

Original Paper

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

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Abstract

Self-regulated Learning (SRL) skills have been argued to be among the most important determinants of academic achievement. It has been observed that some cultural groups consistently exhibit higher achievement and cultural variation in SRL skills has also been observed. Understanding this variation could provide insight into how to promote SRL development in all children.

This research examined how components of SRL are influenced by cultural variables, by testing models for individualist vs collectivist contexts, utilising constructs from the Theory of Planned Behaviour (TPB) to capture predicted differences in the motivational components.

70 children (35 each from White British [individualist] and Chinese [collectivist] backgrounds) aged between 8 and 11 years, were drawn from UK primary schools.

Data were collected through on-task observation, task-related interview, and self-report questionnaire. Cross-sectional and correlational analyses examined relationships between these components, and whether cross-component influences differed according to cultural background.

The principal finding was that culture impacts on the nature and operation of the motivational components of SRL, not the cognitive ones, with White British children exhibiting motivation based on personal experience and attitude; while Chinese children were motivated more by family expectations. These differences fed through to on-task effort and performance.

The findings provide an impetus to cross-cultural research in SRL development by providing a model (SRL+TPB) that operationalises the interaction of cultural influences with SRL; and point to ways in which classroom interventions might utilise the patterns of effects observed.

Keywords

self-regulation, learning, motivation, culture, metacognition, attitudes, subjective norms

1. Introduction

Self-regulated learning (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 improvements in learning, which in turn support more optimal performance on future occasions (Pintrich, 1995). There are differences in the various models of SRL that have been proposed (see Pintrich, 1995; Winne & Hadwin, 1998; Wolters, 2003; Zimmerman, Schunk, & Dibenedetto, 2015), yet there is consistent agreement about three components: metacognitive awareness, including monitoring of performance and recognition of factors that can affect it both positively and negatively; knowledge of cognitive strategies that can improve performance; and a motivational component that prompts the deployment of SRL skills and helps promote persistence in the face of less optimal performance.

SRL has emerged as a major area of research and has influenced new initiatives and best practice in primary education (Grau & Whitebread, 2012; Pintrich, 2000). Repeated research findings show SRL skills as the strongest predictor of achievement as it makes more effective learners: they are more persistent, resourceful, confident and higher achievers (Blair & Razza, 2007; Mega, Ronconi, & De Beni, 2014; Pino-Pasternak, Whitebread, & Tolmie, 2010; Pintrich, 1995; Zuffianò, Alessandri, Gerbino, Kanacri, Di Giunta, Milioni, & Caprara, 2013). Understanding sources of individual variation in SRL development and how widespread consistency can be promoted is therefore important. It has been proposed that SRL skills are developed through processes of social modelling, social guidance and feedback, and social collaboration (McInerney, 2011). As culture is embedded in the social fabric of a community, it may play a significant role in the development of SRL skills.

Rogoff (2003) defined culture as:

“The configurations of routine ways of doing things in any community’s approach to living” (p3)

Bempechat, Li and Ronfard (2018) reported evidence that suggests there are cultural differences in learning beliefs, arguing Western and East Asian (Confucian) beliefs held about learning to be conceptually distinct. Western thinking, they argued followed a “mind” model whereas the East Asian followed a “virtue” model of thinking.

Hence, culture influences the way members of a community think, behave and live their lives, including how they approach education and learning. The impact of culture on academic performance could therefore be mediated through the components of SRL (Piña-Watson, López, Ojeda, & Rodriguez, 2015). As outlined below, cultural influences on SRL may operate predominantly through the motivational components: expectations, values, social judgements and perceived efficacy.

As in the UK, the Chinese immigrant community in several other countries have consistently overcome barriers encountered by immigrant communities, and the children achieve high academic performances (OECD, 2012). It must however be noted that there is an existence of significant within-group variation among Chinese background students (Ellis & Simmons, 2014; Pressman, Owens, Evans, & Nemon,

2014).

Values and social judgements may therefore have strong influences on Chinese cultural background learners' high achievements within the English education system (Francis & Archer, 2005).

The objective of this study was to elucidate how culture interacts with the components of SRL. This was achieved by outlining hypotheses based on models created regarding the culture-SRL interaction, and collecting data to test the relationships predicted by these. The intention was 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.

Models of SRL

Prominent models of SRL include those of Pintrich (2000), Winne and Hadwin (1998), and Zimmerman (1989, 2000). These have been applied more recently in studies that highlighted the importance of motivation as a driving force behind metacognitive skill deployment (Baars & Wijnia, 2018; El-Adl & Alkharusi 2020). These share a common feature that is relevant to the approach taken in this study: each addresses processes that occur in relation to specific learning tasks. For instance, Pintrich's model described phases of self-regulation as an individual appraises and proceeds to performing an academic task; similarly, Winne and Hadwin's model described the process used by a learner in performing a learning task. This is important as the models retain ecological validity, giving them real-life relevance and application.

Despite the commonalities between the three models in this respect, they take different approaches to the motivational component of SRL and are less well-specified in this respect. Winne and Hadwin's model, by using an information processing approach, captured motivation as a cognitive condition—hence motivation theory per se was not elucidated. Similarly, Zimmerman's model considered the motivational component by discussing self-beliefs and a learner's affective reaction to a task. Again, motivation theory was not considered specifically (Schmitz, Klug, & Schmidt, 2011). Pintrich's model considered motivation to a larger extent by discussing the importance of motivational components such as goal orientation and task value (Panadero, 2017). Yet how they develop were not discussed. One further difficulty is that the motivational component is portrayed by all three as internally generated, and they are silent on the role of external influences—exactly the area where cultures may differ (Anyichie & Butler, 2017).

In recognition of the potential influence of cultural variables on SRL development and subsequent academic outcomes, and the recognition such influence may be wielded through the motivational aspect, a few studies have investigated these effects (e.g., Bempechat, Li, & Ronfard, 2018; Jang, Reeve, Ryan, & Kim, 2009). Bempechat and colleagues (2018) reported a strong relationship between a sample of American Chinese students' perceptions of family education socialisation efforts and their virtue-oriented learning beliefs; such beliefs subsequently strongly predicted SRL skills and eventual academic success. This illustrated, they argued, the strong influence of Confucian cultural traits on SRL

and academic achievement. Similarly, Jang and colleagues (2009) used Self-Determination Theory as a motivational framework to investigate the influence of cultural variables on motivation in a sample of South Korean students. Their study also reported specific motivation outcomes driven by culture; however, their study was not set out as a cross-cultural comparison, nor was it set up within an SRL model.

A motivational framework based on the Theory of Planned Behaviour (Ajzen & Fishbein, 1980)—a theory that connects beliefs and behavior—offers an alternative which captures this dimension through the distinction between attitude and subjective norm, while retaining the focus on specific behaviours—in this context, learning tasks. It states that attitude toward behaviour, subjective norms, and perceived behavioural control, combine to shape an individual’s behavioural intentions and behaviours. It also includes a dimension of perceived capacity to enact motivated intentions (in this context, application of effort to performance), as a form of self-efficacy, which may also be subject to cultural influence.

TPB is an “expectancy-value” theory whose characteristics make it appropriate to a learning context. The strength of a learner’s motivation, in this theory, is the product of expectancy and value (Schunk, Pintrich, & Meece, 2008).

TPB allows for a mix of internal and external influences on motivational intention via a separation of attitudes and subjective norms. Ajzen and Fishbein (1980, 2005) highlighted the relationship between attitudes and behaviour in the Theory of Reasoned Action (TRA) and later Theory of Planned Behaviour (TPB).

Lung-Guang (2019) used a combined TPB and SRL framework to study the learning behaviours of students on an online environment. The study showed the combined model proved superior to either model when used independently.

The key variables within a model combining the metacognitive and regulatory aspects of SRL with a TPB framework are as follows:

Metacognitive Knowledge

Metacognitive knowledge is an understanding of the cognitive resources that a learner possesses and deploys to perform a particular task (Flavell, 1979). It creates an awareness of their strengths and weaknesses in relation to and contingent upon their internal and external conditions. The learner displaying Metacognitive knowledge, therefore, has knowledge about what a task entails and the cognitive resources and strategies at their disposal, including when and why to use them. Flavell (1979) described three categories of the knowledge factors: 1) person variables 2) task variables, and 3) strategy variables. A fourth category has been argued for by Pintrich (2000)—environment variables—which we include here.

Regulation of Cognition

Pintrich (2000) describes Regulation of Cognition as the different activities and strategies the learner

uses in order to plan, monitor and regulate their cognition to perform a task. This is informed by Metacognitive knowledge, since the learner activates prior knowledge they have about themselves, and the task conditions. A key aspect of regulation of cognition is the process of the actual selection and use of known cognitive strategies in order to successfully carry out a task (Pintrich, 2000, 2004). There are four components of Regulation of Cognition: cognitive planning, cognitive monitoring, cognitive control, cognitive reflection (Pintrich, 2000).

Motivational Dimension (Theory of Planned Behaviour)

In the Theory of Planned Behaviour (TPB), 'intention' is the antecedent to behaviour; the cognitive representation of the individual's preparedness to carry out an action informed by behavioural and normative beliefs—the volitional aspects of behaviour. Behavioural beliefs are the attitudes held towards a behaviour, derived from the expected outcomes associated with performing that behaviour, with the value attached to those outcomes. Normative beliefs are the 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) (Ajzen, 1991).

In educational contexts, since learners are generally acting under a degree of compulsion, persistence or effort, and the intention to apply these, define motivated behaviours. Motivated behaviour in learning contexts can therefore be defined as the deliberate application of effort or persistence, influenced by a) attitude to the effortful behaviour, and b) subjective norms.

Self-efficacy

TPB includes a non-volitional component—perceived behaviour control (PBC)—a belief in the ability and freedom to perform the behaviour, its controllability (Ajzen, 2002). In the learning context, the emphasis is on belief in the capacity to perform the effortful behaviour successfully, making it worthwhile putting that effort in. This means that Self-efficacy is a more appropriate variable than PBC (Ajzen, 2002; Tolma, Reininger, Evans, & Ureda, 2006; Williams, Michie, Dale, Stallard, & French, 2015). Self-efficacy is an individual's conviction in their ability to successfully execute the behaviour needed for a successful outcome on a task (Bandura, 1993).

Four types of Self-efficacy have been discussed in the literature related to learning contexts but three were considered relevant to the present study (Bandura, 1977, 1997, 2003; Britner & Pajares, 2006; Usher & Pajares, 2008, 2009).

- **Experiential:** this refers to the learner's own experience of previous attainments.
- **Received:** is when a learner is told by someone "you can do it" especially from someone they respect and whose opinion matters to them. Teachers' and parents' 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 Self-efficacy

Perseverance and Effort

Perseverance and effort (grit) is perseverance and passion for long-term goals, and is a strong predictor of high achievement; it may be as important as intelligence (Duckworth, Peterson, Matthews, & Kelly, 2007). Students who believe in their ability to perform a task (Self-efficacy) are more likely to persist in the face of challenge than students with poor self-efficacy (Lee, 2014; Paris & Oka, 1986; Pintrich & Degroot, 1990; Schunk, 1985). 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 Metacognitive Knowledge and Regulation of Cognition.

Performance

Including task performance in the model is important as the prominent SRL models all describe their components and processes in relation to specific academic tasks. In addition, it is necessary to frame the components of the model around an academic task where the framework of SRL and its measures can be applied in an “online” fashion. A performance measure also frames the research in an authentic academic context.

How Culture Maps into Model

As a start point for examining cultural influences on SRL, this study focused on a broad dimension of cultural variation—collectivism versus individualism—that specifically predicts differences in the weighting attached to personal attitude, experiential, vicarious and received self-efficacy and subjective norms (Hamamura & Heine, 2006; Nisbett, Peng, Choi, & Norenzayan, 2001). In collectivist cultures (e.g., British from a Chinese background), the individual sees themselves as part of a closely knit collective, and is guided by the expectations of the group. Individuals are steeped deeply in the roles, obligations and orientations within their social network. 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 (Hamamura & Heine, 2006). 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.

The model presented in Figure 1 is derived from the application of these differential emphases on subjective norms and personal attitudes, capture the nature of the hypothesised differences between collectivist and individualistic cultures. Regulation of Cognition and Metacognitive Knowledge are assumed to be the same and to operate in the same way in both cultural groups; differences were expected in the motivational components as that is where cultural variables were expected to wield an influence.

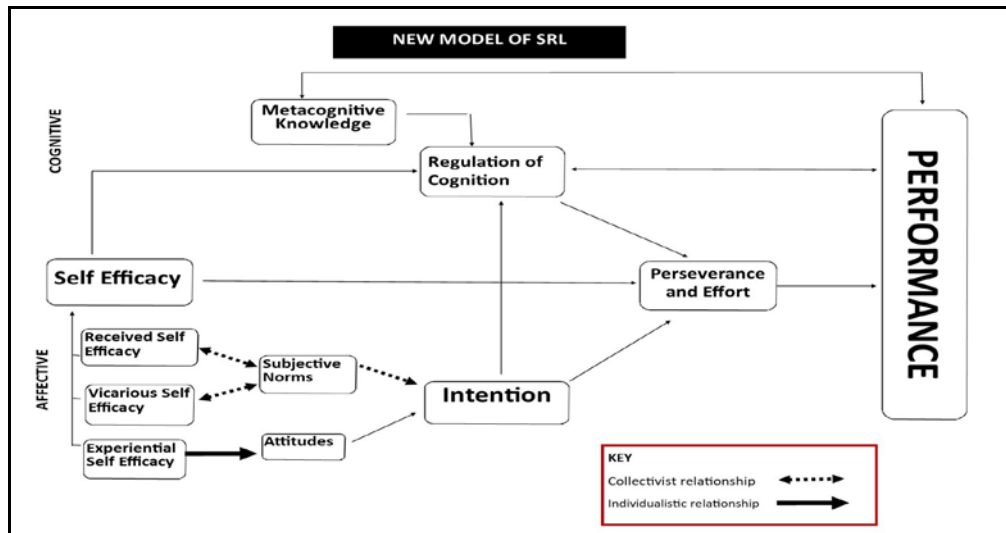


Figure 1. New Model of SRL

Hypotheses

Hypothesis 1 Chinese: Motivation is influenced primarily by the perceived values of important others – the Subjective Norm. White British: Motivation is influenced primarily by Attitudes.

Hypothesis 2 Chinese: Received and Vicarious Self-Efficacy are more dominant sources of self-efficacy. White British: Experiential Self-Efficacy is the more dominant source of self-efficacy.

Hypothesis 3 Chinese: Received and Vicarious Self-Efficacy have greater influence on Perseverance and Effort. White British: Experiential Self-Efficacy has greater influence on Perseverance and Effort.

Hypothesis 4 Cultural differences relate to the influence of the affective variables but not the cognitive ones.

In order to test these hypotheses, data were collected from groups of Chinese (collectivist cultural background) and White British (individualist background) late primary age children on each of the variables in the proposed SRL/TPB framework, via: 1) a self-report questionnaire [attitude, subjective norm, self-efficacy and intention]; 2) observation of performance on a maths problem-solving task [perseverance, regulation of cognition and performance]; and 3) a task-related interview [metacognitive knowledge and regulation of cognition]. These data were then used to examine whether relationships between the various constructs differed as predicted between the two groups.

2. Method

2.1 Participants

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). Consequently, participants (N=70) were drawn, with parental consent, from Years 4 to 6 (8-11 year olds) in 9 UK primary schools. There were 35 children in each of the two target cultural groups—Chinese and White British backgrounds, with as far as possible children from each group being drawn in the same number from each participating school. The cultural group was ascertained by the data held by the schools which was from the information provided by the parents. Therefore, children were identified as having Chinese or White British backgrounds based on parental self-identification. Delineating two cultural groups within the English education system, as done in the present study, may not be perfect; however, that has precedence in all cross-cultural studies conducted in the same country (for e.g., see Cagliero, 2020; Demie & Mclean, 2015; Francis & Archer, 2005). 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).

The sample characteristics are shown in Tables 1 and 2. There were no differences between the two groups by gender, age or prior attainment.

Table 1. 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 |
| <i>Average Age(months)</i> | <i>107</i> | <i>110</i> |
| Year 5 | 5 | 8 |
| <i>Average Age(months)</i> | <i>118</i> | <i>117</i> |
| Year 6 | 11 | 13 |
| <i>Average Age(months)</i> | <i>131</i> | <i>135</i> |

Table 2. Maths National Curriculum Levels (assessment of academic attainment in maths) 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 |
| Total | 35 | 35 |

The research received ethical approval from the Research Ethics Committee of the authors' institution. All the requirements of working with children concerning consent, confidentiality, right to withdraw and safeguarding were observed. Due to the sensitive nature of video recording children, consent for that was sought separately from consent to participate in the research.

2.2 Design and Procedure

The study used a combined cross-sectional and regression design. Data were collected at Time 1 using the self-report questionnaire; observational and interview data contextualised by a maths problem solving task were collected at Time 2, a day later. Data collection was done wholly in an out of class context. The task and accompanying interview lasted approximately 30 minutes, working one to one with each child, and were video recorded for the purposes of subsequent analysis. The questionnaire was administered in a group, with children separated so they could not influence each other's responses.

2.3 Measures

Self-report questionnaire

The questionnaire (Appendix 1) consisted of seven questions on each of the variables: self-efficacy (received [RSE], vicarious [VSE] and experiential [ESE]) and motivation (subjective norms [SN], attitudes [ATT] and intention [INT]). Each question requested ratings on a 7-point Likert scale (ranging from "strongly disagree" to "strongly agree") to statements about one of seven target maths-related behaviours: Feedback, Speed, Grades, Concentration, Time spent, Accuracy and Level of Difficulty. These target behaviours were selected to fulfil the multiple act criterion [using multiple behaviours as measures], which Ajzen and Fishbein (1980) argue allows more reliable measurement of attitudes and related constructs. The self-efficacy items were adapted from a questionnaire used by Usher and Pajares (2006, 2009) in a maths learning context.

Scores were derived by summing the ratings for each variable across the seven target behaviours. Cronbach's alpha values for each dimension ranged from .76 to .87, which is regarded as acceptable (Field, 2013; Nunnally, 1978; Panayides, 2013).

Observation

The observed task (Appendix 2) was a maths problem sourced from the nrich.org website. 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; the children may have been exposed to similar open-ended problem solving tasks but would not have seen this particular one before. They were told there were 28 possibilities and they were scored how many they make out of the total. Observation was used to assess Perseverance and the “monitoring” element of RC.

Perseverance (P) was conceptualised as behaviours related to engagement during the task, including show of enthusiasm, focus on task, or persistence in the face of challenge (Jimerson, Campos, & Greif, 2003; Skinner, Kindermann & Furrer, 2008). These behaviours are typically clearly observable, particularly in terms of the reverse behaviours of disengagement, disaffection, withdrawal and quitting, which are more discrete.

Level of perseverance was scored in terms of the extent to which participants either kept on going or gave up when facing difficulties, using a scale from 0 to 4:

- 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 all accurately (before final minute)—4

The data from observation was thus coded so it will be used in quantitative analysis.

Interview

Metacognitive Knowledge (MK) and was assessed through an interview immediately preceding the task. Data on Regulation of Cognition (RC) was collected using a combination of interview (supplemented by scores from observation of key behaviours during the task itself, where they exhibited behaviours not mentioned during the interview) during the actual task performance, and interview immediately after the task. Questions tapped in turn into the components of both (for MK: Knowledge of Person, Task, Strategy and Environment; Flavell, 1979; Pintrich, 2000; for RC: Planning, Monitoring, Strategy Use and Strategy Change, and Evaluation). The questions were framed to solicit responses modelled on descriptions of behaviour in Pino-Pasternak, Whitebread and Tolmie (2010), and the coding scheme for responses was adapted from the scheme employed in that research. Responses were given one point for every unique response that demonstrated the element being investigated. The data from the interview was thus coded so it will be used in quantitative analysis.

2.4 Reliability

Reliability of coding for MK, RC and Perseverance was established through interrater checks using the recordings of task and interview sessions. To establish agreement, ten participants’ (five from each cultural background) data were coded by an independent rater. Agreement was defined as the

percentage of instances where both raters identified the same number of codable instances on the components that comprised the MK and RC variables across the ten participants. Average agreement across the two components was 96%—well above the threshold generally regarded as an acceptable level (Hartmann, 1977; McHugh, 2012; Stemler, 2004).

3. Result

Analysis focused first of all on comparison of scores between children in the two groups on each of the model variables, in order to establish points of equivalence and difference. Regression analysis was then used to test the influence of relevant variables on the dependent variables. Results are reported below in this order. A p value of .05 was used in all analyses.

Cross-sectional analyses

An independent-samples t -test was conducted to compare the means of each of the variables (Table 3) for the two groups. There was no significant difference for all the variables except Perseverance (Chinese: $M=2.09$, $SD=.658$) and (White British: $M=1.71$, $SD=0.789$), $t=2.139$, $p=0.036$.

Table 3. Test of Mean Differences for Two Groups

| Variables | Chinese group | | White British group | | t |
|----------------------------|---------------|--------------------|---------------------|--------------------|--------|
| | Mean | Standard deviation | Mean | Standard deviation | |
| Attitude | 40.63 | 5.286 | 42.34 | 4.728 | -1.430 |
| Subjective norms | 39.26 | 6.228 | 37.26 | 7.422 | 1.221 |
| Intention | 39.40 | 5.658 | 41.03 | 4.762 | -1.303 |
| Experiential self-efficacy | 33.34 | 6.226 | 35.71 | 7.454 | -1.445 |
| Vicarious self-efficacy | 38.26 | 7.815 | 37.80 | 6.987 | .258 |
| Received self-efficacy | 36.80 | 5.905 | 37.51 | 7.237 | -.452 |
| Metacognitive knowledge | 10.37 | 1.957 | 10.86 | 3.237 | -.760 |
| Regulation of cognition | 6.86 | 1.396 | 6.60 | 2.648 | .508 |
| Perseverance | 2.09 | .658 | 1.71 | .789 | 2.139* |
| Performance | 16.31 | 6.101 | 17.46 | 7.188 | -.717 |

* $p < .05$. ** $p < .01$. Two tailed

When performance (Table 4) was predicted in the Chinese group, it was found that RC ($\beta=.313$, $p < .05$) and Perseverance ($\beta=0.442$, $p < .01$) were significant predictors. MK was not a significant predictor ($\beta=0.188$, $p > .05$). The overall model fit was $R^2=0.55$.

In the White British group, only RC predicted performance ($\beta=.469$, $p < .05$). MK ($\beta=.312$, $p > .05$); and Perseverance ($\beta=-.669$, $p > .05$) were not significant predictors. The overall model fit was .50

This suggests, as hypothesised, that both groups had similar influences of RC and MK.

Table 4. Regression Analysis for Variables Predicting Performance (N=70)

| Variables | Chinese | | | White British | | |
|-------------------------|----------|--------|---------|---------------|--------|---------|
| | B | SE (B) | β | B | SE (B) | β |
| Metacognitive Knowledge | .586 | .515 | .188 | .693 | .425 | .312 |
| Regulation of Cognition | 1.368 | .712 | .313* | 1.273 | .546 | .469* |
| Perseverance | 4.099 | 1.197 | .442** | -.838 | -.092 | -.669 |
| R ² | .548 | | | .495 | | |
| F | 12.504** | | | 10.0122** | | |

* $p < .05$. ** $p < .01$.

Table 5 shows the variables that predicted Metacognitive Knowledge. In the Chinese group, it was found that RSE ($\beta=.38$, $p < .05$) was a significant predictor. INT ($\beta=.14$, $p > .05$); VSE ($\beta=-.273$, $p > .05$) and ESE ($\beta=.203$, $p > .05$) were not significant predictors. The overall model fit was $R^2=.26$.

In the White British group, none of the variables predicted Metacognitive Knowledge (INT: $\beta=-.164$; RSE: $\beta=.376$, $p > .05$; VSE: $\beta=-.341$, $p > .05$; ESE: $\beta=-.008$, $p > .05$). The overall model fit was poor $R^2=.08$.

Table 5. Regression Analysis for Variables Predicting Metacognitive Knowledge (N=70)

| Variables | Chinese | | | White British | | |
|----------------------------|---------|--------|---------|---------------|--------|---------|
| | B | SE (B) | β | B | SE (B) | β |
| Intention | .048 | .073 | .14 | -.112 | .151 | -.164 |
| Received Self-efficacy | .126 | .074 | .38* | .168 | .119 | .376 |
| Vicarious Self-efficacy | -.068 | .049 | -.273 | -.158 | .118 | -.341 |
| Experiential Self-efficacy | .064 | .055 | .203 | -.003 | .092 | -.008 |
| R ² | .257 | | | .082 | | |
| F | 2.591* | | | .674 | | |

* $p < .05$. ** $p < .01$.

The variables that predicted Perseverance were MK, RC, INT, RSE, VSE and ESE as shown in Table 6. In the Chinese group, it was found that only RSE ($\beta=.469$, $p < .05$) was a significant predictor. MK ($\beta=.129$, $p > .05$); RC ($\beta=-.002$, $p > .05$); INT ($\beta=-.221$, $p > .05$); VSE ($\beta=.253$, $p > .05$) and ESE ($\beta=.200$, $p > .05$) were not significant predictors. The overall model fit was $R^2=.45$.

In the White British group, none of the variables were significant predictors of Perseverance: MK ($\beta=-.019$, $p > .05$); RC ($\beta=.429$, $p > .05$); INT ($\beta=.225$, $p > .05$); RSE ($\beta=-.376$, $p > .05$); VSE ($\beta=.058$, $p > .05$) and ESE ($\beta=-.179$, $p > .05$). The overall model fit was $R^2=.26$.

The degree of influence shown by RSE in the Chinese background group was consistent with the hypothesis.

Table 6. Regression Analysis for Variables Predicting Perseverance (N=70)

| | Chinese | | | White British | | |
|----------------------------|---------|--------|---------|---------------|--------|---------|
| | B | SE (B) | β | B | SE (B) | β |
| Metacognitive Knowledge | .043 | .074 | .129 | -.005 | .064 | -.019 |
| Regulation of Cognition | -.001 | .098 | -.002 | .128 | .076 | .429 |
| Intention | -.026 | .022 | -.221 | .037 | .034 | .225 |
| Received Self-efficacy | .052 | .023 | .469* | -.040 | .029 | -.367 |
| Vicarious Self-efficacy | .021 | .016 | .253 | .007 | .029 | .058 |
| Experiential Self-efficacy | .021 | .017 | .200 | -.019 | -.021 | -.179 |
| R ² | .452 | | | .262 | | |
| F | 3.855** | | | 1.66 | | |

* $p < .05$. ** $p < .01$.

A stepwise multiple regression was conducted to evaluate whether both SN and ATT were predictors of Intention as shown in Table 7. At step 1 of the analyses, SN was a significant predictor of Intention in the Chinese group ($\beta=.52$, $p < .01$) $R^2=.27$; but not in the White British group ($\beta=-.092$, $p > .05$) $R^2=.008$.

At step 2 of the analyses, ATT was included with SN as predictors of Intention. In the Chinese group, the model fit improved to $R^2=.46$ with ATT being the significant predictor ($\beta=.575$, $p < .001$); and SN reducing in influence to ($\beta=.150$, $p > .05$). This suggests that ATT is actually the primary influence for the Chinese group or SN is conceptualised as such. It is worth noting SN and ATT were highly correlated in this group.

The White British group was solely influenced by ATT in predicting Intention ($\beta=.744$, $p < .01$). SN did not enter into the model at this stage.

Table 7. Regression Analysis for Variables Predicting Intention (N=70)

| Variables | Chinese | | | White British | | |
|------------------|---------|--------|---------|---------------|--------|---------|
| | B | SE (B) | β | B | SE (B) | β |
| Model 1 | | | | | | |
| Subjective norms | .472 | .135 | .520** | .059 | .111 | .092 |
| R ² | .27 | | | .008 | | |
| F | 12.2** | | | .283 | | |
| Model 2 | | | | | | |

| | | | | | | |
|------------------|----------|--------|--------|----------|------|--------|
| Subjective norms | .137 | .153** | .150 | | .078 | |
| Attitudes | .616 | .181 | .575** | .749 | .123 | .744** |
| R ² | .46 | | | .542 | | |
| F | 13.886** | | | 18.968** | | |

* $p < .05$. ** $p < .01$.

The influences of INT, RSE, VSE and ESE were analysed as predictors of Regulation of Cognition. As Table 8 shows, neither of the variables predicted Regulation of Cognition with very poor model fits in both groups.

Table 8. Regression Analysis for Variables Predicting Regulation of Cognition (N=70)

| Variables | B | Chinese | | White British | | |
|----------------------------|-------|---------|---------|---------------|--------|---------|
| | | SE (B) | β | B | SE (B) | β |
| Intention | .014 | .056 | -.057 | -.066 | .126 | -.119 |
| Received Self-efficacy | .087 | .056 | .367 | .029 | .100 | .080 |
| Vicarious Self-efficacy | .020 | .038 | .111 | .003 | .099 | .009 |
| Experiential Self-efficacy | -.008 | .042 | -.035 | -.039 | .077 | -.110 |
| R ² | .15 | | | .041 | | |
| F | 1.321 | | | .323 | | |

* $p < .05$. ** $p < .01$.

4. Discussion

Hypothesised Relationships

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—the two were highly correlated; perhaps ATT was strongly influenced by SN, or rationalised as such.

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. This is influenced by their Confucian heritage with a deferential influence of family expectations and a fear of failure (Chong, 2007; McInerney, 2011).

The Chinese group’s predominance of ATT influencing INT relative to SN was unexpected. The definition of autonomy, 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 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.

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. These 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. This is illustrated in Figure 2.

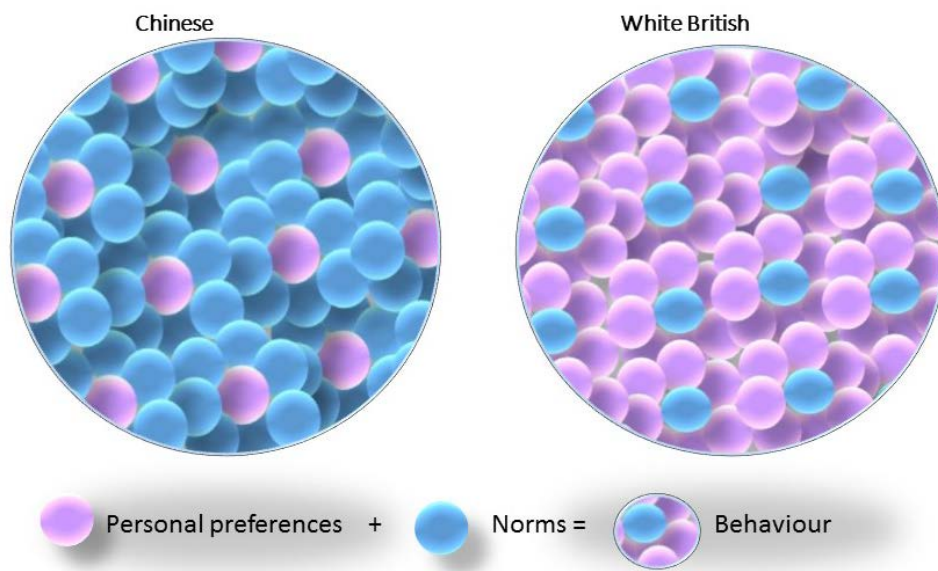


Figure 2. Conceptual Representation of Interplay between Personal Preferences and Norms

VSE, RSE and ESE seem, as in Hypothesis 1, to be accorded different emphasis in the two groups. RSE have a more dominant predictive influence relative to the other two sources in the Chinese background group. In the White British group, on the other hand, none of the three sources stood out particularly.

A possible explanation for the 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.

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.

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.

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 components of SRL relative to the motivational components (though there was still a relationship albeit weaker). In academic outcomes, the influence of Grit (including perseverance and effort), they found, was mediated by the other components of SRL.

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.

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 the variables that predicted them. 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.

Applying the model by Church (2000) to the present study 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 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).

Culture wields the potential to exert its influence on the motivational and affective components of SRL because it 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 components that enhance self-efficacy beliefs as argued by Pajares (2002). These are cultural norms that are inculcated in a child as they grow up.

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).

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 behavior—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 components 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, 2014). 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.

Limitations and recommendations for further study

The present study has showed potential to create a conceptual advancement in SRL conceptualisation. The model created by fusing SRL and TPB could be revolutionary but the limitation of a small sample size means no firm claims could be made at the present stage. It therefore warrants further investigation with a sample size of over 100 participants per group as suggested by Nunnally (1978).

Further research could also be designed around intervention studies where components 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.

This study introduces a proposed conceptual advancement to the study of SRL by providing a means by which components of culture could be assessed for their impact on SRL; the advancement as epitomised by the fusion of SRL/TPB model. This could 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 are not be able to do.

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