means from the Beijing sample straddled those of the high and low FP group (though Beijing and high FP close for VSE). For INT, the Beijing sample was slightly higher than low FP but lower than high FP.

On the whole, the data suggests the Beijing sample was not like the high FP group; it actually fell below the low FP group on all the measures except in VSE and FP.

5.3.2 Correlations

The correlations obtained from the data (summarised in Table 5.6) broadly suggests a trend expected of individuals from a Confucian culture but with a strong influence of ATT as well. ATT had a stronger relationship with INT than with SN even though both were statistically significant. The relationship between RSE and SN was stronger than that between ESE and ATT, suggesting a stronger influence of group norms over the individual. It must be noted however, that the ESE and ATT relationship was also statistically significant. Also, the relationship between RSE and SN was marginally stronger than that observed between RSE and ATT.

In line with typical expectation of individuals from a Confucian background, RSE and VSE both had stronger relationships with FP than ESE; FP and VSE and FP and ESE. There was also a statistically significant relationship between FP and SN but a non-significant relationship between FP and ATT.

Table 5.5 Beijing correlations

	RSE	VSE	ESE	SN	ATT	INT	FP
RSE		.653**	.406*	.531**	.513**	.585**	.337**
VSE			.532**	.418**	.471**	.691**	.364**
ESE				.247*	.427**	.523**	.213*
SN					.550**	.437**	.325**
ATT						.690**	.171
INT							.232*

*p<.05, **p<.001 (2 tailed) N=95

A partial correlation controlling for the influences of ATT and SN respectively produced relationships that were either weakened in both cases or rendered non-significant as shown in Table 5.7 below. However, the relationship between SN and INT disappeared when the influence of ATT was controlled; conversely, the relationship between ATT and INT was maintained when the influence of SN was controlled. This suggests ATT was the dominant variable of the two.

A test of mediation of the effect of SN on INT through ATT showed that ATT was completely mediating the influence of SN on INT. This makes the Chinese sample to

be more like the high FP group from Study 2. This is because just like in Study 3, the high FP group in Study 2 showed a similarly drastic reduction in the influence of SN on INT when the influence of ATT was partialled out even though the mediation of ATT in this case was not as complete as in Study 3.

Table 5.6 Beijing Correlations controlling for ATT and SN

Control ATT			Control SN		
Variables	**r**	**p**	**Variables**	**R**	**p**
SN and FP	**.28**	**=.006**	ATT and FP	**-.01**	**=.93**
SN and RSE	.35	=.001	ATT and RSE	.31	=.002
SN and VSE	.22	=.036	ATT and VSE	.32	=.002
SN and ESE	.02	=.881	ATT and ESE	.36	<.001
SN and INT	.095	=.362	ATT and INT	.6	<.001
ESE and INT	.35	=.001	ESE and INT	.48	<.001
RSE and INT	.37	<.001	RSE and INT	.46	<.001
VSE and INT	.57	<.001	VSE and INT	.622	<.001
RSE and FP	**.295**	**=.004**	RSE and FP	.21	=.05
VSE and FP	.33	=.001	VSE and FP	.265	=.01
ESE and FP	.16	=.13	ESE and FP	.145	=.163

5.3.3 Path Models

The path models for the high FP and low FP groups were both tested with the data from the current study to find out if either group was similar or closest to the data from Beijing. The output diagrams are presented with their fit statistics. The chi square fit statistic in this case (path analysis) shows a good fit if the result is non-significant as it measures a departure from fit.

5.3.3.1a

Figure 5.1a,b Beijing Data High FP Model

a) RSE
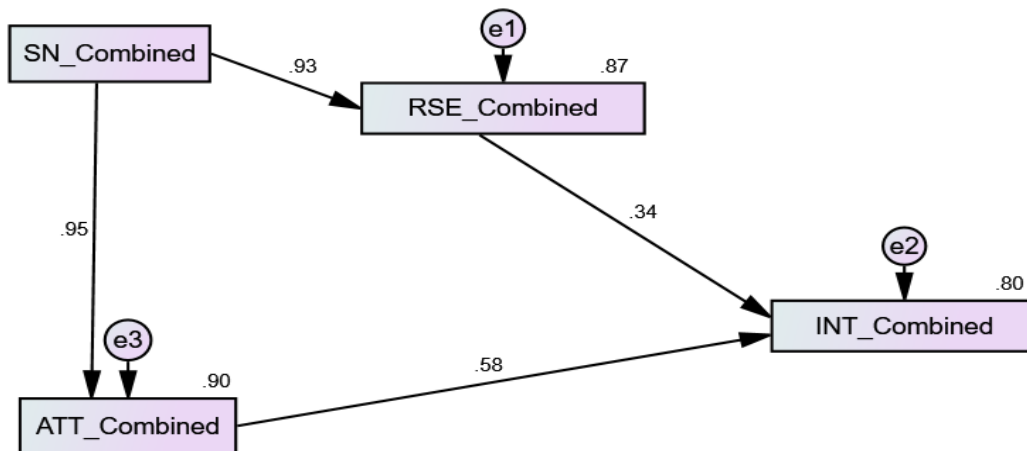
The chi-square goodness of fit index showed the model did not fit the data: χ^2 (5, N=95) = 3244.97, p< .001.

b) VSE
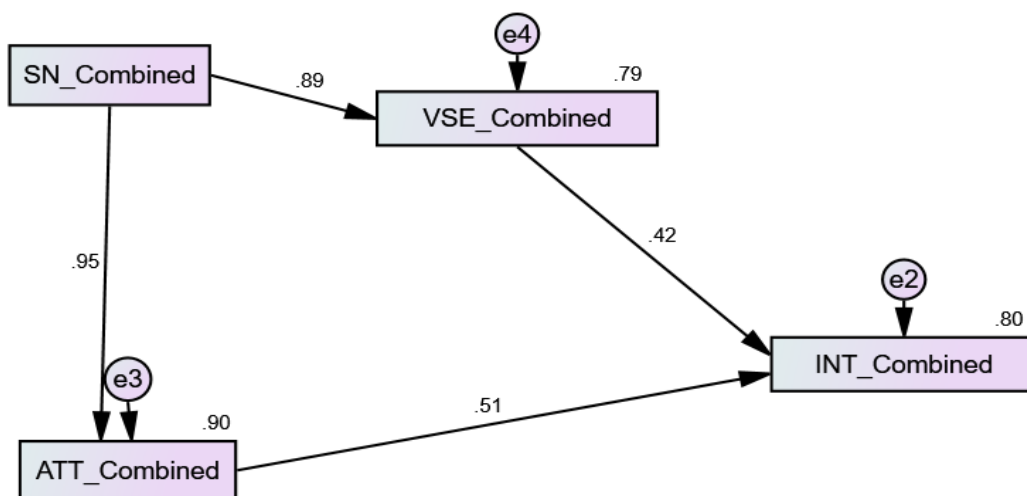
The chi-square goodness of fit index showed the model did not fit the data: χ^2 (5, N=95) = 3188.68, p< .001.

5.3.3.1b

Figure 5.2 Beijing Data Low FP Model
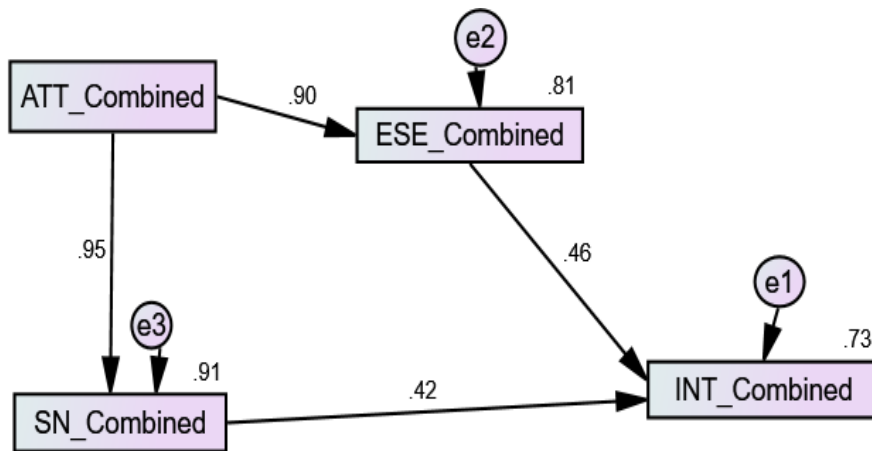
The chi-square goodness of fit index showed the model did not fit the data: χ2 (5, N=95) = 3950.130, p< .001.

None of the models from the UK data fitted the Beijing data. The significant p values and high chi-square figures indicated a substantial departure from fit of the models to the data.

5.3.3.2 Alternate Models (TPB)

Classic TPB models were constructed to test the influence of each of the self-efficacy (RSE, ESE, VSE) variables (representing PBC). As with the models constructed in Study 2, there was no behaviour measure.

5.3.3.2a Alternate TPB Model (RSE)

This model had RSE representing PBC.

Figure 5.3 Alternate TPB Model (RSE)
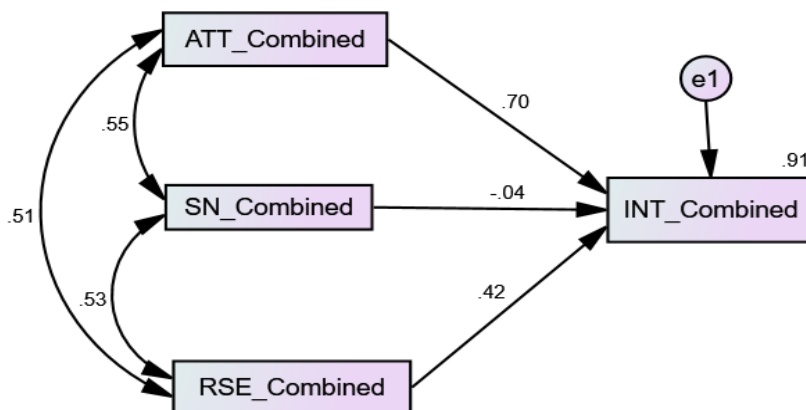
The chi-square goodness of fit index showed the model did not fit the data: χ2 (1, N=95) = 466.26, p< .001.

5.3.3.2b

Figure 5.4 Alternate TPB Model (ESE)

In this model, ESE represented PBC.
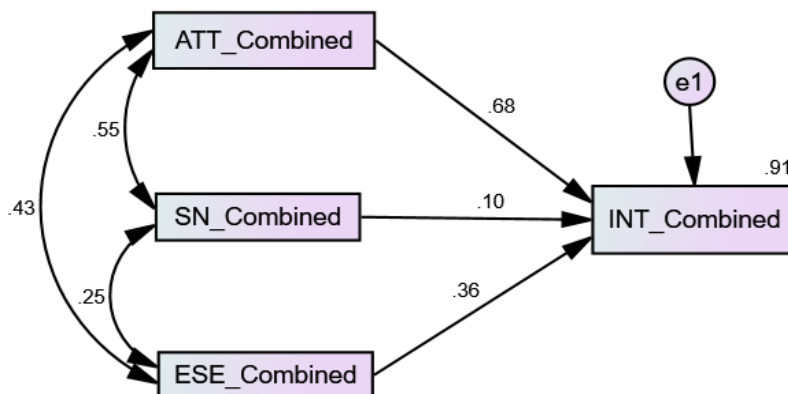
The chi-square goodness of fit index showed the model did not fit the data: χ2 (1, N=95) = 474.23, p< .001.

5.3.3.2c

Figure 5.5 Alternate TPB Model (VSE)
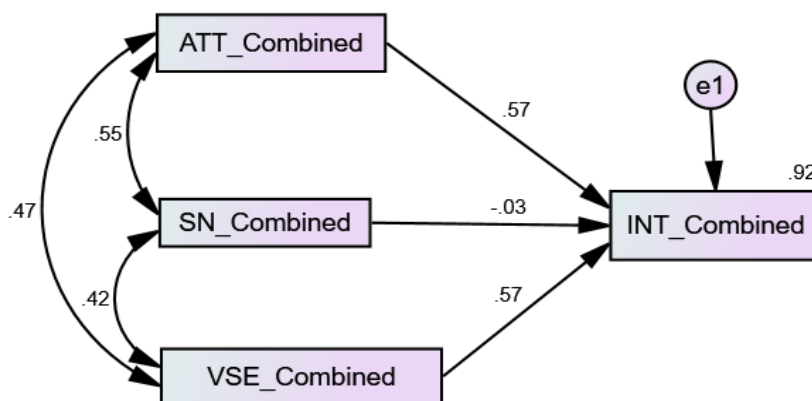
The chi-square goodness of fit index showed the model did not fit the data: χ2 (1, N=95) = 323.177, p< .001.

There was no fit between any of the models and the data; however, the model that had VSE representing PBC was a better fit than the others. This reflected the similarity between the Beijing data and the high FP group on the VSE variable relative to RSE and ESE in the post hoc tests shown in Table 5.6. Moreover, it produced a better fit

than a similar model with the low FP group [χ2 (1, N=86) = 370, p< .001] albeit not as good a fit as the VSE model for the high FP group [χ2 (1, N=81) = 170.55, p< .001].

Also, it suggests a much more dominant role for ATT. This is because of the strong direct effect of ATT on INT shown by the path coefficient (.57) relative to SN (-.03). A similar trend was observed in all classic TPB models (see Figures 5.3.3.2a, 5.3.3.2b) Notably, ATT and SN are correlated in the model.

There is the possibility the lack of fit of the data to either of the models could be due to the test being underpowered.

5.4 Discussion

The means suggest the levels of the variables were lower than both high and low FP group from Study 2; however, this could be due to differences in calibration. The results from the current study (Study 3) suggests the Beijing sample sits somewhere between the high FP and low FP continuum; mirroring and similar position on the individualism-collectivism continuum. Being an urbanised and industrialised city may have impacted the level and influence of classical Confucian ethos.

The models suggest a mix with ATT and SN balanced in influence which inform a classic Theory of Planned Behaviour. The results were not exactly as expected; however, post hoc consideration gives possible explanations.

This observation has been corroborated by Hamamura and Xu (2015). They used Google's Ngram Viewer software to analyse the usage of first-person singular pronouns compared with the use of first-person plural pronouns in literature published in China. It had been argued by Oyserman, Sorensen, Reber and Chen (2009) that personal pronoun usage could give a good indication of the level of individualism or collectivism in a society. Xu and Hamamura (2014) also reported Ngram Viewer plots reliably giving an indication of trends in word usage in a society. The analysis considered the trend from 1950 to 2008. The results showed an increase in the usage of first-person singular pronouns and a decrease in the usage of first-person plural pronouns particularly since the 1970s. This, they suggest, shows an increase in individualism and a decrease in collectivism, contributing to a relatively waning influence of Confucian filial piety.

The trend of ATT having a stronger relationship with INT relative to SN was observed in this study. It is becoming increasingly reliable to agree with other researchers in the field who have opined that the view of children in Confucian communities lacking autonomy and a personal attitude as being inaccurate. For instance, Wang and Cai (2017) conceded that Chinese parents, by virtue of their drive to support their children to fulfil their filial obligation, exercise more control over their children than parents in the West. However, they argued that Chinese children may interpret control differently from their Western counterparts. They illustrate this with the Chinese character: Guan (关), literal meaning 'to govern'; it is interpreted by Chinese children as an act of love (also see Chao, 1994). Chinese children, as a result, may not view parental control and provision of structure as negatively as children in the West would.

This is because according to Parsons, Adler and Kaczala (1982), parental influence could be manifested through one or two processes: parents as role models, and parents as expectancy socializers. They suggested the former, assumes that parents, as models, exhibit behaviours that their children imitate and eventually end up adopting as "… part of their own behavioural repertoire" p 310. This could help explain the stronger influence of VSE relative to the other sources of self-efficacy studied.

Wei (2012), posited that parental influence on children's motivation to succeed academically could be explained by using the concept of 'social capital' as a framework for analysis as propounded by Coleman (1988). Social capital exists in bonds and relations among persons – parents and their children in this case. Coleman suggested the bond between a parent and the child allows the child to access a broad range of resources. Coleman further acknowledged human capital in parents as an important family resource, but he recognised the role of social capital in enabling the harnessing and deployment of human capital; it requires social capital to serve as a medium for children to access it (Wei, 2012).

Of all the variables of social capital studied by Wei (2012), family communication was found to have the strongest influence. Communication enables the transmission of key values and dispositions that enable the formation of strong personal attitudes towards education and learning. Communication in its various forms also leads to the development of strong normative beliefs (SN) further strengthening the child's motivation and affect towards learning and education.

This is enhanced further by the one child policy in China. Having only one child meant all the family's attention and resources are devoted towards that single child. Parents and family relations devote considerable resources and effort towards ensuring the child gets the best education and that in turn communicates subjective norms that develop in the child.

A study by Wang et. al. (2017) provides further insight to the SN/ ATT interaction in how they influence intention. They used a classic TPB framework to study the relative influences of each of the determinants of intention to play computer games instead of doing homework in a sample of Chinese adolescents. Even in the presence of strong personal attitudes and PBC, they found that subjective norms that involve parental monitoring rather than that of peers had a strong influence on the students' decision to spend time on their studies. When the subjective norm was driven by peers, the students opted to play computer games. This highlights the strong influence of parental pressure in driving SN and positive personal attitudes towards learning and academic pursuits.

The mediating influence of ATT on the relationship between SN and INT as found in this study could be explained (albeit admittedly post hoc) by the changes in the concept of filial piety as argued by Kim et. al. (2015). They identified with the bifurcation of filial piety into authoritarian and reciprocal piety by Yeh and Bedford (2004). Contemporary forms of filial piety emphasise reciprocal piety as opposed to the erstwhile traditional dominance of authoritarian piety (Kim et. al., 2015). Reciprocal piety, they argued, is more consensual in approach so a child in contemporary Confucian society is able to take on board the subjective norms of the community and internalise them into manifesting through personal attitudes. This is because of the pervading influence of reciprocal piety as opposed to authoritarian piety. Lai et. al. (2016) discussed this contemporary form of piety as being operationalised as the all-important 'cultural capital' that influences children's academic performance and therefore social mobility.

Children in Confucian culture may therefore exhibit very high levels of personal attitudes (ATT) that is driven by the subjective pressures to show filial piety (reciprocal piety) and maintain face (SN).

Chapter 6

General discussion, conclusions, recommendations and limitations

6.1 Introduction

This final chapter is a reconciliation of the main findings from all three studies; it will seek to consider whether the research answered the research questions set out at the start, and how the UK studies relate to the Beijing study. The utility of the theoretical model created for this research project will be discussed and also of differentiating cultural background via the filial piety measure. Specifically, the potential advancement in SRL conceptualisation by fusing SRL with TPB to enable research into a cultural dimension will also be discussed. Furthermore, in the light of the findings from the present studies, there will be a discussion of the potential malleability of the processes feeding into SRL skills, especially with regard to the motivational dimension, and thus how they might be actively promoted.

There will also be a presentation of the conclusions to be drawn from this study and their practical implications for teaching and intervention in the classroom. The thesis closes with a discussion of the limitations as well as recommendations for further studies.

6.2 Answers to Main Research Questions

The primary purpose of this study was to find out whether culture influenced how children developed self-regulated learning skills (SRL). It sought to seek answers to the research questions; each research question is addressed in turn in the following sections:

6.2.1 Does culture have an impact on the development and organisation of SRL skills?

There is promising evidence across all three studies that culture potentially wielded an influence on the relationships between the variables in the models created for the two cultural groups as defined by cultural background in Study 1 and by high versus low filial piety in Study 2.

In Study 1, the hypothesised differences due to cultural influence on the fused SRL/TPB models were supported by the data to an extent. This study compared two groups of participants – one group consisted of children from a Chinese cultural

background and the other from a White British background. The data suggests participants from the White British cultural background were influenced by personal attitudes and experiential self-efficacy. Conversely, those from the Chinese cultural background were influenced by subjective norms though there was an influence of personal attitudes as well. As demonstrated by the normative-contextual model of attitudes by Riemer et al. (2014), attitudes still influence behaviour in non-individualistic societies. However, as opposed to the Western conceptualisation of attitudes (the person-centric view), the normative-contextual view explains that in collectivist contexts, personal preferences (personal attitudes) interact with social norms activating interdependent frames of thinking in the formation of attitudes.

The evidence from Study 2 came from a comparison of two groups created by splitting a sample of participants based on levels of filial piety – a high filial piety group and a low group. Filial piety is a Confucian set of values hypothesised to be a medium through which cultural levers wield their influence on elements of SRL. The data suggested that subjective norms are a driver of motivation in the group with high levels of filial piety. The same attitude effect was observed in this study as noted in Study 1, but it was more promising here that attitude was a direct mediator of SN influence. This is in line with the hypothesised operationalisation of cultural influence on SRL. The results from the low FP group were less defined; they showed a mix of relationships from both groups in Study 1. This observation will be discussed at the end of this subsection.

Likewise, the results from Study 3, which was based on a study in an authentic Confucian cultural group in Beijing, suggested subjective norms had the strongest relationship with intention, the indicator for level of motivation. Received and vicarious self-efficacy were also relatively more strongly related with filial piety.

It has been a known fact that culture has an influence on SRL (see McInerney, 2008, 2011; Turingan & Yang, 2009). What this research adds to the literature on SRL is to provide some promising evidence derived from clearly stated and tested hypotheses. This is a potential conceptual improvement from the previous studies whose results and conclusions could be criticised as being post hoc (e.g. see Turingan & Yang, 2009). Furthermore, these studies provide some insight about the influence of culture on SRL in the primary phase of education (specifically ages 8 to 11).

Some observations could be made from the difference in the direction of effect implied by support for the two models. Firstly, in the individualistic and low FP groups, the driver is experience itself, which creates a positive feedback loop in which SE is boosted by positive performance, which in turn boosts attitudes and subsequent effort. Secondly, for the collectivist and high FP groups, the experience-SE-attitude relationship exists but is relatively weaker; and external SN drives SE and effort regardless of actual performance – which may be in some senses a more resilient system.

6.2.2 Which elements of SRL skills are impacted by cultural differences?

Having obtained some promising evidence regarding the possibility that culture did have an influence on the development and organisation of SRL skills, it was important to assess whether the influence was on specific elements.

As addressed in Chapter 3 (discussion section), the evidence suggests culture wielded its influence on the motivational/ affective elements. That seemed to be where the differences identified between the two cultures studied were found. The results for the cognitive elements between both cultures followed a similar pattern. Yet, there appeared to be differences between the two groups in how the motivation/ affective variables were related although some relationships were not as clear cut as envisaged. For instance, in Study 1, the White British group was predicted to have a relationship between PA and ATT. This seemed to be the case yet there was also a relationship between CA and ATT. This could be the result of the blurring of hitherto distinct cultural characteristics, which has been attributed to the influence of globalisation (Ogihara & Uchida, 2014). CA had a relationship with both ATT and SN in the Chinese group with SN being predominant as predicted. The influence of ATT in the Chinese group has been discussed in the previous section (see section 6.2.1).

 A similar trend was observed in Study 2 where the group with high filial piety appeared to indicate a predominance of subjective norms as the driver of motivation.

6.2.3 Does the impact of culture influence the organisation of SRL skills in a consistent and predictable fashion?

Findings that culture influenced the development of SRL were in agreement with extant literature. The Chinese background children and those with higher FP appeared to have a stronger influence of perceived values of relevant others (Subjective Norms

and Received/Vicarious Self-efficacy) while the White British children showed a higher degree of the personal autonomous influences (Experiential Self-efficacy and Personal Attitudes). The results from Studies 1 and 2 show a pattern that is suggestive of consistency in the development of SRL in the light of cultural influences. The Chinese background group from Study 1 showed a number of relationships that were similar to the high filial piety group from Study 2; for instance, both groups had subjective norms as being the predominant driver of motivation (intention) but with attitudes and RSE as apparent mediators. This suggests a consistency in the influence of a collective culture trait – subjective norm – on the motivation aspect of learners' SRL

The low FP group from Study 2 showed a blurring of the pattern in the relationships. This could be attributable to overlap in the mid-range with the high FP group; a tripartite split produced a lowest FP group who looked more like the white British group in Study 1 – confirming the pattern. This illustrates that there is actually a continuum of relationships, rather than a polarity.

Nevertheless, the FP measure was a useful tool that enabled the capture of individuals' position on a continuum without having to place them into predetermined groups – a more realistic and plausible reflection of the true nature of human characteristics.

6.3 Beijing study relative to UK

The data from Beijing did not fit the profile of any of the groups from the UK study. The expectation was for the profiles to be similar to the Chinese background or high FP groups from the UK studies. However, they mostly sat between the high and low groups on the FP continuum. These results, albeit unexpected, may reflect the political, cultural and social upheaval in contemporary China, the brunt of which has been felt in a highly urbanised city such as Beijing. De Barry (1995) captured the sentiment with this observation:

"… the Great Proletarian Cultural Revolution rent China in the late sixties and early seventies, with its bloody vendetta against any supposed remnants of Confucianism, or how youthful phalanxes of Red Guards, waving Little Red Books, waged lethal campaigns against intellectuals and state officials, targeted as covert agents of the ancient sage - or indeed if one's memories reach back to the early founders of the

Chinese Communist Party, a generation of young iconoclasts bent on smashing the old 'Confucian Curiosity Shop'" (p 175).

De Barry was conveying the upheavals created by the new political movement in the late sixties and seventies led by Mao Zedong that sought to purge China of Confucian influence. That created a generation of Chinese citizens who lacked the cultural ideals of Confucianism. However, De Barry noted a return to Confucian ideals in the eighties during the new political movement led by Deng Xiaoping. Interestingly, De Barry noted that traditional Confucianism was upheld in countries such as Japan, Korea and Singapore during that period.

One of the consequences of the purge of Confucianism during the Maoist cultural revolution was an erosion of filial piety. Nevertheless, Qi (2014) argues that family obligations continue to play an important role in China, although there may be changes in the conventions associated with the attitudes, expectations and emotions associated with obligations. It is therefore not prudent to assume filial piety or Confucianism was completely degraded; it is simply an acknowledgement of it being modified in the present dispensation.

In a similar vein, Zhang, Lin, Nonaka and Beom (2005) observed the differences that exist among Confucian countries from the results of a study comparing university students from different countries on levels of Confucian characteristics. Differences have arisen as each country has experienced different political reforms, social and cultural changes as part of the process of technological innovation and modernization to create increasingly advanced societies. This is supported by Lin and Ho (2009) who reported respondents in Taiwan displaying relatively higher levels of Confucian values than those in mainland China.

Therefore, the results from Beijing probably partly show evidence of the effects of the cultural revolution experienced by that society as a result of the political events of the sixties and seventies. It could also be a consequence of the growth of Beijing into a cosmopolitan, modern city.

The question still remains about why Confucianism apparently had a larger influence in the UK relative to Beijing. One explanation could be that the Chinese community in the UK are a relatively self-contained group in particular (Song, 2015; Zhu, 2008), and

also because the majority originated from Hong Kong (see Chan, 1997; Zhu, 2008) where the impact of the cultural revolution was minimal or non-existent.

There is also a probable implication for the differences in Confucian influence between the UK sample and Beijing on the status of the SRL/TPB models propounded by the present research; it suggests they represent distinctly different points on a continuum, with a blurring of influences between them in certain aspects – a position supported by the FP measure.

6.4 New Model of SRL - Fusion of SRL and TPB

The model of SRL created for the present research appears to be supported by the data and this is a potential advancement on existing models; this is particularly the case when SRL is being considered in cross-cultural contexts. The model with its two main constituents – cognitive and motivational/affective – allowed for an assessment of the specific areas where the element of culture wielded its influence. It was therefore possible to identify that the fusion of TPB, with its original TRA components – personal attitudes and subjective norms – provided a means of assessing the influence of culture on the model. Also, the substitution of PBC with SE enabled an assessment of the influence of culture on the sources of SE and by extension, agency. In other words, the inclusion of a TPB framework made it possible to hypothesise and test those specific aspects of motivation on which cultural differences (in these groups at least) seem to hinge.

This model is a potential conceptual advancement on SRL that could provide an impetus to SRL research and its application in supporting learners of all backgrounds. This is because it showed the potential to shed light on how cultural influence is exerted in the SRL framework and how the elements of SRL interacted in different cultural settings. Furthermore, it shed light on the potential drivers behind sources of motivation – whether internal or external – paving the way for intervention programmes and investigations into how internal motivation, argued by researchers to be more resilient (Deci et. al., 1991; Gorozidis & Papaioannou, 2014), could be fostered. Also, this approach makes it easier to operationalise the key variables in the two cultural settings.

6.5 Malleability of processes feeding into SRL

A fundamental assumption and supposition about SRL is that it can be taught, and that is well established in the research literature (e.g. see Olakanmi & Gumbo, 2017; Schunk & Zimmerman, 1998, 2011; White, Gruppen, & Fantone, 2010; Wolters, Benzon, & Arroyo-Giner, 2011). SRL skills have been taught successfully across all phases of education in various contexts (Perels, Merget-Kullmann, Wende, Schmitz & Buchbinder, 2009, [preschoolers 5-6 years]; Schunk, & Rice, 1991 [10-11 year olds]; Olakanmi & Gumbo, 2017 [students aged 14-15 years]; White, Gruppen, & Fantone, 2010 [medical school students]), hence it is reasonable to claim that SRL processes are malleable.

Asserting the processes of SRL are malleable is supported by Winne (1995).

"Regulation is inherent and universal in nonreflexive learning but its forms and, therefore, its effects are malleable because SRL depends on knowledge. Because knowledge accumulates and changes, so, too, will regulation" (Winne, 1995 p223).

Furthermore, Cleary and Kitsantas (2017) observed that motivational processes and SRL behaviours are malleable; this implies that they can be changed and improved presenting implications for instruction and intervention.

The present research shows it wields the potential to make a contribution to optimising the malleability and development of processes feeding into SRL, in that it provides some insight into how the processes could interact within different cultural settings. It appears to show how external support and the use of feedback could bolster RSE which might particularly provide protection against negative experience of performance regardless of cultural background. RSE was an influence in the Chinese/high FP groups and was present in the White British/low FP albeit at a weaker level – providing scope for it to be boosted in the latter groups. As discussed previously, there is blurring of effects in aspects of the models even though they both sit on distinct points on a continuum.

The research studied two cultural backgrounds, and the knowledge about how culture could influence SRL processes, potentially, could help inform any future intervention in other cultural backgrounds to be sensitive to elements within that culture.

In addition, as will be discussed in the ensuing sections about the roles of parents and schools respectively, this research by providing some insight into how culture might influence SRL through the affective dimension, means both parties could have a worthwhile role to play in supporting children to develop their SRL skills.

6.6 Home school partnership

This research has provided some promising evidence of SRL development and deployment in the primary phase of education. It provides some support for the researchers who argue that SRL development starts in early childhood (e.g. see Von Suchodoletz, Trommsdorff, & Heikamp, 2011; Zhang & Whitebread, 2017). This is because SRL processes were probably well developed and established within the age range of the research participants. Parental interaction and scaffolding have been reported as playing a key role in children's development of SRL. This is supported by a number of studies that report a relationship between parent-child interaction and children's SRL (see Neitzel & Stright, 2003; Pino-Pasternak, Whitebread, & Tolmie, 2010; Whitebread & Basilio, 2012).

It therefore follows that parents must be regarded as key partners in children's development of SRL skills by educators. Programmes aimed at developing SRL skills in children in school have a better chance of optimum success if parents are involved as partners in delivering the programmes. This is particularly crucial in deprived areas where children are disadvantaged due to their backgrounds and come into early learning centres and schools with relatively lower baselines. SRL skills can be taught, even to children in the early years (Whitebread & Basilio, 2012), so parental support must be a key consideration.

As suggested by the present research about how the affective dimension of SRL could be shaped and developed, parents may have a particularly crucial role. It does not require parents to have particular technical expertise regarding tasks – the cognitive dimension. Their influence could be targeted at supporting the children to develop those positive affective elements of self-efficacy and motivation – equally crucial if their children are to become successful learners. Parents can support their children to develop resilience through bolstering RSE and their normative beliefs regarding hard work and effort, the importance of learning and modelling positive response to challenges and learning in general.

An underachieving demographic such as white working class children, for instance, (Demie & Lewis, 2011; House of Commons, 2014; Stahl, 2017) would benefit from their parents being supported through intervention programs that enable them to use the right communication to bolster their children's RSE and to model behaviours that boost VSE. Pino-Pasternak, Whitebread and Tolmie (2010) demonstrated the impact parents could have on children's SRL during a parent-child homework programme.

Moreover, as the findings from this research suggest, culture may have an influence on the development of SRL skills that specifically impacts on the affective dimension. As parents are the primary purveyors of culture, because they inhabit the microsystem of the child's ecological niche (Bronfenbrenner, 1994), educators must bear in mind that attempts to engage with parents may not yield to a 'one size fits all' approach. It may be valuable to identify helpful cultural elements and promote them while attempting to bolster less helpful manifestations.

6.7 Implications for classroom practice

According to Bruner (1999), how a teacher conceives of a learner determines the instruction he/ she employs. As a result, it is crucial, Bruner argues, that teachers are equipped with the best understanding of how children's minds work – important if the child's cultural background influences the development and organisation of SRL skills. In arguing for the importance of cultural considerations in a child's development, Bruner posits that interest needs to move from what a child is doing to an understanding of what the child thinks he/ she is doing and the reasons (motivation) for doing it. As suggested by the evidence from the present study, culture does have an influence on the development of SRL skills by working on the motivation/ affective dimension. This lends support for Bruner's argument thus:

"… children show an astonishingly strong 'predisposition to culture'; they are sensitive to and eager to adopt the folkways they see around them. They show a striking interest in the activity of their parents and peers and with no prompting at all try to imitate what they observe" (Bruner, 1999 p47)

He claims in a classroom context, it is important to appreciate a cultural approach as it:

"…emphasizes that the child only gradually comes to appreciate that she is acting not directly on 'the world' but on beliefs she holds about that world" (Bruner, 1999 p49)

Teachers and the education fraternity need to understand, therefore, that they are dealing with learners who are cultural beings with dispositions and attitudes influenced by their cultural backgrounds. Focusing solely on the mechanical elements of the curriculum and its delivery without paying due attention to the affective/ motivation of the learners may lead to sub-optimal results.

Teachers possess the technical skills to equip learners with the requisite metacognition skills to enable them to achieve academic success. Cognitive strategies and the ways of monitoring performance could be scaffolded into lessons to support learners to acquire them. Equipping learners with the cognitive strategies coupled with development of positive affect and motivation ensures learners make the effort needed to complete even the most challenging tasks.

Also, teachers have an important role to play in developing the SE and motivation of learners. Children consider teachers alongside parents to be important referents whose opinions and words they take very seriously. Through marking and feedback (both oral and written), teachers wield the influence to either build or damage a child's RSE. The role of teachers also includes the creation of a conducive environment and classroom culture where effort and challenge are celebrated and mistakes are seen as learning opportunities.

The teacher's role in supporting SRL development should harness the strengths of both cultural orientations to give children of all backgrounds the best opportunity to achieve optimum academic performance. Children with a CHC orientation, may benefit from being supported to develop in the area of experiential self-efficacy (in addition to the strong affinity to RSE); this will be an enhancement on SRL skills from the blind application of effort without attention to feedback from experience. Drawing attention to the importance of experience could help bolster both the cognitive side of SRL, and the more personal sense of agency as a layer to add to collective values. In other words, teachers have the scope to make use of the continuum of SRL processes and generate a mix of learning opportunities that place children in the mid-range on that continuum where they might get the best of both worlds.

6.8 Implications for policy

Furthermore, due to the pressures created by international performance league tables, policy makers in Western countries such as the UK who fall behind East Asian countries come up with strategies to imitate those countries. The international studies, called the 'Olympics of education' (*The Guardian* newspaper, 11th December 2008 issue) generates immense interest in the media, politicians and educators. However, those strategies have not led to the UK catching up or overtaking their East Asian counterparts. This could be due to a lack of factoring in the fact that children from the different cultural backgrounds are socialised in different ways hence develop SRL skills in different ways (Biggs, 1998; Leung, 2014). This observation was put eloquently by Leung (2014) in the quote below:

"complicated cultural factors might have affected classroom practices and student achievement, and so drastic changes should not be undertaken until such factors are thoroughly examined. Any changes in educational policy must ensure that the strengths in a country are not lost in the process. Simple transplant of policies and practices from high achieving countries to low achieving ones would not work, because one cannot transplant the practices without regards to the cultural differences" (p600).

The present research has potentially provided some insight about how cultural influences interact with SRL. Policy makers and stakeholders may need to consider the social cultural influences that could impact on learner's SRL and performance.

Leung (2014), in analysing the reasons behind the high performance of East Asian countries relative to Western countries in the global TIMSS studies, noted that students in East Asian countries held rather negative attitudes towards maths – a surprising and unexpected observation. Nevertheless, the crucial commonality for the high performing countries, Leung noted, was they are all Confucian Heritage Countries (CHC). Therefore, as suggested by the evidence in the present study, students and their teachers' cultural values may be important factors to be considered in discussions about student achievement and consequently, their SRL skills.

The way of socialisation in CHC creates a collective orientation with a strong drive of normative beliefs (subjective norms) guiding behaviour so not dependent on experience being positive. Leung (2014) identified values such as: emphasis on the importance of education; high expectations to achieve; and a belief in effort, driving

motivation to achieve in school. This creates a positive belief in the child's capabilities that become internalised, and then used by the child to direct their own behaviour in the face of negative experiences.

CHC places a strong emphasis on the importance of education, and parents communicate the importance they attach to educational achievement to their children. Parents and family members often demonstrate the importance attached to education by spending considerable resources in that regard. This leads to the creation of considerable subjective pressure to study and to achieve good grades. This is coupled with a belief in hard work because according to Confucian belief, "sagehood is a state that any man can achieve by cumulative effort" (Chai 1965); everyone has the ability to be educated if he/ she is prepared to make the effort. Parents and family members teach their children very early on that the only way to achieve success in life is by working hard. In CHC success or failure is attributed to internal and controllable factors (effort and hard work) rather than to innate ability (uncontrollable factor).

6.9 Limitations

There are some limitations with the present research. Firstly, a problem could arise due to the data collection procedures. In Study 1, the first and third stages involved one to one interviews with the participants. There was the challenge of expecting children to remember an issue in giving answers to the questions. In addition, the third stage was a straight forward repeat of the first stage and some of the participants may have been bored with hearing a repeat of questions they had already answered only a few days previously. However, the consistency in the pattern of the results between Studies 1 and 2 suggest that may have not been an issue.

Also, there was an issue with the psychometric properties of the questionnaire measures where some of the alphas were not as high as they might have been, and the pilot suggested that a small change in wording had quite an impact on responses – though a consistency in the alphas across studies was suggestive of stability in the final versions.

Furthermore, the sample size for the first study was smaller than originally planned. The nature of the research meant cooperation was needed from a very large number of schools and their headteachers. The spread of Chinese background children meant only a handful could be found in any single school so a great amount of effort went

into gaining the cooperation of a school but with only one or two children available to participate. It was necessary to solicit for participants through schools because the study was designed to find comparable White British children to match the Chinese sample from the same school. As a result, some of the analysis originally planned (e.g. regression) could not be done. Nevertheless, the numbers allowed for some analysis to be done that addressed the research questions and set the platform for the subsequent studies.

Moreover, there were a few cases where matching cultural group pairs could not be found within the same school. In those instances, matching participants were found from schools with similar demographics and backgrounds. This presents the problem of type of school attended becoming a potential confounder in the data. For example, individual teachers or schools may emphasise different behaviours and aspects of SRL strategies. Some schools actively promote perseverance as a skill to be developed in their children while some do not, for instance. Some also have a well instilled strategy of problem solving in the learners. Furthermore, as it was not possible to match the two groups by exact maths NC levels, there exists the possibility, however unlikely (even though chi square results showed no significant differences), that one group may have had better mathematicians. However, the consistencies between Study 1 and Study 2 suggest there were no issues of confounding.

The number of participants (35 from each group), raises the issue of representativeness of the sample involved in the study. This restricts the applicability of any of the findings outside the group who participated in the study. The confidence intervals for the sample estimates are larger as a result. Again, the cross-study consistency (with Study 2) suggests the results were representative.

There was also a problem with the fact that all the research was conducted within a narrow age band and with a tight focus on maths. Therefore, it is not possible to know for certain that the same patterns would be obtained for different age groups and areas of the curriculum. However, there was the necessity of maintaining a tight focus within this initial set of exploratory studies. Maths may be a particular issue within this age group because it may be seen as a more challenging area by many children, and this is the age range at which they are getting to grips with it properly.

Another issue was that there were no cognitive or performance components in Studies 2 and 3, so although the affective variables appeared to follow similar patterns as in Study 1, there is no way to be sure that they would not have interacted with the cognitive variables in a different fashion.

However, it was not feasible to include task performance in Studies 2 and 3 due to constraints of time and scope within the small set of studies. A pragmatic approach was taken to omit the cognitive component from Studies 2 and 3, particularly as the models had been tested in Study 1, and the subsequent ones were to do a more focused investigation of an element identified as potentially relevant to the discussion around Confucian culture. These issues can be addressed in future research; and would lend itself to studies that can be driven by clear hypotheses.

The agency measures (CA and PA) were also dropped for Studies 2 and 3 so there could be no way of telling if the variables would have interacted in a similar pattern. Dropping the agency measures enabled Studies 2 and 3 to be tested using a classical TPB framework (except PBC was substituted for SE); also, agency was conceptualised as deriving from SE by Bandura (2001) so could be assumed to be subsumed within SE. The analysis from Study 1 suggests ATT has a mediating role with agency and appears to have personal and collective elements.

Also, in Study 1, the expectation that performance during Stage 1 will lead to SE development that can be measured during Stage 2 turned out to be overambitious. The stages were ordered so assessment of self-efficacy would take place during Stage 2, so that the impact of performance during Stage 1 on the development of self-efficacy could be assessed during Stage 2. Conceptually, that was not viable because self-efficacy development happens over time and over a series of events, not just after a single task performance. The short time span between Stages 1 and 3, and the repetitive nature of the task compounded the issue. The time intervals of the stages based on an assumption of measuring self-efficacy development as a result of Stage 1 task performance was a little ambitious.

6.9.1 Recommendations for further study

The present study has showed some promise and potential to create a conceptual advancement in SRL conceptualisation. The model created by fusing SRL and TPB could be revolutionary but the evidence from the present study only shows 'promise'.

The limitation of a small sample size means no firm claims could be made at the present stage. The research therefore warrants further investigation with larger samples and with hopefully more robust methodology.

Generally speaking, a potentially new model of SRL, as suggested by the present research, would require a more conservative consideration given to the minimum sample requirement. Hence, it will be ideal to test the models with a minimum sample size of over 100 participants per group as suggested by Nunnally (1978), thereby increasing the power of the tests.

Furthermore, the small sample size for Study 1 meant the level of analysis was restricted to a comparison of the two groups only. Differences within the same cultural group could not be analysed as originally intended. As theorised by Vygotsky (1986), language is a means through which culture is transmitted. The research would have benefitted from a closer analysis of the Chinese cultural background group by splitting them on the basis of whether the participants spoke a Chinese language or not. This is because some scholars (e.g. De Vos, 1995; Giles, Bourhis, & Taylor, 1977; Isajiw, 1990; Mchitarjan & Reisenzein, 2014) have suggested that being fluent in a child's heritage language is an essential component of his/her ethnic identity; and heritage language use by parents is a means of exemplifying and asserting their cultural ideals and ethnic identity, transmitting their cultural heritage (Giles, Bourhis & Taylor, 1977; Isajiw, 1990; Suárez-Orozco & Suárez-Orozco, 2001). It can therefore be expected that the children who spoke a heritage Chinese language would possess higher levels of Chinese cultural values therefore having a higher collectivist orientation. The models could have been tested in both groups created to assess which of them displayed more collectivist culture characteristics by way of hypothesised relationships between the elements of SRL.

The power of the measures used in testing the models could be increased by refining and modifying the questionnaire so as to increase the reliability alphas. A finer grained analysis could lead to the creation of more reliable measuring scales. In addition, the reliability of the coding schemes and the process of coding used for the observation measures may be amenable to further refinement and improvement. These should contribute to increasing the power of the tests (Maxwell, 2004; Simmons, Nelson & Simonsohn, 2011).

Also, there may be scope for the models itself could be improved and simplified. For instance, the agency measures (CA and PA) could be omitted from a refined model as they were conceptualised as being subsumed in self-efficacy. Also, it can be argued that agency variables did not make any distinctive contribution to the overall model so can be taken out for the sake of parsimony.

As the present research was done within a narrow age band (8-11 years), further research could consider a wider range of age groups. There are particular possibilities with regard to looking at younger children to examine how early the patterns found in the present research become established. There should also be work looking at secondary school students to examine how far these patterns are affected by the primary-secondary transition. The insight from the present research means subsequent studies can set out with clear hypotheses adding impetus to research into cross cultural research in SRL.

Further research could also be designed around intervention studies where elements of culture identified as supporting the development of SRL (such as SN, RSE) are promoted in learners. Hulleman and Barron (2016) argued that intervention studies were the culmination of a research continuum that starts as non-experimental but conclude in interventions that help establish cause and effect relationships in some cases, but more importantly lead to improvements in teachers' practice.

Intervention research could involve teachers in action research introducing strategies that develop SRL skills in children over time. Quantitative and qualitative data could then be collected to assess the impact of the intervention programme. Duration of interventions could range from whole school terms to a full academic year.

Lessons learned from such programmes could be incorporated into whole school development programmes that could be used to raise performance of whole schools over a period of years.

For instance, self-efficacy is known to be strongly associated with academic performance; from the knowledge suggested by the present research, intervention could be designed to support learners to develop this all-important skill. The expectation will be for all learners to display improvements in academic performance over a period of time (such as 3 or 6 months) as their levels of self-efficacy improves.

They could then be subsequently tested post intervention for SRL skills development and enhanced task performance.

Another avenue for further study would be research into the models of SRL in different cultural background groupings but with much larger samples. This is because the fused SRL and TBP model needs to be tested in different contexts and with larger samples to gain widespread understanding of the influence of culture on SRL. The present research focused on Confucian heritage and white British cultures. As revealed by the FP measure, they sit on disparate points on a continuum with blurring in certain aspects. It stands to reason that different cultural groups such as: Afro-Caribbean, black African or south Asian may sit on yet different points along the same continuum. It will therefore be of interest to find out about the patterns in relationships those cultural groups may display. Also, the study from the present research that assessed the models had small sample sizes so further research with larger samples will be useful to test the viability of the model. Sample sizes around 150 and above will enable analyses such as regression and path modelling to be carried out.

The study in an authentic Confucian cultural context was done with a sample drawn from Beijing in China, a highly urbanised and cosmopolitan society. It will be of interest to conduct a similar study but with the inclusion of a task performance as in Study 1. It will also be of interest to conduct this study in a rural community in China to assess further whether the level of urbanisation or otherwise of inherently Confucian background societies influenced how culture interacted with elements of SRL; also, there could be a comparison between Beijing and Hong Kong, where the level of urbanisation and indeed westernisation are similar, but the historical pattern of engagement with Confucianism differs. The models of SRL could also be tested in those two contrasting communities to assess the relationships between the elements.

The present research introduces a proposed conceptual advancement to the study of SRL by providing a means by which elements of culture could be assessed for their impact on SRL; the advancement as epitomised by the fusion of SRL/TPB model. The new SRL/TPB model should lead the way for new lines of research that breaks the monopoly of SRL research that is dominated by Western viewpoints by offering a viable means of assessing SRL in cross-cultural contexts. This is because the TPB framework offers a potentially significant contribution by providing a clear handle for

cultural influence in a way other theories such as 'achievement goal' or 'self-determination' will not be able to do.

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6 Beads

If you put three beads onto a tens/units abacus you could make the numbers **3, 30, 12 or 21.**
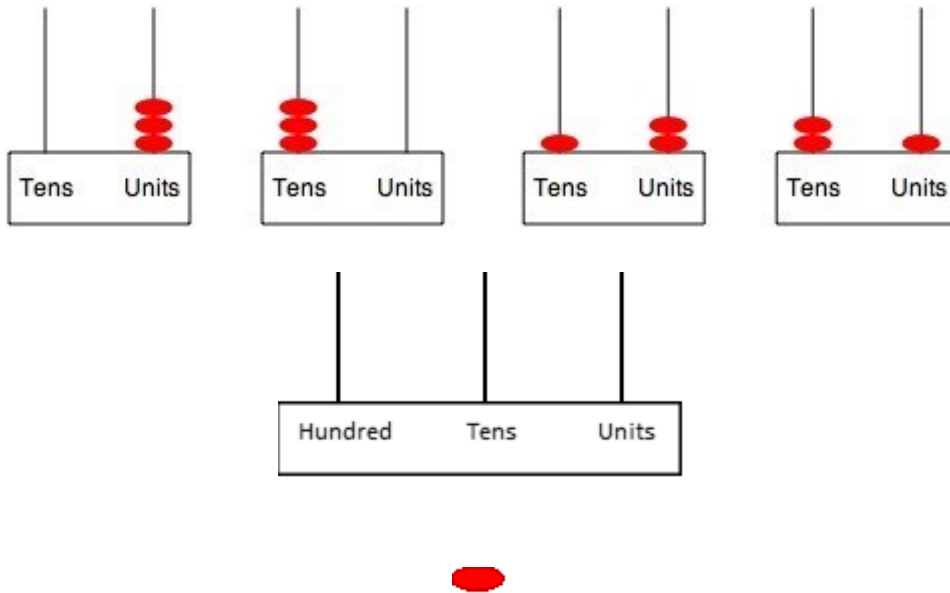
Explore all the numbers you can make using six beads on a Hundreds, Tens and Units abacus.

There are 28 possibilities so you are to try and find all of them in 10 minutes.

You are free to choose any resources you want.

Now before you start, do you have any questions?

Appendix 2 Interview Schedule

INTERVIEW QUESTIONS

MK Questions (Before task completion)

What do you think about solving maths problems?
Are there any areas of maths you like?
Are there any areas of maths you don't like?
(Follow up: which areas? Why do you like or not like that area?)
Do you think how you feel about maths affects how well you do?
(E.g. suppose you really didn't like maths problems but it is important
you do well at a task; what do you do about that?)
Have you solved a problem like this before?
(No: How good do you think you will be?)
How good are you at solving maths problems like this one?
(Follow up: how do you know?)
Do you understand the instructions?
Do you think you can see how you will go about solving the problem?

— Knowledge of Person

How does your understanding of a task affect how well you do?
What do you think makes a task difficult to do?
Please explain to me what you are expected to do on this task?
Do you think it is an easy or difficult task? Why?
(Follow up: what about it makes it easy/ difficult?)
a) In what way is this task similar you have done before?
(Follow up: In what way is it similar or different?)

Knowledge of Task

Suppose you are given a task to do; what do you do if you don't
understand it after reading through the instructions?
Suppose you have been given a maths problem to solve and you want
to do well; what do you do next?
What do you think you are going to do to solve this problem?
(Follow up: how is that going to help?)
Do you have to start in a particular way or order?
(Follow up: what way or order and why?)
Do you think using the ideas you have mentioned will work? Why?
(Follow up: What will you do if they don't)

Knowledge of Strategy

Does where you work on problems like this matter? *(Follow up: please explain?)*
If you could create your ideal place to work on it, what would it be like?
Is there anything in this room that will help you to solve the problem?
Is there anything that distracts you when you are solving a problem?
Is there anything in the room that could distract you?

Knowledge of Environment

RC Questions (After task completion)

When I showed you the task, did you think about how you were going to do it before you started or you just jumped in?

Would you normally find one way of solving a problem then get on with it or you try and find several ways before choosing the best way?

Look at your work and tell me or show me:

What did you do that you found helped you to solve the problems?

Did you find the instructions helpful? Why or how?

What do you think about being told there were 28 possibilities?

Planning

What do you think about asking for help when solving a problem?

Did you do anything to check you were on the right track?

How did you make sure you were doing it right?

How did you (would you) know you made a mistake?

Monitoring

Did you try to use something you have learnt previously in this task?

(Follow up: What is it?)

Did you have to change anything as you were doing the task?

What did you change?

Did you draw or write anything to help you?

Strategy Use & Strategy Change

How do you think you performed on the task?

Did you think you were going to do as well as you did?

Would you do anything different next time?

What would you do differently next time?

Evaluation

Appendix 3

Please read each statement and put a ring around the **one** response that most applies to you. Please try to give an answer to every question if you can.

Example

I think I am better at Maths than at Writing

Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

1. I intend to work at being able to solve harder maths problems.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

2. Seeing my friends try to solve harder maths problems makes me feel I can to do the same.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

3. My family and friends say that I am capable of spending a lot of time practising maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

4. My family and friends have told me they know I can get good grades in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

5. I will work hard in order to get better grades in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

6. My family push me to concentrate on my maths learning.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

7. I intend to spend a lot of time practising my maths work.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

8. For me, getting good feedback in maths is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

9. Seeing my classmates get good feedback in maths tells me that I can too.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

10. My family and friends make me know I am able to concentrate on my maths learning.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

11. Seeing kids get good grades in maths makes me believe I can do the same
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

12. I choose whether I spend a lot of time practising maths
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

13. I always get good grades in math.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little Agree   Strongly agree

14. For me, to get good grades in maths is important:
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

15. My family and friends push me to get good feedback in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

16. In my opinion, practising working faster through a maths problem is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

17. I am always able to work fast through maths problems.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

18. I am always able to solve maths problems accurately
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

19. In my opinion, practising solving maths problems more accurately is important
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

20. It is up to me to decide whether I concentrate on my maths learning.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

21. I have always been good at solving harder maths problems.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

22. I intend to work at getting better feedback in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

23. My family and friends think being able to solve harder maths problems is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

24. My family members decide whether I spend a lot of time practising maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

25. My family and friends think getting good grades in maths is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

26. My family and friends think getting good feedback in maths is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

27. The people in my family put me under pressure to get good grades in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

28. I am always able to concentrate well on my maths learning.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

29. My family and friends think spending a lot of time practising maths is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

30. I see being able to solve harder maths problems as important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

31. My parents and family push me to work fast through maths problems.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

32. My parents and family push me to solve maths problems more accurately.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

33. I think concentrating on my maths learning is extremely important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

34. I intend to practise working faster through maths problems.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

35. I intend to practice solving maths problems more accurately.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

36. Seeing children like me concentrate on their maths learning shows me I can do the same.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

37. I intend to get better at concentrating on my maths learning.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

38. Seeing my mates spend a lot of time practising maths makes me feel I can do the same.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

39. My family and friends think concentrating on my maths learning is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

40. My family and friends think practising working faster through a maths problem is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

41. My family and friends think practising solving maths problems accurately is important
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

42. It's my decision if I want to get good feedback in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

43. I always get good feedback in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

44. My parents and family push me to solve harder maths problems.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

45. My family and friends know I do well at solving harder maths problems.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

46. My family and friends tell me I am able to get good feedback in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

47. My family and friends know I'm good at working faster through maths problems.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

48. My family and friends know I'm good at solving maths problems accurately
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

49. I always spend a lot of time practising maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

50. When I see how my mates can work fast through maths problems, I know I can do the same.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

51. When I see how my mates can solve maths problems accurately, I know I can do the same.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

52. It's up to me to choose whether to solve harder maths problems.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

53. In my opinion, spending a lot of time practising maths is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

54. It's up to me whether I work fast through maths problems.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

55. It's up to me whether I solve maths problems accurately.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

56. Whether I get good grades in maths is up to me
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

Appendix 4

Department of Psychology and Human Development

IOE LONDON

Leading education
and social research
Institute of Education
University of London

25 Woburn Square
London WC1H 0AA
Telephone 020-7612-6000
Fax 020-7612-6304
Website www.ioe.ac.uk/phd

Director: Professor Chris Husbands

Dear Parent/ Carer,

Invitation to participate in research on primary school children's learning in Maths

We will be grateful if you could give us your consent for your child to participate in a doctoral research project aimed at understanding Maths problem solving and improving how children develop self regulated learning (SRL) skills. This is due to commence this academic year. The research is funded by the Economic and Social Research Council (ESRC), a government funded organisation which seeks to promote research it deems likely to have an impact on society and policy making.

SRL skills are of crucial importance since it enables children to have a good understanding about themselves as learners and what they need to do to succeed at a particular task. They have a range of learning strategies and know when to use or change any particular strategy. They are also very motivated and believe in their ability to successfully complete a task so they persevere in the face of challenges.

The project itself will be subject to the rigorous ethical standards of the ESRC, the IOE and the British Psychological Society. It will be a cross cultural study comparing how children from two distinct cultural backgrounds - Chinese versus White British - develop SRL skills by looking at how they approach Maths problem solving. The research is intended to help inform educators and policy makers about the role of culture in the development of SRL skills and consequently academic performance and achievement. This stage of the project will take approximately one school term to complete. Data collection would occur in three phases with one to two weeks apart to check the stability of any identified effects.

Participation will be absolutely voluntary. If your child wants to stop at any point, they will be free to do so without needing to justify themselves. All data that we collect will be treated confidentially and anonymously, which means that if the results are published, there will be no way of identifying any data as that of your child's. If at any later point you wish your child's data to be withdrawn from the research, please let me know.

We hope you will consider this opportunity and we would be more than happy to provide more information and answer any questions or queries you may have.
Please complete the form attached to this letter giving your consent for the research to proceed. We will also solicit the consent of the child personally before we proceed.

We look forward to your reply.

Yours sincerely,

Gideon Sappor
(PhD Student)
Email: gsappor@ioe.ac.uk

Professor Andy Tolmie
(Supervisor and Dean of the Doctoral School)

Appendix 5

Information about the Parent (To be completed by the parent)
Please complete this brief questionnaire to give us some information about the child's background.

Your Name: ....

Occupation: ....

How many years have you been in the UK? (Please tick ✓)

☐born here   ☐0-5 years   ☐6-10 years   ☐10-15 years   ☐Over 15 years

Your cultural background as a parent
Parent 1: ....
Parent 2: ....

Highest Education Attained (please tick ✓)

☐ GCSE/ O Levels/ NVQ 1 or 2

☐ NVQ 3 or 4/ A Levels/ Diploma

☐ Undergraduate degree/ Higher Diploma

☐ Post graduate degree

Number of other children in the family and their ages:

Child 1: ....   Child 2: ....

Child 3: ....   Child 4: ....

Child 5: ....   Child 6: ....

Do you speak another language apart from English: **Y   N**   Details: ....

If yes, do you use this language with your child?   **Y   N**

Department of Psychology and Human Development

Please sign this slip giving your consent for your child to participate in the research

I give my consent for my child ....
to participate in the research study about how children develop SRL skills.

☐ I give my consent for my child to be videoed as part of the research (please tick)

Signed-.. (Parent/ Carer)

Date-...

Thank you.

Appendix 6

Metacognitive Knowledge (MK)

Definitions	Tally Questions	Observation	Total
Knowledge of Person Variables			
Knowledge of Task Variables			
Knowledge of Strategy Variables			
Knowledge of the Environment			

Total MK Score   _____

Regulation of Cognition (RC)

	Questions	Observation	Total
Planning			
Monitoring			
Strategy Use & Strategy Change			
Evaluation			

Total RC Score   _____

PERSEVERANCE AND EFFORT

Definitions		Score
Engagement versus *Disengagement*	A stopwatch will be used to time then find the Percentage of allocated time spent focused on task.	
Level of perseverance	*In case of stopping before total allocated time (not all 28 possibilities found)* Gives up at the first sign of difficulty – **0** Gets into difficulty, stops briefly and goes back to try some more but not till the end (up till 9th minute) – **1** Hangs in there trying right to the end – **2** Carries on searching till they find all 28 permutations – **3** Completing before time is up – **4**(completes before final minute) - **4**	

Performance (Raw Score): _____

Performance (Rate per minute): _____

Appendix 7

Name: .... Boy / Girl   Class ....___   Date of Birth: ....

Please read each statement and put a ring around the one response that most applies to you. Please try to give an answer to every question if you can.

Example

I think I am better at Maths than at Writing

Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

1. I always get good feedback in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

2. I intend to spend a lot of time practising my maths work
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

3. My parents and family say I am capable of spending a lot of time practicing maths
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

4. It is important to do what grown-ups tell me in school because it makes them respect my family and me.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

5. Seeing kids get good grades in maths makes me believe I can do the same.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

6. Seeing children like me concentrate on their maths learning shows me I can do the same.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

7. For me, getting good feedback in maths is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

8. I always try to show good behaviour to avoid upsetting my parents and family.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

9. My parents and family think spending a lot of time practising maths is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

10. It is my duty to take care of my parents when I am older.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

11. My parents and family have no influence on who I am; I am who I am.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

12. It is okay to disagree with my parents and family because I don't have to accept their point of view.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

13. In my opinion, spending a lot of time practising maths is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

14. When I see my classmates spend a lot of time practicing maths, it makes me feel I can do the same
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

15. I am always able to concentrate well on my maths learning.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

16. My parents and family think concentrating on my maths learning is important.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

17. Spending time with my parents and family is not that important because I need to get on with my own life.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

18. My parents and family make me know I am able to show a high level of concentration and focus in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

19. I intend to get better at concentrating on my maths learning.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

20. My parents and family tell me I am able to get very good feedback in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

21. It is important to respect elders in my family because that is what is expected of me.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

22. What I do with my life has nothing to do with my parents and family.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

23. My parents react unfairly when I do something wrong.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

24. I do spend a lot of time practicing maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

25. Seeing my mates get good feedback in maths tells me that I can too.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

26. I will work hard in order to get better grades in maths.
Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

27. My parents and family think getting good grades in maths is important.

Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

28. I think concentrating on my maths learning is extremely important.

Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

29. My parents and family have told me they know I can get good grades in maths.

Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

30. My parents and family think getting good feedback in maths is important.

Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

31. I always get good grades in maths.

Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

32. I really appreciate what my parents are doing to take care of me.

Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

33. For me, to get good grades in maths is important.

Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

34. I intend to work at getting better feedback in maths.

Strongly disagree   Disagree   Disagree a little   Don't know   Agree a little   Agree   Strongly agree

Appendix 8 – Study 2 Data collection brief

The influence of culture on the organisation and development of self-regulated learning skills (SRL).

This study is aimed at examining the relationship between a trait esteemed in Confucian culture (filial piety) and the motivational/ affective variables in my model of SRL.

Sample

Children in years 4-6 (ages 8 to 11) in a primary school. A sample size of 60 and above would be ideal.

Parental consent will be sought by sending a letter home to the parents. Also attached to the parent letter will be a questionnaire for the parent to complete in order to provide some background information on the child, with a section for a signature.

Data Collection Procedure
Data can be collected with a whole class in a class setting doing it together so long as they are reminded to do everything independently.
Data collection will involve:

(a) *Problem solving task must be done first. (10 minutes)*

Children will be given a maths problem to solve in 10 minutes. The question may be read to children.
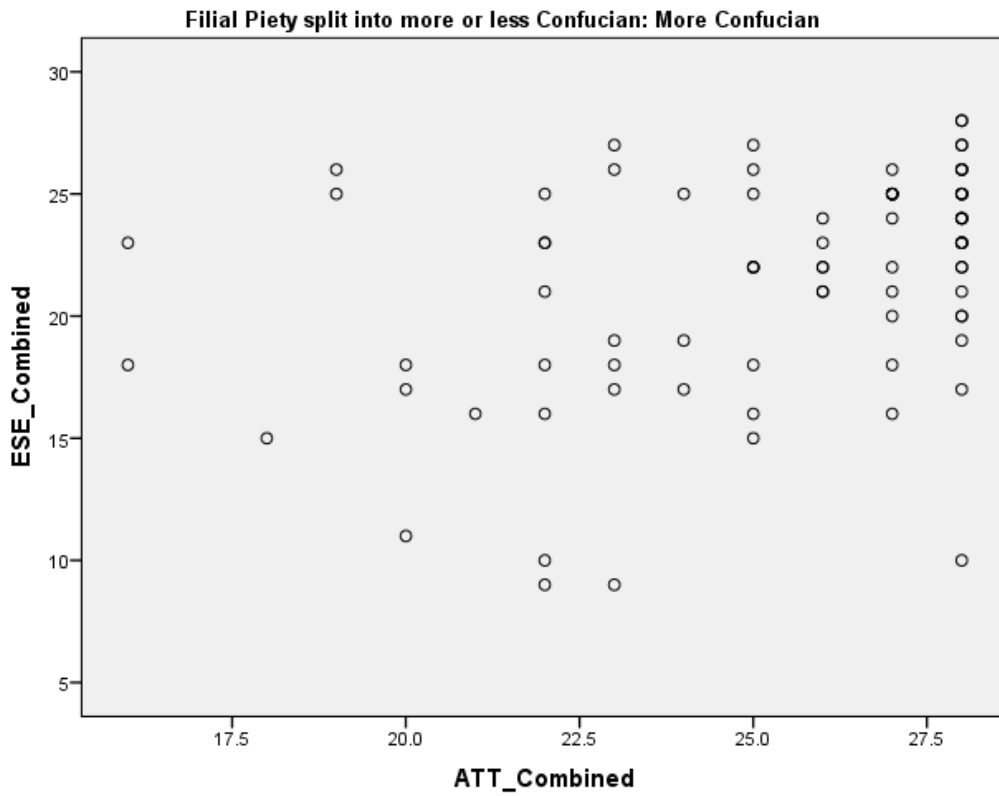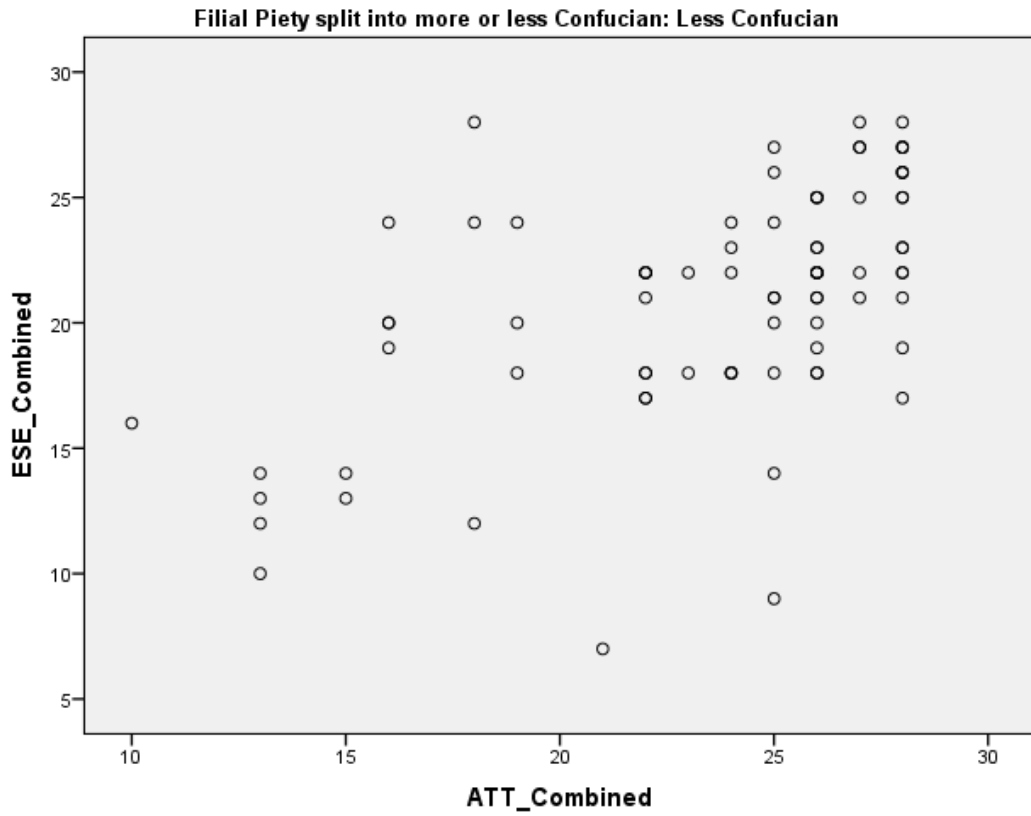
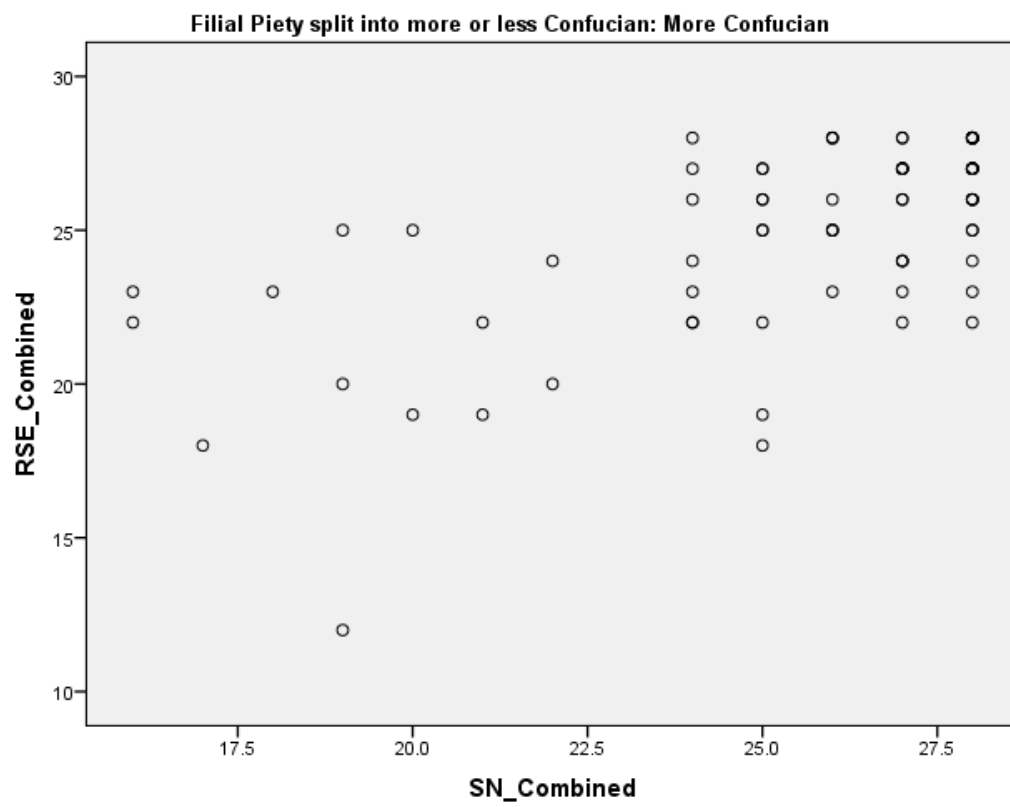(b) *Questionnaire (Expected to take no more than 10 minutes)*

A questionnaire with a 7 point likert scale will be administered. All the questions are set in the context of maths learning and they will choose from responses ranging from 'strongly disagree' to 'strongly agree'.

Administering the task will take no more than 15 minutes and the questionnaire, 10 minutes. The entire process would therefore take approximately 25 minutes.

*Consent will be sought from both the child's carer as well as the child.

Appendix 9

Filial Piety split into more or less Confucian: Less Confucian

Filial Piety split into more or less Confucian: More Confucian

Filial Piety split into more or less Confucian: Less Confucian

Filial Piety split into more or less Confucian: More Confucian

Filial Piety split into more or less Confucian: Less Confucian

Filial Piety split into more or less Confucian: More Confucian
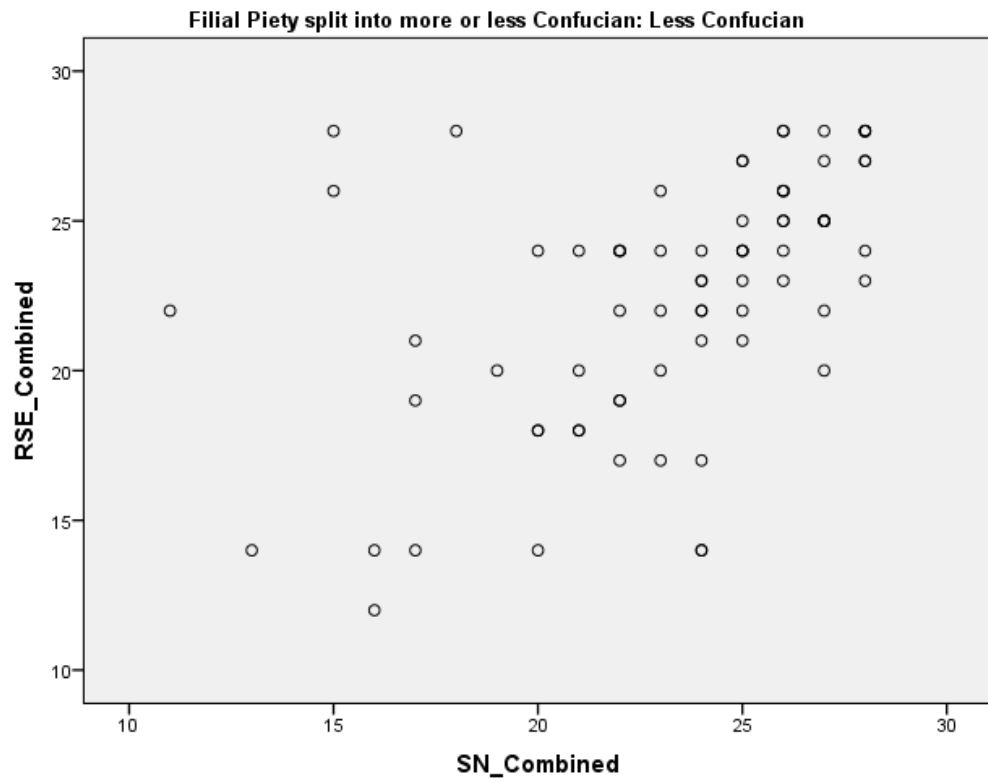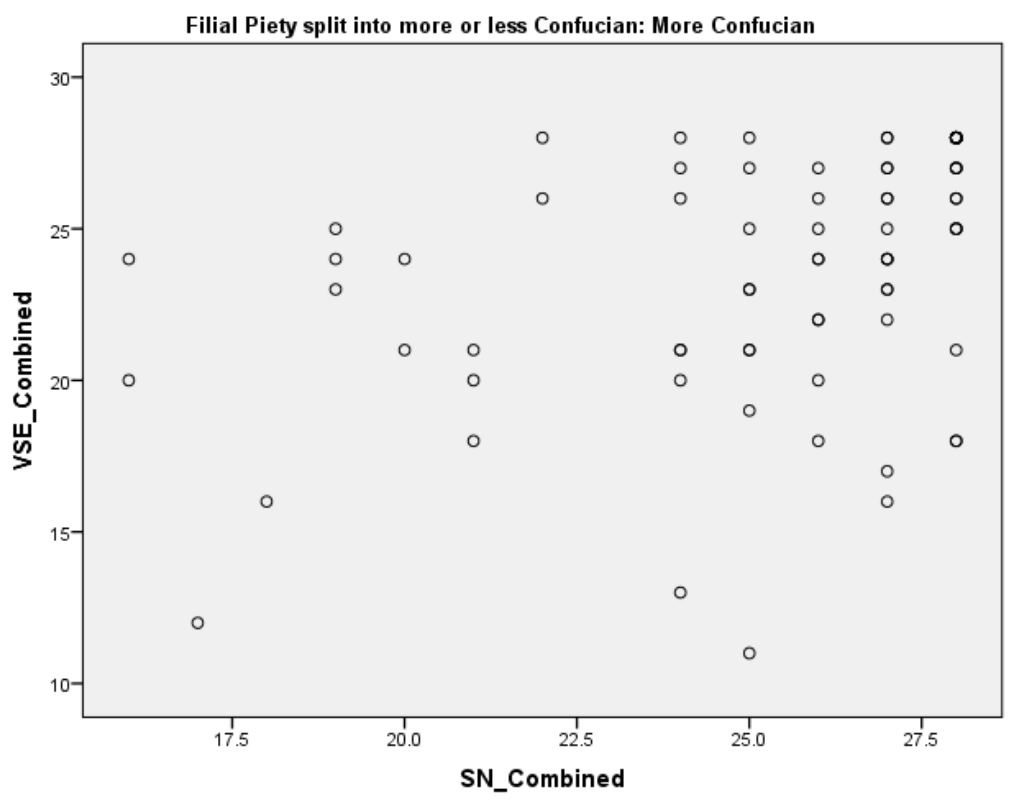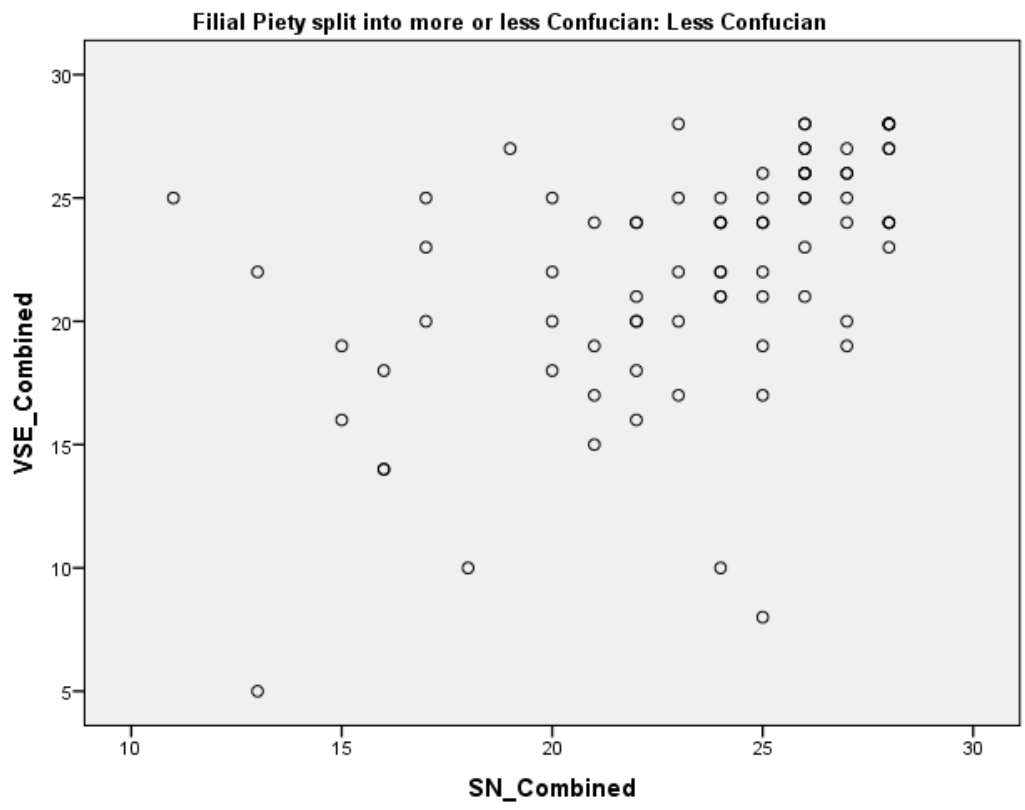
Appendix 10

姓名：＿＿＿＿ 性别：男 年级：＿＿ 年龄：10

请阅读每一项题目，选择一个最适合你情形的答案，画上"√"。

序号	问题	非常不同意	不同意	有些不同意	不知道	有些同意	同意	非常同意
1	学习数学的过程中我经常得到表扬						√	
2	我想花很多时间来练习数学							√
3	父母和家人都让我用更时间来学数学							√
4	在学校按照大人说的话去做很重要，因为这样才会使别人尊重我和我的家人							√
5	看到同学取得好的数学成绩，相信我也可以做到							√
6	看到同学能专心学数学，相信我也可以做到							√
7	对我来说，能够在数学上得到好评非常重要							√
8	我在学校表现好是为了让我的父母开心	√						
9	我的父母和家人都认为花很多时间来练习数学很重要							√
10	当我长大后，照顾父母是我的责任							√
11	父母和家人对我认识自己没有产生影响；我就是我							√
12	我可以不接受父母和家人的意见，因为我不必听从他们的意见							√
13	我认为花很多时间来练习数学很重要							√
14	当我看到同学花很多时间练习数学时，我觉得自己也可以做到							√
15	当我在学习数学时，我总是非常专心							√
16	我的父母和家人都认为专心学习数学很重要的							√

序号	问题	非常不同意	不同意	有些不同意	不知道	有些同意	同意	非常同意
17	花时间和父母、家人在一起并不是那么重要，因为我需要有自己独立的空间							
18	我的父母和家人让我知道，我在数学学习上能够非常专注							
19	我想更加专心学习数学							
20	我的父母和家人说我有能力在数学上得到极好评价							
21	在家中尊重长辈是很重要的，因他们希望我做到这一点							
22	我自己所要过的生活与我的父母和家人都无关							
23	当我犯错时，父母并没有公正地对待我							
24	我的确花了很多时间去学习数学							
25	看到朋友的数学得到好评，我知道我也可以和他们一样得到好评							
26	我必须努力学习数学以取得好成绩							
27	我的父母和家人认为取得好的数学成绩非常重要							
28	我认为集中精神学习数学是重要的							
29	我的父母和家人都有告诉过我，我可以取得好的数学成绩							
30	我的父母和家人认为在数学学习中取得好评是重要的							
31	在数学学习中，我常常取得好的成绩							
32	我非常感谢父母对我的照顾							
33	对我来说，数学拿到好成绩很重要							
34	我想努力得到数学学习上的好评							