

## *Original Paper*

# Effects of Biliteracy in Writing and Metacognition: Biliterates, Bilinguals, and Monolinguals

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### **Abstract**

*This quantitative study investigates metacognitive knowledge (i.e., knowledge about text characteristics and writing strategies) and metalinguistic awareness (i.e., awareness of metalanguage and language rules) of Years Ten and Eleven Sydney high school writers across three groups: Chinese-English biliterates, Chinese-English bilinguals, and English monolinguals. It also examines the relationship between the three groups' levels of metacognition and text quality in English, and the relationship between the biliterates' levels of metacognition and text quality in Chinese. Findings indicate biliterates are advantaged in error classification and rule explanation within metalinguistic awareness, while monolinguals are advantaged in their metacognitive knowledge about writing strategies. Socio-cultural contexts of the three groups such as past schooling, may have played a role in determining the kinds of metacognitive advantages they developed.*

### **Keywords**

*bilingualism, biliteracy, metacognition, metalinguistic awareness, writing*

## **1. Introduction**

This study bridges research on the effects of bilingualism and of biliteracy, and research on metacognition and writing. The examination of biliteracy and writing is particularly relevant today, as an increasing proportion of students in Australia possess diverse linguistic backgrounds. Bilingualism has not always been as valued as it is today. Prior to 1960s, some migrant parents purposely delayed their children's acquisition of their mother tongue, believing that speaking multiple languages would hinder language development (Petitto et al., 2001). Over time, views on bilingualism became more

positive, and people began to argue that bilingualism could lead to numerous advantages, such as cognitive flexibility (Cummins, 1976). Currently, much research has been done to examine potential cognitive advantages. Although mixed, findings have generally pointed toward positive effects, such as a heightened metalinguistic awareness (i.e., the ability to reflect on different aspects of language) and metacognitive awareness (i.e., the ability to reflect on one's own thinking processes) as a result of constantly managing multiple languages (Adesope et al., 2010; Bialystok et al., 2003; Schraw & Moshman, 1995).

Fewer studies have examined the effects of biliteracy on writing, or in terms of specific aspects associated with writing, such as metacognitive knowledge of texts and writing strategies. Biliteracy may be understood as an advanced state of bilingualism, in which a person can not only speak two languages proficiently, but can also read and write proficiently in them (Niyekawa, 1983). Past studies comparing biliterates to monoliterates have mainly investigated the effects of biliteracy in reading, identifying advantages such as increased phonological awareness. This is because learning to read in two languages better equips biliterate readers to differentiate between different syllables and sounds (Schwartz et al., 2010); however, these advantages seem only to occur for biliterates in alphabetic languages rather than in languages with different writing systems such as English and Chinese.

The present study examines whether Chinese-English bilinguals (encompassing two sample groups, divided by biliteracy proficiency) have any advantages over English monolinguals across various aspects of metacognition and writing. My sample is divided into three groups: (1) Biliterate-bilinguals, who speak, read and write in both English and Chinese, (2) mono-literate bilinguals, who speak both languages but read and write in English only, and (3) mono-literate monolinguals, who speak, read, and write in English only. The three groups will be referred to respectively as biliterates, bilinguals, and monolinguals.

### *1.1 Effects of Bilingualism*

Cummins' (1976) threshold hypothesis suggests that people must attain age-appropriate proficiency in both languages before bilingualism (or biliteracy) can promote cognitive development. If these thresholds are not reached, no cognitive advantages occur, and cognitive deficits may even result for those with two underdeveloped languages (Ricciardelli, 1992). Research confirms a wide range of positive effects for proficient bilinguals (Ng, 2015), among them increased metalinguistic awareness (Bialystok et al., 2003), control of attention in language processing (Daniels et al., 2006), and inhibitory control in languages (Ransdell et al., 2006).

Among the positive effects, metalinguistic awareness has received particular attention. Some studies have referred to metalinguistic awareness as analysis of representation, which is the ability to think, analyze, and inwardly reflect on formal aspects of language (e.g., grammar) with conscious knowledge (Dillon, 2009). These studies found proficient bilinguals to have greater linguistic sensitivity because

they have more exposure to the structural aspects of different language systems than monolinguals (e.g., Bassetti, 2007; Dillon, 2009; Lasagabaster, 2001). Dillon (2009) reported high levels of metalinguistic awareness and general language proficiency in bilinguals. Similarly, Lasagabaster (2001) reported significant relationships between metalinguistic awareness in bilinguals and different aspects of language including grammar, reading, speaking, and listening. Other studies have reported monolingual advantages in areas such as verbal fluency, lexical access, and receptive vocabulary, particularly when skills are assessed in only one language (Bialystok & Feng, 2009; Bialystok & Luk, 2012; Hoff et al., 2012; Sandoval et al., 2010).

### *1.2 Effects of Biliteracy*

Studies on the effects of biliteracy have largely examined cross-linguistic transfer in reading (e.g., Branum-Martin et al., 2012; Jared et al., 2011) rather than transfer in writing. Cross-linguistic transfer refers to the transfer of literacy skills, such as reading or writing strategies, between biliterates' languages. These studies have mainly adopted a skill-transferability framework rather than the cognitive advantage framework commonly seen in research on bilingualism and have identified a number of skill-transfer advantages for biliterate readers, including orthographical processing, and phonological awareness and processing between alphabetic languages (e.g., Branum-Martin et al., 2012; Lyster et al., 2013; Schwartz et al., 2010). Biliterate reading often enhances the ability to manipulate different sounds and to recognize letter and sound relationships, though this relationship does not hold for biliteracy in languages that do not share an alphabet, such as Chinese and English.

#### *1.2.1 Effects of Writing in Two Languages*

Some biliteracy studies have also reported positive skill transfer for biliterate writers (e.g., Bournot-Trites & Seror, 2003; De Courcy & Smilevska, 2012; Gort, 2006) who were able to employ most of their general writing strategies and language knowledge cross-linguistically. Their dual language knowledge may be an advantage for such positive transfer, but this has not been directly examined. De Courcy and Smilevska (2012) reported positive transfer of writing strategies from Macedonian to English among Macedonian-English biliterate children in Australia. Gort (2006) reported positive literacy transfer such as strategic lexical code-switching between the language use of Spanish-dominant and English-dominant biliterates. Other studies have reported high levels of metalinguistic awareness in those with biliterate ability and suggest that language awareness may contribute to writing skills (e.g., Francis, 2004; Lasagabaster, 2001). However, these studies have only examined metalinguistic awareness and writing in bilinguals or L2 writers, and no comparisons have been made to monolinguals.

### *1.3 Metacognition and Writing*

In the process of writing, individuals often need to reflect on what they know about the task at hand, and call on strategies to assist them in overcoming any associated challenges. This is why

metacognition—one’s ability to reflect on thoughts and behaviours and to self-regulate during an activity (Hacker, 1998)—plays such an important role in writing. There are two main components to metacognition: regulation of cognition (i.e., self-regulating one’s own thought processes during an activity) and knowledge of cognition, also known as metacognitive knowledge. This study focuses on examining the differences in metacognitive knowledge of text characteristics and writing strategies between biliterate, bilingual, and monolingual writers. There are three types of metacognitive knowledge: declarative knowledge (“knowing about things”), procedural knowledge (“knowing how to do things”), and conditional knowledge (“knowing when and why to do certain things”) (Olivares, 2002; Schraw & Graham, 1997).

Declarative knowledge involves factual concepts about a text, such as knowing that a title tells the reader what the text is about, and understanding the differences between a narrative text and an essay. Procedural knowledge concerns how to write or how to carry out certain writing tasks, for example, how to structure proper sentences with appropriate grammar and vocabulary. Conditional knowledge is the ability to correctly employ declarative and procedural knowledge to approach a task using appropriate strategies.

This study views metalinguistic awareness as part of one’s metacognitive knowledge of writing, which includes a writer’s explicit knowledge about conventions in spelling, punctuation, grammar, and vocabulary use and how a writer draws upon this knowledge to detect and explain language errors in a text and make appropriate changes.

### 1.3.1 Empirical Research

Studies in metacognition and writing have identified different types of metacognitive knowledge, as well as the associations between metacognitive knowledge and different aspects of writing, such as writing performance, or text quality (e.g., Olinghouse & Graham, 2009; Olivares, 2002; Raphael et al., 1989; Schoonen et al., 2003; Sasaki & Hirose, 1996; Wong & Storey, 2006). Reported declarative knowledge includes discourse knowledge (Olinghouse & Graham, 2009) and linguistic knowledge (Schoonen et al., 2003), while reported procedural knowledge includes brainstorming, organizing, outlining, pausing to think, and reviewing (Olivares, 2002).

### 1.4 Overall Summary on Background and the Present Study

Studies on the effects of bilingualism based on a cognitive advantage framework have reported a range of advantages for both bilinguals and monolinguals. Studies on the effects of biliteracy based on a skill-transferability framework have identified a range of positive reading transfers between a biliterate’s languages, such as phonological processing, mainly occurring when the languages share the same orthography. Positive writing transfer has also been found in the writing of biliterates and some L2 writers. This study intends to bridge the current gap in the literature by examining the effects of biliteracy in writing and writers’ metacognitive knowledge based on a cognitive advantage framework.

The research questions are as follows:

- 1) Is there a difference between levels of metacognition (i.e., metacognitive knowledge and metalinguistic awareness) in monolinguals, bilinguals, and biliterates?
- 2) Is there a relationship between levels of metacognition (i.e., metacognitive knowledge and metalinguistic awareness) and text quality in monolinguals, bilinguals, and biliterates?

## 2. Method

### 2.1 Context

This study was conducted at three schools located in middle class suburbs within the Sydney metropolitan area, namely (1) an independent private high school in the Hills District with a high population of Anglo-Australian families, (2) a partially-selective, government-funded high school in the lower North Shore with a high population of Chinese-speaking families, and (3) a public weekend school in the North Shore offering special heritage and language maintenance programs to students with home languages other than English.

### 2.2 Selection Procedure and Participants

Forty participants attending Years Ten and Eleven were recruited for each sample group—biliterates, bilinguals, and monolinguals—based on a language background questionnaire (Appendix A), an English literacy test, and a Chinese literacy test.

Both literacy tests were administered to ensure that the participants had similar levels of reading and writing ability in English and Chinese to their sample group peers. The English literacy test was taken from the 2004 School Certificate Examination, a qualification issued by the Board of Studies in New South Wales to Year Ten students until 2011. The Chinese literacy test was taken from the 2006 Higher School Certificate (HSC). Older versions of the tests were specifically chosen to ensure that the students would not have taken these tests previously at school.

Inter-rater reliability was calculated for the English and Chinese writing tasks and the Chinese reading task from the literacy tests. The English reading task was multiple choice and did not require a second rating. The raters were the author of this paper and an experienced school teacher, both literate in English and Chinese. Descriptions for rating these tasks were identical to those used in the original past papers. Significant and positive correlations were found between the scores given by the two raters for all three tasks (English writing task:  $r(120) = .91, p < .01$ , Chinese writing task:  $r(120) = .78, p < .01$ , and Chinese reading task:  $r(120) = .81, p < .01$ ).

Table 1 presents the reading and writing task scores for each of the three groups. One-way ANOVAs found no significant difference between the three groups' level of English writing,  $F(2,117) = .64, p = .53, \eta^2 = .01$  or English reading,  $F(2,117) = 1.10, p = .34, \eta^2 = .02$ .

**Table 1. Group Performance in Literacy Tests**

Group	English reading task (out of 12)	English writing task (out of 20)	Chinese reading task (out of 15)	Chinese writing task (out of 25)
Monolingual <i>N</i> = 40	Mean 8.75 SD 2.32	Mean 12.49 SD 3.05		
Bilingual <i>N</i> = 40	Mean 8.85 SD 1.76	Mean 13.17 SD 1.88		
Biliterate <i>N</i> = 40	Mean 8.13 SD 2.92	Mean 13.14 SD 3.78	Mean 11.46 SD 2.39	Mean 18.22 SD 3.49

### 2.3 Instrumentation

#### 2.3.1 Metacognitive Knowledge Questionnaire

This tested participants' knowledge about text characteristics and writing strategies, and was adapted from Schoonen et al. (2003 & 2004) (Appendix B). Cronbach's Alpha indicated it was a reliable measure (50 items;  $\alpha = 0.86$ ).

#### 2.3.2 Metalinguistic Awareness Quiz

This tested metalanguage, error classification, error correction, and explanation of language rules, and was developed on the basic format of metalinguistic assessment in Elder and Manwaring (2004) and Andrews (1999) (Appendix C). Cronbach's Alpha indicated it was a reliable measure (35 items;  $\alpha = 0.97$ ).

#### 2.3.3 Writing Tasks

The English and Chinese writing tasks were used to examine the relationships between metacognition and text quality, the English task assigned to all three groups, the Chinese task only to the biliterate group.

### 2.4 Procedure

All potential participants from the three schools completed the selection procedure tests during school hours. The selected groups ( $N = 120$ ) then completed the metacognitive and metalinguistic tests on a separate day.

### 2.5 Data Analysis

One-way ANOVAs were used to analyze differences between the three groups in metacognitive knowledge and metalinguistic awareness. Where a significant difference was found, a post-hoc Tukey's HSD test was performed to identify the group that caused the difference.

Text quality was measured using the same rating system as used in the original selection procedure.

### 3. Result

#### 3.1 Differences in Metacognition

Table 2 presents the descriptive statistics for levels of metacognition across the three groups. Overall, different patterns of results were found in the two measures of metacognition. Moreover, different patterns were found when sections or sub-sections of the tests were considered separately.

In terms of metacognitive knowledge, the monolinguals performed significantly better than the other groups on the entire metacognitive knowledge questionnaire. There were significant differences between the three groups' performance,  $F(2,117) = 3.55$ ,  $p = .03$ ,  $\eta^2 = .06$ . Post-hoc Tukey's HSD tests showed that the monolinguals had significantly higher scores on the entire questionnaire at the .05 level of significance. Comparisons between the bilinguals and biliterates were not significant. However, when two sections of the test—knowledge of text characteristics and knowledge of writing strategies—were examined separately, there was significant difference between the three groups in writing strategies,  $F(2,117) = 3.23$ ,  $p = .04$ ,  $\eta^2 = .06$ , but not text characteristics,  $F(2,117) = 1.22$ ,  $p = .30$ ,  $\eta^2 = .02$ . Monolinguals had significantly higher scores in writing strategies at the .05 level of significance, while comparisons between the bilinguals and biliterates on writing strategies were not significant.

No significant differences were found between any of the groups' performance on the metalinguistic awareness quiz,  $F(2,117) = 1.06$ ,  $p = .35$ ,  $\eta^2 = .02$ . However, when each section of the quiz was examined separately (metalanguage, error classification, error correction, and rule explanation), biliterates performed significantly better than the other groups in error classification and rule explanation. Significant differences between the groups were found in error classification,  $F(2,114) = 8.01$ ,  $p = .001$ ,  $\eta^2 = .14$ , and rule explanation,  $F(2,112) = 3.12$ ,  $p = .04$ ,  $\eta^2 = .06$ . Post-hoc Tukey's HSD tests showed that the biliterates had significantly higher scores in both measures at the .05 level of significance. Comparisons between the bilinguals and monolinguals in these measures were not significant. There were no significant differences between the groups in any other section of the quiz.

**Table 2. Levels of Metacognition and Text Quality**

	Monolinguals <i>N</i> = 40		Bilinguals <i>N</i> = 40		Biliterates <i>N</i> = 40	
Metacognitive knowledge questionnaire (Out of 50)	Mean	44.45	Mean	42.55	Mean	43.35
	SD	2.56	SD	3.80	SD	3.13
Section one—Texts characteristics (Out of 20)	Mean	17.55	Mean	16.88	Mean	17.18
	SD	1.63	SD	2.14	SD	2.01
Section two—Writing strategies (Out of 30)	Mean	26.90	Mean	25.68	Mean	26.18
	SD	1.52	SD	2.65	SD	2.19
Metalinguistic awareness quiz (Out of 110)	Mean	69.53	Mean	72.90	Mean	75.46
	SD	17.52	SD	16.14	SD	21.15
Section one—Metalanguage (Out of 10)	Mean	6.54	Mean	6.88	Mean	7.63
	SD	2.72	SD	2.45	SD	2.53
Section two part one—Error classification (Out of 25)	Mean	17.99	Mean	19.25	Mean	20.91
	SD	4.09	SD	2.72	SD	2.71
Section two part two—Error correction (Out of 25)	Mean	22.69	Mean	22.69	Mean	21.87
	SD	2.33	SD	2.28	SD	3.50
Section two part three—Rule explanation (Out of 50)	Mean	22.80	Mean	25.69	Mean	29.24
	SD	12.02	SD	10.62	SD	10.95
English text quality (Out of 20)	Mean	12.49	Mean	13.17	Mean	13.14
	SD	3.05	SD	1.88	SD	3.78
Chinese text quality (Out of 25)					Mean	18.22
					SD	3.49

### 3.2 Relationships between Metacognition and Text quality

Prior to examining the relationships between metacognition and text quality, a one-way ANOVA was carried out to check if there was a difference between the three groups' English text quality. No differences were found,  $F(2,117) = .64$ ,  $p = .53$ ,  $\eta^2 = .01$  (Table 2). Pearson correlation tests then examined the relationships between the three groups' levels of metacognition and English text quality, and the relationships between the biliterates' levels of metacognition and Chinese text quality (Table 3). Overall, the relationships between metacognition and English text quality were consistent across the

three groups. There were significant relationships between metacognitive knowledge and English text quality for all three groups (monolinguals:  $r(40) = .35, p < .05$ , bilinguals:  $r(40) = .35, p < .05$  and biliterates:  $r(40) = .43, p < .01$ ). Similarly, there were also significant relationships between metalinguistic awareness and English text quality (monolinguals:  $r(40) = .65, p < .01$ , bilinguals:  $r(40) = .41, p < .01$  and biliterates:  $r(40) = .76, p < .01$ ). In contrast, for the biliterates, there was no significant relationship between metacognitive knowledge and Chinese text quality,  $r(40) = .20$  or between metalinguistic awareness and Chinese text quality,  $r(40) = .05$ .

**Table 3. Correlations between Metacognition and Text Quality**

	English text quality		Chinese text quality	
	Monolinguals <i>N</i> = 40	Bilinguals <i>N</i> = 40	Biliterates <i>N</i> = 40	Biliterates <i>N</i> = 40
Metacognitive knowledge	.35*	.35*	.43**	.20
Metalinguistic awareness	.65**	.41**	.76**	.05

\*\* Significant at 0.01 level

\* Significant at 0.05 level

## 4. Discussion

### 4.1 Differences in Metacognition

Overall, findings indicate that the biliterates and monolinguals appeared to be advantaged in different aspects of metacognition, the biliterates in certain aspects of metalinguistic awareness, the monolinguals in certain aspects of metacognitive knowledge.

### 4.2 Metacognitive Knowledge

Although the monolinguals performed better in metacognitive knowledge as a whole, they were only better in their knowledge about writing strategies, namely planning, formulating, and revising texts.

Although some studies have found that bilinguals possess better metacognitive awareness, due to their dual language management (e.g., Adesope et al., 2010, Ransdell et al., 2006; Vorstman et al., 2009), others found monolinguals are better (e.g., Schoonen et al., 2003). These mixed findings may be due to the specific aspects of metacognition examined. In this study, monolinguals and biliterates were found to be advantaged differently across various aspects of metacognition—monolinguals better in writing strategies, biliterates better in error classification and explanation of rules. Similarly, existing studies

have reported a range of biliterate, bilingual, and monolingual advantages across different areas of metacognition and language use. Daniels et al. (2006) found bilingual advantage in control of attention in language processing. Schwartz et al. (2010) found biliterate advantage in phonological processing, and Gollan et al. (2007) found monolingual advantage in lexical access. The present findings generally agree that monolingual, bilingual, and biliterate writers are advantaged in different areas of metacognition.

#### 4.2.1 Metacognitive Knowledge and Social Contexts

Regarding differences between the three groups' levels of metacognitive knowledge in writing, monolinguals' better knowledge of writing strategies may result from a longer period of schooling in Australia than the other groups. All the monolinguals and some bilinguals were born and educated in Australia, whereas the bilinguals not born in Australia, had only an average of four to five years of schooling before migrating. Though the biliterates had an average of eight to nine years of schooling before migrating, their writing instruction may not have emphasized self-reflective examination of texts and writing strategies. Indeed, writing strategies are rarely taught at schools in many Chinese-speaking countries (Yang et al., 2006). This may have resulted in less knowledge about general writing strategies (Angelova & Riazantseva, 1999; Yang et al., 2006).

#### 4.3 Metalinguistic Awareness

Although there were no differences in metalinguistic awareness between the three groups as a whole, biliterates performed better in classification of language errors (i.e., punctuation, spelling, grammar, and vocabulary), and explanation of language rules using the correct metalanguage. This may indicate that biliterates possessed better knowledge about language and grammar than the other groups. This finding seems to be inconsistent with previous findings that report metalinguistic awareness as a metacognitive advantage for bilinguals (e.g., Bassetti, 2007; Dillon, 2009). Bilinguals have generally been found to have greater awareness and sensitivity toward language, due to their greater exposure to the structural aspects of different language systems. Metalinguistic advantages include better understanding of grammatical form, and better judgment of ungrammatical sentences (Renou, 2001).

In complete contrast to studies mentioned above, this study only identified metalinguistic awareness as an advantage among biliterates, not among bilinguals. Most previous studies compared metalinguistic awareness of monolinguals and bilinguals (or L2 learners) without specifying whether they were literate in both languages, whereas this study distinguishes between bilinguals and biliterates. Nonetheless, those studies that did distinguish between bilinguals and biliterates found aspects of metalinguistic awareness to be both a bilingual and biliterate advantage, for example word awareness (e.g., Bassetti, 2007).

#### 4.3.1 Metalinguistic Awareness and Social Contexts

In the present study, the differences between the three groups' prior experience in English language learning may explain why metalinguistic awareness was identified only as a biliterate advantage. Attention to form is an important factor determining people's metalinguistic awareness and their ability to reflect on language (Hu, 2002). As discussed, bilinguals in this study were either born in Australia or arrived at a young age, so their experience in learning English more closely resembled that of monolinguals. In contrast, the biliterates were once learners of English as a foreign language. Just as previous schooling may have influenced monolinguals' better knowledge of writing strategies, biliterates' better awareness of language errors and language rules may have resulted from their previous schooling, given the common practice at schools in Chinese-speaking countries for English grammar and structure to be explicitly taught, memorized, and assessed (Hu, 2002; Yang et al., 2006). Such a strong focus on grammar may have resulted in the biliterates' better knowledge and awareness of errors and rules, and better analytical ability on language structures.

#### 4.4 Relationships between Metacognition and Text Quality

Findings from this study support previous findings that there is a relationship between metacognition and writing. Significant relationships were found between metacognition (across both metacognitive measures) and English text quality for all three sample groups. Previous studies similarly reported significant relationships between metacognitive knowledge in writing and writing performance (e.g., Olinghouse & Graham, 2009; Sasaki & Hirose, 1996; Wong & Storey, 2006), as well as significant relationships between metalinguistic awareness and writing performance (e.g., Bournot-Trites & Seror, 2003; Francis, 2004; Lasagabaster, 2001).

The above findings suggest that bilingualism may have more effect on the *process* of writing rather than on the written product. As reported, significant relationships between metacognition and English text quality were found across the three groups, but when they were compared separately, differences were only found in the two metacognitive measures, not in text quality. Monolinguals' better knowledge of writing strategies and biliterates' better awareness of language errors and rules did not seem to cause a significant difference to the quality of their English texts.

##### 4.4.1 The Biliterates' Metacognition and Chinese Text Quality

In this study, the relationship between biliterates' metacognition and English text quality and their metacognition and Chinese text quality were inconsistent. Although there was a relationship found in English, no relationships were found between metacognition and Chinese text quality. The fact that both metacognitive tests were developed in English may explain the inconsistency.

Firstly, as the biliterates' metalinguistic awareness was solely assessed based on features of the English language, it is possible that, for the participants, Chinese text quality has no association with their awareness of it in English. Secondly, certain items in the questionnaire may be language dependent, for

example, the item on spelling, which does not apply to the Chinese language. Thirdly, as discussed, instruction on writing strategies may not have been a common practice at schools in biliterates' home schooling (Yang et al., 2006). Therefore, it is possible that the biliterates may not reflect on their Chinese writing in the same way as they reflect on their English writing.

## 5. Conclusion and Future Research

Two conclusions may be drawn from this study. Firstly, those who have mastered two languages (i.e., bilinguals and biliterates) and those who have mastered one language (i.e., monolinguals) are advantaged differently. They demonstrate different abilities in terms of text knowledge, writing, and language skills. Findings suggest that the socio-cultural contexts of the three groups such as their past schooling, may have played a role in determining the kinds of metacognitive advantages they developed. Indeed, the influence of certain social aspects such as schooling is known to be relevant to people's metacognitive development (Vorstman et al., 2009). In past studies, participants' metacognitive advantages have largely been examined from a cognitive perspective, independent of social and cultural influences. Future research may consider socio-cultural aspects in the development of metacognition in cognitive studies (Roca de Larios & Murphy, 2001; Vorstman et al., 2009) as it is possible these may play a significant role in determining their metacognitive development and metacognitive advantages in text knowledge, language, and writing.

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## Appendixes

### Appendix A. Language background questionnaire (only main items are presented)

- Do you speak English?
  - Not at all
  - A little
  - Reasonably well
  - Well
- Do you read in English?
  - Not at all
  - A little
  - Reasonably well
  - Well
- Do you write in English?
  - Not at all
  - A little
  - Reasonably well
  - Well
- Do you speak a language other than English?
  - Yes
  - No
- If you answered 'Yes', did you learn the language:
  - at home?
  - at school?
  - both at home and at school?

**If you answered 'No' in the previous question, you do not need to complete any further questions in this questionnaire.**

- If you speak a language other than English, what language is that? \_\_\_\_\_
- If you speak a language other than English, how well do you speak this language?
  - A little
  - Reasonably well
  - Well

**If the language other than English you speak is not Chinese or a Chinese dialect, you do not need to complete any further questions in this questionnaire.**

- If you speak Chinese, do you speak Mandarin i.e., 'Pu Tong Hua' or 'Guo Yu'?
  - Yes
  - No
- If you answered 'No', which type of Chinese do you speak? \_\_\_\_\_

- Do you read in Chinese?
  - Not at all
  - A little
  - Reasonably well
  - Well
- Do you write in Chinese?
  - Not at all
  - A little
  - Reasonably well
  - Well
- Where is your birth place? \_\_\_\_\_
- How many years have you lived in Australia? \_\_\_\_\_

### Appendix B. Metacognitive knowledge questionnaire (some main items are presented)

#### “What do you know about texts and writing?”

- There are two sections in this questionnaire—the first is on “texts” and the second is on “writing”.
- Circle the letter Y next to the statements that you agree with, and N next to the statements that you disagree with.
- Time allowed: 25 minutes

#### **SECTION ONE—Texts**

- 1) The only purpose of paragraphs is to make sure that there are not too many sentences in a row.....( Y / N )
- 2) Sometimes changing the order of information in an essay will change the meaning of the essay as a whole.....( Y / N )
- 3) To be able to understand a text properly, you sometimes need to know things that are not said in the text.....( Y / N )
- 4) Not all parts of a text deal with the main idea of the text.....( Y / N )
- 5) The new information contained in a sentence is usually put at the beginning of the sentence.....( Y / N )

#### **SECTION TWO—Writing**

- 1) If you have difficulty thinking of a word as you write, it is useful to check for alternatives.....( Y / N )
- 2) If it is difficult to finish a sentence, it is important to make sure you finish the sentence without changing the beginning of it.....( Y / N )
- 3) It is always correct to put your ideas in the text in the same order in which you think of

- them.....( Y / N )
- 4) It is a good thing to start writing straight away after reading the topic you have to write about.....( Y / N )
- 5) When you are having difficulty writing a particular sentence, it is useful to think of alternative ways of saying it.....( Y / N )

**Appendix C. Metalinguistic awareness quiz (some main items are presented)**

- This is a quiz to find out how much you are aware of the English language.
- There are two sections in this quiz.
- Time allowed: 1 hour

**SECTION ONE—Metalanguage**

- Read the following sentences with words underlined.
- Select a term from the **\*\*word bank\*\*** that best represents the underlined word for each sentence, and
- Write the terms on the lines provided.

**\*\*Word bank\*\***

Possessive pronoun	Adjective	Plural	Abstract noun	Conjunction	Future tense
Adverb	Preposition	Personal pronoun	Article	Proper noun	Verb

- 1) Australia is a peaceful country. \_\_\_\_\_
- 2) The skillful pianist won the competition. \_\_\_\_\_
- 3) I am having an ice-cream. \_\_\_\_\_
- 4) Fiona laughed joyfully when her horse won the race. \_\_\_\_\_
- 5) Our friendship will last forever. \_\_\_\_\_

**SECTION TWO—Error Correction and “What’s the Rule”?**

This section is about correcting and explaining errors in spelling, grammar, punctuation and vocabulary. There is one error in each sentence in this section, and the error has already been identified for you.

There are three things you need to do:

- a. identify whether it is an error in spelling, grammar, punctuation or vocabulary,
- b. correct the error by rewriting the sentence with the error changed to its correct form, and then
- c. explain the reason why it is incorrect.

*Some errors are harder to explain than the others. Try explaining them the best you can.*

- 1) The three **dog's** tails are waving.
  - a. spelling / grammar / punctuation / vocabulary
  - b. Correct:
  - c. Explain:
  
- 2) A pilot's job is to **drive** a plane.
  - a. spelling / grammar / punctuation / vocabulary
  - b. Correct:
  - c. Explain:
  
- 3) I am going to two **partys** on the weekend.
  - a. spelling / grammar / punctuation / vocabulary
  - b. Correct:
  - c. Explain:
  
- 4) You have been **unhonest** about the money that went missing.
  - a. spelling / grammar / punctuation / vocabulary
  - b. Correct:
  - c. Explain:
  
- 5) The boat sank last week. The body **has been found** only yesterday.
  - a. spelling / grammar / punctuation / vocabulary
  - b. Correct:
  - c. Explain: