PHONOLOGICAL AWARENESS AND WORD READING DEVELOPMENT IN ACEHNESE-INDONESIAN BILINGUALS LEARNING ENGLISH AS A THIRD LANGUAGE

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ABSTRACT

This study investigates the phonological awareness and multi-literacy acquisitions of Indonesian-speaking children with a varied level of Acehnese spoken language experience. The study specifically looks for the possibility of metalinguistic awareness benefit on the level of phonology by having Acehnese as a second spoken language after Indonesian, and the possibility of transfer of this phonological awareness into the third language English which is learnt formally at school as a foreign language. The other purposes of the study are to examine the roles of both Acehnese and English oral language vocabulary in the Acehnese and English word reading performances, respectively, once the L1 Indonesian word-reading skill is controlled.

Forty-six 7-year-old children from a primary school in Banda Aceh, Indonesia were given three vocabulary tests, each in Indonesian, Acehnese and English, and were assessed for their daily (passive and active) spoken language use in Indonesian and Acehnese through a parental questionnaire. The participants were also assessed for their non-verbal intelligence and phonological awareness abilities that includes phoneme deletion, syllable deletion, onset oddity and rime oddity in the three languages. Finally, the participants were assessed for their Indonesian, Acehnese and English word reading abilities through a list of 30 words arranged in increasing difficulty level.

The results show that when Indonesian literacy skill is not controlled, having exposure to spoken Acehnese at home does not facilitate literacy and phonological awareness skills in Acehnese, Indonesian or English. Once the Indonesian word reading skill and the level of intelligence are controlled, the Acehnese spoken language skills (Acehnese active use and Acehnese receptive vocabulary) is found to predict the Acehnese word reading significantly. The role of English vocabulary in English reading score is indicated to be significant even before the Indonesian literacy skill is controlled, but the significance level of L1 Indonesian word reading is still higher than the L3 English vocabulary skill in English word reading. The absence of L2 Acehnese orthographic knowledge, the L1 Indonesian orthographic dominance, as well as the L3 English opaque orthography are the primary causes of why no Indonesian-Acehnese bilingualism benefit found in the children's L3 English phonological awareness and word reading skills, and why Indonesian and English proficiency levels are more important for increasing phonological awareness.

This study contributes to early literacy teaching and learning in Aceh-Indonesian context, especially teaching and learning to read in English as a foreign language. My study provides evidence that among multilingual children, the phonological processing skill can be elevated through teaching the orthographic knowledge of all the languages.

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CHAPTER 1 INTRODUCTION

Third language acquisition (TLA) is a relatively new area of research that has expanded rapidly in recent years (Falk and Bardel, 2010; Cenoz, 2013). Some third language acquisition studies have focused on the effect of monolingualism/bilingualism (Rauch, Naumann and Jude, 2013; Sanz, 2000; Toloa, McNaughton and Lai, 2009; Kuile *et al.*, 2011; Escudero, Broersma and Simon, 2013; Gallardo del Puerto, 2007). Other studies have looked at the cross-linguistic influence among the three languages (Wrembel, Gut and Mehlhorn, 2010; Llama, Cardoso and Collins, 2010; Gut, 2010; Marx and Mehlhorn, 2010; Falk and Bardel, 2010; Falk, Lindqvist and Bardel, 2015).

The success of TLA in bilingualism, and/or the positive transfers made by trilinguals, have been reported to be mediated by three factors: (1) heightened metalinguistic awareness—the ability to identify, analyse, and manipulate language forms (Cenoz, 2013; Jessner, 2008; Jessner, 2010; Koda and Zehler, 2008, p. 69), (2) biliteracy—dual language and literacy skills (Rauch *et al.*, 2013), and (3) the linguistic similarity factor (Barac and Bialystok, 2012). These three factors do not operate independently of one another. Metalinguistic awareness and biliteracy in particular have strong correlation (Basseti, 2007; Cenoz, 2013). In addition, a language learner will transfer their first language awareness to their second language awareness through the linguistic similarities shared by the two languages (Durgunoglu, Nagy and Hancin-Bhatt, 1983; Durgunoglu, Nagy and Hancin-Bhatt, 1993; Dickinson *et al.*, 2004; Pasquarella *et al.*, 2014; Melby-Lervag and Lervag, 2011; Goodrich, Lonigan and Farver, 2013; Verhoeven, 2007). In this chapter, I review the role of (1) metalinguistic awareness, (2) bilinguals' language and literacy proficiency, and (3) typological distance or linguistic similarities in second and third language acquisition contexts. Then, by referring to the three factors, I state the aim of and the significance of the present study. Finally, I briefly outline the organisation of the chapters.

1.1 Metalinguistic Awareness: The Role of Executive Functions

Bialystok (2001) defines metalinguistic awareness (MA) as the executive functions that control attention to language forms and meanings and analyse the structure of language. Someone with high MA is able to not only grasp the meaning of an utterance but also notice the linguistic forms used by the speaker. Executive functions are responsible for attention, selection, inhibition, shifting, and flexibility (Barac and Bialystok, 2011, p. 37). Therefore, bilinguals with high MA can flexibly focus their attention on either the forms of the language while inhibiting meaning or on the meaning while inhibiting the forms.

Ianco-Worrall (1972) tested bilingual children's ability to perceive language as something separate from meaning. He asked children to imagine that they could invent names for things and then if the children would call a cow 'dog' and a dog 'cow'. The results showed that the bilingual group were comfortable with naming animals interchangeably, whereas most monolingual children said that the animals' names could not be interchanged (Baker, 2001, p.151). In another study, Ben-Zeev (1977) compared bilingual and monolingual groups in a task that tested participants' level of awareness of referential arbitrariness. In the task, Ben-Zeev asked children to substitute the word 'we' with the word 'spaghetti' and found that it was easier for bilingual children to perform this task without arguing about the nonsensical sentence that resulted. The author concluded that bilinguals were aware that language was a tool that can be separated from meaning(s).

MA entails various types of awareness at different linguistic levels. The awareness of language as a construction of meaningful units is morphological awareness (Zhang, Koda and Sun, 2014; Ramirez, Chen and Geva, 2010; Wang, Ko and Choi, 2009). The awareness of the organisation of meaning and semantic domains of language is semantic awareness (Kuo and Anderson, 2008). The understanding of how words in a language are joined to form sentences is syntactic awareness (Nation and Snowling, 2000; Kuo and Anderson, 2008). The ability to understand language as sound structures is phonological awareness (Gillon, 2004; Kuo and Anderson, 2008). Bilingual children have been reported to have higher MA sub-linguistic skills, such as morphological awareness (Barac and Bialystok, 2012) and phonological awareness (Campbell and Sais, 1995; Andreou, 2007).

Barac and Bialystok (2012) reported that bilinguals have higher executive functioning than monolinguals. Four groups of children, namely English monolinguals, Chinese-English bilinguals, French-English bilinguals, and Spanish-English bilinguals, were given two kinds of test: (1) a nonverbal task that tested their executive control using a colour-shape switching task; and (2) a verbal task that tested their vocabulary, grammar, and metalinguistic knowledge (all tests were given in English). The findings indicated that the bilingual groups performed better than the monolingual group in the executive control task.

However, MA tasks demand not only the cognitive-specific skills of executive functioning, but also the language-specific skills, whether phonological, morphological, or on other linguistic levels (Bialystok, Peets and Moreno, 2014; Branum-Martin *et al.*, 2012). When linguistic knowledge is more demanding, bilinguals do not always outperform monolinguals. Bialystok *et al.* (2014) carried out a longitudinal study that compared the development of two groups of English children. The first group of participants were English monolingual children, identified based on the parental rate of English home-language use, whose medium of instruction since the age of 5 had been L2 French. The second group was comprised of English monolinguals educated using English as the medium of instruction. Both groups were comprised of children from the second and the fifth grade. Among the second grader groups, the English monolingual children from French immersion program performed better in two metalinguistic awareness tasks – a Wug test (word manipulation test) and a sentence judgement test – compared to the English monolinguals educated using English as the medium of instruction. However, the English-only group performed better than the bilinguals in a verbal fluency task, which demanded greater linguistic rather than cognitive skills. Three years afterwards, or among the fifth grader participants, the immersion group were found more accurate in sentence-judgement task but both groups were equal in verbal fluency. Bialystok *et al.* (2014) suggested that bilinguals' English vocabulary skills were limited at some point in their dual language acquisition because the bilinguals had to share their memory capacity with their second language. Therefore, if an MA task is very linguistically demanding, bilinguals' and monolinguals' proficiency levels in the language tests must first be controlled.

The findings from the study support those of Hoff *et al.* (2012), who found that bilingual children who were not yet fully proficient in both languages would perform in each language in accordance with the amount of input the children gained in the language on a daily basis. Specifically, Hoff *et al.*'s study compared the English vocabulary and grammar skills of 47 English monolinguals and 56 Spanish-English bilinguals in South Florida, US. Younger bilinguals who acquired languages simultaneously were reported to perform poorer than monolingual peers when tested in only one of their languages (Hoff *et al.*, 2012). The results showed that all measures of vocabulary and grammar were related to the relative amount of input in that language, and monolinguals performed better in the two English skills than the bilingual group. In other words, before adequate proficiency is achieved across both languages, the bilingual benefit of ‘a better language learner’ cannot be achieved. In other words, the full-proficiency status of bilinguals is essential in the development of metalinguistic awareness.

In the following section, I discuss the role of bilinguals’ background and target language proficiency, particularly bilinguals’ literacy proficiency and its role in obtaining the cognitive benefits of bilingualism.

For the present study, which takes place in a multilingual setting, the definition of metalinguistic awareness has been adopted from Hofer and Jessner (2016, p. 3), who argued that metalinguistic awareness among multilingual learners relates to one’s awareness of linguistic forms and structures across languages. Metalinguistic awareness is not the same as linguistic knowledge because it deals with not only the ability to use the forms and structures of languages, but also the ability to reflect on these forms and structures (Pinto *et al.*, 1999; Hofer and Jessner, 2016).

1.2 Bilinguals’ Language Proficiency: The Role of Biliteracy

Bilinguals’ cognitive benefits, such as high executive functioning, are determined by the level of proficiency in both languages. Cummins (1980) distinguished language proficiency in terms of two elements: basic interpersonal communicative skills (BICS) and cognitive academic language proficiency (CALP). BICS are language skills used in daily communication during informal situations wherein context is embedded. In embedded context communication, other than the verbal language, visual clues such as gestures and location are used and support communication. CALP is required for more cognitively demanding situations, such as classroom or literacy activities wherein context is reduced. According to the BICS and CALP models, only bilinguals with both types of skills can enjoy cognitive benefits such as higher academic and language skills. Thus, in second language learning, the more proficient one is in one's first language, the easier that person can learn the L2, although this transfer is only possible at all if a certain level of proficiency is achieved first. This hypothesis of conditional transfer is the Threshold Hypothesis (Cummins, 1979).

Some studies have challenged the Threshold Hypothesis, pointing out that high MA correlates with background language proficiency (Sanz, 2000; Renou, 2010; Rauch *et al.*, 2013). Sanz (2000) compared two groups of English language learners, namely Spanish-Catalan bilingual (n = 121) and Spanish monolingual (n = 77) high school juniors in northern Spain. The participants were given an English proficiency test along with other measures to control their English exposure and attitudes towards the language. The results suggested that the immersion programmed produced more efficient L3 learners (Sanz, 2000).

Rauch, Naumann, and Jude (2013) provided further evidence of the language proficiency effect on MA and third language learning. The study compared biliterate German-Turkish, partly biliterate German-Turkish, and monoliterate monolingual German secondary students regarding MA and L3 English proficiency. This study used a sample of 299 Year 9 students from 14 schools across Hamburg. These participants were tested for reading skills in German, Turkish, and English, and their levels of biliteracy were measured through Turkish and German reading scores. These participants were also given a metalinguistic awareness task in the form of a Language Aptitude Test (LAT), which required them to build words in two unknown languages, Swedish and Dutch, after certain rules were introduced in English. The study reported that biliterate students outperformed both partly biliterate and monolingual peers in both the metalinguistic awareness task and L3 English reading. The result persisted even after the SES factor was controlled for.

In short, full proficiency, written and spoken, in both languages aid third language learning. The practice of using more than one writing system boosts MA growth; in comparison to oral experiences with language, exposure to written forms of a language builds a well-established language system with less effort (Galambos and Goldin-Meadow, 1990; Jessner, 1999; Parisse, 2002; Basseti, 2007; Proctor and Silverman, 2011; Perfetti and Dunlap, 2008).

In summary, background written language experience plays a key role in learning an additional language, particularly in terms of L3 literacy skills. However, many third language learning studies have also acknowledged the role of transfer in different language skills. Edele and Stanat (2015) conducted an experimental study on a nationwide sample of ninth-grade students who spoke Russian (n=502) or Turkish (n=662) as L1 and German as L2. Their study based its hypothesis on Cummins' Interdependence Theory (1979), which suggested that skill in one language was transferable to the same language skill in the target language. Participants were given a German reading comprehension test and a Russian or Turkish listening comprehension test. The results suggested that L1 listening skills were associated with L2 reading skills, suggesting the possibility of transfer across different language skills. The authors suggested that the language skill transfer found in their study may not be restricted to the written domain, but could also appear in oral language (Edele and Stanat, 2015, p. 14).

1.3 Linguistic Similarities: The Role of Transfer

Studies on third language acquisition have focused not only on the additive effect of bilingualism, but also on the linguistic influence of background languages, namely on whether background languages support or impede the learning of a third language and, if so, on how. For example, one who performs well in L1 reading may also perform well in L2 reading. This act of applying previously learned patterns to a new learning situation is 'transfer' (Gass, 1979, p. 328).

According to (Pavlenko and Jarvis, 2008, p. 176), comprehension across languages that are typologically close is easier than comprehension across languages with greater typological distances; in short, the recognisability of structures facilitates comprehension. In language learning, cross-linguistic similarity also plays an important role (Ringbom and Jarvis, 2011). According to Ringbom and Jarvis (2011), foreign language learning can draw on two types of similarities between the foreign language and the L1: (1) actual similarities or similarities that can be linguistically analysed; and (2) assumed similarities or similarities based on the learners' assumptions (Ringbom and Jarvis, 2011, p. 106). Hence, linguistic similarities among languages comprise another critical factor in determining the speed and ease of new language acquisition.

When Barac and Bialystok (2012) investigated the effects of language similarity on verbal and non-executive control performance using English monolinguals, Chinese-English bilinguals, French-English bilinguals, and Spanish-English bilinguals, the highest scores were achieved by Spanish bilinguals, whose language of instruction at school was the same as the language of testing (English), and whose L1 had more significant overlaps with English. The Spanish-speaking group was reported to have outperformed other bilingual groups due to the similarities of Spanish with English (Barac and Bialystok, 2012, p. 413).

Cenoz (2013, p. 71) argued that bilinguals have a potentially larger linguistic repertoire. If that is the case, it is significant, as language repertoire influences the speed and learning strategies of the learner (Jessner, 2008; Kemp, 2007). The claim that bilinguals have a larger language repertoire than monolinguals has been supported in a number of studies (Silven and Rubinov, 2010; Escudero, Broersma, and Simon, 2013; Antoniou *et al.*, 2015). Escudero, Broersma, and Simon (2013) investigated L1 Spanish, L2 English, and L3 Dutch vowel similarities to examine the effects of knowing the two other languages on L3 Dutch word learning. After controlling for participants' L2 English and L3 Dutch proficiency, L1 Spanish speakers were trained and subsequently tested on the mapping between pseudo-words and non-objects (drawings created to represent the pseudo-words). A group of native Dutch speakers was used as a control group. The findings suggested that there was a strong continuity between sound perception and L3 word recognition and that L2 English proficiency predicted participants' accuracy in identifying L3 minimal pairs (Escudero *et al.*, 2013). Moreover, no correlation was found between L2 English and L3 Dutch proficiency scores. English proficiency significantly predicted learners' understanding of minimal pairs, whereas Dutch proficiency did not lead to any predictions and was hence not included in the regression analysis. This study found that learning an L2 with a larger vowel inventory than the L1 is beneficial in word learning in an L3 with a similarly extensive vowel inventory (Escudero *et al.*, 2013, p. 746). In third language learning, having background language knowledge and skills from two languages may increase the possibility of having more in-common linguistic knowledge with the L3, which ultimately supports the L3 learning.

Cross-linguistic influence also emphasises literacy as a predictor of positive transfer and developing MA. Every language's writing system, with all its varied complexities, influences the development of sub-linguistic skills in MA, such as phonological, morphological, and syntactical skills and orthographical awareness (Anthony and Francis, 2005). Orthographic types (alphabetic, syllabic, or logographic) and orthographic depths (shallow, deep, or in between) shape one's sub-linguistic aspects of MA and determine transfer in the language-learning process (Perfetti and Dunlap, 2008, p. 15). Conversely, MA has also been reported to have an influence on one’s literacy skill (Zipke, 2007; Zipke, Ehri and Cairns, 2009; Li and Wu, 2015). In reading comprehension and skilled reading, semantic awareness taught through riddles has been shown to help middle school students cope with homonyms and ambiguities in texts (Zipke *et al.*, 2009). In early reading, phonological awareness has been reported to predict literacy acquisition (Goswami, 2008; Anthony and Francis, 2005; Caravolas *et al.*, 2012).

Bassetti (2007) examined the effect of first language word awareness on Chinese L2 text segmentation skill. The author hypothesised that word awareness is only possible for learners who are literate in a writing system that marks word boundaries; thus a learner’s Chinese word awareness is influenced according to the learner’s background language and its writing system. The study compared three groups with different orthographic backgrounds, namely Chinese monolinguals, English speakers learning Chinese, and Japanese speakers learning Chinese. Each group consisted of 25 adults. The groups were asked to segment Chinese sentences and texts into words and then analyse the words by determining whether or not each character (*hanzi*) was a word. English and Japanese participants were given translations to aid them in understanding the text. The results showed that orthographic background had a significant effect. The Chinese and Japanese groups, which consisted of participants who spoke languages with non-word-spaced writing systems, segmented longer words because their L1 writing systems represented complex nominals as single words. On the other hand, in the English group, the complex nominal or noun phrases were counted as non-single words because of the English writing system's interword spacing regulation for noun phrases. This study thus illustrated the first language orthographic effect on one's metalinguistic awareness.

In addition to confirming the L1 orthographic effect, (Basseti, 2007) also provided evidence of the biliterate effect. The English group in his study demonstrated the highest agreement level compared to the other two groups in rating whether a *hanzi* character was a word or not. The participants in the English group mostly held the same opinions and provided the same answers in determining if a *hanzi* was a word or not. In contrast, the Chinese group had the lowest agreement level. Indeed, Chinese text is reportedly difficult to segment into words because the language has a different concept of words: *hanzi*, which are morphemic syllables, are used instead of words in counting the length of a text (Basseti, 2007, p. 5). The Japanese group, although these participants produced the same word length as the Chinese group (and segmented longer words than the English group), showed intragroup agreement higher than that of the Chinese group but lower than that of the English group (Basseti, 2007, p. 13). Basseti (2007) had believed that, as the Japanese and Chinese groups both read and wrote using non-word-spaced writing systems, both groups would result in the same level of intragroup agreement. The only possible explanation for the Japanese group's higher intragroup agreement level, according to Basseti (2007), was the Japanese dual writing systems (Kanji, Hiragana, and Katakana) which allowed the participants to experience learning another writing system or having undergone a second language instruction. He found that the Japanese group had (1) background orthographic interference and (2) dual experience due to learning Japanese dual orthographies, which also influenced their responses in the Chinese text segmentation task.

Kahn-Horwitz *et al.* (2014) also demonstrated the positive effect of a larger linguistic repertoire. Kahn-Horwitz *et al.*(2014)(2014)(2014) sought to determine whether L1 Circassian-speaking children in Israel had an advantage in learning specific English orthographic conventions over L1 Hebrew-speaking children; specifically, the researchers examined whether the L1 Circassian-speaking children's wider linguistic and orthographic repertoire led to such an advantage. The first group, the Circassian-speaking children, had been exposed to Circassian oral language and to Hebrew oral and written language in the first grade. Since Circassians are Muslims, all Circassian participants was introduced to Standard Modern Arabic since the first grade; in third grade, children begin to learn written and oral English; and in fifth grade, written Circassian is introduced. The second group consisted of L1 Hebrew-speaking children learning L2 English. The result revealed that the Circassian-speaking children outperformed the L1 Hebrew-speaking children in both Hebrew and English phonological awareness tasks but performed poorer than the L1 Hebrew-speaking children in Hebrew spelling and decoding. In English pseudo-word reading tasks using various vowels, the L1 Circassian-speaking children performed significantly better than the L1 Hebrew-speaking children in 5 out of 7 tasks. The L1 Circassian-speaking children performed better in differentiating long and short vowels in English tasks, which was suggested to be the result of the children having learned Arabic orthography (Kahn-Horwitz *et al.*, 2014, p. 56).

In another multilingual setting, Abu-Rabia and Siegel (2003) found that being exposed to a specific language influence trilinguals' literacy performances. The study investigated the interconnections among three languages, namely Arabic, Hebrew, and English, by testing 70 trilingual word and pseudo-word reading tests in the three languages. The study found significant relationships between word and pseudo-word reading skills within and across languages. Since the trilinguals were exposed least to English, their

English performance was the poorest. However, the better their performance in L1 Arabic and L2 Hebrew, the better their performance in L3 English. The authors suggested that the varying performances in literacy were not only caused by the language-specific characteristics, such as orthographies, but also by exposure to a specific language (Abu-Rabia and Siegel, 2003, p. 631).

However, two genealogically unrelated languages can also be similar in certain formal features or components (De Angelis, 2006; Cenoz and Gorter, 2011). Data from Cenoz and Gorter (2011) indicated that the English and Spanish grammar produced by Basque-Spanish-English trilinguals correlated with Basque grammar, even though Basque grammar is entirely different from that of English and Spanish. Moreover, centuries of contact between Basque and Spanish, which has resulted in a large amount of shared vocabulary (in particular words of Spanish origin used in Basque), did not make the correlations stronger than those between Basque and English.

Wang, Ko, and Choi (2009), Cheung *et al.* (2010), and Zhang (2015) reported similar findings, namely that Korean, Chinese, and Malay morphological awareness predicts English word reading. Cheung *et al.* (2010), for instance, found that morphological awareness in Chinese had a significant correlation with English word reading despite the vastly different writing systems of the two languages. Whereas English is a phonemic-based/alphabetic opaque language, Chinese is a morpho-syllabic/logographic language. Nevertheless, because English has frequent inconsistencies between sounds and spelling, words are commonly learnt through what could be labelled a ‘whole-word approach’(Ingram and Ingram, 2001). Similarly, Chinese morpheme-based characters encourage morphological awareness among Chinese morpho-syllabic writing system users. Chinese morphological awareness thus facilitates Chinese-speakers’ English reading (Cheung *et al.*, 2010). Therefore, even when two languages are not directly related genealogically, they may still share similarities that support learning. In reading and spelling, orthographic processing similarities are essential.

The possibility of common underlying orthographic processing was also demonstrated in a study conducted by Commissaire *et al.* (2014) on English-French bilingual children. The researchers tested the bilingual children on lexical orthographic processing by asking the children to choose the correct spelling between ‘people’ and ‘peeple’. The researchers also tested the children’s sub-lexical orthographic processing by using terms which were merely word-like (e.g., ‘vaid’ and ‘vayd’). The tests included both language-specific and language-shared orthographic regularities. The children’s performance was found to be similar across languages. Therefore, in English and French, there are common underlying orthographic processing skills (Commissaire *et al.*, 2014).

To conclude, the similarities, whether in orthography, phonology, morphology, syntax, or lexicon, between the first and the third language, and/or between the second and the third, mean that bilinguals learning a third language perform better than monolinguals learning the same target language.

1.4 Research Statement

This chapter has, so far, examined studies of bilinguals outperforming monolinguals in relation to metalinguistic awareness and third language learning. The chapter has also discussed how the conditions of proficient bilinguals are necessary to gain the benefits of MA and language skill transfer for a target language. The role of literacy skills and a larger linguistic repertoire in positive cross-linguistic transfer to the third language production has also been discussed. The unique language-specific characteristics brought by every language, as well as potentially common underlying characteristics, must always be considered in multilingual studies. Therefore, a more holistic perspective in studying multilingualism is key; the whole linguistic repertoire of a multilingual speaker or language learner, as well as the relationship between the languages, must be examined (Cenoz and Gorter, 2011).

The present study aims to examine whether being a bilingual Indonesian/Acehnese speaker benefits learners in English word reading acquisition by taking into account the literacy skills in all three languages. Given that the bilingualism benefit in third language learning is reported to be facilitated by heightened metalinguistic awareness and biliteracy, the present study also investigates the level of metalinguistic awareness related to literacy acquisition, namely phonological awareness. Specifically, the present study investigates to what extent bilingualism, in a monoliterate context, facilitates phonological awareness in Indonesian/Acehnese bilinguals learning English as their L3. In terms of linguistic similarity in third language learning, the present study further aims to determine to what extent a larger phonological repertoire from Indonesian and Acehnese facilitates L3 English word decoding.

1.5 Significance of the Study

The present study uses a new language, Acehnese, in examining the role of bilingualism in phonological awareness and multiliteracy. The study is conducted in a context wherein many of the bilinguals lack Acehnese reading instruction and are only passive users of Acehnese as their second language, i.e. users who understand Acehnese but do not actively speak it; the context thus allows the study to test the bilingualism benefit hypothesis (Cummins 1980). The study also determines whether the benefit of bilingualism in phonological awareness and third language learning can be found in an Indonesian-Acehnese bilingual monoliterate context.

In many places of the world, minority languages have started to gain importance in education. Nonetheless, a significant number of countries are still struggling to preserve their minority languages due to the influence and dominance of a majority language. In Indonesia, being bilingual in a minority language is still seen as a flaw rather than a benefit. Literature has demonstrated the benefits of bilingualism through the facilitation of MA in bilingual contexts. If bilingualism in the Aceh context is proven to yield positive results for young bilingual language learners, one application of this study would be to change attitudes toward bilingualism in Indonesia.

Moreover, the results of the present study can offer greater insight into how English language learning is acquired in a Southeast Asian bilingual language context, particularly in the early years of literacy learning.

1.6 Organisation of the Study

This thesis is organised into seven chapters. The remaining chapters are organised as follows. Chapter 2 is a discussion of current theory on phonological awareness and word reading acquisition. The chapter begins with a discussion of phonological awareness and its definitions, subskills, development, and reciprocal relationship with reading; the chapter then discusses the transfer of skills across languages and the effect of bilingualism on those skills. The chapter also presents key theories on word reading acquisition and the aims of the present study. Chapter 3 examines the structures and contexts of the Indonesian and Acehnese languages, including their functions and status in society, and compares the two languages' phonological and orthographical systems. Chapter 4 elaborates on the methodology, outlining the location of the research, the sampling approach, the research instruments, and the procedure. The remaining sections of the chapter deal with data scoring and analysis and research ethics. Chapter 5 presents the analyses and findings of the study by focusing on answering the main questions of the present study. The chapter first presents the scores and descriptive statistics for all variables. This presentation of the findings is followed by the correlational analyses between the independent variables (Acehnese spoken language skills) and the dependant variables (phonological awareness and word reading skills) to see if the heightened level of Acehnese spoken skills are parallel to the heightened ability in phonological processing and word decoding. The final sections of the chapter present the cross-correlational regression analyses to determine the most effective word-reading predictors for each language. Chapter 6 discusses the findings from Chapter 5 by linking them to previous studies on bilingualism, phonological awareness, and word reading acquisition. The chapter evaluates to what extent Acehnese spoken language skills play a role in this multi-literacy acquisition context. Chapter 7 deals with the limitations, conclusion, and implications of the study.

CHAPTER 2 LITERATURE REVIEW

This chapter elaborates on the concepts of phonological awareness, literacy acquisition, and spoken language experience to determine how the theories in these fields of knowledge relate to children's bilingualism and multilingualism.

2.1 Phonological Awareness

2.1.1 Definition

The definition of phonological awareness can be drawn from the definition of its more general skill, metalinguistic awareness. If metalinguistic awareness has been defined as the ability to control attention from language meaning to language forms (see Section 1.1), on a phonological level, it means the ability to control attention from a language or word as something meaningful to a language or word as a structure of sounds (Campbell and Sais, 1995). Someone with high metalinguistic awareness is able to shift his or her attention flexibly from meaning to the form of a language or vice versa. On a phonological level, metalinguistic awareness is realised as the ability to move attention interchangeably, for example, from /l/ as a sound unit, to the /l/ as the embedded element that changes a word from 'crew' to 'cruel'.

Most scholars have defined phonological awareness in a similar way; as the skill of identifying and manipulating sounds. According to Muter (1994, p. 45), phonological awareness is a child's awareness of the speech sounds within words or the realisation that words can be broken down into sequences of constituent sound segments.

Gillon (2004) defined the term as the ability to break down words into smaller units, whereas Branum-Martin, Tao and Garnaat (2015, p. 111) referred it to the ability to recognise and manipulate linguistic sounds separately from their meaning. According to Goswami (2008), phonological awareness is a child's ability to detect and manipulate component sounds that compose words of different grain sizes. Kuo and Anderson (2008, p. 42) viewed the concept as the ability to reflect upon and manipulate the phonological units of a language. Based on these definitions, it is understood that one's level of awareness of their language sound structure may be measured through the ability to manipulate sounds.

Because language is a hierarchy of sounds, measuring somebody's phonological awareness means measuring their ability to disentangle this hierarchy of sound into levels (e.g. syllable, onset-rime, phonemes) and measuring how well they are able to manipulate units on each level.

2.1.2 Phonological Awareness Levels

Phonological awareness is a generic term covering a number of concepts (Goswami and Bryant, 1990, p. 2). According to Goswami and Bryant (1990, 1994), there are at least three ways of breaking up a word into its consequent sounds: (1) syllables, (2) intra-syllabic units, and (3) phonemes. Due to its significance in literacy, researchers have also included supra-segmental phonology as a component of phonological awareness (Wood, Wade-Woolley, and Holliman, 2009).

The first approach, syllable awareness, is the understanding that a word can be divided into syllables. This awareness is demonstrated through the ability to segment words into syllables, identify the number of syllables in a word, take away certain syllables from a word, blend syllables into a word, or replace one of a word's syllables with another.

Second, intra-syllabic, or sub-syllabic, awareness is the understanding that syllables can be broken down into onset-rime, body-coda, or phonemes. Regarding onset-rime, Kirtley *et al.* (1989) observed that a syllable can be broken down into onset (the first consonant or consonant clusters) and rime (the following consonant and consonants followed, if any). Rime is different to rhyme, in that rime refers to a part of syllable, whereas rhyme is the notion used to determine if two rimes sound the same. The ability to recognise which rimes sound the same and which do not is rhyming awareness. Similarly, the ability to tell if two syllables or words start with the same onset or not is onset awareness. In addition, syllables can also be broken down into body (the first consonant or consonant cluster and the vowel) and coda (the consonant or consonant cluster at the end of the syllable) (Cho and McBride-Chang, 2005, p. 570). This syllable division is also referred to as post-vowel segmentation (Wise, Olson, and Treiman, 1990). Finally, the last way to divide a syllable is by breaking it into the smallest sound unit: phonemes. Phoneme awareness is the understanding that words and syllables are built from phonemes. Similar to syllable awareness, phoneme awareness is commonly measured through segmenting, identifying, blending, and deleting certain phonemes from a word or syllable.

Third, supra-segmental phonology refers to the phonological elements beyond phonemes, such as stress or tone. A growing number of studies have shown the significant roles of supra-segmental phonological sensitivity such as stress, duration, and tone (Wood *et al.*, 2009; McBride-Chang, 2016). Tone awareness, for example, has served as a predictor of Chinese reading acquisition in a number of studies (McBride-Chang *et al.*, 2008; Yeung and Chan, 2013). A study of Cantonese-English phonological awareness (Yeung and Chan, 2013) included Cantonese tone awareness in Cantonese phonological awareness tasks. The results of Yeung and Chan's study found a correlation between tone awareness and English rhyming skills but admitted that the correlation may have been caused by measurement similarity factors. The study employed a detection task, and children was asked to choose two of three words that shared the same tone in the Chinese tone awareness test and which words rhymed in the English rhyming awareness test (Yeung and Chan, 2013, p. 556). Branum-Martin *et al*. (2015) conducted a meta-analysis on several English language learners' phonological awareness added that this tone awareness task played an unclear role in bilingual Chinese-English phonological awareness. Therefore, supra-segmental phonology may, at least to a degree, predict (or have an impact on) reading, but this impact may be limited to languages that are supra-segmentally salient, such as Chinese, which has tonal syllables.

Each language has its own phonological and supra-segmental characteristics. For languages with simple consonant-vowel construction, onsets, rimes, and phonemes are equivalent because each onset and each rime in a single syllable is also a single phoneme (Goswami, 2008). In Indonesian phonology, rimes are either in the form of a single vowel (V), or a vowel and a consonant (VC), such as rime /a/ and /an/ from syllable /ka/ and /kan/, in words *bu.ka*, and *bu.kan*. In some languages, the onset and rimes consist of more than two phonemes, and so breaking down a syllable into onset and rime before breaking it down again into the smallest unit, phonemes, is important. English is an example of a language with heavy onsets and rimes (Treiman and Kessler, 1995; De Cara and Goswami, 2002). Therefore, different language speakers develop phonological awareness differently based on their first language's phonological peculiarities.

2.1.3 The Development

Because different languages have different levels of complexity in their phonological structures (some languages have heavier consonant clusters), the pace of phonological awareness development on each level can vary across languages. The development depends on the (1) phonological and (2) orthographic elements or the writing system characteristics of the language (Anthony *et al.*, 2003; Anthony and Francis, 2005). The subsections below describe theories of phonological awareness development over time.

2.1.3.1 Developmental Independence and Developmental Progression Hypotheses

Cisero and Royer (1995) proposed two hypotheses to explain the development of phonological awareness, namely The Developmental Independence Hypothesis and The Developmental Progression Hypothesis. The Development Independence Hypothesis posited that children acquire the phonological units that they are most exposed to. Because preliterate English-speaking children have high exposure to rhymes from nursery songs and poems, they first acquire rhyming awareness (Treiman and Zukowski, 1991). The developmental progression hypothesis suggests that a child's phonological awareness development always starts from the largest unit, word, to the smallest unit, phoneme. This development implies that, before a child develops syllable awareness, they develop word awareness, and before developing their phoneme awareness, they develop onset-rime or rhyming awareness (see Section 2.1.2).

Although they proposed two hypotheses, Cisero and Royer's (1995) study of English-Spanish bilinguals supported the Developmental Progression Hypothesis of phonological awareness, which posited that rhyme awareness emerged before phoneme awareness. The subjects of the study were 36 English-Spanish bilingual children, 22 of whom had received bilingual education in Spanish and English, while the 14 remaining participants were from mainstream English classrooms, all located in Massachusetts, USA. The subjects were all tested in their first grade using rhyme detection, initial phoneme (onset) detection, and final phoneme detection tasks (see Section 4.3.6 for the details of tasks), all given in both languages. The results illustrated that the participants performed best on the rhyme task, followed by the initial phoneme task, and poorest on the ending phoneme task. These findings supported the large-to-small phonological awareness development hypothesis. Several studies have also supported this hypothesis (Anthony *et al.*, 2003; Anthony and Francis, 2005; Goswami, 2006).

In the European languages tested, there seems to be developmental progression in the phonological domain from larger to smaller units (Ziegler and Goswami, 2005).

2.1.3.2 Developmental Psycholinguistic Conceptualisation of Phonological Awareness

Phonological awareness involves varied degrees of consciousness (Ouellette and Haley, 2013; Seymour, 2006; Morais, 1999). Anthony *et al.* (2003) determined a general order of phonological awareness acquisition, and that children are able to detect phonological information before they can elide phonological information of the same level of linguistic complexity. Wagnet *et al.* (1994), cited in Anthony (2003), reported that kindergarten children could blend phonemes but not segment words into phonemes. Ouellette and Haley (2013) defined implicit awareness as a higher sensitivity towards a certain sound structure at the word or syllable level the gained solely from oral vocabulary before literacy is introduced. On the other hand, explicit awareness is a conscious awareness on a phonemic level, usually acquired at the point at which letters or literacy is introduced. As well as developing awareness of linguistic dimensional skills, such as syllable or phonemes, children also develop phonological awareness related to cognition, such as identifying and manipulating the word components.

Anthony and Francis (2005) proposed the Developmental Psycholinguistic Conceptualisation of Phonological Awareness, which emphasised the importance of counting the developmental stage of the child before testing phonological skills. For example, although both phoneme segmentation and phoneme deletion measure phoneme awareness, the task levels of difficulty are different. Some tasks (such as deleting and blending) require higher cognitive skill than others (segmenting) because, as children age, their cognitive capacity to handle phonological tasks increases (Branum-Martin *et al.*, 2012). Therefore, due to the varied degree of cognitive ability across ages and individuals, a non-verbal intelligence test is commonly used to control phonological awareness scores in phonological awareness studies.

2.1.4 Phonological Awareness and Oral Language Skills

The level of oral language vocabulary skills relates to the level of phonological awareness, which emerges among young preliterate children through subconscious lexical restructuring processes (Walley, Metsala, and Garlock, 2003).

Section 2.1.4.1 reviews the Lexical Restructuring Model in detail and presents a review of studies that provide evidence for the model (Section 2.1.4.2).

2.1.4.1 The Lexical Restructuring Model

According to The Lexical Restructuring Model (LRM) by Metsala and Walley (1998), phonological awareness is initially developed through a mental process of restructuring vocabulary in the spoken language during early years of life. This process occurs when a child subconsciously process vocabulary that they hear in the spoken language as a single lexicon and gradually as a segmented lexicon (Walley *et al.*, 2003). Some words sound similar to one another, and to distinguish them, a child must mentally restructure words' phonological structures, which allow them to be stored in their mental lexicon as two different words. For instance, 'cat' is different to 'can' in the final sound, which is /t/ versus /n/. Goodrich and Lonigan (2016) illustrated the process of restructuring as follows: 'To keep phonologically similar words distinct in the lexicon, it is necessary to be able to detect the differences between the words. To do so, children's mental representations of words shift from holistic forms to more segmented forms' (Lonigan, 2016, p. 685). Based on this model, certain words have a greater chance of being restructured in the child's mental lexicon (Metsala and Walley, 1998; Goodrich and Lonigan, 2016). The following are the determinative factors:

The first factor is related to the child's age of the acquisition of a given word. Words acquired earlier in life have a higher chance of being restructured than those acquired later in life (Goodrich and Lonigan, 2016, p. 685). Goodrich and Lonigan (2016), in a study of Spanish-English bilinguals' phonological awareness, used a parental survey to collect information on the children's age of acquisition of some Spanish words to be used in a phonological awareness task. The parents' rating of this age of acquisition was then averaged to obtain a value for each word (Goodrich and Lonigan, 2016, p. 690). The age of acquisition was found to be related to the participants' likelihood to respond correctly to a given item used in a phonological awareness task. For instance, Child A had known and used the word 'break' since he was 3 years old, whilst Child B had just heard and used the word a few months ago. The two children were five years old and given a test to segment the word into onset and rime. Child A had a higher chance of performing the task correctly compared to Child B due to his familiarity with the word. This child's brain has stored the word ‘break’ both lexically (holistically), and sub-lexically (separately from words ‘bake’ or ‘brave’). In LRM, vocabulary growth is essential in phonological awareness development.

The second factor is related to the word’s frequency of occurrence in the child’s life. The higher the frequency of occurrence, the higher the chance of the word being restructured in the child’s brain. This factor has been considered in a number of studies. For example, Reddy and Koda (2012) used a classroom teacher survey in deciding Kannada (an Indian language) words that would be included in a phonological awareness task. The study included only items that had been approved as familiar to participants.

The final two factors are phonological neighbourhoods and phonotactic probability. Phonological neighbourhoods can be defined as a word that has neighbours or words in a given language that only differ by one phoneme. The more neighbours the word has, the higher the occurrence of restructuring, which makes it easier for children to manipulate the word. Goswami (2006) emphasised the importance of this factor above other factors proposed by Metsala and Waley (1998) because it represents more of the language-specific aspect of phonological awareness than the others. The nature of a word’s neighbours in a language may differ depending on other aspects of phonological structure, such as proportion of open versus closed syllables or sonority profiles (Goswami, 2006, p. 467).

The final factor is the phonotactic probability. Instead of words, this factor deals with the probability of occurrence of a certain phonological structure, such as a consonant cluster in each language. Words containing frequently occurring sounds or sound combinations have a higher chance of undergoing restructuring, which means that these words are easier to work on or to manipulate. Goodrich and Lonigan (2016) used the online database CLEARPOND (Marian *et al.*, 2012) to generate English and Spanish words used in their study. This database is a cross-linguistic resource for phonological and orthographic neighbourhood densities in English, Dutch, French, German, and Spanish. The findings indicated that the phonological awareness task items containing high-frequency sound or sound combination easier for participants than items containing lower sound/sound combinations. This high-frequency sound combination is not the same as high-frequency words. Onsets /br/, /st/, and /tr/ are familiar sound combinations in English, but words 'brig', 'stag' or 'troat' are unfamiliar words despite containing familiar English sounds or sound combinations.

2.1.4.2 Evidence from Select Studies

Durgunoglu and Oney (1999a) investigated the influence a spoken language's phonological characteristics may have on phonological awareness among kindergarten-first grade Turkish- and English-speaking children. The Turkish children (n = 94) and US children (n = 44) attended public schools in Istanbul and Minnesota, respectively. These children were tested for letter recognition, letter usage, decoding, and phonological awareness tasks. Unique to this study is that the phonological awareness tasks, which consisted of syllable segmentation, phoneme segmentation, initial and final phoneme deletion, were all given in identical pseudo-words that adhered to the phonological rules of both languages. The examples of the pseudo-words were '*fid', 'nud', 'lef*' and '*rem'*. It was not explained how these words were given, whether administered by the same or different experimenter. The findings suggest that the Turkish children outperformed the English children in (1) syllable tapping, which measured one's ability in segmenting words into syllables, and (2) final phoneme deletion, which measured one's ability in deleting the final phoneme of a word. The authors suggested that it was the Turkish syllable-saliency that triggered the findings.

Caravolas and Bruck (1993) compared the phonological awareness of Czech-speaking children to that of English-speaking children. This study that Czech preliterate children were better at isolating consonants, which was explained by the high frequency of consonant-cluster words in their language. An analysis comparing word frequency in English books and Czech books found that Czech has 285 consonant cluster combinations, whereas English had only 31 combinations (Caravolas and Bruck, 1993, p. 6).

Cooper, Roth, and Speece (2002) conducted a longitudinal study on students from kindergarten (n=88) to second grade (n=52), all of whom spoke English as a native language, and found that oral language proficiency played an independent role, aside from orthographic knowledge in phonological awareness. The oral language skills were measured in terms of semantic, morphological, and syntactic features. In terms of semantic features, participants were given receptive vocabulary tasks (choosing one out of four pictures for a word given orally by an experimenter), word retrieval (naming as many words as possible from a category), and oral definition test (defining orally a set of words). For syntactic and morphological oral language skills, measures included an auditory comprehension test (multiple-choice listening comprehension task), receptive syntax (repeating sentences given by the experimenter) and an expressive syntactic measure (analysing students' spontaneous speech). Phonological awareness was tested with phoneme blending (combining sounds to make a word) and elision (deleting certain sounds of a word) tests. The study reported that the overall oral language skill measured predicted significant and meaningful proportions of unique variance in phonological awareness skills from kindergarten to second grade, beyond the influence of letter and word knowledge (Cooper *et al.*, 2002).

Cheung *et al.* (2010) in a study involving Chinese-English kindergarten, second grade, and fourth grade students in Hong Kong (total=141), found that phonological awareness was uniquely predicted by speech perception. Speech perception was tested in both English and Chinese using two kinds of tasks, namely syllable discrimination and categorical perception. In the first task, the child was prompted to determine if two spoken syllables were the same or different. In the second tasks, the child judged if a spoken syllable, given orally, was /kwaal/ or /gwaal/, by pressing one of two designated buttons with the words written on. The authors suggested that these findings were consistent with lexical restructuring theory (Metsala and Walley, 1998).

The role of oral language in phonological awareness was not only assessed on a lexicon level, but also investigated on a narrative skill level. Four- to five-year-old English monolingual children were tested for their expressive vocabulary, narrative discourse skill, non-verbal reasoning, alphabet knowledge, phonological memory, word reading, and phonological awareness (Hipfner-Boucher *et al.*, 2014). In the study conducted, the narrative skill was measured through a story-retelling task using illustration and wordless picture books. The results showed a significant, unique contribution made by the narrative story structuring skill in blending and elision. This contribution was more significant than the contribution of vocabulary (Hipfner-Boucher *et al.*, 2014).

A study of Singaporean bilingual children provided evidence supporting the Lexical Restructuring Hypothesis (Dixon, Chuang, and Quiroz, 2012). This study found that the Mandarin, Malay, and Indian home-language user children's English vocabulary level statistically significantly predicted English phonological awareness scores together with the mother's level of education. The authors of this study argued that children did not simply acquire higher phonological awareness at higher vocabulary levels automatically. However, something that more highly educated mothers were doing seemed to be enhancing these children's phonological awareness after the children had reached a certain threshold on the vocabulary score. The authors emphasised the pivotal influence of language practices used at home by the mother, such as nursery rhymes or literacy practices (Dixon *et al.*, 2012. p. 387).

Girard and Girolametto (2013) found a correlation between kindergarten children's phonological awareness and peer exclusion behaviour. The parents rated 102 children's (52 boys and 50 girls) behaviours in a pre-test. Following the pre-test, the children were tested for their expressive vocabulary, non-verbal intelligence, and phonological awareness skills. The results revealed the negative correlation between literacy and problematic social behaviours (Girard and Girolametto, 2013), while also illustrating the critical role of spoken language experience, phonological awareness, and literacy acquisition in general.

A recent study of Spanish-English bilinguals by Goodrich *et al.* (2014), comparing L1 and L2 scores in phonological awareness and language oral skills of 466 Spanish-English preschool bilinguals in the United States, found that PA-PA correlation was stronger in participants with high L1 and L2 oral proficiency skills and weaker among those with low English oral proficiency skills.

In short, oral language skills, particularly vocabulary skills, are a significant predictor of phonological awareness in a process of lexical restructuring.

2.1.5 Phonological Awareness and Reading

The study of phonological awareness is inseparable from that of reading acquisition. According to Koda and Zehler (2008, p. 5), phonological awareness (PA) and literacy have a reciprocal relationship. This relationship entails that the development of this awareness before literacy supports literacy acquisition. Similarly, being introduced to letters and spelling further enhances this awareness (Anthony and Francis, 2005; Gombert, 1992; Seymour, 2006).

2.1.5.1 Phonological Awareness in Early Reading

Introduction to literacy is widely understood to increase phonological awareness (Anthony and Francis, 2005; Gombert, 1992; Seymour 2006). Ouellette and Haley (2013) defined implicit awareness as a higher sensitivity towards a certain sound structure at a word or syllable level gained solely from oral vocabulary or before literacy is introduced. According to Ouellette and Haley (2013), introduction to literacy turns phonological sensitivity into phonological awareness, or explicit awareness, a more conscious knowledge of phonological structures. Loizou and Stuart (2003) provided evidence of the alphabetic knowledge effect when testing monolingual Greek, monolingual English, bilingual Greek-English, and bilingual English-Greek children for phonological awareness. Despite all samples' ages being the same (five-years-old), Greek-English bilinguals and Greek monolinguals were reported to have not received literacy instruction. These two groups were reported to have poorer performance in phonological awareness compared to the other two groups, indicating the benefit of alphabetic knowledge in PA.

According to Goswami (2008), phoneme awareness emerges at different ages in different languages, depending on (1) the syllable structure of the language and (2) the transparency with which orthography represents phonemes and morphology (Goswami and Ziegler, 2006). Among all orthographies, alphabetic- and phoneme-based orthographies are the most effective in promoting phonological awareness (Anthony and Francis, 2005; Kuo and Anderson, 2008).

Many studies have attempted to examine how different consistency levels of language orthography influence reading acquisition. In a study conducted on monolingual English and Czech children, Caravolas *et al.* (2005) found that phoneme awareness played the same important role in predicting reading speed, conventional spelling, and reading comprehension in both transparent Czech and opaque English orthographies. The Czech monolingual group consisted of 107 children from second to fifth grade, ranging from 7 years old to 11 years old. The English group consisted of 71 children ranging from 6 to 12 years old. Both groups were taught literacy skills with phonic methods and were equal in cognitive skills and social background. The two groups were tested for spelling, reading comprehension, reading speed, and phoneme deletion tasks, all of which were assessed in their own language. Both groups had their phoneme awareness score correlated with their word reading, suggesting the importance of phoneme awareness in transparent and opaque orthographies.

A study of the transparency of Greek orthography by Rothou, Padeliadu, and Sideridis (2013) tested 120 first graders and 123 second graders for phonological awareness (phoneme deletion and phoneme segmentation), morphological awareness, decoding, and receptive vocabulary skills. In first grade, phonological awareness was found to predict decoding skills, whereas, in second grade, none of the measures significantly predicted decoding skills. This finding supported the decreasing role of phonological awareness in reading transparent orthgraphies, as a child ages (Deacon, 2012). The implications of this decreasing role is that as children decode high-frequency words fluently, they start to read words lexically and stop reading sublexically, except for unknown words (Deacon, 2012; Marcolini, Burani and Colombo, 2009; Maionchi-Pino, Magnan and Ecalle, 2010).

In an acquisition study of English orthography by Deacon (2012), phonological awareness predicted the real and pseudo-word reading scores. The study that took place in Canada had 202 first- to third-grade, English-speaking children from seven rural schools as participants. Phonological awareness was measured in terms of phoneme, syllable, and cluster deletions. Independent contributions of phonological awareness of early word reading of first- to third-grade, English-speaking children were found to be larger than morphological or orthographical awareness.

Phonological awareness is an important predictor in reading alphabetic language, but importance level varies by the degree of the script's opaqueness (Ziegler *et al.*, 2010). Georgiou, Parilla, and Papadopoulos (2008), through a longitudinal study on English and Greek-speaking children, focused on comparing the predictors of reading acquisition in deep orthography, orthography with low consistency of its letter-sound relationships, shallow orthographies, and orthographies with higher sound-letter relationship consistency. The study measured phonological awareness, phonological memory, rapid naming speed, orthographic processing, word decoding, and reading fluency of 110 English-speaking children and 70 Greek-speaking children two times, both in first and second grades. The results showed that both phonological and orthographic processing contributed uniquely to reading ability in first and second grades. However, the importance of these predictors was different in the two languages, particularly in terms of their effect on word decoding. Reading in transparent orthographies was reported to acquire fewer phonological awareness skills compared to reading in deep orthographies.

Furthermore, commonly, word reading skills may be predicted by more than one phonological unit size. For example, alphabetic languages, which are phonologically simple and transparent in consonant-vowel constructions, are also salient on a syllable level. Aidinis and Nunes (2001) found that Greek reading was predicted by both syllable and phoneme, suggesting the multi-dimensional role of phonological awareness in reading and writing. The Indonesian alphabet is transparent and predicted by phonemes and syllables (Winskel and Widjaja, 2007), and the Malaysian alphabet is predicted by syllables followed by phonemes (Yeong and Liow, 2012). English is a language with high onset-rime consistency, such as *all-call-tall-fall*, which all have *all* rimes, and *brown-break-brush-*

bring, which all have *br*- onsets. Therefore, English reading acquisition is predicted both by phoneme and onset-rime awareness (Ziegler and Goswami, 2005; Anthony *et al.*, 2003).

Moreover, it is not only the writing systems that influence phonological awareness, but also how the writing system is impacts the child's phonological awareness. The phonic approach, for instance, is now used side by side with the 'look and say' method in English literacy teaching in English-speaking countries to increase children's phonological awareness and help them to learn to read efficiently (Hatcher *et al.*, 2004). Lundberg *et al.* (2012) reported that a phonemic awareness training programme supported children detected to have lower phonemic awareness. Therefore, phonological awareness training, similar to what is included in the phonic approach, supports phonological awareness development.

2.1.5.2 The Role of Phonological Awareness in Later Stages of Reading

Vaessen *et al.* (2010) provided evidence of the decreasing role of phonological awareness as the child ages. This decrease has been reported to occur in both transparent and opaque language readers. The study compared the cognitive dynamic of reading fluency of first-fourth grade students literate in Hungarian, Dutch, and Portuguese. The findings showed that regardless of the depth of the orthography, the child's phonological awareness in reading fluency decreased over time, whereas the rapid naming role reportedly increased. Based on these findings, the authors suggested that there was a universal cognitive basis for fluent word reading across alphabetic orthographies (Vaessen *et al.*, 2010), at least for the orthographies included in the study.

Although the role of phonological awareness in literacy acquisition has been reported to be decreasing in older children, Castles *et al.* (2003) found that orthographic knowledge may still influence phonological awareness performance among adult readers.

The study conducted an experiment on 51 English-speaking first-year psychology students in Melbourne (age = 20 years old). Orthographic knowledge was measured with a spelling test containing 30 long, irregularly spelt words, while phonological awareness was tested using phoneme deletion and a phoneme reversal task. The phoneme deletion task consisted of 45 items using transparent words or words with a one-to-one relationship of the letter and the sound, while the other half of the words were opaque items or words with an inconsistent letter-sound relationship. In the phoneme reversal task, participants were asked to reverse the sounds from the given word, e.g. '*mood' – 'doom'*. The task consisted of 40 words, with half of the words transparent, such as '*mood'* and '*meet',* while the other half was opaque, such as '*gnome'* and '*quiche'.* The results illustrated a significant correlation between spelling accuracy and performance in transparent items, whereas the correlation between spelling accuracy and performance among the opaque items was insignificant. The results showed that adults found it easier to delete phonemes on items where there was a direct correspondence between letters and the target sounds, e.g. /rʌ/ in '*struggle'*, than where there is not, e.g. /wʌ/ in '*squabble'*. These findings provide evidence of a spelling-phonological awareness relationship in that orthographic knowledge affects phonological awareness performance.

In Cheung *et al.* (2001), three groups of children from different linguistic backgrounds were compared in terms of their phonological awareness development. The first group consisted of Cantonese-speaking children from Hong Kong who only read logographic Chinese, whereas the second group consisted of Cantonese-speaking Guangzhu children who were exposed to both logographic Chinese and Pinyin (alphabetic Chinese), and the final groups was a group of English-speaking children in New Zealand who read only Roman letters. Other than these linguistic backgrounds, participants were also grouped according to their reading and pre-literate levels. Children were measured for phonological awareness in their own language (either Cantonese or English), and phonological awareness was measured using sound-matching technique where the child was asked to choose one of two items that sounded more like the target item. The phonological awareness subcomponents tested were whole syllable, onset, rime, and coda. The results showed that pre-literate Guangzhou and Hong Kong children attained a very similar level of performance on all phonological awareness tasks, due to speaking the same language and –at this stage—the absence of orthographic knowledge. However, Guangzhou-reading children performed better than their Hong Kong counterparts in onset and coda matching, and the writers suggested that this finding was due to the better orthographic experience for children who read alphabetic orthography. Guangzhou children learnt Pinyin in reading Cantonese words, and so they had experience of classifying the Cantonese one-syllabic words based on onset and coda. This study is an example of circumstances where children speak only one language, but their two different writing systems lead them to have a different form of phonological awareness.

Although there has been considerable debate on the role of spelling as a barrier or support for phonological awareness and reading, a meta-analysis study found that children learning alphabetic spelling through explicit instruction will have higher phonemic awareness (Graham and Santangelo, 2014). Seven studies were analysed to determine the correlation between various approaches of spelling instruction (e.g. with or without intervention, less or more instruction) in phonological awareness and reading skills. The results of this study suggested that taught spelling instruction increases one’s phonological awareness and word reading skills by shaping children’s knowledge of phonemic awareness and strengthening their grasp on the alphabetic principle (Graham and Santangelo, 2014, p. 1704).

In conclusion, early reading is predicted by phonological awareness, but the introduction to literacy develops the smallest phonological awareness unit, phoneme awareness. Phoneme awareness, sometimes referred to as phonemic awareness, is a significant predictor of both transparent and opaque orthography reading with the relationship, with transparent orthography predicted as stronger. The correlation between phonological awareness and reading is reported to be weaker in older students, although orthographic knowledge continues to influence adults' phonological awareness performance.

2.1.6 Phonological Awareness in Bilingual/Multilingual Children

This section reviews studies of phonological awareness conducted on bilinguals using different language pairs and different writing system pairs. The impact of bilingualism on phonological awareness and the concept of phonological awareness transfer are also discussed.

According to Barac *et al.* (2014), the effect of dual language experience on phonological awareness is unclear because studies have reported mixed results when comparing bilingual and monolingual groups. Some of these studies have found that bilinguals outperformed monolinguals (Bialystok, Majumder, and Martin, 2003; Verhoeven, 2007; Barac and Bialystok, 2012), whereas others have insisted that monolinguals outperformed bilinguals (Bruck and Genesee, 1995; Bialystok *et al.*, 2014; Goodrich and Lonigan, 2016). A number of studies have also found no differences between the groups (Guron and Lundberg, 2003). Barac *et al.* (2014) suggested that these varied results were caused by multiple factors, such as the specific language pairs, language characteristics, and orthography.

In Bruck and Genesee (1995), monolinguals were reported to have performed better than bilinguals in phonological awareness skills. The study was a longitudinal study of English-speaking children in French immersion school. The participants were tested twice: at the time of kindergarten and in first grade. In the first study, bilingual children (n =91) performed an onset-rime awareness task better than English monolingual age-matched peers from English schools (n = 72). In the second study, monolinguals performed better in the phoneme awareness task, and bilinguals performed better in the syllable awareness task. The authors suggested that English monolinguals' performance in phoneme tasks was caused by the phonological awareness instruction given explicitly at schools, while the bilinguals' syllable task attainment was due to their second language input on phonological awareness.

In Bialystok, Majumder, and Martin (2003), the results were different for each L1. The study found that Spanish-English bilinguals performed better than English-speaking monolinguals in an English phoneme-segmentation task, but Chinese-English bilinguals performed worse compared to English monolinguals (Bialystok, Majumder, and Martin, 2003). Moreover, although Chinese-English bilinguals performed worse in the English phoneme-segmentation task, there were no differences found in phoneme substitution.

In an English-Swedish bilingual context, differences in Swedish phonological awareness skills were not found between English-Swedish bilinguals and Swedish monolinguals. The authors suggested that this finding was a result of the bilinguals' high proficiency in Swedish, the language of the phonological awareness tested (Guron and Lundberg, 2003). Guron *et al.* (2003) investigated Swedish monolinguals and children learning Swedish as an Additional Language (SAL), and only a Swedish phonological awareness was administered to both monolingual Swedish and bilingual English-Swedish children. Guron and Lundberg (2003) and Bialystok, Majumder, and Martin (2003) focused on the phonological awareness in only one out of two bilinguals' languages. The non-significant differences found in these studies may be due to the test being given in the strong or mainstream language. Many studies on bilingual phonological awareness were initially conducted neglecting the phonological skills of the bilingual's other language and only testing participants in phonological awareness of the mainstream language (Bruck and Genesee, 1995; Bialystok *et al.*, 2003; Verhoeven, 2007). As a result, bilinguals' phonological awareness could not be fully understood. Cho and McBride-Chang (2005) stated that they had failed to examine how the subsequent English phonological awareness developed from Time 1 to Time 2 of their longitudinal study of Korean-English bilinguals' phonological awareness because they did not administer English phonological awareness tests to the subjects at Time 1. The author's reason was that the children had not been given English instruction yet at that time. This study found that information on Korean phonological awareness from Time 1 was not sufficient for them in predicting complex English PA. Therefore, measuring phonological awareness among multilingual children should be done by taking into account all the languages that the children know (Loizou and Stuart, 2003; Cho and McBride-Chang, 2005).

Testing both in L1 Korean and L2 English, Kang (2012) found that Korean-English bilinguals, 5-6-year-old children (n = 70), outperformed Korean monolingual kindergarten students in both English and Korean phoneme awareness, rime awareness, real and pseudo-word reading in L1 Korean and L2 English. This study found that phonological awareness skills were transferable across languages both bilingual and monolingual groups. Kang (2012) suggested that the study provided evidence for the benefit of dual orthographic knowledge, in Korean and English, for phonological awareness.

Haigh *et al.* (2011) found the L1 phonological awareness skill predicted not only L1 reading, but also L2 reading skills. The longitudinal study was conducted on English-dominant children in a French immersion programme. The 98 children were tested on phoneme and onset-rime awareness tasks during first grade and tested again in second grade along with the word reading tests. The results showed a strong correlation between first grade phonological awareness performance with French word reading performance in the second grade, suggesting that L1 phonological awareness is transferrable to L2 reading through phonological awareness transfer. Haigh *et al.* (2011) focused their research solely on the development of phonological awareness across time and the transfer that occurred across bilinguals' language skills. The study did not discuss how bilingualism and monolingualism differ in their ability to enable children to manipulate sounds in general.

Bruck and Genesee (1995) found that the level of reading instruction was more effective in predicting phonological awareness than bilingualism. Reading instruction, which results in orthographic knowledge, and its significant role was also found in Reder *et al.* (2013). Ninety-five French-German bilinguals and fifty-two French monolinguals, all in the first grade when data was collected, were compared for their syntactical, morphological, and phonological awareness (Reder *et al.*, 2013). Of these three levels of metalinguistic awareness, bilingualism benefits occurred only on syntactical and compound-morphological levels; benefits were absent on morphological[1] and phonological levels. The authors argued that the similar orthographies of German and French lowered bilinguals' advantage in terms of phonology, and the bilingual group did not need to analyse and compare linguistic features or may not have paid particular attention to syllables and phonemes any more than monolingual children (Reder *et al.*, 2013, p. 698). Furthermore, all participants were all literate in the alphabet and had acquired phoneme awareness equally through literacy instruction (Reder *et al.*, 2013).

[1] This level involves affix deletion and addition.

The relationship between phonological awareness and bilingualism is complex because the orthographic factor plays an important role in phonological awareness. Moreover, in a bilingual context, orthographic influence may be the result of more than one writing system. Melby-Lervag and Lervag (2011) found that orthographic distance (alphabetic-alphabetic or alphabetic/non-alphabetic) may be a possible cause of phonological awareness transfer. From a meta-analysis of 47 studies of English learner bilinguals, this study found a high transfer in the aspects of phonology and decoding, and that the transfer was higher in samples where both L1 and L2 were alphabetic than where the L2 was alphabetic and L1 was morphosyllabic. A meta-analysis study by Branum-Martin *et al.* (2012) found that the cross-language correlation of phonological awareness tasks was influenced heavily by language used and, to some extent, by the linguistic grain size of the tasks (phoneme, syllable, or onset-rime). The study listed and analysed 38 phonological awareness studies that examined the role of phonological awareness across languages. Melby-Lervag and Lervag (2011) found the higher transfer across phoneme-based orthographies, such as Korean-English, Greek-English, and Spanish-English. Orthographic distance on phonological awareness and bilingualism was also reported to be found among adults (Holm and Dodd, 1996).

As well as orthographic knowledge, language proficiency, i.e. which language is weaker or stronger, the difference between balanced and imbalanced bilinguals, means that research on phonological awareness in a bilingual context is more complex. Phonological awareness transfer has been reported to occur from the weaker language to the stronger language (Anthony *et al.*, 2009). Laurent and Martinot (2010) suggested that bilingual balance proficiency was a critical factor in researching the role of bilingualism in literacy. However, instead of comparing bilingual groups based on their L1-L2 proficiency balance, Laurent and Martinot (2010) conducted a longitudinal study on French-Occitan bilingual children investigating at which point of a bilingual programme the benefit of bilingualism could be seen. Two groups of children, the monolingual and the bilingual groups, were followed from third to fourth grades, and the other group was bilingual and monolingual children from fifth grades, making three groups altogether. Each group was divided into monolingual and bilingual subgroups to compare. Participants were tested in three phonological awareness tests using pseudo-words whose characteristics matched the French language (Laurent and Martinot, 2010, p. 441). The tests assessed syllable deletion, phoneme deletion, and permutation (putting sounds or syllables in a reverse order). The results showed that the positive influence of bilingualism was not found until fourth grade. The data from fourth and fifth grades indicated that French-Occitan bilinguals outperformed monolingual French students in most of the phonological awareness tasks. Laurent and Martinot (2009) concluded that their study supported Cummins' Threshold Hypothesis (1979) that bilingualism advantage can be gained when a certain level of proficiency across the two languages is achieved.

In another study, phonological awareness levels among bilinguals were reported to be determined by how the two languages were acquired (Gottardo *et al.*, 2015). Conducting a longitudinal study using early reading children with orthographically-varied L1, Gottardo *et al.* (2015) found that sequential and simultaneous bilinguals differed in terms of phonemic awareness and reading transfer. The participants were L1 Chinese, Portuguese, and Spanish children learning L2 English in 19 schools in predominantly middle-class and working-class neighbourhoods in two Canadian cities. English was the language of instruction, while the heritage language was spoken at home with a number of children attending weekly heritage language class. The aim of the study was to challenge Ziegler and Goswami's (2005) Psycholinguistic Grain Size Theory by examining if the specific subcomponents of phonological awareness were related to English reading for each group of L2 learners. The findings supported the theory. Reading in Spanish and Portuguese were correlated to phonemic awareness, whereas reading in Chinese was uniquely correlated to tone detection. Although phonemic awareness predicted reading in Spanish and Portuguese, Spanish phonemic awareness was related to Spanish reading, and Portuguese reading was related to English phonemic awareness. Gottardo *et al.* (2015) concluded this finding was due to Portuguese-English simultaneous nature of bilinguals, whereas Spanish-English children were stronger in Spanish skills due to their sequential bilingual nature with the English language (Gottardo *et al.*, 2015).

According to a number of studies, the benefit of bilingualism in phonological processing skills (e.g. phonological awareness or speech discrimination) is caused by the more extensive phonological inventories as the results of being exposed to two different phonological systems (Cenoz, 2013; Escudero *et al.*, 2013; Silven and Rubinov, 2010).

Finnish and Russian speakers differ significantly in term of phoneme inventories, syllabic complexities, and stress patterns in words (Silven and Rubinov, 2010, p. 389). To determine if having been exposed to both languages before literacy could affect phonological awareness, Finnish-Russian 4-year-old bilinguals who were selected exclusively from Russian-Finnish parents were examined for the benefits of bilingualism in Silven and Rubinov (2010). These children were assessed for language proficiency, semantic, morphological, and phonological skills. The phonological measures included rhyme detection tasks in Finnish and Russian. The children were asked to identify two rhyming words from three words given. The next phonological awareness task was syllable segmentation, where the children were asked to tap on the table while pronouncing the given word. One tap represented one syllable. The next task was syllable substitution, where the children were asked to change one syllable from a word to produce another word. As phoneme awareness measure, the children were asked to identify the first sound of a word. Lastly, the children were tested for their working memory by being asked to repeat two-digit number sequence (e.g. two-nine) after the experimenter. In this study, infants raised in monolingual Finnish-speaking families were not different from bilingual peers reared in Finnish-Russian-speaking families in terms of phonological awareness, and so the authors predicted that the absence of the bilingualism effect may be caused by an imbalance in the proficiency of the bilinguals, where the participants were more dominant in Finnish (Silven and Rubinov, 2010). Despite the non-significant role of bilingualism, the participants' phonological awareness scores across languages were significantly correlated.

The benefit of bilingualism was reported only in cases where the second language was simpler phonologically to the first one (Melby-Lervag and Lervag, 2011; Branum-Martin *et al.*, 2012; Anthony *et al.*, 2009). The study examined Spanish-speaking English learners' development of phonological awareness by focusing on vocabulary, letter knowledge, and prior phonological awareness scores. The study was conducted in the US and involved40 preschool classrooms in the Texas area. The classrooms were varied in terms of Spanish-English usage: some children spoke more English than Spanish, some spoke more Spanish than English, some spoke equal English and Spanish, some spoke only Spanish, some others spoke only English. Due to the variety of English-Spanish use, a sampling strategy enabling the removal of classroom context effects was employed. The students who passed Spanish and English language screens were given phonological awareness tests in both languages. The results supported the Interdependence Theory by Cummins' (1979), that phonological awareness from one language can be transferred to another less-dominant language.

The role of orthographic knowledge, bilingual proficiency, and language distance is implied in almost all studies above. Bilingual children's literacy skills, level of proficiency, and first and second language similarities determine their phonological awareness development across the two languages. The transfer of phonological awareness across languages has driven researchers to determine if knowledge is something universal across languages or is language-specific. Before presenting studies that specifically investigate the nature of phonological awareness in bilingual children, it is necessary to re-review Guron and Lundberg (2003), which tested Swedish monolinguals and English-Swedish bilingual children for Swedish phonological awareness. Guron and Lundberg (2003) found that both groups were not significantly different due to similar levels of Swedish proficiency. The findings were interpreted by the authors as evidence for the universality of metalinguistic awareness. Guron and Lundberg (2003) suggested that metalinguistic awareness skills do not need to be learned separately in each language because they are transferable between languages, and that testing a bilingual's phonological awareness in one of their languages is considered sufficient as long as the proficiency in the tested language is relatively high. This perspective of phonological awareness and bilingualism cannot justify the cognitive nature of phonological awareness in bilinguals. To understand the nature of phonological awareness in someone who is exposed to more than one language, all languages must be considered.

A study found that the high transfers of phonological awareness across bilinguals' languages were caused by similarities in assessing the skill in each language. Branum-Martin, Tao, and Garnaat (2015) analysed the means, standard deviations, and sample sizes reported in 25 studies referenced in Branum-Martin *et al.* (2012) using a structural equation model. The study focused on examining the causes of the correlations to determine whether they were due to the similarity of tasks used in measuring the phonological awareness. The findings suggested that the measures' similarity was an important cause of the high or low correlations between phonological awareness across languages. For example, the Korean and English PA's measures in three studies of Korean-English phonological awareness adequately represented a single, cross-language factor (Branum-Martin *et al.*, 2015, p. 118). Based on the findings of Branum-Martin, Tao, and Garnaat (2005), it may be argued that phonological awareness, to some extent, is language-specific, but the task type, e.g. deletion or segmentation, is what makes it universal.

As well as analysing the inter-language phonological awareness scores, Comeau *et al.* (1999) also analysed word reading scores across languages. Comeau *et al.* (1999) studied students in first, third, and fifth grades in an English-French bilingual immersion programme. This study found that the correlations between phonological awareness skills across languages were as strong as the correlations found with word-reading skills. Of these findings, and along with findings from Cisero and Royer (1995) and Caravolas and Bruck (1993) on English-Spanish bilingual subjects, Comeau *et al.* (1999) concluded that phonological awareness was a universal skill across languages rather than language-specific.

Engel de Abreau and Gathercole (2012) examined the specific links between executive processes of working memory, phonological short-term memory, phonological awareness, and proficiency in L1, L2, and L3 of 8-9-year-old Luxemburgish, German, and French trilinguals. This study tested phonological awareness in participants' native language, Luxemburgish, and found that the scores were significantly related to all three languages' vocabulary, grammar, and word reading, suggesting that phonological awareness represents distinguishable constructs in young multilingual children (Engel de Abreau and Gathercole, 2012, p. 8).

However, according to Reddy and Koda (2013), phonological awareness is not a single unitary construct because its multiple facets are differentially related to literacy development. Interlanguage transfer of phonological awareness among biliterates, bilinguals who read in two languages, occurs only regarding the facets of phonological awareness needed to read in both orthographies. For example, phonological awareness transfers of biliterate bilinguals reading alphasyllabic Kannada, a writing system of an Indian language in which consonant-vowel sequences are written as a unit, and alphabetic English demonstrated transfer only in terms of phonemic awareness (Reddy and Koda, 2013). Kannada syllable awareness was reported only correlated to English phonemic awareness but not with English syllable awareness. The authors suggested that this finding was because both writing systems involved phonemes in their decoding processes (Reddy and Koda, 2013, p. 125). Syllable awareness may also be involved, but only in Kannada, and not in English opaque orthography. It may be concluded that bilinguals' transfer of phonological awareness is determined by orthographic factors, such as similarities in the writing system, how similar the writing system is and the level of phonological awareness involved in both orthographies' decoding processes. However, a significant number of researchers have suggested that oral language is a key factor in bilinguals' phonological awareness (Cheung *et al.*, 2001; Goodrich, Lonigan and Farver, 2014; Goodrich and Lonigan, 2016; Ziegler and Goswami, 2005).

Ziegler and Goswami (2005) suggested that the differences in the characteristics of the spoken languages are a more plausible source of developmental differences in global levels of phonological awareness attained. Tone awareness among Chinese-English bilinguals, for example, was reported to have an unclear role in English phonological awareness and English reading (Branum-Martin *et al.*, 2012). English is not a tonal language, and although tone awareness is essential in reading Chinese, it has not been reported to have a role in English L2 reading (McBride-Change *et al.*, 2004).

Ziegler and Goswami's argument (2005) is supported by Goodrich and Lonigan (2014), who found stronger correlations between L1 and L2 phonological awareness if L2 expressive vocabulary was higher. According to Goodrich, Lonigan, and Farver (2014, p.

127), phonological awareness skills can be broken down into language-independent and language-specific components. The language independent skill is what is commonly transferred into another language and causes phonological awareness results across languages. The higher the L2 oral language skills, the higher the language-specific phonological awareness in the L2, allowing individuals to perform better in L2 phonological awareness tasks. The study confirmed that the correlations between phonological awareness and oral language skills were, to some extent, language-specific.

The language-specific phonological awareness skills discussed in Goodrich, Lonigan, and Farver (2014) were theorised in the lexical restructuring model (Metsala and Walley, 1998) (See Section 2.14). Goodrich and Lonigan (2016) examined the lexical characteristics of Spanish and English lexicon and Spanish-speaking children's phonological awareness development. Two independent groups of preschool language-minority children, consisting of 553 and 600 children each, were tested for word blending and elision skills and naming and definitional vocabulary skills. The findings offered little support for the Lexical Restructuring Model in L1 Spanish phonological awareness development but considerable support for the Lexical Restructuring Model in L2 English phonological awareness development. The lexical characteristics of the English words predicted the children's English phonological awareness performance (Goodrich and Lonigan, 2016, p. 697). The authors judged that this finding was due to the lack of deliberate of L1 Spanish word manipulation, which had caused the non-significant role of L1 Spanish lexical characteristics.

To conclude, phonological awareness is transferrable across languages. Bilinguals transfer their phonological awareness from their strongest language to the weaker language accordance with the Interdependence Hypothesis (Cummins, 1979), although there is also evidence of transfer determined by the second language in Goodrich and Lonigan (2016).

The transfer of phonological awareness between the two languages of biliterate bilinguals is determined by the orthographic similarities of both languages, and only the phonological awareness involved in the decoding process of both orthographies correlates significantly (Reddy and Koda, 2013). Moreover, when bilinguals are compared to monolingual peers in terms of phonological awareness skills, bilinguals' levels of vocabulary in both of their languages, not only one, must be considered to avoid bilingual shared-vocabulary factors (Hoff *et al.*, 2012). In terms of the nature of phonological awareness in bilinguals' brains, researchers have continued to debate to what extent ability is language-specific, and to what extent it is universal across languages. Studies of phonological awareness conducted in bilingual children have shown significant correlations between phonological awareness skills across languages (Branum-Martin *et al.*, 2015).

2.2 Learning to Read

Reading involves obtaining meaning from printed symbols (Ziegler and Goswami, 2006). There are two 'routes' of reading: phonological or sub-lexical and visual or lexical (Marshal and Newcombe, 1973; Goswami and Bryant, 1990). The skill of mapping symbols in a writing system is phonological decoding or recoding (Ziegler and Goswami, 2006; Goswami and Ziegler, 2006; Ziegler *et al.*, 2010; Ziegler and Goswami, 2005). The skill of reading words by recognising the patterns or pictures is the visual reading route (Gillon, 2004).

Recent studies have shown that the phonological route is the first route taken by early readers before mastering the lexical route (Aaron *et al.*, 1999; Marcolini, Burani and Colombo, 2009; Maionchi-Pino, Magnan, and Ecalle, 2010). Aaron *et al.* (1999) found that early readers rely on decoding skill in reading familiar words, although, for some words, they can name them quite rapidly. Students in later grades and college, in contrast, read the words using a predominantly word-sight route, or a visual route. The findings implied that the word-sight reading was founded on being able to decode words first (Aaron *et al.*, 1999) .

2.2.1 Language and Orthographic Variety

According to Perfetti and Dunlap (2008, p. 15), language orthographies can be distinguished based on two principles: the size of phonological information in mapping the language to forms and the mapping rule consistency. Based on the first principle, a language's orthography can be alphabetic (phoneme-based, e.g. English, Italian, Indonesian, Korean Hangul), syllabic (syllable-based, e.g. Japanese Hiragana, Indian Kannada), or logographic/morpho-syllabic (picture/logo/meaning-based, e.g. Mandarin Chinese).

In terms of mapping rule consistency, a language's orthography is distinguished based on how consistent the written and the spoken relationships are. A deep/opaque language (e.g. English, Arabic) has many inconsistencies in the sound-spelling relationship, in which one letter/graph represents many sounds, and one sound can be represented by graph(s) in more than one way. In contrast, a shallow/transparent orthography has a clearer and consistent graph-sound relationship.

English, Indonesian, and Korean are all alphabetic languages because they use phonemic units to map their languages into symbols (Perfetti and Dunlap, 2008). However, the three language's orthographies are not alike in other aspects. First, English and Indonesian orthographies are not alike to Korean because the first two use Roman alphabetic letters, while Korean uses the Hangul alphabet. Moreover, despite the similarities between English and Indonesian in terms of the alphabetic type, they are not alike in terms of orthographic consistency. English has most of its letter-sound relationships inconsistent. This inconsistency is due to the language's complex graphemic units. For example, the letter <c> is pronounced /k/ in 'cat' but pronounced /s/ in 'pencil'. Reversely, sound /u/ is represented several ways in print, with the grapheme <u> in 'full' or the diagraph <oo> in 'foot'.

Unlike English, Indonesian is orthographically consistent (Winskel and Widjaja, 2007). The 26 alphabetic letters represent sounds almost one-to-one. The /k/ sound is represented only by the letter [k], such as in the word *kaki*, which means 'foot'. Similarly, the sound / ʧ/ is always represented by letter [c], such as in the word *cuci,* which means 'wash'. Furthermore, although Korean is written using a alphabetic type from Indonesian, both are similar in terms of orthographic consistency. Korean Hangul is also consistent in terms of the sound-letter relationships (Cho and McBride-Chang, 2005; Wang, Park, and Lee, 2006; Kang, 2012).

In some cases, orthography can be both transparent and opaque. Icelandic and Greek writing systems are writing systems that are transparent to read, but opaque to write (Pind, 2006; Georgiou, Torppa *et al.*, 2012). Another example of a system that is both opaque and transparent is Greek. Greek pronunciation can be consistently predicted from spelling but is relatively opaque in spelling For example, the phoneme /i/ can be written in five different ways: <η>, <ι>, <υ>, <ει>, and <οι> (Rothou, Padeliadu, and Sideridis, 2013; Aidinis and Nunes, 2001). Investigating reading models for English, Greek, and Finnish, Georgiou *et al.* (2012) proposed future research on reading that would no longer perceive orthographic transparency in a monodirectional way, but in a bidirectional way, because spelling and decoding affect the importance of different cognitive skills in literacy development (Georgiou *et al.*, 2012).

The indirect relationships between spoken dialects and standard orthography can also impact literacy learning by degrading motivation (Terry, 2014). This study looked at the Nonmainstream American English (NMAE) used in a spoken context by Native Americans. The NMAE spoken dialect has a relatively distant correspondence with Standard English orthography, which resulted in disappointment among the speakers when encountering how different the sounds and spelling are. For example, the word ‘fast’ is pronounced /fas/ in NMAE.

2.2.2 Theories of Learning to Read

Because each language has specific orthographic characteristics, children across languages learn to read at different speeds and using different strategies. The following section reviews hypotheses on learning to read across different orthographies.

2.2.2.1 The Orthographic Depth Hypothesis (Kartz and Frost, 1992)

This hypothesis suggested that shallow orthographies are easier to read through a phonological route, whereas opaque orthographies are easier to read using a visual route (Kartz and Frost, 1992).

This hypothesis has two branches, which are referred to as the strong and the weak Orthographic Depth Hypotheses. The strong version posits that the phonological route is sufficient in reading both transparent or shallow orthographies and that the sight-reading technique is sufficient in reading deep orthographies. Kartz and Frost (1992) supported the weak version of the hypothesis, which posits that the word reading process in transparent or opaque languages, to some extent, still allows for the possibility of other routes being involved. For example, it is possible to have stored lexical phonology in reading transparent language rather than just pre-lexical letter-phonology correspondences.

Goswami *et al.* (2003) examined reading strategies used by English- and German-reading children in sounding out non-words. There were two types of non-word reading tasks giving to 7-, 8-, and 9-year-old German-speaking children: large and small unit word reading tasks. The large unit words were orthographic neighbours of real words. For example, for English, the words were *dake, bicket*, and *bactory* (from *cake, ticket*, and *factory*). The small unit words were non-words that were not the orthographic neighbours of the real words. For example, if the real word was *fake,* the non-word was *daik* rather than *dake*. These words were then given under two conditions. The first of these conditions was the blocked condition, where the large and small unit words were given separately in a different list. In the second condition, the large and small-unit non-words were given in a mixed condition. The German readers were expected to employ a grapheme-sound strategy relying on the sub-lexical route and would treat the non-words the same (sub-lexically) under both conditions. The English readers were expected to employ different reading strategies to read the non-words under different conditions. The results found that, unlike German readers, who relied only on small-size units, English readers switched back and forth to and from lexical and sub-lexical strategies (Liow and Poon, 1998) when reading under the mixed condition. Goswami *et al.* (2003) concluded that the flexibility of reading strategies was influenced by the nature of the orthography.

One of the studies that support this Orthographic Depth hypothesis is Ellis *et al.* (2004). This study expanded on the number of languages studies to include Greek, Albanian, Kanji, and Hiragana, alongside English. This study investigated orthographic readers to determine how children age 6-15 years old acquired the skill to read aloud based on the orthographic level of opaqueness. Measuring for the response accuracy, latency, and error types, this study found that the transparent orthographies, Hiragana, Greek, and Albanian, were the easiest to read in terms of those measured criteria, compared to the opaque ones, English and Kanji. This study confirmed that that the more opaque the language, the more time a learner needs to acquire the skills to read in that language.

In brief, this hypothesis asserts that the level of orthographic transparency determines the rapidity of reading acquisition, with shallow orthographies as the most rapidly learnt. However, orthographic depth is complex. English, for instance, is categorised as deep, but the process of its word recognition is highly phonologically mediated (Seidenberg, 1992, p. 88). Although this theory explains the correlation between the rapidity of early reading acquisition and the depth of orthography in many languages (Ellis *et al.*, 2004), it fails to explain reading acquisition in English orthography.

2.2.2.2 Psycholinguistic Grain Size Theory (Ziegler and Goswami, 2005)

The theory emphasises three important issues in mapping the word reading acquisition process, namely availability, consistency, and granularity. Availability refers to whether all phonological information held by symbols/letters is available prior to learning, which is indicated by a person's spoken language skills. Letter knowledge, or the knowledge of the sounds of all letters in a writing system determines learning success. The second issue is the consistency, which refers to the level of reliability of the relationship between the letters and the sounds. An orthography is consistent when it has a high number of one-to-one relationships between its letters and the sounds that they represent. The higher the consistency, the more easily that the writing system is mastered. The final issue is granularity or linguistic unit size (whether morpheme, syllable, or phoneme) used to map the language. Granularity also determines the level of difficulty that a writing system poses to a child learning to read. Chinese uses morphemes as the smallest linguistic information to map the language in the writing system, which means that the learner must acquire/know all morphemes in Chinese to be able to fully master reading. As the number of sounds are not as many as the number of morphemes or syllables in a language, learning to read alphabetic languages takes less time than learning to read languages mapped in larger phonological units, such as syllables or words (Ziegler and Goswami, 2005, p. 13).

The Psycholinguistic Grain Size Theory explains the relationship between the levels of phonological awareness necessary to use in the writing system (Ziegler and Goswami, 2005). According to Branum-Martin *et al.* (2012), Psycholinguistic Grain Size Theory may explain developmental progression in English reading acquisition (Anthony and Lonigan, 2004) (See Subsection 2.1.3). If the Orthographic Depth Hypothesis covers solely consistency, which is related to spelling and pronunciation, the Psycholinguistic Grain Size

Theory covers other factors, such as spoken language (availability) and speed of acquisition. Transparent alphabetic languages use the smallest grain size, and so learning to read in those languages takes a relatively shorter time. English orthography takes a longer time to acquire because readers rely on both small (phoneme) and large (rhyme) grain sizes to read the orthography because of phoneme-letter inconsistencies (Treiman and Zukowski, 1991; Treiman and Kessler, 1995; Savage and Carless, 2005).

Winskel and Iemwanthong (2010), using Psycholinguistic Grain Size Theory, investigated and explained the learning to read process of Thai orthography. Thai is a consistent alphabetic writing system with vowels placed vertically above, below, or at the sides of consonants. The study found that, instead of making more phonological errors, Thai readers made more lexical errors reading tasks. This finding indicated that Thai readers relied on different phonological grain sizes to read their writing system. Instead of relying on phoneme level like other transparent alphabetic language readers, Thai children rely on a larger grain size on a lexico-syllabic level. The authors suggested that this lexical or word-sight strategy employed by Thai readers was caused by the orthography's similar characteristics with both alphabetic and syllabic scripts (Winskel and Iemwanthong, 2010).

Moreover, the Psycholinguistic Grain Size Theory can also explain cross-language reading acquisition through the use of phonological awareness transfers (Branum-Martin *et al.*, 2012). In meta-analysis of studies of phonological awareness and word reading transfers from a number of languages to English, studies that used composite manipulations may have greater cross-language correlations than syllable level tasks, implying that tasks involving multiple grain sizes may involve processes that are more closely related across languages. (See Sections 2.1.4 – 2.1.6).

Among L1 Spanish and English language learners, Spanish phonological awareness predicts English oral reading fluency (Ellis *et al.*, 2004; Solari *et al.*, 2014). Solari *et al.*

(2014) sought predictors of English oral reading fluency among the L1 Spanish kindergarten and first grade students in California, US. The 150 participants were tested at kindergarten level (Time 1) and again in first grade (Time 2). The participants were administered phonological awareness, vocabulary, letter knowledge, decoding, and oral reading fluency tasks. In the last task, the children were asked to read a passage in English and the correct number of words read in a minute was counted. The results suggested that Spanish phonological awareness and decoding skill predicted English oral reading fluency (Solari *et al.*, 2014).

2.2.2.3 The Phonological Linkage Hypothesis (Hatcher, Hulme, and Ellis, 1994)

This theory emphasises the importance of combining both explicit phonology teaching and reading for maximum success in acquiring literacy. Hatcher, Hulme, and Ellis (1994) argued that spending an equivalent amount of time concentrating on either component in isolation is less effective.

Vellutino *et al.* (2004) supported this theory, stating that other than biological factors, poor readers are impaired because of inadequate instruction. A meta-analysis by the National Reading Panel reported that phonemic awareness instruction helps children learn to read in English (Ehri *et al.*, 2001). Explicit phoneme training combined with phonic reading instruction was also reported to help children avoid reading failure, which was determined by dividing a child's reading age test scores by their chronological age (Hatcher, Hulme, and Snowling, 2004). Kjeldsen *et al.* (2014) found that the effects of letter knowledge and phonological awareness training in 209 Swedish-speaking kindergarten children was positively associated with the level of decoding skills in third grade.

However, when comparing phonemic awareness and Spanish reading between Spanish-speaking children at various levels of phonemic instruction, Goldenberg *et al.* (2014) found a relatively insignificant role of phonemic awareness in Spanish reading, though the role for English reading was reported to be more significant. This result implied varied levels of significance in terms of instruction (letter knowledge or phonological awareness) for different literacy acquisition. Based on the findings of Goldernberg *et al.* (2014), it may be understood that transparent orthographies require less explicit instruction than opaque orthographies.

Contrary to the Phonological Linkage Hypothesis, which emphasises the importance of both explicit teaching of phonology and literacy practices (e.g. reading and writing), Dixon (2011) found that Singaporean bilingual kindergarten children, who were reported have lower English spoken exposure vocabulary than US kindergarten children, outscored the US norm in writing but scored lower in phonological awareness. Singaporean children never gained phonological instruction but were exposed to English writing and spelling practices. The author took the findings as evidence of possible English literacy acquisition, such as spelling, when English was not taught using the phonic approach, the phonological literacy instruction.

Based on the three theories discussed in this section this paper concludes that in a learning to read process, the factors that influence the speed of the acquisition include the type of the language, the type of orthography (e.g. deep or opaque, phoneme-based, or syllable-based), the children’s spoken knowledge of the language (spoken vocabulary level), and the methods/approach of how reading is introduced (whether phonological awareness training is given and whether reading practices are enforced).

2.2.3 Factors that Predict Word Reading Skill

The three theories have all placed phonological awareness and phonological awareness training as important factors in early reading acquisition. However, several other factors have been suggested as key predictors of early reading success.

2.2.3.1 Letter Knowledge

Letter knowledge, or knowledge of letter identities by names or sounds (Muter and Diethelm, 2001), has been found to be strongly correlated with early reading development (Muter, Snowling, and Taylor, 1998; Winskel and Widjaja, 2007; Leppanen *et al.*, 2008; Anthony *et al.*, 2009; Duranovic, Huseinbasic, and Tinjak, 2012; Manolitsis *et al.*, 2009; Winskel, 2013). In a study of English learners from different language backgrounds in Switzerland, across first-grade children, Muter and Diethelm (2001) found that letter knowledge was the most important predictor of reading skill followed by phonological segmentation ability (phoneme identification, deletion, and sound blending), and vocabulary.

The pivotal role of letter knowledge was also reported in the reading acquisition of orthographically consistent languages such as Indonesian and Bosnian (Winskel and Widjaja, 2007; Duranovic *et al.*, 2012). Duravonic *et al.* (2012) conducted a study on 505 preschool Bosnian-speaking children, and found that letter knowledge was an important reading predictor. The study also found that letter knowledge was associated with all phonological measures (Duranovic *et al.*, 2012).

The consistency between letter names and the sounds that they represent, to some extent, makes a difference to children’s phonological awareness (Winskel, 2013). Although Indonesian and Malaysian orthographies are both alphabetic and transparent, the different letter names between orthographies cause Indonesian readers to rely more heavily on the phoneme than the syllable, whereas Malaysian readers rely more heavily on the syllable than the phoneme (Winskel, 2013). According to Winskel (2013), the reason for this variation is the ways in which the orthographies were originally developed. Malaysian children use an alphabet derived from English, where letters have less direct relationships with sounds that they represent. Indonesian, on the other hand, is modelled on the Portuguese alphabet. Young readers rely on Portuguese alphabet, which has more direct correspondences with the sounds. To illustrate, *Ayam* is the word for chicken, both in Indonesian and Malaysian. In both languages, this word is pronounced /ʌjʌm/. The Indonesian letter names for this word subsequently are /ʌ/, /ʝe/, /ʌ/, and /em/, while the Malaysian names are /ei/, /wʌi/, /ei/, and /em/.

2.2.3.2 Orthographic Processing

The term orthographic processing is often used interchangeably with lexical processing or look-and-say or sight-word reading strategy (see Section 2.2). The notion has been defined as the ability to remember word spellings and regularities in letter sequences (Cunningham and Stanovic, 1990). However, later scholars have specified the theory in terms of finer grains, not only covering the ability to remember word letter sequences, but also including letter sequences of sub-lexical elements, such as [i-e] letter combination in words ‘fine’, ‘line’, or ‘desire’ (Deacon, 2012; Sprenger-Charolles *et al.*, 2003; Commissaire *et al.*, 2014).

Deacon (2012) argued that orthographic processing on a lexical level was reported to make an independent contribution to both word and non-word skills among children learning to read in English. Lexical-level orthographic skills were measured with a task in which the participant was to choose one from two alternative spellings, which are each phonologically plausible for a specific word (e.g. *boal* versus *bowl*).

Commissaire *et al.* (2014) measured Canadian English-French bilingual first and second graders' development of orthographic processing on both lexical and sub-lexical levels. On a lexical level, a child was to choose the correct spelling of the target word given orally by an examiner, e.g. *rain* or *rane.* For sub-lexical orthographic processing, the ability was measured by asking the child to decide which of two pseudo-words (and very high-frequent words), e.g. *cruck* or *cruq*, looked more like an English word, when English words allowed [uck] ending such as in 'truck'. The results showed that bilinguals of French and English have underlying orthographic processing skills due to similarities that both languages share (Commissaire *et al.*, 2014, p. 16).

Therefore, in reading across languages, transfer is more easily achieved between two orthographically similar languages (Melby-Lervag and Lervag, 2011; Branum-Martin *et al.*, 2012). Two writing systems can be equally phoneme-based or alphabetic, like Korean Hangul and English Roman, but the visual forms of the letters are dissimilar (Korean uses the Hangul system, whereas English uses Roman system), and so the two languages are not orthographically similar (Wang *et al.*, 2006). The definition of orthographic processing is not limited to the ability to memorise the visual look of a word, but also the visual look of a syllable, or sounds such as letters or characters.

2.2.3.3 Rapid Automatized Naming (RAN)

While orthographic processing deals with the ability to memorise the visual forms of speech lexically and sub-lexically, rapid automatized naming (RAN) deals with the level of fluency with which one can retrieve that memory. In other words, RAN is the ability to retrieve the pronunciations associated with symbols (letters and words) fluently (Georgiou, Papadopoulos *et al.*, 2012). RAN is measured through articulation time and pause time, and in a study on Greek literacy acquisition, RAN was correlated with reading fluency of Greek children followed from second to sixth grade (Georgiou *et al.*, 2012). The authors suggested that RAN is related to reading because it involves serial processing and oral production of the names of stimuli (Georgiou *et al.*, 2013).

According to Georgiou *et al.* (2008, p. 576), for transparent orthographic readers, RAN, or the speed of naming things, is more important than orthographic processing. Orthographic processing, which tested by asking children to choose the correct-spelled word from a word pair, was reported to be less important in decoding Greek transparent orthography but important in reading the English opaque orthography because English words have common letter patterns that can be decoded as orthographic unit rather than letter-by-letter (Georgiou *et al.*, 2008).

In a longitudinal study of English, Spanish, Czech, and Slovak monolingual children (n = 675), Caravolas *et al.* (2012, p. 684) proposed RAN as one of the reading predictors in all alphabetic languages involved, along with phoneme awareness and letter-sound knowledge. The authors of this study suggested that RAN is not like phoneme awareness and letter knowledge, which are skills that form alphabetic principle. Instead, RAN is a different mechanism regarding printed words and pronunciation (Caravolas *et al.*, 2012, p. 684). Somebody with higher phoneme awareness and letter knowledge but lesser knowledge of RAN is able to read correctly but not fluently.

2.2.3.4 Oral Vocabulary Skills

Section 2.1.4 discussed how oral language skills develop phonological awareness through a mental lexical restructuring process (Metsala and Walley, 1998). Sections 2.1.5 and 2.2.2 discussed the critical role of phonological awareness in literacy acquisition using the Psycholinguistic Grain Size Theory (Ziegler and Goswami, 2005). When both sections are summarised, oral vocabulary skills, mediated by lexical restructuring and phonological awareness, predict reading acquisition. This section reviews studies that provide evidence for how oral vocabulary skills impact directly literacy acquisition.

Ouellette (2006) demonstrated that not all oral language skills related to decoding skills. The study examined closely the role of oral language in literacy skills by distinguishing the breadth (receptive) and the depth (expressive) of vocabulary knowledge among 60 fourth graders in a Canadian urban centre. Although all children spoke and read English as their dominant language, some participants were also exposed to various indigenous languages at home. The participants were measured for non-verbal intelligence, pseudo-word decoding, visual word recognition (children prompted to read aloud a list of orthographically complex words that could not be decoded with regular phonic rules) and reading comprehension. Oral vocabulary was measured through a receptive vocabulary test, an expressive vocabulary test, a word definition test (a word presented in written and verbally that the children were asked to define), and a synonym test (where the children were asked to select from four words, the synonym of the target word). The findings indicated that the breadth of the receptive vocabulary was the only oral vocabulary/feature that predicted decoding performance after age and non-verbal skill were controlled.

Expressive vocabulary predicted reading comprehension, and depth vocabulary knowledge predicted reading comprehension (Ouellette, 2006).

Moreover, in a study on Chinese-speaking children learning L2 English, both English phonological awareness and oral language skills were reported to have predicted English reading skills (Yeung and Chan, 2013). The study also reported that English expressive vocabulary predicted word reading more strongly than picture naming or receptive English vocabulary.

In another study, the role of oral language skills in reading was reflected in phonological familiarity. In examining the role of vocabulary knowledge on decoding reading skills, Nation and Cocksey (2009) argued that the relationship between vocabulary knowledge and the ability to read aloud may only be mediated by lexical phonology or familiarity with the phonological form a word. This argument was based on the findings of their study on 27 English-speaking children (aged 7). The children were prompted to listen and respond if the item that they heard was a word or not. These children were given sets of regular and irregular words along with compatible non-words. Afterwards, the two sets of words were presented on a screen. Results in general showed that known words were read more accurately than unknown words, though it was unclear if the participants knew the meaning of the items that they claimed as words. Despite uncertainty with the semantic role, the authors believed that reading aloud was associated with familiarity of the word's phonological form.

As well as lower reading skills, which include decoding, oral language skills also have significant impact on reading comprehension (Tobia and Bonifacci, 2015). 1,895 first- to fifth- grade Italian children were tested for their oral comprehension, where participants listened to a narrative passage read aloud by an examiner and were asked to answer ten comprehension questions. The variable was found to be correlated significantly to reading comprehension and decoding skills.

The role of oral language skills, particularly oral vocabulary, on reading comprehension was also demonstrated in Rydland, Aukrust, and Fulland (2012). The study took place in Norway, involving 67 language-minority students speaking Urdu and Turkish as L1 and Norwegian as L2. The participants were given a series of tests measuring their reading comprehension and decoding skills in their L2. Oral language skills were measured with a receptive vocabulary task in L1 and L2, and a productive vocabulary task, in which they defined the meaning of words read out loud by the examiner, in L2. The findings showed that L2 reading comprehension was predicted by different facets of L2 oral vocabulary skills. The correlations between word reading, and decoding skills, and oral vocabulary scores were not discussed in the study.

English oral vocabulary has also been found to be a significant predictor of English spelling of Singaporean multilingual children. Once phonological awareness is controlled, vocabulary stills exhibited a much smaller but still significant effect on spelling (Dixon, 2011).

Florit and Cain (2011) reported that the degree of influence from decoding and listening comprehension on reading comprehension is relative based on the types of orthography. 33 studies were included in Florit and Cain's (2011) analyses, 20 of which were carried out with English-speaking children and 13 of which were conducted with children speaking other European languages. The study reported that listening comprehension is a key predictor of reading comprehension during the first years of schooling for readers of transparent orthographies, whereas decoding influences reading comprehension more strongly and for a longer period of development in English readers than those of more transparent orthographies (Florit and Cain, 2011). Based on these findings, it may be concluded that a transparent language reader can easily decode all words in a sentence correctly but they prioritise fully understanding the meaning of the sentence, and so they need to have a sufficient level of vocabulary gained from spoken language experience. On the contrary, opaque language readers commonly would not understand a sentence without first successfully knowing how to sound out all printed words in it. Therefore, decoding and spoken language experience both have a strong relationship in language learning.

2.3 Bilingualism Advantages in Phonology and Literacy

Despite the complex factors involved in a bilingual's phonological awareness development, there must be a significant role played by bilingualism independent of those of orthographic and phonological awareness. This section discusses studies that have been conducted with the aim of determining the role of bilingualism in early literacy acquisition.

2.3.1 Russian-Hebrew Biliterate Bilinguals Learning L3 English

A number of studies have been conducted on Russian-Hebrew bilingual contexts and confirm the benefit of Hebrew-Russian bilingual biliteracy on the bilinguals' multi-literacy skills (Schwartz *et al.*, 2007; Leikin and Schwartz, 2009; and Haddan, Kogan, and Walters, 2010). This subsection discusses the research by Schwartz *et al.* (2007) in detail.

Schwartz *et al.* (2007) was conducted in Israel in a multilingual context where Hebrew was the mainstream language used in education, and English instruction was given from the third grade. Schwatz *et al.* (2007) investigated the impact of biliteracy in Russian and Hebrew on Russian immigrant children's literacy skill development in L3 English. Three groups of eleven-year-old children were involved in the study. The first group was biliterate bilinguals in Russian and Hebrew, the second group was composed of monoliterate bilinguals of Russian and Hebrew, literate in Hebrew, and the third group was comprised of monoliterate monolinguals literate in Hebrew. The groups were compared across five literacy skills and four metalinguistic and linguistic skills in English. The first literacy skill was the word identification test where the child was asked to read a list of words in English of increasing difficulty. The second test was a word attack test, where the children were asked to read pseudo-words from simple monosyllabic to multi-syllabic words with complex vowel patterns. The following test was the identification of high-frequency words, where the children were assessed for not only their reading accuracy, but also their reading rate of high-frequent English words. The fourth test given was the identification of high-frequent word test; the spelling of high-frequent words, where participants were asked to spell words taken from the previous tests. The last English literacy skill test was pseudo-word spelling test in which the participant was asked to spell pseudo-words with English orthographic patterns. Schwartz *et al.* (2007) administered the following tests: English initial consonant deletion; final consonant deletion; phoneme analysis, where children were asked to break words into phonemes; and an English grammatical test, where the child was asked to repeat reading a sentence with a missing word and asked to circle one of three words to fill the blank. Schwatz *et al.* (2007) predicted that Russian-Hebrew biliterate children would perform better than the monoliterate bilingual and monoliterate monolingual groups in all L3 English literacy skills, and that Russian literacy would be positively transferred to L3 English literacy skills.

When recruiting participants, Schwartz *et al.* (2007) sought Hebrew monolinguals with matching English learning experience with the bilingual Russian immigrant children through a parental questionnaire. The parental questionnaire was also used to split bilingual groups into mono and biliterate groups. Schwartz *et al.* (2007) also took into account participants' background language skills by giving them literacy tests in Hebrew and Russian and controlling for intelligence levels by giving a non-verbal intelligence test. The results of Schwartz et al. (2007) provided evidence of the biliteracy advantage. This study found that the biliterate group outperformed the other two groups in English phoneme deletion, phoneme analysis, pseudo-word decoding, and pseudo-word spelling. Biliteracy was reported to predict English word reading accuracy even after Hebrew reading accuracy was controlled. The Russian-Hebrew biliterate group outperformed the Russian-Hebrew monoliterate and Hebrew monolingual groups, not only in L3 English, but also in the Hebrew metalinguistic and literacy skills, phonemic manipulation, and pseudo-word decoding accuracy.

The study provided evidence of how Hebrew vocabulary level did not determine the success of literacy acquisition in language among Russian immigrant children (Schwartz *et al.*, 2007, p. 40). The monoliterate bilingual group, due to a longer length of stay in Israel, was found to have higher Hebrew vocabulary level compared to the biliterate group. Despite the higher Hebrew vocabulary skills, this group performed poorer than the biliterate group in several English and Hebrew literacy and metalinguistic skills. According to Schwartz *et al.* (2007) and Leikin and Schwartz (2009), studies on Russian-Hebrew bilinguals suggested the specific benefits of knowledge of an orthography characterised by a fully-fledged alphabet (Hebrew) with letters representing consonant and vowels (Russian) in the acquisition of another alphabet, such as that of English. In a Russian-Hebrew bilingualism context, it is understood that bilingualism plays a positive role in third literacy acquisition only when both previous orthography skills are acquired and level of proficiency, as proposed in Cummins' Interdependence Theory (1979), is not a determinative factor in this context.

2.3.2 Turkish-Dutch Bilinguals Versus Dutch Monolinguals

Janssen and Bosman (2013) compared monolinguals of Dutch and Turkish-Dutch bilinguals only literate in their L2 Dutch. The study involved immigrant children from various language backgrounds. However, due to a relatively large number of Turkish participants, the authors categorised the groups in their paper in two ways, first by including the Turkish L1 participants along with other participants from the other language backgrounds, and then by excluding the Turkish L1 children as a separate group representing Turkish-Dutch bilinguals.

The study aimed to determine whether bilingually raised children in the Netherlands who received literacy instruction only in their second language had an advantage in Dutch phoneme awareness compared to Dutch monolingual peers. The study expected to find a positive transfer from the participants' Turkish because Turkish is more transparent orthographically than Dutch (Janssen and Bosman, 2013, p. 4). The participants were given a series of tests assessing their phoneme awareness to determine their phoneme segmentation, initial-phoneme and final-phoneme deletion, vocabulary, and word decoding ability. Phoneme awareness tests used pseudo-words that were pronounceable in Turkish and Dutch. In the phoneme segmentation task, participants were asked to repeat the word and tell the experimenter how many sounds there were in the word. In the phoneme deletion tasks, the participants were asked to repeat the word with a deleted initial sound (for the initial-phoneme deletion task) and final sound (for the final-phoneme deletion task). The same words were used in both tasks. The vocabulary test was given twice, first in Dutch and again in Turkish. The participants were asked to mention the name of nouns or events from 40 picture stimuli. In the final test, Dutch word decoding test, participants were asked to read 150 words arranged in order of increasing orthographic difficulty.

The results did not provide evidence of bilingualism's positive role in phoneme awareness. When monolingual and bilingual groups were compared for their phoneme awareness scores, the result did not show any significant differences. The only significant difference found was in Dutch vocabulary. Turkish-Dutch bilinguals were reported to have significantly lower Dutch vocabulary than Dutch monolingual peers. However, both groups were not different in phoneme awareness nor word decoding performance (Janssen and Bosman, 2013, p. 10).

Janssen and Bosman (2013) obtained similar finding to those of Schwartz *et al.* (2007) on the role of vocabulary. Similar to the findings reported in Schwartz (2007), Janssen and Bosman (2013) also found that higher vocabulary knowledge did not determine higher literacy ability. In Schwartz (2007), higher Russian vocabulary knowledge in Russian-Hebrew monoliterate bilinguals compared to Russian-Hebrew biliterate bilinguals did not make them superior in either Russian or Hebrew literacy. Similarly, the lower Dutch vocabulary level of the Turkish-Dutch bilinguals did not make Turkish-Dutch bilinguals perform poorer in Dutch literacy skills compared to their Dutch monolingual peers.

Another study conducted in the Turkish-Dutch bilingualism context was Verhoeven (2007). Verhoeven (2007) showed that kindergarten Turkish-Dutch bilingual children with higher L1 and L2 proficiency performed better in phonological awareness tasks (word objectification, rhyme, phoneme segmentation, and word blending). The language proficiency level of 75 participants was tested twice, both at the beginning and at the end of kindergarten. The participants were found to be dominant in Turkish rather than Dutch, but the gap of the proficiencies was smaller at the end of the kindergarten. The results indicated that children with high L1 Turkish and L2 Dutch performed Dutch phoneme segmentation more efficiently than the subsamples of participants with imbalanced bilingualism (lower L1 or L2).

2.3.3 Basque-Spanish Bilinguals Learning L3 English

Gallardo (2007) aimed to determine the advantage of bilingualism in the phonological competence of L3 English among Basque-Spanish bilinguals. Unlike the two studies reviewed earlier in the chapter (Schwartz *et al.*, 2007 and Janssen and Bosman, 2013), which examined the impact of bilingualism on literacy acquisition, decoding, and phonological awareness, Gallardo (2007) focused on speech discrimination. Gallardo (2007) also used much older participants (9-18-year-old children and teenagers). All participants received education in Basque and spoke Basque and Spanish with different degrees of frequency. The participants were measured for Basque-Spanish use based on questionnaire and their responses, from which they were divided into two groups, namely those with the most and those with the least L1 Basque exposure. Those with an intermediate exposure to daily Basque were eliminated from the sample list. English was taught at school, and most of the participants were reported to have had received the English instruction for 6-7 years when the data was collected. Participants who reported to have English learning experience other than that given by school were also eliminated from the sample.

Gallardo (2007) expected to find a significant difference between the two types of bilinguals in the English speech discrimination test. The two groups were compared for their performances in distinguishing English vowel and consonant phonemes. The phonemes were given in forms of minimal pairs. Before the tests were administered, the participants had the words in the test exposed to them in English lessons. When the words were given to the teacher, the words were grouped based on meaning instead of sound to avoid the teacher explicitly teaching phonetics of the words. The teacher was not told about the intentions of teaching those words also to avoid him/her focusing the teaching on phonetics.

The results demonstrated no significant differences across bilingual groups in speech discrimination performance. Even when the cognitive effect through age level control was controlled, the data still did not show significant differences. Older bilinguals are not different than younger ones in discriminating English sounds. Gallardo (2007) concluded that the positive benefit of bilingualism on third language learning proposed by Cenoz (2003) only applied to third language general proficiency rather than specific phonological competence (Gallardo, 2007, p. 13).

2.4 Conclusion and Relevance to the Present Study

Phonological awareness and literacy acquisition are two inseparable concept. The level of phonological awareness before the instruction of literacy predicts an individual's rate of literacy acquisition. The introduction to reading and letters develops a speaker's phonemic awareness. Although the sequence of development of phonological awareness always starts from the largest to the smallest units across different languages, the phonological and orthographic characteristics of languages mean that the pace of the development vary across different languages.

Languages that are orthographically transparent and alphabetic most easily facilitate the development of phonological awareness. This type of orthography requires less explicit reading instruction, and their transparent phoneme-letter correspondences mean that mapping rules are less complicated and comparatively easy to apply. The other consequence of direct phoneme-letter relationships is the phonological route reading strategy, which relies on the phonemic information provided by each letter. Furthermore, in cross-language reading, this type of orthography has been reported to be the most effective L1 orthographic knowledge to start learning to read in a second orthography. In contrast, an opaque orthography slows the development of phonological awareness unless explicit instruction on the phoneme-letter relationship is provided. English is an example of a language that requires learners to be phonologically aware of both phoneme and onset-rime levels due to significant inconsistencies in the phoneme-level spelling-pronunciation. Therefore, English may be considered a language with reading and spelling skills that are difficult to master.

Studies on phonological awareness and reading acquisition among bilinguals have found that phonological awareness skills are transferable across languages mediated by typological distance, particularly similarities in phonology and orthography. It is easier to acquire biliteracy (literacy skills in two languages) when the two languages are transcribed using the same systems (such as the Roman alphabet), than when the languages are orthographically different (Durgunoglu *et al.*, 1993; D'Angiulli, Siegel, and Serra, 2001). Considering the significant role of oral language skills in the development of phonological awareness through the lexical restructuring process (Metsala and Walley, 1998), and the possibility of phonological awareness transfer across languages, the role of bilinguals' vocabulary levels in both languages should be equally counted in literacy skills.

Moreover, studies on phonological awareness and literacy acquisition have been only conducted on Indo-European, particularly English, and few widely spoken Asian languages, such as Chinese and Japanese. Phonological awareness studies that look at small or less frequently written languages are rare. Furthermore, few studies have focused on skills in three languages in phonological awareness research. The present study aims to fill the research gap by examining phonological awareness and word reading acquisition in two Austronesian languages, namely Indonesian and Acehnese, in relation to English.

CHAPTER 3 ACEHNESE-INDONESIAN PHONOLOGICAL AND ORTHOGRAPHIC SYSTEMS

Acehnese and Indonesian are branches of the Malayo-Sumbawan sub-family of the Austronesian language family (Lewis, 2009). Within this grouping, Acehnese is further classified as a Chamic language, and Indonesian, or Bahasa Indonesia, is a Malay language. Indonesian is spoken by people of Indonesia as the national official language (Lewis, 2009), whereas Acehnese is one of the regional languages spoken by the Acehnese ethnic group of Sumatera, Indonesia. Acehnese is the native language of approximately 3.5 million people (Lewis, 2009) inhabiting Aceh, a provincial state of Indonesia.

3.1 The Historical Review of Acehnese and Indonesian

Before the independence of Indonesia, Malay was spoken in many regions of Southeast Asia, including the Aceh area. For hundreds of years, Malay was a lingua franca for the archipelago (Ansaldo, 2009) and acted as a language of public or "external" communication (Durie, 1996), spoken widely in ports and cosmopolitan urban centres in Southeast Asian kingdoms (Andaya, 2001, p. 45). There was extensive contact with other languages in the area, which resulted in different varieties of Malay being spoken during the 16th-20th centuries (Andaya, 2001, p. 58), such as Bazaar Malay (spoken in the northern region of Malaysia), Baba Malay (spoken in southeast Malaysia and Singapore), Betsuni Malay (spoken in Jakarta, Indonesia), Menado Malay (spoken in Sulawesi, Indonesia), West Papua Malay (spoken in West Papua), among other varieties.

Aceh, before becoming a part of Indonesia in 1945, was a kingdom in its own right located in the northern tip of Sumatra (Takeshi, 1984). The population inhabiting the area at that time spoke Acehnese as their main language and Malay as a second language. During that time, few members of the population spoke Malay. The language was only spoken by royals, scholars, poets, and merchants (Durie, 1996, pp. 114-115). Furthermore, scholars also developed Arabic language proficiency due to contact with Islamic merchants and scholars from the Middle East (Andaya, 2001). As well as sharing a number of cognates with Malay, both inherently and from borrowings, Acehnese also borrowed a significant number of words from Arabic (Durie, 1996, p. 116). The spread of Islam at that time also played a crucial role in why Acehnese (and Malay) adopts words from Arabic (Al-Harbi, 2003).

Linguists have agreed that Acehnese belongs to the Chamic sub-family within the Austronesian language family (Blust, 1994; Thurgood, 1999; Sidwell, 2006) and therefore is a descendant of the Proto-Malayo-Chamic subgroup (Thurgood, 1999). Other Chamic languages include Champ, Rade, Jarai, Haroi (spoken in Vietnam), and Tsat (spoken in China) (Blust, 1994). A number of theories have been proposed on when languages separated into distinct varieties. Thurgood (1999) predicted that Acehnese separated from other Chamic languages around the 10th century CE, while Sidwell (2006) concluded that the language was separated earlier, in 5th century CE or before Proto-Chamic was influenced by Mon-Khmer. This argument is based on the Acehnese Chamic-lexicon analysis showing that Acehnese has the fewest Mon-Khmer borrowings compared to other Chamic languages, such as Tsai and Hainan (Sidwell, 2006, p. 199). Thurgood (2007) suggested that it was important to study Acehnese dialects (Table 1.1) and their interactions to understand the language's origins.

In post-colonial era, Malay spoken in now-Indonesia area was enacted as an official national language to unite all small kingdoms in one new nation, Indonesia. This language was called Bahasa Indonesia, which means Indonesian language. Goebel (2002) conducted out a sociolinguistic analysis of the language used around Java to investigate multilingualism in Indonesia and found that Indonesian was mainly used in inter-ethnic contexts functioning to maintain social relationships. According to Alisjahbana (1976), as cited in Kirkpatrick (2010, p. 3), Malay was chosen as the National language of Indonesia may be for the same reason that the language was adopted as a lingua franca for centuries within the Southeast Asian region. This choice was a compromise because it was represented by a small minority and presented no threat to the other ethnic groups in Indonesia. The regional language with the highest number of speakers at that time was Javanese (Ansaldo, 2009). However, Javanese was not chosen to be the new country's language because (1) it was considered a privilege to an already powerful group, (2) because the language was much more complicated in the politeness hierarchical structure compared to Malay, and (3) because it had never served as a lingua franca before (Kirkpatrick, 2010, p. 3).

As a province ruled by the Indonesian government, Aceh has two main languages spoken in its area. These languages are Acehnese (and its dialect varieties) and Indonesian Malay (or Bahasa Indonesia, or Indonesian, henceforth Indonesian). Some other ethnic languages also exist, such as Jamee (a variant of Minang language of West Sumatera), Gayo (a language spoken by Gayo ethnic group inhabiting the mountains of Central Aceh), Kluet (a dialect of Bataknese from North Sumatera province), Tamiang, Simeulue, amongst others (Thurgood, 2007). Among the four main Acehnese dialects spoken in the Aceh area (see Table. 3.1), the northern dialect is the most studied and it is considered the standard Acehnese dialect (Durie, 1985; Yusuf Qismullah and Pillai, 2012).

Table 3.1 Acehnese Dialects Spoken within the Aceh Province of Indonesia (Asyik, 1987, p. 3)

No	Dialect	Spoken in
1	The Greater Aceh Dialect	Aceh Besar Regency
2	The Pidie Dialect	Pidie and Pidie Jaya Regencies
3	The North Aceh Dialect	East Aceh, North Aceh, and Bireuen Regencies
4	The West Aceh Dialect	The Aceh Jaya, West Aceh, Nagan Raya, and South Aceh Regencies

The official status of Indonesian Malay or Indonesian has allowed the language to become the only language used in formal contexts. Indonesian is the language used in politics, education, economics, literature, and the mass media. Due to the new role of Indonesian and its widespread use across the country, smaller languages have become increasingly endangered. Today, there is an increasing number of monolingual speakers of Indonesian in urban areas and a decreasing number of monolingual regional language speakers in rural areas (Lamb and Coleman, 2008, p. 191). A bilingualism survey held in 1980 in 9 of 13 provinces (Nababan, 1985) found that there was a significant increase in people acquiring Indonesian as L1 or home language. A considerable socialisation of the national language, Indonesian, through education and mass media into provisional areas has put many regional languages in danger. In Aceh, particularly, Acehnese is only used at home and social gatherings. The language is also used more in rural areas than in urban ones and is less popular among the younger generation. This language shift toward Indonesian was observed by Durie (1996), who named the phenomenon Malay/Indonesian-ism or M/I-ism. Durie (1996) suggested that the shift is observable in the language choice and in the discourse structure of spoken and written Acehnese texts. Fewer children grow up bilingually in Acehnese and Indonesian, and Indonesian is used in increasing domains while Acehnese is still used only in limited domains. The Acehnese alphabetic writing system is rarely exercised even in Acehnese writing and reading; instead, the Indonesian alphabetic system is preferred.

It is important to highlight that, just like Malay in the past, Indonesian has a great number of dialects. Indonesian spoken in Aceh, and in other areas in Sumatera, has similarities to the Malay variety spoken in Malaysia due to geographical factors. On the phonological level, Aceh-Indonesian and Malaysian Malay (MM) are similar in displaying additional glottal sounds in the word-final codas of *minta*, *pula*, and *bedak*. Words will be realised as /mintaʔ/, /pulaʔ/ and /bədaʔ/ respectively in the Aceh area, but realised as /minta/, /pula/, and /bədak/ in Jakartan (the variety spoken in the capital of Indonesia in Java Island). The Indonesian variety spoken in Aceh also has similarities with MM in supra-segmental sounds like stress and final tones. However, as Aceh is politically a part of Indonesia, the presence of the Jakartan dialect is stronger than that of the Malaysian dialect, particularly in national mass media like TV and films (Lamb and Coleman, 2008).

3.2 Reading and Writing in Acehnese and Indonesian

Before the Western colonial period (before the 15 or 16th century) and during the Islamic spread, Indonesian (Malay at the time) was written using the Jawi writing system (Gallop *et al.*, 2015) , or Jawoe in Acehnese. This writing system used Arabic letters to transcribe words in Malay and Acehnese. Due to different phonological systems between Arabic and Malay, five additional graphemes, namely p, c (ch), g, ng, and ny, were created to represents sounds in Malay (Kratz, 2002; Gallop *et al.*, 2015). In the Aceh region, Arabic, Malay, and Acehnese were all used in literacy (Durie, 1996, p. 116). Acehnese people during the Islamic Sultanate era (16th) learned to read Arabic orthography from reading the Quran. This group did not necessarily understand Arabic because the purpose of the teaching was solely to be able to recite the Holy Book. When this population was familiar with the sound-letter relationship, they learned to read religious books written in Malay Jawi or Acehnese Jawoe (Durie, 1996; Daud, 1997; Nurdin, 2012).

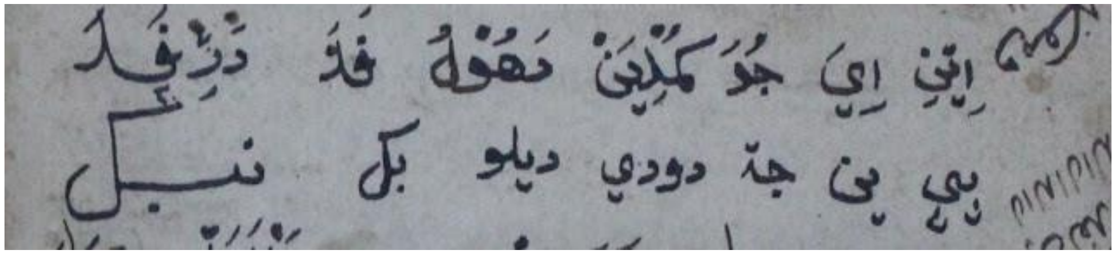

Figure 3.1. Malay (top) and Acehnese (bottom) written in Jawi and Jawoe (Syah, 2016).

Figure 3.1 is an example of words written in Jawi and Jawoe transcripts. Like Arabic, they are read from right to left. On the first line are Malay words *ini, iya, jua, kemudian, dahulu, pada, daripada*, written in Jawi, mean ‘this’, ‘yes’, ‘too’, ‘after that’, ‘then (past)’, ‘at’ and ‘of’, respectively. On the second line are Acehnese words *nyoe, nyan, jéh, dudoe, dilèe, bak, nibak*, which mean ‘this’, ‘that’, ‘that/there’, ‘later’, ‘then (past)’, ‘at’ and ‘on’, respectively.

From the 16th to 17th century, Aceh became the most productive centre of Malay literary activity, particularly in Malay Islamic literature (Andaya, 2001, p. 46). Consequently, Acehnese was influenced by Malay in the form of translations from Malay to Acehnese, something commonly practised by the Acehnese scholars at the time. Linguistic influences from Malay to Acehnese were delivered through *haba*, an activity that involved retelling *hikayat* (metrical-romance translated from Malay literature) to Acehnese villages. The translating of literature from Malay, Persian, Turkish, and Arabic for religious purposes caused many word borrowings from these languages into Acehnese. As European colonialisation expanded, Jawi Malay started to be replaced by the Roman alphabet.

Acehnese phonology itself was first mapped into Roman alphabetic letters by Dutch scholar Snouck Hurgronje in 1892 (Siraishi, 1983; Durie, 1985).

In modern times, Acehnese is still used as a spoken language but is rarely found in written forms. While Acehnese literacy in the Jawoe script was learnt after learning to read and write in Arabic and Malay Jawi (Siraishi, 1983), Acehnese Roman today is also learnt after children learn to read Indonesian Roman. Even after the standardisation of its Roman spelling by following the Indonesian Standard Spelling System, Acehnese literacy is still uncommon. To most Acehnese people, the Acehnese standard writing system is unfamiliar. Acehnese-Indonesian bilinguals become literate in Indonesian from schools and receive Acehnese reading instruction from the third grade of primary school (every school varies in terms of the point at which Acehnese instruction is first given due to regional language status as a content-based instruction in the National Curriculum). Schools that include Acehnese in their curriculum give children Acehnese reading instruction regardless of whether they speak the languages or not.

A study on Acehnese spelling among fourth-grade Acehnese-Indonesian bilinguals (Yulia, 2009) found that both Acehnese-speaking and Indonesian-speaking children transferred the Indonesian spelling system into Acehnese writing. Two groups of children, the first of whom were from Acehnese-speaking families, and the other from Indonesian-speaking families, were compared in terms of Acehnese word-spelling ability. These children were controlled for years of instruction in both languages. The results suggested that children with lower exposure to Acehnese spoken language performed better in Acehnese spelling compared to Indonesian-speaking children. The results also found that even Acehnese-speaking children made significant errors in their Acehnese spelling. Yulia (2009) suggested that errors were caused by a lack of exposure to Acehnese literacy, as well as a lack of instruction in Acehnese spelling.

Based on the author's experience as an Acehnese native speaker beyond a school context, Acehnese-Indonesian bilinguals at all ages are continuously found to write in non-standard Acehnese spelling, both in formal and informal communications. In informal communications, Acehnese non-standard writing is used on social media sites, such as Facebook. In formal contexts, such as newspaper advertisements or political campaign posters on the street, Acehnese is also commonly written in non-standard forms.

3.3 Acehnese and Indonesian Phonological and Orthographic Systems

3.3.1 Vowel Phoneme-Grapheme

Acehnese has more vowel sounds than Indonesian, which is reflected in the wider variety of vowel graphemes. Table 3.2 below illustrates the different oral vowel systems in Acehnese and Indonesian orthographies. The Acehnese chart is based on Asyik (1987, p. 19). Acehnese vowels can be broken down into 10 oral monophthongs and 12 oral diphthongs, while the Indonesian oral vowel system consists only of 8 oral monophthongs and 3 oral diphthongs (Winskel and Widjaja, 2007, p. 24). Acehnese's 10 oral monophthongs are all represented differently by vowel letters that can be broken down into 9 monographs (i, é, è, e, ö, ô, a, o, and u) and one digraph (eu). Indonesian's 8 vowel sounds are represented only by five letters, namely a, i, u, e, and o. In other words, some vowel letters in Indonesian represent more than one phoneme (as seen in Table 3.2). Based on the table, Indonesian diphthongs are highly consistent in terms of sound-digraph relationships, whereas the Acehnese diphthong system is more complex.

Table 3.2 Acehnese and Indonesian Oral Vowel Systems

No	Vowel	Indonesian			Acehnese		
		Letter(s)	**Phoneme(s)**	**Written-word/IPA/meaning**	**Letter(s)**	**Phoneme(s)**	**Written-word/IPA/meaning**
1.	Oral Monophthongs	i	i	pikir /pikir/*think*	i	i	dit /dit/ *little*
		e	e ə ɛ	sore /sore/*afternoon* enam /ənam/*six* becek /bɛcɛk/*muddy*	é	e	ék /ek/ *climb up*
		a	a	mata / mata /*eye*	è	ɛ	pèh /pɛh/*to hit*
		o	o ɔ	toko /toko/*stores (n)* kolot /kɔlɔt/*rigid*	eu	ɯ	neu /nɯ/ *you (polite)*
		u	u	ulat /ʔulat/*caterpillar*	e	ə	ret/rət/*fall*
					ö	ʌ	mantöng /mantʌɧ/*only*
					a	a	brat /brat/*heavy*
					u	u	bu /bu/*(cooked) rice*
					ô	o	lôn /lon/*I (polite)*
					o	ɔ	koh /kɔh/*to cut*
2.	Oral Diphthongs	ai	ai	pantai /pantai/*beach*	ie	iə	wie /wiə/*left*
		au	au	kacau /kaʧau/*chaos*	eue	ɯə	bleuet/blɯət/*to open (eye)*
					ue	uə	glue /gluə/*slippery*
		oi	oi	sepoi /səpoi/*breeze*	èe	ɛə	lagèe /lagɛə/*like(adj)*
					öe	ʌə	thoe /tʰʌə/*dry*
					oe	ɔə	lakoe /lakɔə/*husband*
					ui	ui	apui /ʔapui/*fire*
					ei	əi	hei /həi/*to call*
					ôi	oi	bhôi /bʰoi/*a name of cake*
					öi	ʌi	lagöina /lagʌina/*very*
					oi	ɔi	poih/pɔih/to *hit, to kill*
					ai	ɑi	amai /ʔamai/*good deeds*

Asyik (1987, p. 17) grouped Acehnese diphthong sounds into two kinds according to the final vowel sounds: (1) ə-final diphthongs or (2) i-final diphthongs. Indonesian has three kinds of diphthongs that can only occur in open syllables (Winskel and Widjaja, 2007), whilst some diphthongs in Acehnese (like /iə/, /uə/ or /ɔi/) can also occur in closed syllables (Durie, 1985; Yusuf Qismullah and Pillai, 2012). The diphthongs are represented by digraphs in the Acehnese writing system. Because Indonesian does not allow diphthongs in closed syllables, digraphs in an Acehnese closed syllable can easily be mistaken for two syllable words. For example, the monosyllabic word *lueng* in Acehnese, if decoded using Indonesian decoding principles, may be read as the two-syllable word *lu.eng.* Furthermore, the Acehnese vowel system is rich in nasal sounds. Unlike Indonesian, which has no nasal vowel sounds (Stokhof, 1975, p. 269), except from Arabic loanwords, such as *syair* /ʃɑ’ir/ ‘poet’, Acehnese is rich in nasal vowel sounds (/ĩ/, /ɯ̃/, /ũ/, /ɛ̃/, /ʌ̃/, /ɔ̃/, /ã/, /ĩ^{ə}/, /ɯ̃^{ə}/, /ũ^{ə}/, /ɛ̃^{ə}/, /ã^{i}/), which are minimal pairs (Yusuf and Pillai, 2012, p.1033). The Acehnese nasal vowels are transcribed into written using the symbol <’>before the vowel grapheme(s) (e.g ’a, ’ue, ’ie). In Indonesian, there is not a symbol for nasal vowels. Arabic-origin words, such as *Jumat* /jum.ʔãt/ ‘Friday’, *dai* /da.ʔĩ/ ‘Islamic missionaries’, and *maaf* /ma.ʔãf/ ‘sorry’, are treated in the same way as oral vowels.

3.3.2 Consonant Phoneme-Grapheme

Acehnese and Indonesian have similar consonant inventories, but Acehnese has ‘funny nasals’ (Lawler, 1975) or ‘incomplete nasals’ (Asyik, 1972). These nasals are nasal consonants that do not nasalise the vowel that follows (see Section 3.3.3). Furthermore, Acehnese also has more complex aspirated consonants, consonants that are pronounced with a puff of air, such as /p$^{h/}$, /b^{h}/, and / ʤ^{h}/.

Both nasalised and aspirated sounds are written differently to non-nasalised and non-aspirated counterparts. For aspirated consonants, the addition of the letter <h> after the consonant letter is used.

Both languages have /f/, /z/, and /ʃ/ as borrowed sounds, and Indonesian has a /x/ as a further borrowed sound. Table 3.3 depicts the sound-letter relationships in both languages.

Table 3.3 Acehnese and Indonesian Orthographic Consonantal Systems

No	Consonants	Indonesian			Acehnese		
		Phoneme(s)	Letter(s)	Words/ IPA/ Meaning	Phoneme(s)	Letter(s)	Words/ IPA/ Meaning
1.	Stops	p	p	*pelan* /pəlan/ slow	p p^h	p ph	*pét* /pet/ to shut eyes *phét* /p^het/ bitter
		b	b	*biru* /biru/ blue	b b^h	b bh	*bibi* /bibi/ lips *bhoi* /b^hoi/ a kind of bread
		t	t	*terang* /təraŋ/ bright	t t^h	t th	*tom* /tɔm/ ever *tham* /t^ham/ to disallow
		d	d	*dulu* /dulu/ in the past	d d^h	d dh	*dum* /dum/ many *dhöt* /dhʌt/ to scold
		ʧ	c	*cuka* / ʧuka/ vinegar	ʧ $ʧ^h$	c ch	*cang* / ʧaŋ/ slice *chueng* / $ʧ^{h}$’ũ^{ə}ŋ/ stinky
		ʤ	j	*jiplak* /ʤiplaʔ/ copy	ʤ $ʤ^h$	j jh	*jaroe* /ʤaro^ə/ hand *jhung* /$ʤ^h$uŋ/ to kick
		k k^h	k q kh	*kita* /kita/ we *qari* /kori/ Alquran reader *khidmat* /k^hitmat/ solemn	k k^h	k kh	*kupiyah* /kupijah/ hat *khôp* / k^hop/ to face-down
		g	g	*garuk* /garuʔ/ to scratch	g g^h	g gh	*gigoe* /gigo$^{ə/}$ teeth *ghon* / g^hɔn/ heavy
		ʔ	k	*tidak* /tidaʔ/ not *api* /^{ʔ}api/ fire	ʔ	k	*paneuk* /panωʔ/ short *alôh* /^{ʔ}aloh/ small
2	Fricatives	f	f v	*arif* /^{ʔ}arif/ wise *gravitasi* /grafitasi/ gravitation	f	f	*nafakah* /nafakah/ living
		s	s	*susu*/susu/milk	s	s	*sabée* /sabe^ə/ always
		z	z	*azab* /azap/ afterlife punishment	z	z	*zakeut* /zakωt/ Islamic charity
		ʃ	sy	*syarat* /ʃarat/ conditions	ʃ	sy	*dèsya* /dɛʃa/ sin
		h	h	*harap* /harap/ hope	h	h	*habéh* /habeh/ run-out
3	Nasals	m	m	*mulai* /mulai/ start	m $\underline{m}$	m m b	*mieng* /mĩ^{ə}ŋ/ cheeks *kamba* /ka$\underline{m}$a/ room
		n	n	*panjang* /panʤaŋ/ long	n $\underline{n}$	n nd	*aneuk* /^{ʔ}anω̃ʔ/ child *keundô* /kωndo/ loose
		ɳ	ny	*nyanyi* /ɳaɳi/ to sing	ɳ $\underline{ɳ}$	ny nj	*panyang* /paɳaŋ/ long *ganja*/ga$\underline{ɳ}$a/ cannabis
		ŋ	ng	*tangkap* /taŋkap/ to catch	ŋ $\underline{ŋ}$	ng ngg	*pungoe* /puŋo^ə/ crazy *tunggang* /tu$\underline{ŋ}$aŋ/ stubborn
4	Others	l	l	*lupa* /lupa/ forget	l l^h	l lh	*lalèe* /lalɛ^ə/ ignorant *meulhö* /mωl^{h}ʌ/ fight
		r	r	*rapuh* /rapuh/ fragile	r r^h	r rh	*rugoe* /rugo^ə/ loss *rhom* /r^hom/ to throw
		w	w	*puas* /puwas/ satisfied	w	w	*waréh* /wareh/ relatives
		j	y	*payah* /pajah/ difficult	j	y	*yuek* /ju^{ə}ʔ/ take away

Based on Table 3.3, it may be understood that Acehnese has more sound-letter relationships than Indonesian. Acehnese has 21 monographs, 14 digraphs, and one trigraph for consonants, whereas Indonesian has 21 monographs and 4 digraphs. Two out of four digraphs in Indonesian, <sy> and <kh>, are found only in Arabic-loanwords such as *syahdu* ‘nice’ or *khawatir* ‘worry’. Reversely, Indonesian has two sounds, /f/ and /k/, which are each represented by more than one type of letter. Sounds /f/ and /k/ are sometimes symbolised with <f> and <k> respectively in words such as *aktifitas* ‘activity’ and *keras* ‘rough’, though the sounds are sometimes symbolised with the letters /v/ and /q/ respectively like in loanwords *Quran* ‘Koran’ and *valuta* ‘currency’.

The consonant /ˀ/ is common in both languages and is usually located at the beginning or end of syllables. When this consonant comes at the beginning of the syllables, the syllable is commonly located at the beginning of the word, e.g. *api*, *ular*, or *ayun*. For /ˀ/ located at the end of the syllable, the sound is represented by <k> (See Table 3.3).

3.3.3 Nasal Consonant Transcription

According to Durie (A grammar of Acehnese: On the Basis of Dialect of North Aceh, 1985), vowel-consonant sequences in Acehnese can either be CV (oral consonant + oral vowel), NṼ (nasal stop/regular nasal consonant + nasal vowel), CṼ (oral consonant + nasal vowel), or NV (nasal stop + oral vowel). CV and NṼ sequences are transcribed with regular vowel and consonant graphemes, such as *cut* /ʧut/ ‘Acehnese female royal family name’ for CV, *ngui* /ŋũĩ/ ‘to groom’ for NṼ. For CṼ (oral consonant + nasal vowel), a diacritic [′] is needed before the vowel letter, for example, *c′ut* /ʧũt/ ‘tangled-knot’.

NV was described by Asyik (Bunyi Bahasa dalam Bahasa Aceh, 1978) as “funny nasals” and is transcribed using multigraphs *mb*, *nd*, *nj*, *and ngg*, as shown in Table 3.3. The Acehnese “funny consonant nasals” are extraordinary because the consonants are nasal (e.g. /m/, /n/), but when these consonants are followed by a vowel, the vowels stay oral rather than nasalised. For example, /kama/ sounds more like /kamba/ because a soft /b/ phoneme sound is inserted. Not all Acehnese dialects realise this kind of nasal sound. *Kama / kamba* are either pronounced /kama/ in Pidie dialect or /kamba/ in the Great Aceh dialect.

In Indonesian, only CV (oral consonant + oral vowel) and NṼ (nasal stop/regular nasal consonant + nasal vowel) structures are available. Nasal stops, for instance, are common in the distribution of prefixation MeN- (standard) and N- (colloquial) in spoken Indonesian (Wouk, 2004). The MeN prefix that is attached to stem words with /b/ initial-sound will transform to *mem*- and *meN-baca = membaca*. Whenever this prefix is attached to words beginning with /g/, /k/, and /h/ sounds, it will transform to *meng*-, such as *meN-galang = menggalang* 'to raise', *meN-ketik = mengetik* 'to type', *and meN-hirup = menghirup* 'to inhale'. The CṼ (oral consonant + nasal vowel) structure is available in Indonesian but limited to Arabic loanwords containing [ع] or /ʕ/ (see Section 3.3.2). For this type of Arabic loanwords, Indonesian used to have diacritic [ʹ] symbol. For example, *Jumat* used to be spelled *Jumʹat, and taat* used to be spelled *taʹat.* However, the most recent Indonesian standardised spelling regulation has eliminated the diacritic usage of these words, which are now presented without diacritics in *Kamus Besar Bahasa Indonesian Modern* (Modern Bahasa Indonesia Dictionary) (Ali, 2003).

3.3.4 Syllable Saliency

Indonesian words have clear syllable boundaries (Winskel and Widjaja, 2007), which means that words are easily segmented into syllables. Acehnese is also syllable-salient phonologically. The overall structure of the Acehnese syllable structure is C(C)V(V)(C) (Al-Harbi, 2003), and a syllable in Acehnese may comprise one or two onset consonants, one or two nuclear vowels, and coda consonant. Phonologically, this combination is relatively simple. However, syllable boundaries in some words are less salient in written forms due to diphthong vowels and digraph [eu] that represents monophthong /ɯ/. Consequently, Acehnese words sometimes have a more complex nucleus, or vowel(s) of a syllable, particularly when the diagraph [eu] is combined with a vowel, making a sequence of three vowel graphemes. For instance, the word *peuet* /pɯət/ 'four' is phonologically a /ɯə/ diphthong sound, but when transcribed into the standard Acehnese writing system, it requires three vowels. Furthermore, unlike Indonesian, Acehnese diphthongs are allowed in closed syllables (Yusuf and Pillai, 2012). As a result, Acehnese diphthongs found in a mono-closed-syllable word may be misdecoded as two syllable words in Indonesian, and so the monosyllabic word *peuet* could be pronounced as disyllabic words pe.uet, peu.et, or trisyllabic pe.u.et by Indonesian readers.

Table 3.4 Comparison of Possible Syllable Structures in Acehnese and Indonesian

No	Indonesian syllable		No	Acehnese syllable	
	Phoneme	**Grapheme**		**Phoneme**	**Grapheme**
1	CV	V	1	CV	V
2	CVC	VV	2	CVC	VV
3	CVV	VC	3	CVV	VC
4	CCV	VCC ***eks**.klusif	4	CVVC	CV
5	CCVC* **stok**	CV	5	CCV	CVV
6	CCVV* **trau**.ma, **klau**.sa	CVV	6	CCVC	CVC
7	CCCV* **stra**.te.gi	CVC	7	CCVV	CVVC
8	CCCVC* **struk**.tur	CVCC ***boks**	8	CCVVC	CCV
9		CCV	9		CCVV
10		CCVV	10		CCVC
11		CCVC	11		CCVVC
12		CCCV	12		CVVV
13		CCCVC	13		CVVVC ***peuet**
14			14		CCVVVC ***kreueng**

†a consonant diagraph, such as ny, ng, sy, kh, etc., is counted as one C in grapheme syllable.
†a vowel diagraph, such as eu (in Acehnese), is counted as VV in grapheme syllable.
**examples of words*

However, Acehnese has less complex consonant clusters than Indonesian. As shown in phoneme columns in Table 3.4, Acehnese only allows two consonants maximum in an onset, whereas Indonesian can have up to three consonants in the onset in borrowing words such as *struktur* or *strategi* (adapted from English words ‘structure’ and ‘strategy’, respectively). Acehnese rarely adapts English words given the limited use of the language in formal contexts such as education, mass media, and politics. Neither language allows consonant clusters at the end of the syllable. However, Indonesian allows the <ks> diagraph in some loanwords such as *boks* ‘box’, or *eksklusif* ‘exclusive’. To summarise, Acehnese, to some extent, has less clear syllable boundaries in its written form than Indonesian due to its vowel system. On the other hand, Indonesian is more complex than Acehnese in terms of the onset consonants.

3.3.5 Possible Sounds for Onset and Coda

A syllable consists of at least a nucleus, with or without an onset or coda. The section above argued that Acehnese has more complex vowel systems than Indonesian, and that Acehnese has more single vowel and diphthong variants. These vowels and diphthongs function as the nucleus in every syllable. In terms of syllable nucleus, Acehnese has more variants than Indonesian. However, regarding onset and coda, Acehnese has fewer variants than Indonesian.

Table 3.5 Acehnese and Indonesian's Multi-consonant Onsets

Acehnese	**Indonesian**
/br/ as in *brat* 'heavy'	/br/ as in *ambruk* 'collapse'
/bl/ as in *bloe* 'to buy'	/bl/ as in *sablon* 'screen printing'
/ ʧh/ as in *ch'ueng* 'stinky smell'	-
/ ʧr/ as in *crôh* 'to fry'	/ ʧr/ as in *mencret* 'diarrhoea'
/ʤh/ as in *dhöt* 'to scold'	/ʤh/ as in *dhuhur* 'midday Islamic prayer'
/ʤr/ as in *drop* 'to catch'	/ʤr/ as in *kodrat* 'force of nature'
-	/fl/ as in *fleksibel* 'flexible'
-	/fr/ as in *frustasi* 'frustration'
/gr/ as in *grak* 'to move'	/gr/ as in *gratis* 'free stuff'
/gl/ as in *gluek* 'to dip (hand)'	/gl/ as in *glamor* 'glamour'
/jh/ as in *jhap* 'flat'	-
/jr/ as in *jroeh* 'nice'	-
/kh/ as in *kh'èp* 'smelly'	/kh/ as in *ikhlas* 'sincere'
/kl/ as in *kloe* 'deaf'	/kl/ as in *inklusif* 'inclusive'
/kr/ as in *krueng* 'river'	/kr/ as in *bangkrut* 'bankrupt'
/ph/ as in *phét* 'bitter'	-
/pl/ as in *pluek* 'to peel'	/pl/ as in *plontos* 'bald head'
/pr/ as in *prang* 'war'	/pr/ as in *jepret* 'to capture photos'
-	/st/ as in *stasiun* 'station'
-	/str/ as in *ekstra* 'extra'
-	/sw/ as in *swalayan* 'supermarket'
	/sk/ as in *skala*
/th/ as in *thôn*	-
/tr/ as in *troe*	/tr/ as in *truk*

The onset is always a consonant that appears before the vowel or the nucleus of a syllable. Acehnese allows almost all consonants listed in the left half Table 3.3 as single onsets. However, only those listed in left side of Table 3.5 are possible pairs of consonant clusters for onset. For Acehnese onsets, glides /l/, /r/, and fricative /h/ are the second consonants (Asyik, 1982). Indonesian onsets also have these sounds for the second member of the consonant pairs, but the language does not allow /ʧh/, /jh/, /jr/, /ph/, or /th/. The fricative /h/ is not a consonant phonetically, but Acehnese fricative consonants were included in Table 3.5 because, in the written form, consonants are represented with multi consonant letters with the use of <h> letter after it.

On the contrary, consonant pairs /fl/, /fr/, /st/, /str/, /sw/, and /sk/ do not exist in Acehnese but are prevalent Indonesian. Indonesian has these sound pairs possible for the onset because the language is used in academic context thus continually borrowing words from other languages, particularly English. Words consisting the sound pairs are usually words borrowed from English (e.g. *fleksible*), Arabic (e.g. *dhuhur*), and Sanskrit (e.g. *swa* in *swalayan* means 'self' in Sanskrit). Even consonant pairs, such as /pr/ and /pl/, come from Javanese loanwords *jepret* and *plontos*.

Coda refers to the consonant(s) after the vowel or nucleus of a syllable. Acehnese and Indonesian both disallow multi-consonants as codas and allow /ʔ/ and /h/ sounds as coda. Indonesian has more variants of coda than Acehnese. Acehnese only allows /p,t,ʔ, h, m, n, ŋ/ as coda, whereas Indonesian allows /p, t, k, h, ʔ, s, m, n, ŋ, l, r/. When an Indonesian word with /r/ ending is borrowed into Acehnese, the /r/ sound is reduced. For example, word *pagar* is *pageue* in Acehnese. Table 3.6 offers further examples of coda changes across the two languages.

Table 3.6 Examples of Coda Changes in Acehnese and Indonesian Cognates

Acehnese	**Indonesian**
kipaih	*kipas*
tikôih	*tikus*
tika	*tikar*
puta	*putar*
lua	*luar*
atô	*atur*
pasi	*pasir*
gatai	*gatal*

3.3.6 Words

Indonesian and Acehnese's words are either monosyllabic, disyllabic, or trisyllabic. Many Indonesian frequently used words are disyllabic, while the majority of Acehnese high frequent words are monosyllabic. Both languages are dominated by disyllabic words and share a significant number of cognates. As well as differing in the coda of the last syllable (see Table 3.6), the cognates also differ in the number of syllables due to Acehnese's sound restrictions for coda. For example, the Indonesian word, *kar.tu* becomes *ka.reu.tu* in Acehnese. Acehnese does not allow /r/ as a coda, and so a vowel is inserted, making the word trisyllabic. Unlike English, Acehnese and Indonesian are syllable-timed languages, which means that multi-syllable words have equal time for every syllable, and that there is no stress prosody like in English.

3.4 Conclusion

Both Indonesian and Acehnese are orthographically transparent and phonologically simpler than English. The contact between the languages for centuries has caused the languages to share a number of commonalities in terms of phonological structures, and orthographical characteristics. However, the languages still have phonological and orthographical features that are language-specific. There are several phonological qualities in Acehnese that are absent from Indonesian. The phonological peculiarity in Acehnese spoken words is the higher variation of diphthongs and their position in words, which are allowed in both open and closed syllables. In Indonesian, diphthongs are less varied and limited to only exist in open syllables. On the other hand, Indonesian words have certain peculiarities that Acehnese words do not possess. The frequent English loan words, with their unique consonant clusters, enrich the Indonesian phonological system.

However, these peculiarities are not visible to Acehnese and Indonesian language users until they pay attention, or are conditioned to pay attention, to them. Acehnese is rarely explicitly learnt and used in a written context, and so the mapping system is not widely functional in society. The absence of the reading instruction in Acehnese, such as letter knowledge and reading comprehension activities, restricts speakers from focusing on the phonological forms of the language.

The only possible sources of understanding Acehnese phonological peculiarities is through spoken language exposure. Therefore, the present study examines the possibility of children acquiring Acehnese phonological awareness through Acehnese home-language exposure. Study also investigates whether the Acehnese phonological awareness skills, given that they are developed, have a significant influence on bilingual children's literacy skills in Acehnese, Indonesian, and English.

3.5 The Current Study

The role of Indonesian as L1 orthography in learning to read in English is still largely unknown. Moreover, the role of Acehnese children's ethnic spoken language on both Indonesian and English literacy skills is yet to be explored. The present study aims to investigate the role of Indonesian and Acehnese dual spoken language skills, along with Indonesian orthographic knowledge, on L3 English word reading skills.

3.5.1 Indonesian and Acehnese: Language Dominance and Acquisition Order

Indonesian and Acehnese are two genealogically related languages. Indonesian is the official and national language of Indonesia, with 260 million speakers (The World Bank, 2018) (of various dialects) across the country. Acehnese is an ethnic language, spoken by approximately 3.5 million people living in the Aceh Province area of Indonesia (Lewis, 2009).

Although Indonesian and Acehnese share many similarities in phonological structures, each language has its own phonological and orthographic peculiarities and regulations. The vowel inventory of Acehnese is larger than that of Indonesian. In total, there are 10 vowel phonemes in Acehnese, and there are only 8 in Indonesian. Moreover, Acehnese has a total of 12 types of diphthongs allowed in both open and closed syllables. Indonesian, in contrast, has three diphthong types that appear exclusively in open syllables. Unlike Indonesian, Acehnese has many aspirated consonants. Words such as 'phon' /p^hon/, for instance, have a /h/ aspirated sound, similar to the /p/ sound in the English word 'pen'.

This characteristic is absent in Indonesian words (refer to 3.3.1 – 3.3.6 for the detailed phonological and orthographical characteristics of Indonesian and Acehnese).

With these differences, children with Acehnese and Indonesian proficiency are expected to have a broader linguistic repertoire, particularly in terms of phonological inventory. Therefore, one of the principal aims of this study is to determine if being exposed to both spoken Acehnese and Indonesian will make a significant difference in one's phonological awareness reflected by skilfulness in performing deletion tasks on syllable and phonemes, as well as in tasks requiring them to detect odd initial and rhyme sounds from a set of words.

As the consequence of the increased popularity of Indonesian, the Acehnese language's role has changed from strong to weak. Among Acehnese-descendant children living in urban areas, Indonesian is the most prominent language because it is spoken to them from birth, whereas Acehnese is introduced indirectly at home. Children living in urban areas observe and listen to their parents speaking Acehnese to other adults (e.g. grandparents, relatives, neighbours, or market sellers). Therefore, since the present study takes place in an urban area, Banda Aceh, Indonesian and Acehnese are referred to as the participants' strong and weak languages, respectively.

Some children in urban areas acquire the two languages simultaneously, particularly when their parents choose to speak Acehnese among themselves, or if the child lives with Acehnese-speaking grandparents or guardian. Some other children are first exposed to Acehnese later due to the absence of the language at home, mostly because the mother and father choose not to speak Acehnese to one another. Consequently, this child will not hear any Acehnese until they meet someone speak the language, such as the grandparents in their family's village whom they meet once or twice a year. Acehnese is not only the weak language for the majority of the young urban children, it is also acquired by many of them as a second language after Indonesian. Therefore, in this paper, Indonesian and Acehnese are generally labelled as the participants' first (L1) and second language (L2), respectively.

3.5.2 Indonesian, First Language, and Literacy Skills

Indonesian is a transparent alphabetic language with a simple consonant-vowel combination, meaning that the orthography highly syllable salient. Studies on Indonesian early literacy are limited and have focused on the development of child phonological awareness.

Winskel and Widjaja (2007) investigated the predominant phonological grain size used to read in transparent Indonesian orthography. This study administered a series of tests that consisted of phonological awareness tasks (syllable segmentation, syllable deletion, phoneme deletion, onset detection, and rhyme detection), morphological awareness tasks (morpheme deletion), letter knowledge, spelling, word and non-word reading tasks to 73 primary school children during their first and second years of study. Phoneme awareness was found to be the most important predictor for reading ability. The results also indicated that syllables played a significant role in reading ability (Winskel and Widjaja, 2007, p. 38). The authors suggested that it was not only the orthographic transparency that made Indonesian easy to learn, but also the close correspondence between letter names and the sounds (Winskel and Widjaja, 2007).

Considering that phonemes are the most prominent unit for reading and spelling in not only Indonesian transparent alphabetic orthography (Winskel and Widjaja , 2007), but also in opaque alphabetic English (Caravolas *et al.*, 2005), the present study aims to investigate the effect of Indonesian orthographic knowledge and additional spoken language exposure (Acehnese) to the phonological awareness and reading ability among Indonesian-Acehnese bilingual children.

3.5.3 Acehnese, the Second Language Acquired in the Spoken Context

In Banda Aceh, the capital of the Aceh, many children are dominant in Indonesian and speak Indonesian in more domains and for longer periods of time than Acehnese. These children also mostly read and write in Indonesian. Acehnese is used only as home language, although some schools have introduced the language only as part of a local curriculum, usually in the form of reading comprehension activities at the first, second, and third years of primary school, depending on school policy. Similar to other parts of Indonesia, Indonesian literacy is the only formal literacy used in the Aceh province. Acehnese, as an ethnic language, although having its own standardised alphabetic spelling, is not often written or read. Children are taught Indonesian orthography when they enter schooling, regardless of their dominant spoken language.

Given that Acehnese and English are written in alphabetic orthographies, Indonesian-reading children, facilitated by their Indonesian phoneme awareness skills, are expected to transfer Indonesian decoding skills into the other two languages (Acehnese and English).

However, although learning to read across phoneme-based orthography is reported to be easier than across writing system with different grain sizes, e.g. Chinese to English (Caravolas *et al.*, 2012; Ziegler and Goswami, 2005; Bialystok, Luk, and Kwan, 2005), some orthographic specific rules and characteristics can restrict learning (Reddy and Koda, 2013). A study on children's Acehnese spelling skill by Yulia (2009) found that the fourth-grade Acehnese-speaking children wrote Acehnese words using Indonesian orthographic rules. For example, in Indonesian orthography, the three vowel-sounds /e/, /ə/, and /ɛ/ are transcribed with one grapheme [e], the participants wrote letter [e] for these three sounds in Acehnese spelling. The correct graphic for those sounds in Acehnese orthographies should be [é], [e], and [è], respectively. Lack of knowledge of the Acehnese specific symbols for certain vowels restricts Indonesian readers when determining the correct Acehnese spelling.

Moreover, the role of Acehnese vocabulary and word reading skills is unknown. Oral vocabulary is widely believed to predict word reading (Ouellette, 2006; Nation and Cocksey, 2009). Therefore, this study thus aims to determine if a child's level of Acehnese vocabulary supports Acehnese word reading performance more significantly than Indonesian orthographic knowledge. Children with higher Acehnese proficiency are expected to outperform Indonesian-speaking peers in reading Acehnese words because those who gain Acehnese exposure at home do not rely only on their Indonesian decoding skills, but also on their Acehnese oral vocabulary.

3.5.4 English as a Third and Foreign Language

This study investigates the role of speaking minority language Acehnese on learning to read English as a foreign language. All primary school children in Banda Aceh area learn English in a formal school context as a foreign language. Unlike Indonesian, English is not used as the medium of instruction, but rather as a school subject, given once a week. Children learn English from a non-native teacher who teaches them basic vocabulary using songs, games, and textbook activities.

Although English is orthographically more inconsistent than Indonesian, both language orthographies are phoneme-based, and so L1 skills are transferrable. Shallow orthographies lend themselves more readily to phonics instruction (Perfetti and Dunlap, 2008, p. 26). Phonological strategy used in learning to read alphabetic transparent languages such as Korean, Indonesian, or Welsh (Wang *et al.*, 2009; Winskel and Widjaja, 2007; Ellis and Hooper, 2001) may help Indonesian readers cope with unfamiliar alphabetic words in Acehnese or English.

After Indonesian word reading skills, English vocabulary level is expected to support English word reading. Given that exposure to peculiar language sound combinations from the spoken context can aid speakers in developing higher sensitivity to language phonological structure (Metsala and Walley, 1998; Cheung *et al.*, 2001; Goodrich and Lonigan, 2016), two spoken language experiences should offer a broader phonological knowledge (Cenoz, 2013; Marx and Mehlhorn, 2010).

Moreover, similarly to Acehnese, English has a number of diphthongs (Jenner, 1995, p. 149), available in both open (e.g. 'fry' /frʌi/) and closed syllables (e.g. 'straight' /streit/). Although slight, there is the possibility of positive impact from Acehnese spoken experience on English learning. Those with higher Acehnese proficiency may perform better in English phonological awareness and/or English word reading tasks.

3.5.5 Research Problems

The present study aims to investigate the role of spoken languages in a bilingual context where one of the languages is only orally used and rarely written. The research questions are as follows:

- Are there any significant correlations between the Acehnese spoken language experience with Indonesian, Acehnese, and English phonological awareness and word reading skills among Indonesian children exposed to varied degrees of home-language Acehnese?
- Do Acehnese spoken language skills play a significant role in Acehnese word reading skill once the Indonesian word reading skill is controlled?
- Does English vocabulary level play a significant role in English word reading skills once the Indonesian word reading skill is controlled?

- Which phonological level, from syllable, phoneme, onset, and rime, is the most important for Indonesian, Acehnese, and English word reading skills among the Year 2 Indonesian-Acehnese bilinguals learning L3 English?

3.5.6 Hypotheses

Hypothesis 1 is as follows:

Children with more Acehnese spoken language experience will perform better in the Acehnese phonological awareness tasks and word reading due to their higher Acehnese vocabulary. However, these children will perform the same as other peers in both Indonesian and English. Acehnese vocabulary will not support Indonesian or English word reading; these children's monoliterate bilingual status and the different phonological and orthographic systems between Acehnese and English will restrict them from reading the language better than their peers with less Acehnese knowledge.

According to Schwartz *et al.* (2007), as explained in Section 2.3.1, biliteracy in Russian and Hebrew is a significant factor that supports Russian-Hebrew bilinguals in learning to read in English. Therefore, the monoliterate Indonesian-Acehnese bilinguals are predicted not to perform better than Indonesian monolinguals in English literacy skills. However, there is a possibility that children with greater Acehnese vocabulary will perform better in Acehnese-related tasks because studies that look closely on the correlation between reading and vocabulary have reported that vocabulary plays a significant role in reading, both in transparent and non-transparent orthographies (Ouellette, 2006; Nation and Cocksey, 2009; Dixon, 2011) (see Section 2.2.3.4), and developing phonological awareness in a particular language (Metsala and Walley, 1998) (see Section 2.1.4).

Hypothesis 2 is as follows:

Acehnese spoken language skills will play a significant role in Acehnese word reading performance when Indonesian word reading is controlled for. To read correctly in Acehnese, one must have familiarity with the Acehnese lexicon as well as Indonesian word reading skill. Knowledge of features of diphthongs and aspirated consonants gained from spoken language experience will support the children in decoding words containing these features and help them to avoid producing negative transfers from Indonesian.

This paper hypothesises that, to some extent, Acehnese spoken language skills influence phonological awareness and literacy skills in Acehnese. This role is more salient when the Indonesian word reading skill is controlled for. Indonesian and Acehnese orthographies are highly similar, and so, with limited Acehnese vocabulary knowledge, speakers can decode some Acehnese words successfully. Section 3.3 explained the distinct features of Acehnese phonology in comparison to those in Indonesian. Therefore, Indonesian decoding skill, although helpful, is insufficient in decoding Acehnese words accurately. Familiarity with Acehnese words is also necessary. By controlling for Indonesian orthography decoding ability, the role of the Acehnese spoken language knowledge, such as the familiarity to the sound or sound structure, can be more closely analysed.

Hypothesis 3 is as follows:

English vocabulary will play a significant role in the English word reading performance after Indonesian word reading skill is controlled for because English is a relatively opaque language that requires a whole-word strategy to read, relying on lexical knowledge of the words. Indonesian alphabetic reading skill is important because it provides a strategy for decoding words on a phonemic level (i.e. sounding out words by analysing the phonological information letter by letter). However, familiarity with spoken forms, e.g. rhymes, consonant clusters, and words as a whole, is also crucial in the process of decoding English words with inconsistent phoneme-letter relationships.

Since participants in the present study are all non-native speakers of English with relatively low English vocabulary knowledge, English decoding performance will heavily rely on phonological information. The role of English vocabulary is clearer when the phonological decoding skill is controlled. According to many studies of English reading acquisition, conducted in both monolingual or bilingual contexts, English vocabulary plays a significant role in reading performance (Ouellette, 2006; Nation and Cocksey, 2009; Dixon, 2011). Therefore, this paper posts that English vocabulary should play an important role in English word reading skills among Indonesian-Acehnese bilingual children.

Hypothesis 4 is as follows:

Phoneme awareness will be the most important factor in reading in all three languages followed by syllable, onset, and rime. As in other phoneme-based orthographies, the most important phonological processing level in Indonesian, Acehnese and English is the phoneme. Because the participants' strongest literacy skill is in Indonesian, and the language is salient on a syllabic level, the second most important phonological processing level will be the syllable. Onset is more important than rime because Indonesian readers are taught to notice the first sound of the word before the last sound of the word.

Many scholars have reported that phoneme awareness is the main predictor of reading in all alphabetic orthographies (Caravolas *et al.*, 2005; Janssen and Bosman, 2013; Winskel and Widjaja, 2007; Goldenberg *et al.*, 2014). For Indonesian-reading children, the second most important processing level is syllable (Winskel and Widjaja, 2007). Therefore, this paper predicts that syllable-processing skills are the second most dominant skill after phoneme used by participants not only to decode Indonesian words, but also to interpret English and Acehnese vocabulary.

CHAPTER 4 METHODOLOGY

To investigate the phonological awareness and word reading skills in young bilingual readers, I conducted an experimental study on second-grade, Indonesian-speaking children who had been exposed to varied amounts of Acehnese and were learning English as a third language at school. The experimental data collection consisted of a battery of tests. This chapter outlines the materials used for data collection. The chapter also provides information on the location, participants, and procedures of the experiments in the present study. Before explaining the details of the tests and procedures of the experiments, I begin by presenting the location and participants of the research.

4.1 Location and Participants of Research

This study was carried out in Banda Aceh, the capital of Aceh Province, Indonesia. The city is inhabited by people of Acehnese ethnicity, many of who speak Acehnese along with Indonesian or Bahasa Indonesian. The city is also inhabited by a small number of other ethnicities that speak different languages such as Gayonese, Bataknese, and Minangnese. Indonesian is spoken throughout the city as the lingua franca. The Acehnese language is also easily found in markets, social gatherings, neighbourhoods, and many other informal settings. Based on my personal observations as an Indonesian citizen who is bilingual in Acehnese and Indonesian, those who live on the outskirts of the city speak more Acehnese than those who live in the centre of the city. The older population tends to speak more Acehnese than the younger generations. An increasing number of inter-ethnic marriages is encouraging the use of Indonesian in new families because Indonesian can accommodate the child's communication with both sides of the family, and accordingly usage of Acehnese is declining (Alamsyah *et al.*, 2011). The increasing popularity and prestige of the Indonesian language also encourages Acehnese-ethnic parents to speak Indonesian to their offspring. The status of Acehnese is shifting gradually from L1 in the older generation to L2 in the younger population.

The school where my study was carried out is a private school located in the Syiah Kuala sub-district of Banda Aceh, Indonesia. The sub-district is located about 5 km away from the city centre. The students mostly reside in the same district and are fluent Indonesian-language speakers. The parents mostly come from Banda Aceh city or other kabupatens (districts) of the Aceh province and, at present, are residing and working in the Banda Aceh area. Both Acehnese and Indonesian are commonly spoken in the neighbourhood where the children live. The Acehnese dialect spoken in the community is varied, because the neighbourhood consists of new housing occupied by both Acehnese and varied non-Acehnese speakers. However, the local people dwelling in the old housing in the surrounding area mostly speak the Great Aceh dialect of the Acehnese. Children mostly live with their parents, siblings, and sometimes with a female caretaker or relative. Their grandparents are mostly of Acehnese descent.

I chose to study this school because the students are reported to live with Acehnese-speaking neighbours and parents. I conducted a preliminary interview with the head teacher, who confirmed that a good number of students could speak Acehnese, and many others understand the language passively. I could have instead chosen a school in a more rural area, but such schools tend to introduce English in later grades. The participants in the present study had been introduced to English in kindergarten. Therefore, the school chosen for this study was ideal because it represents multilingual communities where Indonesian is the norm, Acehnese is available, and English education is accessible.

The school comprises of 6 grades, and each grade has 2 to 5 classes. Each class has approximately 30 students. Children learn English as a foreign language starting from the first grade and learn Acehnese starting from the fourth grade. In addition to English, Acehnese, and Indonesian, students also learn to read Arabic orthography at school as part of their Islamic education.

The population of the study comprises the entire second grade. The second graders (age: 7; 4) are grouped into five classes. There are about 30 to 35 students in each class. For most subjects, students are supervised by one classroom teacher in every class. In other subjects, such as Tahfizh (Al Quran memorisation) or physical education, classes are supervised by one or two teachers. This population was chosen for two reasons: (1) They are at the initial stage of literacy acquisition, and (2) according to preliminary research with some classroom teachers, the students were reported to have relatively sufficient vocabulary knowledge both in Acehnese (for some) and English. The Acehnese tended to be gained from home, and the English was generally obtained from kindergarten and year 1.

4.2 Sampling

Recruitment for the sample was done by distributing questionnaires (see 4.3.1), information sheets, and consent forms to all parents in all of the five classes (see appendices 1, 2, 3, and 4). The classroom teacher and I gave the documents directly to the parents during the collection time after school. My contact number was given for any questions regarding participation.

After one week, 39 questionnaires and parental consents were returned. Two of the consent forms were not signed, and the questionnaires were returned blank. One consent form was signed, but the child never participated due to long-term absence from school right after the questionnaire was returned. One other questionnaire was eliminated because the child was found to have lived in Malaysia and spoke a Malaysian (a Malay variety spoken in Malaysia) instead of Indonesian. This left 35 students allowed to participate.

To ensure that I had participants with varied levels of Acehnese proficiency, soon after the child assents were recorded, I tested the 35 participants for their Indonesian and Acehnese vocabulary knowledge. The HALA word naming task (O'Grady *et al.*, 2009) was used for this purpose (the details of the task are explained in the Materials section below). This word-naming test was designed to test a bilingual subject's productive vocabulary knowledge balance. This test was chosen because it measures the child's two language strengths. By testing both their Indonesian and Acehnese knowledge on one of the basic spoken vocabulary domains, body parts, I would gain a representative picture of their spoken language experience with the two languages (Indonesian and Acehnese). This test was given in advance, before other tests, so that I could anticipate whether the participants were sufficiently varied in their Acehnese proficiency. If some were not, I could quickly recruit more participants by contacting other parents with reminders to return questionnaires and sign consent forms that had not been returned.

In general, the result of the test displayed that all participants had good Indonesian vocabulary knowledge (mean = 16.4 out of 20). However, results concerning Acehnese were unknown since most of the participants could not pass the trials of the test. I assumed that this was because the test was analysing active vocabulary of the language, which I suspected might not have been gained yet by most of the participants. In other words, their Acehnese proficiency was significantly poorer than their Indonesian fluency. Finding participants who had balanced Indonesian and Acehnese proficiency meant that I would need to collect participants from another school located in a more rural area. However, children in this area usually originate from families with an economically and educationally lower status. This gives them little access to English learning, so involving them would cause a bias in the children's literacy outcome.

Based on this assumption, I decided to change the type of task for the Acehnese vocabulary measurement. Instead of testing the participants' productive vocabulary, I tested their receptive vocabulary. Testing in the same domain, body parts, most items used in the Acehnese receptive vocabulary test were taken from the same items used in the Indonesian test. The order of presentation was changed to avoid the child remembering the order from the Indonesian test.

Instead of actively naming the body part shown to them, the participants were asked to point out the body parts read out in Acehnese, using their hands, fingers, and their own bodies. Using this special Acehnese passive vocabulary test, I roughly divided the participants into two categories: those who could answer ≥50% of the 20 total items, and those who could answer ≤50% of the total test items. The purpose was to see how many participants fell into each category, so I could focus on recruiting more participants to balance the size of each category. The result was that 22 out of 35 participants answered 10 and more items correctly, and 13 out of 35 participants answered less than 10 items correctly.

To balance the size of the groups, I decided to contact more parents to collect more participants who have lower Acehnese proficiency. In this second batch, 20 students were able to participate, and most of them had been confirmed by their parents to have low or no Acehnese proficiency. The parents gave consent first and were asked to return the questionnaire a week later. After the 20 participants' verbal assents were recorded, they were given the Acehnese passive vocabulary test. It was found that 15 students scored low and the remaining 5 scored high. Added to the first batch, there were 55 students altogether. 27 students scored high and 28 scored low in the Acehnese passive vocabulary test. When the data collection was completed, one student who scored high in Acehnese vocabulary was eliminated due to a reading problem. The participant was not able to do any phonological awareness task and was not able to decode the easiest word on the word reading list. The total number of participants at this stage was 54.

After the participants' family demographic information was gained from the parental questionnaires, it was found that some participants had parents actively speaking other ethnic languages apart from Acehnese (e.g. Jamee, Minang, Javanese, and Gayonese). Three children were exposed to Jamee, three to Gayonese, and one participant each had Alasnese-, Sundanese-, Minangnese- and Javanese-speaking parents and caregivers. These eight children were eliminated from the list in order to get a more objective picture of the role of exposure to spoken Acehnese without influences from other languages. This left only 46 participants whose parents spoke either pure Indonesian or a combination of Acehnese and Indonesian.

4.3 Materials

Information on the participants' level of Acehnese proficiency is pivotal in this research. Therefore, in addition to the body part pointing vocabulary test, the children's Acehnese level was also measured through a parental assessment included in the questionnaire. In addition to the Acehnese proficiency measures, the participants were also assessed for their English language vocabulary proficiency using the British Picture Vocabulary Scale (Dunn *et al.*, 1997). Also, the participants were tested for their phonological awareness skills and word reading skills. Since phonological awareness and literacy is strongly influenced by intelligence, a non-verbal test was also given to the participants to measure intelligence. Below, I outline each of these measurements in detail. First, I elaborate on the questionnaire, particularly the parts in which the parents assess their child's language exposure. Second, I review the vocabulary tests. Third, I elaborate on the phonological awareness tests, followed by the word reading tests. Finally, the data collection, scoring, and analysis procedures are discussed in the last section of the chapter.

4.3.1 Parental Questionnaire

Developed from the questionnaire example in Chin and Wigglesworth (2007, p. 271), the questionnaire was constructed in 6 sections as depicted in Table 4.1. This tool assessed the family demographic and the sociolinguistic profile of each child. The child's Acehnese home language exposure score was gained from the accumulated points given by the parents in Section 2 (Child Home Language Use). In Section 2, the parents were asked to choose the degree of frequency of Acehnese and Indonesian used by their child to a varied member of the family. The total score gained for Acehnese home language use, both passive and active, would make up the independent variables representing the participant's level of Acehnese spoken language skills.

Information from other sections (e.g. Family Income or Parent Level of Education from the Family Demographic section) was used as the secondary data in the analyses.

Table 4.1. The Construction of the Parental Questionnaire

Section	Section/Subsection	Item Number
1	Family Demographic Information Parents’ Ethnicity Parents’ Native language Parents’ Highest Level of Education Parents’ Monthly Income	1,2,3,4,5, and 6
2	Child Home Language Use Passive use Active Use	7–18
3	Child Literacy Acehnese Indonesian	19–22
4	Child’s Four Language Skills Parent-Assessment	23–26
5	Parental Language Attitude	27–28
6	Child’s English Learning and Ability, and Parents’ Attitude toward English	29–34

Table 4.1 in Section 1 lists four demographic components gathered from the subjects’ parents. These components include parents’ ethnicity, native language, highest level of education, and monthly income. Regarding the parents’ language, the questionnaire missed one important detail. It did not ask the type of Acehnese dialect used exclusively by the parents. Based on my observations as an Acehnese native speaker whose parents speak the Pidie dialect and whose husband speaks the Southern Aceh dialect, some dialects have more salient diphthong sounds than others. For example, in the Pidie dialect, *troe*, meaning ‘full tummy’, is pronounced /trɔ$^{\text{ɐ}}$/, while other dialect speakers such as those from Great Aceh and South Aceh would say the word as /trɔ$^{\text{ə}}$/. The Pidie dialect seems to have a more open vowel for the second vowel of the diphthong sounds. Future studies should take into account this dialectical factor because it potentially effects the results of the study, especially related to phonemic awareness.

Tables 4.2 and 4.3 are the questions and the scoring for the parental home language assessment in Section 2 of the questionnaire. Use of both the Indonesian and Acehnese spoken language was measured, each for active and passive use. Measuring both languages was intended to detect whether the child was using one language more than the other. Measuring for both active and passive proficiency was intending to see if the child was a passive or active user of the language. Six types of relationships were included in the measurement: mother, father, grandparents on mother's side, grandparents on father's side, other families in the same house, and neighbours/friends. This selection was based on the local cultural characteristics in which children mostly spend their time at home with either mothers, fathers, grandparents, an aunt or a caregiver who lives in the same house, and some children living next door. The total possible score for each language assessment is 48 (24 total for active use, and 24 for passive use).

Table 4.2 Child's Home Language Use – Active Use

Child's Home Language Use – Active Use			
Item No	**Description**	**Acehnese**	**Indonesian**
7	What language(s) does your child speak to his/her mother?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
8	What language(s) does your child speak to his/her father?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
9	What language(s) does your child speak to grandparents on his/her mother's side?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
10	What language(s) does your child speak to grandparents on his/her father's side?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
11	What language(s) does your child speak to other family members (e.g. siblings, caretakers)?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
12	What language(s) does your child speak to neighbour friends?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
Total Score for Active Use		**0–24**	**0–24**

Table 4.3 Child's Home Language Use – Passive Use

Child's Home Language Use – Passive Use			
Item No	**Description**	**Acehnese**	**Indonesian**
13	What language(s) does the mother speak to the child?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
14	What language(s) does the father speak to the child?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
15	What language(s) does your child speak to grandparents on his/her mother's side?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
16	What language(s) does your child speak to grandparents on his/her father's side?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
17	What language(s) does your child speak to other family members (e.g. siblings, caretakers)?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
18	What language(s) does your child speak to neighbour friends?	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)	All the time (4) Most of the time (3) Sometimes (2) Rarely (1) Not at all (0)
Total Score for Active Use		0–24	0–24

The scores gained from this section were added to obtain a total score which reflected each participant's Acehnese and Indonesian spoken language proficiency.

The measurement of the participants' Indonesian home language use was not presented because the means reached the ceiling (M = 22.52, Maximum score = 25), which shows that all participants have high exposure and actively speak Indonesian at home. Thus, only the Acehnese active and passive home language use scores were used in the analyses.

4.3.2 The Indonesian Active Vocabulary Test

The Indonesian active vocabulary test was given along with the Acehnese vocabulary test at the beginning of participation (see Section 4.2). The HALA word naming test by O'Grady *et al.* (2009) was used to assess the participants' Indonesian ability strength. This test, formatted in a Flash video, is designed to measure a bilingual subject's language ability balance. At first, I intended to use this test for this purpose: to measure each child's Acehnese and Indonesian vocabulary skills and to see how balanced both were in each child. However, it was hard to specifically pinpoint the level of proficiency of each child in Acehnese due to a very low Acehnese proficiency displayed by most of the participants when they were tested. Most children could not answer more than 5 items from the 20 items given. Finally, I decided to use this test only for measuring their Indonesian vocabulary skills. I used a passive vocabulary test (see 4.3.3) to assess their Acehnese proficiency levels.

The procedure was carried out as follows: The child was seated in front of a computer and a portable audio recorder device. The child was then instructed to look at a picture that would appear on the screen and then speak out the name of the thing shown in the red circle. For instance, when a picture of a man with his head circled with red ink appears, a child is supposed to respond "head" in Indonesian. There was a beep sound at the onset of every item given. Every item lasted for 6 seconds before another item appeared. The test was equipped with a beep sound between the pictures that was intended to measure fluency/speed, but this facility was not used in this study. The reason for this was that there was only one language tested, so the time result had no compatible result to compare it with. The test comprised of 43 body part items presented through a series of pictures on a computer screen, but only 20 items were used in this study to avoid anxiety since the children had to perform the Acehnese version of the test also. Six trial items were given before the real test. The table below lists the items of the test that I used for the present study.

Table 4.4 The Indonesian Productive Vocabulary Test Items (O'Grady *et al*., 2009)

Item Number	**Item on the Picture**	**Indonesian Target Response**
Trial	t-shirt	
Trial	book	
Trial	hat	
Trial	mug	
Trial	bowl	
Trial	pen	
1	face	muka
2	back	punggung
3	mouth	mulut
4	tongue	lidah
5	foot	kaki
6	hair	rambut
7	fingers	jari tangan
8	ear	telinga
9	teeth	gigi
10	head	kepala
11	leg	tungkai kaki
12	shoulder	bahu
13	lips	bibir
14	eye	mata
15	knee	lutut
16	nose	hidung
17	stomach	perut
18	hand	tangan
19	neck	leher
20	palm	telapak tangan

My scoring was as follows: One point was given for one correct answer, zero points were rewarded for the wrong answer. The Indonesian Vocabulary Test generated active vocabulary. Thus, the answer was considered correct if the child said the correct name of the body part. In the case where the body part had synonym(s), such as the 'ear' item which is formally called *telinga* and informally called *kuping* in Indonesian. Therefore, both *telinga* and *kuping* were considered correct. For items number 11, either *kaki* 'foot' or *tungkai kaki* 'leg' were considered correct. This is because in the daily spoken context, the word *kaki* is more commonly used for 'legs' (and the feet) than *tungkai kaki*.

4.3.3 The Acehnese Passive Vocabulary Test

Due to the participants' inability to answer in the HALA word naming test in Acehnese (See Appendix 7), an Acehnese passive vocabulary test was given (Appendix 8). It still assessed body part recognition, but it did so passively. First, I included the same items as those used in the Indonesian vocabulary test. However, after I pilot tested the items on 4 children in grade 3, some items were found to be problematic. For example, legs and feet were addressed using the same word by modern Acehnese speakers, which is *gaki.* The word 'feet' in Acehnese is *tapak*, but this word is not popular among modern Acehnese speakers (who tend to speak more Indonesian than Acehnese in their daily lives). These items were merged in the Acehnese test. The other problematic item was that 'eye' is the same word in Acehnese and Indonesian, which is *mata.* I changed the word to 'cheek' instead and used 'eye' as one of the 6 trial items.

The procedure was carried out as follows: 20 items in the list (Table 4.5) were read by me to the participant individually. Prior to that, an instruction was given to the child to listen carefully to the word given and to then point out their body part which corresponded to the one mentioned. Three trials were given before the real test. The child was given 10 seconds to respond to each item. In a situation in which a child changed their response, the latest response was counted.

My scoring was as follows: 20 was the maximum score for the test.

Table 4.5 The Acehnese Passive Vocabulary Test Items

No	Item in Acehnese (read aloud to the child)	Meaning
Trial 1	*tangan*	hand
Trial 2	*kepala*	head
Trial 3	*mata*	eyes
1	idông	nose
2	babah	mouth
3	jaroe	hand
4	gaki	legs/feet
5	gigoe	teeth
6	ulèe	head
7	geulunyueng	ears
8	ôk	hair
9	bahô	shoulder
10	rueng	back
11	takue	neck
12	pruet	stomach
13	tu'ot	knee
14	aneuk gaki	toes
15	keu'ieng	waist
16	gukèe	nails
17	sapai	arms
18	mieng	cheeks
19	kheueng	chin
20	paleuet	palm

4.3.4 The English Receptive Vocabulary Test

The measurement of English vocabulary in the present study was intended to measure the level of familiarity each child had with English as a foreign language. Specifically, it sought to determine if that familiarity supported their English decoding skills more than their Indonesian alphabetic skills. To test English vocabulary, the standardised test named the British Picture Vocabulary Scale (Dunn *et al.*, 1997) was used. The lexical items used in this test were not limited only to body parts. Instead, they varied from other lexical domains, such as action verbs, vehicles, and musical instruments. The test consisted of several parts ranging from easy to difficult. Only Part A of the test, consisting of 12 items, was used in this study. According to my discussion with the classroom teachers, the lexical items in Part B were too difficult for the participants. Also, I myself am an English teacher, so I also knew that for Indonesia English language learners, the lexical items in Part B were too difficult for a second grader. Moreover, according to one of the teachers, not all items in Part A were known by their students.

The procedure was carried out as follows. The participant was asked to respond orally to the target word I gave to them by pointing with their finger to the corresponding picture on a page containing 4 pictures. I told them, “Point out one picture that you think has the meaning for the word that I am about to say”. Ten seconds were given for the participant to respond to each item. Only one out of four pictures corresponded to the target word. For example, the child was told to point out the picture showing a baby. There on the paper, the child could see a picture of a baby, a hand, a bottle, and a flower. To respond correctly, the participant had to point to the picture of the baby. The 12 target items given in Part A were *hand, baby, cat, jumping, bus, drinking, tractor, running, gate, reading, cow*, and *drum*.

My scoring was as follows. The scores could not be converted into the standardised scores given in the test booklet because the latter were only applicable to native English speakers. In order to score the results in the present study, I awarded one point for the correct answer and zero points for the wrong answer, with 12 points for the total score. Three practice items were given before the actual test. Thus, 12 remained the highest possible score.

4.3.5 The Non-Verbal Test

A non-verbal test was assigned to control the child's level of intelligence. This is important because phonological awareness tasks involve manipulating skills that must require a certain level of intelligence such as deleting, blending, and isolating. The task given was Standard Progressive Matrices Parts A and B (Raven, Raven and Court, 1996), with a total of 24 items and 12 items for each part. Only Parts A and B were given because according to the manual of the test, these parts were intended for children aged between 5 and 11 years old. In each item of the test, the participant was asked to identify the missing element that completed a visual geometric pattern. The child was then asked to choose one from six possible pictures that matched the pattern of a set of pictures.

The procedure was carried out as follows. This test was given collectively – first to 35 participants, then to the other 19 in the second batch. The test was given in a quiet room. There was no time limit for finishing the test, but the participant took about an average of 15 minutes to finish the two parts of the test.

My scoring was as follows: One point was given to one correct answer, and zero points were given for the wrong answer. The total score was 24.

4.3.6 The Phonological Awareness Tasks

The Order of the Test Presentation. The administration of the phonological awareness tests was conducted in three batches: (1) syllable deletion, (2) phoneme deletion, and (3) an onset-rime oddity test. In each test, lexical items from three languages were included (Indonesian, Acehnese, and English). For example, for the syllable deletion test, the first five items were Indonesian words, the sixth to tenth items were Acehnese, and the eleventh to fifteenth items were English words. In other words, the tasks were not given in language order. Instead, they were presented in the task-type order. The syllable deletion tasks were given first, followed by phoneme deletion, onset oddity, and rime oddity.

I chose this task arrangement because I thought it would be less hectic for the participant to be doing the tasks in task-type order compared with doing the Indonesian syllable deletion, followed by Indonesian phoneme deletion, Indonesian onset oddity, rime oddity, and coming back to the syllable deletion again for another language. Later in the data analysis (Chapter 5), I found that this arrangement caused a biased result in syllable awareness (see Chapter 6, Section 6.1.2). Moreover, the low item number included for each language could not fully capture the phonological awareness subskills in each language. I explain the details of this limitation in Chapter 7.

The Selection of the Items. The selection of words for use in the phonological awareness tasks was done by considering two important factors: (1) the language-specific phonological structure complexity, and (2) the language phonological structure frequency. The first factor means that the words chosen must contain phonological units (syllable, onset, rime, and phoneme) that are peculiar to that language. This could be a multi-consonant cluster as rime in English, or diphthong /ie/ and /oe/ in Acehnese. The latter factor deals with the frequency of that phonological peculiarity found in the language's use. It means that the words selected must be those which contain phonological characteristics commonly found in most words in that language. For instance, rime /eous/ in 'gorgeous' is not as common as rime /oot/ in 'foot' for the English language. In this case, the word 'foot' was preferred. The subsections below provide the details of the tasks: the item selection, procedure, and scoring.

4.3.6.1 The Syllable-Deletion Task

The syllable-deletion task consisted of 5 Indonesian, 5 Acehnese, and 5 English words. Three trial items were given in Indonesian, followed by five real test items in Indonesian, five in Acehnese, and five in English. In each of the language lists, the words were arranged based on the number of syllables from two- to three-syllable words. In total, there were 9 two-syllable words, and 6 three-syllable words.

Indonesian Items. The Indonesian words used in this task were taken from the Indonesian syllable deletion task used in Winskel and Widjaja (2007). The original task consisted of 20 items, but in the present study, the number was reduced to only 5. The items were selected by choosing three disyllabic words out of fourteen available in the original test and two trisyllabic words from six available in the test. The reason for this reduction was that this study focused on Indonesian, Acehnese, and English literacy skills. Thus, to ensure that I could get sufficient amounts of data for each language in the limited time for data collection granted by the school, the task needed to be simplified since the research was carried out during the participants' school time. This minimised taking too much of the participants' time. The Indonesian language, having the most frequent CV or CVC construction out of all three of the languages in this study, the words involved were combinations of these constructions. Deletion involving CVC construction – such as in *bukan* 'not', *jempol* 'thumb', *rambutan* 'rambutans', and *terompet* 'trumpet' – was considered more difficult than deletion involving CV – such as in *ayu* 'beautiful' (Winskel and Widjaja, 2007).

Acehnese Items. Five Acehnese words – three disyllabic and two trisyllabic words – were chosen from the school Acehnese textbook and dictionary. The words chosen were words commonly used in children's daily life. They also contained Acehnese diphthong constructions, such as in *jaroe* 'hand', *sikureueng* 'nine', and *bungoeng* 'flower'.

English Items. Five English words were chosen from the Year Two English textbooks used in the school (i.e. words that the children ought to be familiar with). The words chosen were *doughnut, ice-cream, football* (disyllabic), *pineapple*, and *motorbike* (trisyllabic). I decided to include compound words such as *motorbik*e and *ice-cream* because these English words are more familiar than multi-syllabic words such as *property* or *important*. The use of English short phrases for testing English syllable deletion was also done in Cho and McBride-Chang (2005).

Table 4.6 The Syllable Deletion Task Items

No	Before deletion	After deletion	Meaning	Language	Complexity
trial	***bu**ta*	*ta*	*blind*	*Indonesian*	
trial	***ca**ri*	*ri*	*look for*	*Indonesian*	
trial	***ke**lapa*	*lapa*	*coconut*	*Indonesian*	
1	**a**yu	yu	pretty	Indonesian	2-syllable/first
2	bu**kan**	bu	not	Indonesian	2-syllable/final
3	**jem**pol	pol	thumb	Indonesian	2-syllable/first
4	**ram**butan	butan	rambutan fruit	Indonesian	3-sylable/first
5	terom**pet**	terom	trumpet	Indonesian	3-syllable/final
6	**a**bèe	bèe	ash	Acehnese	2-syllable/first
7	ja**roe**	ja	hand	Acehnese	2-syllable/final
8	**bu**ngoeng	ngoeng	flower	Acehnese	2-syllable/first
9	siku**reueng**	siku	nine	Acehnese	3-sylable/final
10	**i**tangèn	tangèn	bicycle	Acehnese	3-syllable/first
11	**dough**nut	nut		English	2-syllable/first
12	ice-**cream**	ice		English	2-syllable/final
13	**foot**ball	ball		English	2-syllable/first
14	**pine**apple	apple		English	3-sylable/first
15	motor**bike**	motor		English	3-syllable/final

The table above lists the items used in the syllable deletion task. The bold syllable was the syllable to be deleted. For the Indonesian and Acehnese items, the words used before deletion were all real words, while the words after the deletion were not necessarily real words. The intention was to prevent the child from thinking and guessing of a possible word as the output. Meanwhile, for the English items, the output words were real words.

The procedure was carried out as follows. The child was tested individually in a quiet room. The participant was seated face-to-face with me, the experimenter. First, I explained the task to the child in Indonesian. I would say, “We will play a game. I will read a word, and you will repeat the word after me”. After saying this, I gave an example.

Me	: Say ‘bunga’
Child	: “bunga”

Then I explained the second rule, “I want you to say the same word, but without a certain part. Let’s try!”

Me	: Say ‘bunga’
Child	: “bunga”
Me	: Say it again without ‘bu’
Child	: “nga”.

After that, I gave the participant three trials in Indonesian. When they had done the trial correctly, I told them that the game was about to start. I told them that first, they would do the game using Indonesian words, then Acehnese words, and then English words. Usually, the child would look worried when I mentioned that there would be English words in the test. At this point, I would tell them that this was just a game, not an exam, so they did not need to feel afraid of giving the wrong answer. I told them, “In this game, there are no wrong or right answers, but try to do as good as you can”.

The child was told each time they moved to another language word set.

My scoring was as follows. One correct answer was given one point, and as before, the wrong answer scored zero points. The total score would add up to 15.

4.3.6.2 The Phoneme-Deletion Task

The phoneme-deletion task used the same principle as the syllable deletion task. This task required the child to delete the phoneme of a word instead of the syllable. There are 15 total items with the same order as the syllable deletion task regarding the language. In terms of the sound position deleted, 6 items are initial-deletion, 6 items are final-deletion, and 3 items are middle-deletion. They are distributed in the three language items. For middle deletion, the exact sound position of deletion for Indonesian items is designed slightly differently from the corresponding Acehnese and English items. The reason for this special treatment is due to the low frequency of consonant clusters in the first syllable in Indonesian words. Thus. instead of deleting the second consonant of the first onset (such as in items 10 and 15 in Table 4.7), the sound deleted for the Indonesian word is the first sound of the coda (item number 5, Table 4.7). The three items equally require the middle sound deletion of a disyllabic word. Only the exact position differs in the attempt to adjust the sound construction complexity of each language. The language peculiarities can be seen from the sound construction around the sound that is to be deleted.

Different from the syllable deletion task, the phoneme-deletion task is made to have real words as the output of the deletion. However, the output is not necessarily a word familiar to the participants. The real word after a phoneme deletion was unavoidable in many Indonesian words. However, the participant was not told that the word would turn into another word after the deletion.

Table 4.7 The Phoneme Deletion Task Items

No	Before	After	Meaning	Language	Complexity
trial	***a**pi*	*pi*	fire	*Indonesian*	
trial	***s**api*	*api*	cow – fire	*Indonesian*	
trial	***c**air*	*air*	melt – water	*Indonesian*	
1	**b**ulat	ulat	rounded – caterpillar	Indonesian	CV – initial sound deletion in the first syllable
2	**k**arung	arung	sack – sail	Indonesian	CV – initial sound deletion in the first syllable
3	bala**i**	bala	gazebo – group	Indonesian	CVV – final sound deletion in the last syllable
4	pinta**r**	pinta	smart – ask	Indonesian	CVC – final sound deletion in the last syllable
5	ba**n**tu	batu	help – stone	Indonesian	CVC – final sound deletion in the first syllable
6	**b**ulèe	ulèe	body hair – head	Acehnese	CV – initial sound deletion in the first syllable
7	**p**lueng	lueng	run – trench	Acehnese	CCVVC – initial sound deletion in the first syllable
8	gata**i**	gata	itchy – you	Acehnese	CVV – final sound deletion in the last syllable
9	kuwé**h**	kuwé	cake – cake	Acehnese	CVC – final sound deletion in the last syllable
10	b**l**ang	bang	ricefield – brother	Acehnese	CCVC – second sound deletion in monosyllable
11	**f**at	at		English	CVC – first sound deletion in a monosyllable
12	**s**top	top		English	CCVC – first sound deletion in a monosyllable.
13	kee**p**	key		English	CVCC – final sound deletion in a monosyllable
14	sea**t**	sea		English	CVC – final sound deletion in a monosyllable
15	p**l**ane	pain		English	CCVVC – second sound deletion in a monosyllable.

Indonesian Items. I chose five Indonesian disyllabic words from Winskel and Widjaja (2007). In this phoneme deletion task, the focus was more on the complexity of the consonant-vowel construction than on the length of the word. Since Indonesian is a language rich in multisyllabic words – especially disyllabic words – the words used in the Indonesian phoneme deletion task were all disyllabic words. The participants were also given the trials of this syllable deletion task in Indonesian disyllabic words. In the first and second items (*bulat* and *karung*), the child was asked to delete the consonant in CV syllable construction. This CV construction was given twice because this CV construction is typical for Indonesian words. On the third item, *balai,* the participant was asked to delete the final sound of the last syllable with a CVV construction. For the fourth item, *pintar,* the participant was asked to delete the last sound of the word, but this time, within the syllable CVC construction. Finally, maintaining CVC construction, the participant was asked to remove the last sound, but within the first syllable of the word. This means that the participant was required to remove a sound in the middle of the word (*bantu- batu).* In short, this progressing level of difficulty was decided by considering the typical Indonesian consonant-vowel construction from simple to relatively complex.

Acehnese Items. I chose three Acehnese monosyllabic words and two disyllabic words from the Acehnese textbook and dictionary. I did this because Acehnese is richer in monosyllabic than in disyllabic words. The first item required the participant to delete the first sound of the word *bulèe*. This CV construction of syllable *bu* is the simplest consonant-vowel construction in Acehnese. In the second item, the participant was asked to remove the first sound from the monosyllabic word *plueng*, where the consonant-vowel construction is CCV – a bit more complex than that in the first syllable. In the third and fourth items, diphthong and -h coda sounds were given in Acehnese. Finally, the participant was to remove the second consonant, /l/, of the CCV construction in the monosyllabic word *blang* – the most difficult task.

English Items. English is also rich in monosyllabic words. For this reason, all words included for English items were monosyllabic words. In the first item, the participant was to delete the first sound of the monosyllabic CVC word *fat*. Afterward, the child was to delete the first sound on the monosyllabic CCV word *stop*. Then, the participant was asked to delete the /p/ sound from the word *keep*. Finally, in the last item, the participant was asked to delete the second sound of the word *plane*. This /pl/ onset is common in English words. All words before deletion were chosen from the students' English textbooks.

The procedure was carried out as follows. After three trials were given, the child was asked to repeat a word, and then to repeat it for a second time but without a certain sound. I would say to the participant in Indonesian, "Can you say *sapi?"* They would then repeat the word *sapi,* and I would say, "Now, say *sapi* without *ssss…"*

My scoring was as follows: As done in the syllable deletion task in the previous subsection, the minimum-maximum score for this task was 0-15.

4.3.6.3 The Onset Oddity Task

If syllable and phoneme deletion tasks were measuring the child's syllable and phoneme awareness, onset and rime oddity tasks measured onset and rime awareness. Onset is the initial sound (s) of a syllable or before the nucleus (usually a vowel) of a syllable. Onset can be a single consonant or a consonant cluster. The child was asked to listen to a three-word set and to choose which of the three words had a different initial sound or onset. There were 9 items in total for this task (three items in Indonesian words, three in Acehnese words, and three in English words) and they were given in the same language order as the other two previous tests. Three trials were given in advance using Indonesian words.

Indonesian Items. Consisting of relatively few monosyllabic words, the Indonesian word sets consisted of both mono and disyllabic words, and they were taken from the onset detection task in Winskel and Widjaja (2007). Indonesian words commonly started with single consonant onsets. Thus, this type of onset was used in this task by including the language's highly frequent consonant sounds, such as /b/, /m/, /t/, /k/, and /l/ (Item 1-3, Table 4.8).

Acehnese Items. The next three items were Acehnese words with its typical onset consonants and consonant clusters, such as /k/, /gr/, and /br/. The words were chosen from textbooks and the Acehnese dictionary.

English Items. For the English onset oddity task, the single consonant onset was given first: /b/ versus /r/. Afterward, the onset complexity was increased to a pair of similar single consonant onsets /f/ vs /p/. Finally, the double consonant onsets /sn/ and /sl/ were given. The first item was taken from an example given in Bradley and Bryant (1985). The second and third items were developed from words taken from the English textbook.

Table 4.8 The Onset Oddity Test Items

Onset Detection Task				Language	Complexity/Nucleus Pattern
Trial	*bis*	*ban*	***lap***	*Indonesian*	
Trial	*rumah*	*rakus*	***mobil***	*Indonesian*	
Trial	*bantu*	*bingung*	***tarik***	*Indonesian*	
1.	tikus	tiga	**garam**	Indonesian	t,t VS g
2.	**becak**	kota	kaki	Indonesian	k,k VS b
3.	mata	**laci**	muda	Indonesian	m,m VS l
4.	kasô	karu	**malèe**	Acehnese	k,k VS m
5.	grak	griek	**pruet**	Acehnese	gr,gr VS pr
6.	brat	**trôh**	brôh	Acehnese	br,br VS tr
7.	bus	bun	**rug**	English	b, b VS r
8.	fat	food	**pet**	English	f,f VS p
9.	snow	**slow**	snail	English	sn, sn VS sl

The procedure was carried out as follows: The participant was again seated in front of me, the experimenter. On the table between me and the participant, I put out three colour pencils: red, blue, and yellow. These colour pencils were used as aiding tools for the child to refer to the three-word set in the task. First, in Indonesian, I explained to the participant that we were going to play a different game that day. I told them that they were going to hear me saying three words out loud. Each time I said one word, I would lift one pencil from one end, the middle pencil, and then the pencil at the other end. I would say, "While I do that, I want you to pay attention to the first sound of the word, the sounds which the words start with. From the three words, you will find that one word starts with a different sound than the other two words. I want you to tell me which of the words you think has a different beginning sound (*bunyi awal* means the onset sound in the Indonesian term). You can say the word out loud if you like, or you can move one of the pencils that I have lifted while I say that word to you". I told them not to worry because I would repeat the three words in the same order three times before giving them the chance to answer. After they listened to this explanation, I asked them to practice three times before the game began. In the trials, I repeated the words as many times as needed until they understood the rule of the game. The real items were not given until the three trials were done correctly.

My scoring was as follows: The maximum score for this task was 9 and the minimum was zero. This task had less item numbers than the syllable and phoneme deletion tasks. This is because it involved more words in one item, and I believe the task also requires different cognitive skills than the deletion tasks.

4.3.6.4 The Rime Oddity Task

The term Rime refers to the remainder of a syllable after the onset (i.e. the nucleus and coda). I gave each participant a three-word set orally and asked them to choose one word that had a different rime. Beforehand, the child was instructed to listen carefully and pay attention to the final part of each word. Three trials were given in Indonesian prior to the real test. Among 9 items of the test, three items were Indonesian word sets, another three were Acehnese, and the other three were English.

Indonesian Items. For Indonesian items, I included several words from the same test in Winskel and Widjaja (2007). The task included the common Indonesian rimes /ap/, /at/, /ah/, /as/, and /an/, and tested whether the participant could distinguish them. In the first item, rimes /ap/ vs /at/ were incorporated. Afterward, the test added rimes /at/ and /ah/ and finally /an/ and /as/.

Acehnese Items. Acehnese rime oddity task items included several rimes with Acehnese common vowel + coda; /ah/, /an/, /ωk/, /ok/, /εh/, and /eh/. In the first item, Acehnese rimes /ah/ and /an/ were given. These were followed by /ωk/ and /ok/ in the second item. The last item was the most difficult, since it involved similar rimes /εh/ and /eh/.

English Items. The English rime structure included in this task was selected from Fergusson (1985). The participant was first asked to distinguish rimes /ei/ to /ou/, then rimes /el/ to /i:l/, and finally /ai/ to /eik/.

Although the Acehnese and English languages also contain sounds such as /ap/, /at/, /ah/, /as/, and /an/, I did not include these sounds because they had been presented through Indonesian items. Thus, the rime sounds selected for Acehnese and English were sounds which were unavailable in their Indonesian L1.

Table 4.9 The Rime Oddity Task Items

Rime Detection Task				Language	Complexity
Trial	*gas*	*tas*	***map***	*Indonesian*	
Trial	*panjang*	*sarang*	***patuh***	*Indonesian*	
Trial	*suka*	*bila*	***gelap***	*Indonesian*	
1.	lap	cap	**cat**	Indonesian	ap/ap/at
2.	**ingat**	rumah	lebah	Indonesian	at/ah/ah
3.	bukan	**bekas**	teman	Indonesian	an/as/an
4.	kah	pah	**nan**	Acehnese	ah/ah/an
5.	**paneuk**	mantôk	batôk	Acehnese	euk/ôk/ôk
6.	puléh	patéh	**cèh**	Acehnese	éh/éh/ ***èh***
7.	say	day	**paw**	English	ei/ei/ou
8.	tell	bell	**deal**	English	el/el/i:l
9.	fry	tie	**take**	English	ai/ai/eik

The procedure was as follows. Similar to the format of the onset oddity task, the participant was first explained the rules of the task. However, instead of asking them to look at the beginning sound of the word, the child was asked to pay attention to the final sound of the word. I asked one of the classroom teachers if the participants had been introduced to the term of rhyming, or *sajak* in Indonesian. The teacher confirmed that the children had not yet been taught the term. Learning about *sajak* explicitly in Indonesian reading is not directly related to learning to read the orthography. Thus, this term is not popular among early Indonesian readers. Therefore, in explaining the rule of this rime oddity task, I used the term *bunyi akhir,* which means ‘final sound’, to replace the term ‘rhyming’. This term was also used to connect this task to the previous one, in which I asked them to pay attention to *bunyi awal* (onset sound).

The scoring was as follows. The scoring was the same as the system used for the onset oddity task, where the maximum score is 9 and the minimum is 0.

I admit that the present study is weak in terms of the onset and rime oddity measures because the total item for each language was very small (only three items per task). Consequently, it was hard to analyse the language-specific skill aspect of phonological awareness. Future studies should improve the onset and rime awareness measures so that each language’s phonological characteristics can be maximally represented in the test items.

4.3.6 Indonesian Word Reading

The Indonesian word reading test in the present study used the list of words from Winskel and Widjaja’s (2007) Indonesian word reading. This task consisted of 30 Indonesian words arranged in increasing level of difficulty. Since Indonesian is a language with a high number of multi-syllable words and a small number of mono-syllabic terms, the list was also arranged according to the number of syllables, from disyllable to five syllable words.

The procedure was as follows: The participant was presented with a piece of A4 paper with the list of words printed on it in Arial 22 font (Appendix 15). I placed by audio recorder next to the paper on the table. First, I gave the participant an explanation in Indonesian about the task. I told the participants, “In front of you there is a list of 30 Indonesian words. I want you to read the word aloud from number one to number thirty”. I let them have a look at the paper and gave them time to ask questions. Some of them asked what if they did not know how to read a certain word. I told them that they were encouraged to try, but if they could not make it, they could skip the word. I told them to start reading whenever they were ready. When they said they were ready, the audio recorder would be started.

My scoring was as follows: To be considered correct, the word must be comprehensible and reflect the meaning it contained when the word reading production was heard. If these requirements were fulfilled, the reading would be scored 1. Otherwise, the word would be considered an error and would be scored zero. The word ‘stress’ was not assessed because Indonesian is not stress-timed – it is syllable-timed. It did not matter on which syllable stress was made, and it did not affect the scoring. However, if the participant produced the wrong number of syllables, the answer would be considered wrong and scored zero.

If the participant produced two or more decodings for one item, the last answer was counted. To identify the types of error, the wrong word production would be entered into the worksheet. For instance, for item number 18 (Table 4.10), the word *khidmat* /khidmat/, which is decoded as /kəhidmat/, would be scored 0 and coded as ‘kəhidmat’. The total score for this task is 30.

Table 4.10 The Indonesian Word Reading Test (Winskel and Widjaja, 2007)

No	**Indonesian Real Words**	**Meaning**
1.	ibu	mother
2.	aku	eye
3.	bola	ball
4.	cuci	wash
5.	guru	teacher
6.	intan	diamond
7.	enak	yummy
8.	cabut	pluck
9.	buas	fierce
10.	daun	leaf
11.	pisau	knife
12.	kecap	sauce
13.	rumah	house
14.	sampah	rubbish
15.	kancil	deer
16.	bangku	chair
17.	mangga	mango
18.	khidmat	respectfully
19.	stasiun	station
20.	trenggiling	anteater (name of the animal)
21.	kemudi	steer
22.	kurung	cage
23.	bagaimana	how
24.	caci-maki	abuse
25.	lauk-pauk	meat dish
26.	tulislah	write (instruction)
27.	dilakukan	done (passive verb)
28.	bepergian	travelling
29.	membutuhkan	need
30.	disempurnakan	perfected/completed (passive verb)

4.3.7 Acehnese Word Reading

The Acehnese word reading test also had 30 words on its list, ranging from mono-syllabic to four-syllable words. The list of words was selected from the Acehnese reading textbook used by the school and from the Acehnese-Indonesian dictionary (Daud and Durie, 1999). Unlike Indonesian, which has a high frequency of multi-syllabic (even five-syllabic) words in its texts, Acehnese has a relatively lower frequency of five-syllabic words. However, in terms of consonant-vowel constructions, the words were arranged by considering the complexity of the orthographic structure from simple CV constructions (such as *bu* ‘rice’ and *karu* ‘noisy’) to relatively more complex CVV or CVVC constructions (such as the syllable *eueng* in *ureueng* ‘people’ and *kloe* ‘deaf’).

The procedure was as follows: The participant was given an explanation about the paper in front of them, and it was explained that the words listed there were Acehnese words. They were then given time to have a look and ask questions. They were then told that they could start reading when they were ready.

The scoring was as follows. As explained in Chapter 3, Acehnese has many dialects used by different ethnic groups in the Province. I was open to different dialect influences in this task, accepting all possible dialect variations of a sound. Symbol [ö] in item numbers 13, 19, and 20, for example, is pronounced more like schwa /ə/ in the Pidie dialect. However, it is realised as /ʌ/ in the Southern Aceh dialect. Both will be considered correct because both are dialectal variations representing the same meaning. However, should the letter [ö] be realised as /ɔ/, for example, this would be considered wrong, as there is no dialectal variant of this form.

The number of the syllable decoded by the participant was carefully examined. Acehnese has a diagraph [eu] that represents vowel /ω/. This diagraph should not have been held for too long as it was not a two-syllable entity. If this diagraph was realised as two syllables – such as by holding each vowel with the same length of duration or by stressing the second vowel sound, the answer would be considered incorrect. For example, the word *kloe* ‘deaf’ is a monosyllabic word read as /kloω/. If this word was read as /klo.we/, the reading would be considered incorrect. Items containing this symbol are item numbers 8, 11, 13, 15, 16, 20, 23, 24, 25, 26, 27, 28, 29, and 30 (Table. 4.11).

In Acehnese, diphthongs are written as (1) two letters in items 3, 7, 10, and 18, such as [oe], [ue], [ui], and [ée]. In items 11 and 16, the Acehnese diphthongs were written as (2) three letters, such as [eue]. The syllables containing these diagraph/triagraph should be read as a single syllable and should not be realised as two or three syllables. Moreover, if the child did not pronounce (or just minimally pronounced) the second sound of the diphthong in every diphthong ending with the schwa sound, the answer would still be considered correct if s/he correctly pronounced the first sound of the diphthong. This was acceptable because the Acehnese spoken in urban areas has sometimes undergone simplifications or reductions in terms of the diphthongs, but this is understood in communication. However, if the child reduced the first sound of the diphthong and only realised the second one (this applies only for schwa ending diphthongs), the reading production would be considered incorrect. In cases when the participant read one word twice, the second reading was scored.

It is also important to assess the child's [ph] production, such as in items [12] and [19]. This diagraph should be realised as the onset of a syllable. Indonesian does not have this [ph] or phonological /ph / sound. Thus, the child would tend to realise this as two syllables through insertion. For example, the word phèt sometimes was read as /pèhèt/. This is incorrect because it would not be understood in communication. However, if the child omitted the /h/ sound and only realised the /p/ sound without making any insertion to the word, this was considered correct. If the child omitted the /p/ sound and only realised the /h/, it would be incorrect. The Acehnese urban dialect, especially spoken by the younger generation, sometimes allows dropping the /h/ sound in /ph/ or /kh/ onsets to make the language sound less Acehnese.

Table 4.11 Acehnese Word Reading Test

No	Item	Syllable Construction	Meaning
1.	bu	CV	rice
2.	karu	CV.CV	noisy
3.	uet	CVVC.	rub
4.	apui	CV.CVV	fire
5.	kuwéh	CV.CVC	cake
6.	ngon	CVC	friend
7.	troe	CCVV	full (for tummy)
8.	teupèh	CV.CVC	hit
9.	brôh	CCVC	rubbish
10.	gurèe	CV.CV	teacher
11.	uleue	V.CVV	snake
12.	phét	CVC	bitter
13.	peugöt	CV.CVC	make
14.	bungoeng	CV.CVC	flower
15.	rinyeun	CV.CVC	stairs
16.	ureueng	V.CVVC	people
17.	cukèh	CV.CVC	poke
18.	kloe	CCVV	deaf
19.	jidhöt	CV.CVC	scold
20.	beungöh	CV.CVC	morning
21.	manyang	CV.CVC	kidding
22.	cangklak	CVC.CCVC	arrogant
23.	peungeut	CV.CVC	to lie
24.	seumiké	CV.CV.CV	think
25.	keumawé	CV.CV.CV	fishing
26.	seumampôh	CV.CVC.CVC	sweeping
27.	geulunyueng	CV.CV.CVVC	ears
28.	jimeukreuh	CV.CV.CCVC	insist
29.	beuseumatéh	CV.CV.CV.CV	be obedient
30.	neupeumeu'ah	CV.CV.CV.VC	forgive me

4.3.8 English Word Reading

The English word reading consisted of 30 words ranging from one- to three-syllable words. These words were selected from www.readingbear.org (Charles Place Education Foundation, 2016). These words were arranged from short to long words and were considered in their complexity of phonological construction. The website provided items to practice reading in English, starting with easily-decoded words with relatively simple consonant vowel constructions (CVC) such as *fan, jet*, *and pig*. The items progressed to relatively complex words like *blink* (CCVCC). Reading also progressed from consistent monographs [o] such as in *pot* to diagraphs [oo] such as in *moon.* The level of difficulty was also arranged based on syllable-complexity, from monosyllabic to three-syllabic words.

The procedure was as follows. The procedure was the same as the strategy used for the previous word reading tasks, except that the participant was told that the list they were about to read was a list of English words.

The scoring was as follows. English has many dialects, especially in the aspects of long and short vowels and rhoticism. In this study, all English dialects were accepted if understood and acceptable in global communication. For example, item numbers 16 and 17 (park and sports) contained an /r/ sound that is pronounced as rhotic in American and non-rhotic in British accent. Both pronunciations were accepted in this test, and if the child pronounced the /r/ in British without turning it into a long vowel, it was also acceptable because Indonesian and Acehnese do not have a long/short vowel distinction. The stress aspect was not assessed. The participants were all beginner English learners and read all English words in this task in the Indonesian way (syllable-based). Thus, if a word was read without the correct stress position, it was still considered correct.

For some other sounds, especially those unavailable in the participants' L1 and L2 such as /æ/ or /θ/, the closer sounds like /e/, /a/, and /t/ were accepted. However, if the child pronounced 'moon' (item 15) as /mon/ instead of /mu:n/ or /mun/, where the sound /u/ is available in their L1 and L2, the answer would be considered incorrect. If sounds /ɪ/ and /i/ were pronounced as /i/, due to Indonesian's absence of /ɪ/, this was acceptable.

Table 4.12 English Word Reading Test

No	English Real Word	Construction (in Phonetics)
1.	fan	CVC
2.	jet	CVC
3.	pig	CVC
4.	pot	CVC
5.	cat	CVC
6.	kid	CVC
7.	lock	CVC
8.	melt	CVCC
9.	gift	CVCC
10.	nest	CVCC
11.	king	CVC
12.	ducks	CVCC
13.	helps	CVCCC
14.	blink	CCVC
15.	moon	CVC
16.	park	CVC
17.	sport	CCVCC
18.	rabbit	CV.CVC
19.	bathtub	CV.CVC
20.	bucket	CV.CVC
21.	dentist	CVC.CVCC
22.	flowers	CCV.CVCC
23.	sunday	CVC.CVV
24.	butterfly	CV.CVC.CCVV
25.	nation	CV.CVC
26.	active	VC.CVC
27.	sailor	CVV.CVC
28.	dictionary	CVC.CV.CV.CV
29.	conclusion	CVC.CCV.CVC
30.	blueberries	CCV.CV.CVC

4.4 Procedure

In this section, I review and summarise the chronological order of the data collection.

At the onset of this study, I sent a consent form and an information sheet (Appendix 2) to all parents of the second graders of the chosen school. The forms explained the information of the study and procedure of data collection using clear and simple language. The parents could sign and return the consent form if they agreed to give their child permission to participate. In the information sheet, it was also mentioned that the child would also be asked for verbal assent before any data was collected from them.

After I received consent from a parent, I met the child and read the information about the study to them. I also outlined the activities that they were going to attend if they were willing to join. The child was asked for their willingness, and this statement was audio recorded for ethical purposes. First, I read to them the information about the study and the participation and asked if they would like to join. The information was given to the child in a very simple language suited to their age (Appendices 5 and 6). When they agreed to participate, they were asked to pronounce words clearly. This procedure was carried out individually and recorded on audio. None of the 54 children with the parental consent expressed unwillingness.

After a participant verbally expressed his/her willingness to participate, they were invited to take part in the battery of tests. To administer the test, I was assisted by a Tahfizh teacher – a Quran memorisation teacher – who would help me take the children one-by-one into the test room. The test room was in the same building of the school, but it was located on the first floor of the building. The room was typically used for textbook storage, and had been used occasionally for teacher meetings. The room was quiet, but noise from the schoolyard could be heard during break times.

The children, who were studying in one of five classrooms, were collected from the class and taken to the study room. After finishing the session, they were taken back to their class by the assistant. The child was administered one or two tests per call, which usually took 5 to 15 minutes each, sitting in front of me separated by a low table. After each session, the child could pick one sticker from a basket on a different table where the assistant would wait. At the end of the study, the remaining children in Year 2 who did not participate in the study were also given a sticker to avoid jealousy.

All participants were given the battery of tasks in the same order. On the first call, the participant would be asked for their assent. Soon after that, the HALA word naming test was given. Afterwards, the Acehnese vocabulary test was given. On the second calling, the participants were collectively given non-verbal tests during break times in one of the classrooms. The English vocabulary test was administered individually in the test room. Apart from the non-verbal test, other tests were given individually. One participant was absent, so he took the non-verbal test alone on a different day. During the third meeting, each participant was given the syllable deletion and phoneme deletion tests. At the fourth meeting, each participant was given the onset and rime awareness test. At the sixth, seventh, and eighth meetings, each participant was given Indonesian, English, and Acehnese word reading tests. There was no special order arranged for the administration of the word reading tests.

4.5 Data Scoring, Entry, and Storage

The scoring was done by playing the performance using Sony Sound Organizer Software. The play speed was reduced to allow for the scoring process. The audio file was replayed when necessary to ensure accuracy. After one year, I repeated the word reading scorings on the first 10 participants and then compared them with the scorings results I had done one year earlier. I used the Kappa inter-reliability test in SPSS to calculate the scoring reliability. The results yielded Moderate (K = 0.41 -0.60) to Very Good (K = 0.81 – 1.00) evaluations (see Appendix 18).

Then, all scores from the battery of tests were entered and stored in Microsoft Excel files before they were exported to SPSS. All subjects (children and parents) were made anonymous, and their names were replaced with labels: Sample 1 to Sample 46. The scores from the Acehnese vocabulary, English vocabulary, non-verbal, and all phonological awareness tests were transferred from the question sheets to the Microsoft Excel files. Scores from the Indonesian productive vocabulary and all word reading tests were also transferred to Microsoft Excel files. The data from the questionnaires were also copied from the questionnaire sheets to Excel files.

CHAPTER 5 RESULTS

This study investigates the relationship between phonological awareness and literacy among Indonesian children with varying degrees of exposure to Acehnese and English. A set of parental home language assessments was given to the parents, and a series of tests was given to 54 Grade 2 children in Banda Aceh primary school from July to September 2016. The details of the methods used are discussed in Chapter 4, including the decision to exclude a number of children from the study. The total number of participants in this study is 46.

The specific goal of the present study is to investigate the answers to the following research questions:

- Are there any significant correlations between the Acehnese spoken language experience and Indonesian, Acehnese, and English phonological awareness and word reading skills among Indonesian children exposed to varied degrees of home-language Acehnese?
- Do Acehnese spoken language skills play a significant role in Acehnese word reading skills once Indonesian word reading skill is controlled for?
- Does English vocabulary level play a significant role in English word reading skills once Indonesian word reading skill is controlled for?
- Which phonological level (syllable, phoneme, onset, or rime) is the most important for Indonesian, Acehnese, and English word reading skills among Year 2 Indonesian-Acehnese bilinguals learning L3 English?

This chapter presents the descriptive statistics of all variables and the data analysis for each research question.

Statistical tests were used to address the research questions. The tests used for the first research question included the Spearman's correlation coefficient and partial correlation. The second, third, and fourth research questions were related to factors predicting English, Indonesian, and Acehnese word reading skills. To address these questions, a series of regression analyses, also known as multiple regressions, were conducted. As proposed by Allison (1999, p. 1), the multiple regression is a statistical method for studying the relationship between a single dependent variable and one or more independent variables. Unlike correlation analysis, which only allows researchers to determine the relationship between two variables at the same time, regression analysis enables researchers to determine how one or more independent variables give variance to a dependent variable. This study sought to investigate which factors gave more variance to English word reading performance: Was it the English vocabulary or the Indonesian L1 word reading skill? Regression analysis allowed the study to compare these two competing variables and examine the unique contributions of each variable (Allison, 1999, p. 3).

5.1 Descriptive Statistics

Table 5.1 Descriptive Statistics of All Variables

Variables	N	Minimum Score	Maximum Score	Mean	Std. Deviation
Age (month)	46	81	89	87.89	3.34
Non-Verbal Intelligence (24)	46	4	23	14.61	4.75
Parental Assessment					
Active Acehnese Use (24)	46	0	18	5.41	4.93
Passive Acehnese Use (24)	46	0	17	6.63	4.54
Vocabulary Tests					
Indonesian HALA Body Part Vocabulary (20)	46	14	20	16.68	1.50
Acehnese Body Part Receptive Vocabulary (20)	46	1	19	8.70	5.44
English BPVS Receptive Vocabulary (12)	46	3	12	7	2.10
Phonological Awareness Skills					
PA Syllable Deletion (15)	46	7	15	13.87	1.77
PA Phoneme Deletion (15)	46	4	15	11.24	2.77
PA Onset Oddity (9)	46	4	9	7.50	1.33
PA Rime Oddity (9)	46	4	9	7.33	1.35
Word Reading Skills					
WR Indonesian (30)	46	13	30	26.28	4.14
WR Acehnese (30)	46	3	28	14.46	6.23
WR English (30)	46	0	23	9.43	5.16
Parents' Level of Education and Family Income					
Father's level of Education (6)	46	2	5	4.02	.91
Mother's level of Education (6)	46	0	5	3.89	.91
Family Income (6)	45	2	5	3.33	.93

Table 5.1 above illustrates the mean, standard deviation, minimum, and maximum values of each variable. As shown in the Table, there were 46 total participants. The exception to this is in the last variable, the Family Income, in which there were only 45 due to one missing data point. One parent did not provide an answer for this variable.

The first two variables were age and non-verbal intelligence. As discussed in Chapter 4, participants were all from the same grade, Year 2. The age of the participants ranged from 81 (6; 9 months) to 89 (7; 5 months). Because they were from the same grade and relatively equal ages, the participants were found to have mixed non-verbal intelligence levels. The minimum score for this variable was 4, the maximum was 23, and the standard deviation was 4.75.

The following variables are Acehnese active and passive frequency uses. Higher scores for active Acehnese meant more frequent active use of Acehnese at home with family members. Meanwhile, higher scores for passive Acehnese meant that the participant was reported to be more frequently spoken to in Acehnese at home by family members. These two scores are the independent variables in the present study. The Mean value for Acehnese active use was 5.41, while the Mean value for passive use was 6.63 out of 24.

The following variables are the vocabulary scores. As discussed in Chapter 4, the tools used to assess the three languages were not equivalent due to the contrast levels of proficiency across the languages. The Mean for the Indonesian productive vocabulary variable was 16.68 (from the total score of 20), while the Acehnese Receptive Vocabulary Mean score was 8.70 (from the total score of 20). For English basic receptive vocabulary, the Mean value was 7 (of the total score of 12). The high Mean value for Indonesian productive vocabulary skills and the relatively low Mean values for Acehnese and English receptive vocabulary knowledge show that the participants in the present study were dominant in Indonesian. Based on the British Picture Vocabulary Scale Norm scores (Dunn et al., 1997), the participants in the present study scored below the norm score of English native speakers. In terms of Acehnese spoken vocabulary knowledge, the participants varied from knowing only 1 to 19 of 20 body part names.

The following category of variables is phonological awareness. In Table 5.1, the skills are categorised based on phonological levels syllable, phoneme, onset, and rime. The Mean value for syllable awareness skills was higher than that of phoneme awareness. The Mean value for syllable awareness was 13.87, while the Mean value for phonemes was only 11.24. The Mean values for the onset and rime awareness scores were relatively equal (7.50 and 7.33 respectively).

The last two sections of Table 5.1 depict the Mean, Minimum, Maximum, and Standard Deviation values for word reading skills and the participants' family demographic information, which includes parents' educational level and family income.

In word reading variables, the highest Mean value was achieved in Indonesian word reading (M = 26.28). This value was followed by Acehnese word reading (M = 14.46) and English word reading (M = 9.43). This finding suggests that the participants read best in Indonesian, Acehnese, and English respectively. For levels of mother and father education, the Mean values were 4.02 and 3.89, respectively. The Mean value for family income was 3.33. The average participant in the present study came from a middle-class family and the average parent achieved an undergraduate degree as their highest level of education (Category 4). Appendix 20 and Charts 1, 2, and 3 provide detailed family demographic data.

Table 5.2. Descriptive Statistics of Phonological Awareness Scores by Language

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Indonesian Phonological Awareness (16)	46	8.0	16.0	13.93	1.89
Acehnese Phonological Awareness (16)	46	6.0	16.0	12.70	2.18
English Phonological Awareness (16)	46	8.0	16.0	13.30	1.96

Table 5.2 lists descriptive statistics for phonological awareness scores based on language. The participants achieved the highest scores in Indonesian, followed by English and Acehnese.

5.2 Correlational Analysis

Table 5.3 shows the intercorrelations across variables. Due to the data's abnormal distribution (see Appendix 21), the Spearman test was employed in the correlational analysis. Spearman's rank correlation coefficient, rather than Pearson's, is commonly used to test correlations between variables whose data are not normally distributed.

A number of significant correlations are shown in Table 5.3. For instance, non-verbal intelligence was significantly statistically correlated with Indonesian vocabulary ($r = .495$, $p = .000$) and the three word reading scores Indonesian ($r = .309$, $p = .036$), Acehnese ($r = .367$, $p = .012$), and English ($r = .325$, $p = .027$). The correlations between the Acehnese spoken skills were also found to be strongly and significantly correlated to one another. The active use of Acehnese was correlated significantly to passive use ($r = .835$, $p = .000$) and Acehnese receptive vocabulary ($r = .724$, $p = .000$). Acehnese passive use was also correlated significantly to Acehnese receptive vocabulary, at $r = .576$, and $p = .000$. Indonesian vocabulary was found to be correlated not to Indonesian word reading, but to Acehnese word reading skills ($r = .381$, $p = .009$). English vocabulary was correlated significantly to English word reading ($r = .365$, $p = .013$) and Indonesian word reading ($r = .291$, $p = .0$).

Table 5.3. Intercorrelations of All Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Age and Intelligence																	
1. Age	1.00																
2. Non-Verbal (24)		1.00															
Parental Assessment																	
3. Active Acehnese			1.00														
4. Passive Acehnese			.835[a]	1.00													
Vocabulary Knowledge																	
5. Indonesian (20)		.495[a]			1.00												
6. Acehnese (20)			.724[a]	.576[a]		1.00											
7. English (12)							1.00										
Phonological Awareness																	
8. Syllable Deletion (15)								1.00									
9. Phoneme Deletion (15)								.565[a]	1.00								
10. Onset Oddity (9)									.404[b]	1.00							
11. Rime Oddity (9)											1.00						
Word Reading																	
12. Indonesian (30)		.309[b]		-.365[b]			.291[b]	.522[a]	.682[a]			1.00					
13. Acehnese (30)	.312[b]	.367[b]			.381[b]			.479[b]	.597[a]			.651[a]	1.00				
14. English (30)		.325[b]	-.342[b]	-.412[b]			.365[b]	.476[b]	.676[a]			.665[a]	.578[a]	1.00			
Family Demographic Information																	
15. Father's Level of Education											.366[b]				1.00		
16. Mother's Level of Education										.320[b]					.402[b]	1.00	
17. Family Monthly Income							.399[b]										1.00

a. Correlation is significant at the 0.01 level (2-tailed).

b. Correlation is significant at the 0.05 level (2-tailed).

In Table 5.3, there are statistically significant correlations between word readings and phonological awareness scores. For example, syllable awareness was significantly related to word reading skills in Indonesian ($r = .522$, $p = .000$), Acehnese ($r = .479$, $p = .001$), and English ($r = .476$, $p = .001$). Phoneme awareness was also significantly related to word reading skills, with even larger r values. The values for Indonesian, Acehnese, and English word reading skills were .682, .597, and .676, respectively. The correlations between onset and rime awareness scores to word reading skills were weaker, none of which were statistically significant.

The correlations between the subskills of phonological awareness were almost all significant. The strongest correlation was that of syllable and phoneme awareness ($r = .565$, $p = .000$), followed by the correlation between phoneme awareness and onset awareness ($r = .404$, $p = .005$). Onset and rime awareness were not found to be significantly correlated to any other phonological awareness skills. The results of the test of intercorrelation between phonological awareness scores across languages is presented in Appendix 22.

Word reading performance is also depicted to strongly and significantly correlate to one another in Table 5.3. Indonesian word reading skills were associated with Acehnese at an r-value of .651 and with English at the r-value of .665. Word reading performance in Acehnese and English was statistically related, with an r-value of .578. All three correlations had $p<0.01$ levels of significance.

Table 5.3 also indicates that parental educational levels and family income have significant relationships with some of the participants' test results. For example, a father's education level was significantly correlated with rime awareness skills ($r = .366$, $p = .012$), a mother's education level was correlated with onset awareness ($r = .320$, $p = .030$), and family income was correlated with the English vocabulary level ($r = .399$, $p = .007$).

5.3 Significant Roles of Acehnese Spoken Proficiency

The principal goal of this study is to determine if Acehnese-Indonesian bilingualism had a significant effect on bilingual children’s multi-literacy abilities. The study measured Acehnese spoken-language proficiency in two ways: by assessing the participants’ Acehnese receptive vocabulary levels and assessing the Acehnese language input and output received and produced at home. Three variables were used to represent Acehnese spoken language proficiency skills in the present study. These variables included Acehnese passive use, Acehnese active use, and Acehnese receptive vocabulary.

5.3.1. Active Proficiency in Acehnese

Table 5.3 shows that, outside of Acehnese spoken language skill variables, the Acehnese active use score had a negative but significant relationship with English word reading skills ($r = -.342$, $p = .020$). Aside from this variable, the Acehnese active use variable was not correlated to any other phonological awareness or word reading skills. To determine the impact of Acehnese active use on other variables without including intelligence, this study conducted a partial correlational test and entered the non-verbal intelligence score as a controlling variable. Table 5.4 presents the results below.

Table 5.4 Acehnese Active Use Correlations with Controlled Non-Verbal Intelligence Factor

Controlling Variable: **Non-Verbal Intelligence**	**Acehnese Active Use**	**Indonesian Vocabulary**	**English Vocabulary**	**Syllable Awareness**	**Phoneme Awareness**	**Onset Awareness**	**Rime Awareness**	**Indonesian WR**	**Acehnese WR**	**English WR**
Active Acehnese Use	1000 . 0	.346 .021 42	-.207 .179 42	.052 .738 42	.003 .983 42	-.091 .556 42	.162 .293 42	-.208 .178 42	.105 .496 42	-.229 .134 42

As non-verbal intelligence scores were controlled for, the participant number was automatically reduced to 42. Table 5.4 also shows that, once non-verbal intelligence score was controlled for, the negative but significant correlation between the Acehnese active use and the English word reading previously found in Table 5.3 disappeared. In contrast, the relationship between Acehnese active use and Indonesian vocabulary became stronger and statistically significant ($r = .346$, $p = .021$). Other than this relationship, no significant relationships were found between the Acehnese active use score and other variables.

This study also computed the correlation coefficient test to language-based phonological awareness scores (see Appendix 23), but no significant correlations were found between Acehnese active use scores and language-based phonological awareness scores.

5.3.2. Passive Proficiency in Acehnese

Similar to the Acehnese active use score, the Acehnese passive use score was also significantly but negatively correlated to English word reading ($r = -.412$, $p = .004$, see Table 5.3). In addition to English word reading being affected, Acehnese passive use was also found to be significantly and negatively correlated to word reading in Indonesian ($r = -.365$, $p = .013$). Because English word reading and Indonesian word reading were both correlated significantly with English vocabulary level (see Table 5.3), these correlations may be mediated by English vocabulary level rather than Acehnese passive use. Moreover, considering that all word reading skills were significantly correlated to non-verbal skills (see Table 5.3), the negative and significant correlations between Acehnese passive use and Indonesian and English word reading skills may also be facilitated by non-verbal intelligence.

To control the intelligence and English vocabulary knowledge factors, the study conducted a set of partial correlational tests (Table 5.5).

Table 5.5 Acehnese Passive Use Partial Correlations

Controlling Variable:	Variables	Non-Verbal Intelligence	Indonesian Vocabulary	English Vocabulary	Syllable Awareness	Phoneme Awareness	Onset Awareness	Rime Awareness	Indonesian WR	Acehnese WR	English WR
Non-Verbal Intelligence	**Passive Acehnese Use**	-	.247 .106 42	-.167 .279 42	.047 .762 42	-.094 .542 42	-.100 .519 42	-.037 .813 42	-.307 .043 42	.070 .636 42	-.359 .019 42
English Vocabulary Level	**Passive Acehnese Use**	-.086 .573 43	.015 .923 43	-	-.002 .989 43	-.222 .143 43	-.096 .532 43	-.122 .424 43	-.282 .061 43	-.086 .575 43	-.368 .013 43

Based the results of the partial correlation analysis presented in Table 5.5, after the non-verbal intelligence score was controlled for, Acehnese passive use was still correlated negatively and significantly to both Indonesian and English word reading skills. However, once the English vocabulary score was used as controlling variable, the significant relationship between Acehnese passive use and Indonesian word reading skills disappeared. However, the negative relationship with English word reading was significant ($r = -368$, $p = .013$).

Furthermore, when tested with language-based phonological awareness subskills scores, Acehnese passive use was again found to have a negative and significant relationship with Indonesian syllable deletion ($r = -.424$, $p = .003$). Once non-verbal intelligence was controlled for, the correlation became weaker but significant ($r = -.297$, $p = .048$) (Appendix 23).

Altogether, the Acehnese passive use score was found to make three negative correlations: Indonesian word reading, English word reading, and Indonesian syllable deletion skills. To determine which factors had caused these persisting correlations, the group is median-split[2] based on the Acehnese passive use score, first into two groups (N1= 23, N2 = 23), and then into three groups (N1 = 15, N2 = 16, N3 = 15). N1 is the group with the lower Acehnese score, while N2 and the N3 are the higher one, with N3 as the highest. Then, the study compared the Means of all variables across the groups. The results of the Mann-Whitney U and Kruskal-Wallis Mean comparison tests are presented in Appendices 24 and 25.

In the two-group split analysis, the Mean comparison showed that the high passive-Acehnese group performed significantly worse in Indonesian word reading, English word reading, and Indonesian syllable deletion compared to the low-passive-Acehnese group, with p values of .019, .023, and .031, respectively (Appendix 24, Table B). When the samples were split into three groups and the Mean values of all variables were compared using Kruskal-Wallis test, the groups were found significantly different in English word reading skills ($p = .034$). Nonetheless, the significant difference in terms of Indonesian word reading disappeared ($p = .074$). Meanwhile, the three groups were still found significantly different in Indonesian syllable deletion skills ($p = .039$), and the difference in the Indonesian onset oddity score also became significant ($p = .012$) (Appendix 25, Table B).

In summary, there was a relatively strong relationship shown between Indonesian and English word reading skills and English receptive vocabulary, and there was a relatively strong and significant relationship found between Indonesian syllable deletion and non-verbal intelligence scores. This finding may suggest that the negative correlations were facilitated by two factors: English vocabulary and non-verbal

[2] A method of categorising the continuous variables into two groups which are higher and lower than the median value (Moore, 2000).

intelligence. Therefore, children with more exposure to spoken Acehnese might have happened to have lower intelligence and English proficiency levels compared with those with less exposure to spoken Acehnese. This paper investigates the possibility of bias in Section 5.3.4.

5.3.3. Acehnese Receptive Body Part Vocabulary Level

To determine the significant role of Acehnese oral language skill to literacy and phonological awareness skills, the other Acehnese spoken-language skills (Acehnese vocabulary level) were analysed. In Table 5.3, the variable was found to be correlated only with Acehnese active and passive use variables. Statistically significant correlations to other reading-related variables and the phonological awareness-related variables were absent. This study conducted the partial correlational test again controlling for the non-verbal intelligence factor to determine whether significant correlations would occur once the intelligence factor was controlled for.

Table 5.6 Acehnese Receptive Vocabulary Correlations with Controlled Non-Verbal Intelligence Factor

Controlling Variable: **Non-Verbal Intelligence**	**Acehnese Receptive Vocabulary**	**Indonesian Vocabulary**	**English Vocabulary**	**Syllable Awareness**	**Phoneme Awareness**	**Onset Awareness**	**Rime Awareness**	**Indonesian WR**	**Acehnese WR**	**English WR**
Acehnese Receptive Vocabulary	1000 . 0	.305 .044 42	-.157 .307 42	.055 .724 42	.144 .351 42	.071 .646 42	.153 .321 42	-.129 .402 42	.180 .244 42	- .031 .840 42

After the intelligence factor was controlled for, the Acehnese receptive vocabulary was found to be positively and significantly correlated to Indonesian productive-vocabulary (r = .305, p =.044). No other significant relationships were encountered with the Acehnese receptive-vocabulary score.

5.3.4 Closer Analyses of the Non-Verbal Intelligence and English Oral Vocabulary Factors

Among three measurements representing Acehnese spoken language skills (Acehnese passive use, Acehnese active use, and Acehnese receptive vocabulary), only one measurement was found to have significant and negative correlations to three reading-related variables (Indonesian syllable deletion, Indonesian word reading, and English word reading skills). This continued to be true even after the non-verbal intelligence score was controlled through partial correlation analysis. When referring to Table 5.3 where all variables were tested for their correlation coefficient, this study found that the Indonesian and English word reading scores were significantly correlated with English vocabulary levels ($r = .291$, $p = .050$ and $r = .365$, and $p = .013$ respectively). The study investigated the role of English vocabulary knowledge by median-splitting samples based on the English vocabulary score. The results of the Mann-Whitney test are presented in Appendix 27.

Based on a closer look at English vocabulary scores, the data showed that English vocabulary level was a determinative factor in phonological awareness subskills scores. Participants with higher English vocabulary performed better than the lower English vocabulary group in English phoneme deletion and English onset oddity skills, with p values of .008 and .032 respectively. This finding suggests that higher English vocabulary level is related to more effective English phoneme and onset awareness skills. However, a significant difference in Acehnese oral language skills was not found.

According to the correlation analysis of phonological awareness subskills, oral vocabulary scores, non-verbal intelligence in Table A of Appendix 23, the syllable deletion was significantly correlated to non-verbal intelligence ($r = .357$, $p = .015$) and English vocabulary level ($r = .332$, $p = .024$). It is assumed that negative correlations were facilitated by both non-verbal and English vocabulary skills because the Mean

Rank values for these two variables between the low and high groups were highly different, although not significant (Appendix 24 Table A, Appendix 25 Table A).

The samples were also median-split using the non-verbal intelligence score. The results of the Mann-Whitney test are presented in Appendix 28.

Based on a closer look at the non-verbal intelligence median-split sample analysis (Appendix 28), the low and the high groups were significantly different in terms of Indonesian syllable deletion ($p = .020$), Indonesian vocabulary ($p = .001$), Indonesian word reading ($p = .014$), Acehnese word reading ($p = .003$), and English word reading ($p = .009$). However, a significant difference in Acehnese oral language skills was not found.

The paper median-split another Acehnese-spoken-skills related variable, Acehnese active use, to determine if the group splits were different regarding these two variables. The high-active-Acehnese group was significantly lower at the level of intelligence ($p = .026$) compared with the low-active-Acehnese group (Appendix 30 Table B). However, no significant differences were found in terms of English vocabulary levels.

In summary, although participants with greater exposure to Acehnese were found to have lower English vocabulary levels compared with those with less exposure to Acehnese, the difference was not significant. The difference regarding the non-verbal intelligence level was found to be significant among the participants with both higher and lower Acehnese active use scores. Those with higher Acehnese output scores performed poorer on the non-verbal intelligence test.

5.4 The Role of Acehnese Spoken Language Skills in Acehnese Word Reading

In the previous subsection, particularly in Table 5.3, this paper demonstrated the two-tailed correlations of Acehnese spoken language variables and Acehnese word reading. None of the Acehnese spoken language variables were found to be significantly correlated to Acehnese word reading. Presumably, this non-significant correlation was due to the influence of the Indonesian orthographic skills. Their Indonesian literacy equal learning experience may have homogenised their Acehnese word reading performance. Based on this assumption, the paper conducted another analysis to address the second question of this study: whether there was a unique contribution of Acehnese spoken language skills to Acehnese word reading skills if Indonesian word reading skills were controlled for. The study then conducted a regression analysis, a statistical tool that determined how multi-independent variables interacted with a dependent variable after specific variables were controlled for.

In the first set of analyses, (Table 5.7), the paper controlled only the non-verbal intelligence level. After the non-verbal element was controlled, a score for the Acehnese spoken-language skills (Acehnese active use, Acehnese passive use, and Acehnese vocabulary level) was entered one-at-a-time in the regression analysis with Acehnese word reading skills as the output variable. For the first regression analysis, this study tested whether each of the Acehnese spoken language variables contributed a significant variance to Acehnese word reading after the non-verbal intelligence score was controlled. In Step 1, the non-verbal intelligence score was entered. In Step 2, the Acehnese spoken language variable was entered in turn (Table 5.7).

In the second set (Table 5.8), the Indonesian word reading score was entered as the second controlled variable. In the second regression, the study repeated the steps performed in the first analysis but included the Indonesian word reading score together with the non-verbal intelligence score in step 1 (Table 5.8).

Table 5.7 The Role of Acehnese Spoken Language Skills in Acehnese Word Reading Performance: Intelligence is Controlled

Step and Independent Variables	**Final Standardised Coefficient Beta**	**R square**	**R square Change**	**F Change**
Step 1 Non-Verbal Intelligence	 .374*	.140	.140	7.141*
Step 2 Non-Verbal Intelligence Acehnese Active Use	 .403** .103	.149	.010	.495
Step 2 Non-Verbal Intelligence Acehnese Passive Use	 .391* .071	.114	.005	626
Step 2 Non-Verbal Intelligence Acehnese Receptive Vocabulary	 .417** .172	.167	.028	.238

*p < .05 ** p < .01 *** p < .001

Table 5.7 shows that, after non-verbal intelligence was controlled for, none of the Acehnese spoken-language skills significantly predicted Acehnese word reading skills. However, when the analysis was repeated to include the Indonesian word reading score as one of the controlling variables (Table 5.8), two of three Acehnese-spoken language skills were found to significantly predict the Acehnese word reading score. The first skill was the Acehnese passive use score ($\Delta R2 = .062$, $p <.05$), and the second was Acehnese receptive vocabulary ($\Delta R2 = .054$, $p < .05$).

Table 5.8 The Role of Acehnese Spoken Language Skills in Acehnese Word Reading Performance: Intelligence and Indonesian Word Reading Skill are Controlled

Step and Independent Variables	Final Standardised Coefficient Beta	R square	R square Change	F Change
Step 1 Non-Verbal Intelligence Indonesian Word Reading	 .178 .596***	.457	.457	18.112***
Step 2 Non-Verbal Intelligence Indonesian Word Reading Acehnese Active Use	 .228 .642*** .229	.503	.046	3.904
Step 2 Non-Verbal Intelligence Indonesian Word Reading Acehnese Passive Use	 .216 .679*** .269*	.519	.062	5.443*
Step 2 Non-Verbal Intelligence Indonesian Word Reading Acehnese Receptive Vocabulary	 .230 .625*** .243*	.512	.054	4.681*

*p < .05 ** p < .01 *** p < .001

The Significant Role of Indonesian Vocabulary in Acehnese Word Reading Skill

The two sets of regression analysis results above provided evidence of the Acehnese oral language skills' essential role in Acehnese word reading performance. As this study involves several languages, it is important to highlight the significant correlation made across languages. According to Table 5.3, Acehnese word reading was statistically correlated to Indonesian vocabulary level ($r = .381$, $p = .009$). Moreover, in sections 5.3.1 and 5.3.3, it was clear Acehnese active use and Acehnese receptive vocabulary correlate significantly with Indonesian vocabulary once the intelligence score was controlled for (Tables 5.4 and 5.6). Based on these findings, the paper predicted the possibility of cross-language transfer between L1 Indonesian vocabulary and L2 Acehnese word reading. Another regression analysis was conducted, controlling for non-verbal intelligence and Indonesian word reading skills. However, this time, in Step 2 of the regression, this study entered the Indonesian vocabulary score instead of

Acehnese-oral-language scores (Appendix 29). The result showed that Indonesian vocabulary level was also a significant predictor of Acehnese word reading when non-verbal intelligence and Indonesian word reading were controlled for ($\Delta R2 = .257$, $p < .05$).

5.5 The Role of English Receptive Vocabulary in English Word Reading

To assess the influence of English receptive vocabulary on English word reading, the study computed another regression analysis. In the first set of analyses (Table 5.9), this study only controlled for the non-verbal intelligence factor. In the second set (Table 5.10), the study included Indonesian word reading, the first and strongest alphabetic skill of the participant, as the other control variable. The results of both analyses show that even when only the non-verbal was controlled for, the level of English vocabulary knowledge gave a unique variance to English word reading performance.

Table 5.9 The Role of English Receptive Vocabulary in English Word Reading after Non-Verbal Intelligence is Controlled

Step and Independent Variables	Final Standardised Coefficient Beta	R square	R square Change	F Change
Step 1 Non-Verbal Intelligence	 .367*	.135	.135	6.843*
Step 2 Non-Verbal Intelligence English Receptive Vocabulary	 .302* .351*	.253	.119	6.846*

Moreover, when non-verbal intelligence and Indonesian word reading skills were controlled, English receptive vocabulary contribution to English word reading became larger and more important (Table 5.10). In conclusion, English vocabulary level is a significant predictor of English word reading skill for Indonesian-Acehnese bilinguals literate in Indonesian transparent alphabetic orthography. The role of English vocabulary in English word reading is so significant that even the equal L1 Indonesian word reading experience does not reduce its effect.

Table 5.10 The Role of English Receptive Vocabulary in English Word Reading after Non-Verbal Intelligence and Indonesian Word Reading is Controlled

Step and Independent Variables	Final Standardised Coefficient Beta	R square	R square Change	F Change
Step 1		.535	.535	24.781***
Non-Verbal Intelligence	.147			
Indonesian Word Reading	.670			
Step 2		.637	.101	11.714**
Non-Verbal Intelligence	.092			
Indonesian Word Reading	.656***			
English Receptive Vocabulary	.324**			

*p < .05 ** p < .01 *** p < .001

5.6 The Most Important Phonological Awareness Level in Indonesian, Acehnese, and English Word Reading Skills

The fourth aim of the present study was to determine the most important phonological levels that influenced the word reading of the Acehnese-Indonesian bilingual children. To answer this question, this study conducted three sets of regression analyses – each for each word reading skill. In each of the analyses, the non-verbal intelligence score was entered in the first step, followed by every phonological awareness subskill entered in turn in Step 2.

5.6.1 The Most Important Phonological Awareness Level in Indonesian Word Reading

Table 5.11 Regression Analysis with Indonesian Word Reading as the Output Variable

Step and Independent Variables	Final Standardised Coefficient Beta	R square	R square Change	F Change
Step 1 Non-Verbal Intelligence	 .328*	.107	.107	5.288*
Step 2 Non-Verbal Intelligence Syllable Deletion	 .172 .490**	.323	.216	13.694**
Step 2 Non-Verbal Intelligence Phoneme Deletion	 .276* .542***	.398	.291	20.811***
Step 2 Non-Verbal Intelligence Onset Oddity	 .328* .112	.120	.013	.615
Step 2 Non-Verbal Intelligence Rime Oddity	 .313* .073	.112	.005	.623

*p < .05 ** p < .01 *** p < .001

When Indonesian word reading was entered as the output variable and the non-verbal intelligence was controlled for, the most critical predicting variable among the four tested phonological awareness levels was phoneme awareness, or phoneme deletion score, with a standardised coefficient beta value of .542 and an F-value of 20.811. The second-most important factor was syllable awareness, with a beta value .490 and F-value of 13.694. Onset and rime oddity scores were not proven to be significant predictors of Indonesian word reading.

5.6.2 The Most Important Phonological Awareness Level in Acehnese Word Reading

Table 5.12 Regression Analysis with Acehnese Word Reading as the Output Variable

Step and Independent Variables	Final Standardised Coefficient Beta	R square	R square Change	F Change
Step 1 Non-Verbal Intelligence	 .374*	.140	.140	7.141*
Step 2 Non-Verbal Intelligence Syllable Deletion	 .249 .391**	.277	.137	8.147**
Step 2 Non-Verbal Intelligence Phoneme Deletion	 .321** .554***	.444	.304	23.528***
Step 2 Non-Verbal Intelligence Onset Oddity	 .374* .188	.137	.035	1.838
Step 2 Non-Verbal Intelligence Rime Oddity	 .395** -.106	.150	.011	.545

*p < .05 ** p < .01 *** p < .001

Similar to Indonesian word reading, phonemes was the most important phonological level for reading in Acehnese orthography for children with Indonesian orthographic backgrounds. Comparable to the results found in Indonesian word reading, the second-most important level for reading in Acehnese was syllable awareness, while onset and rime oddity scores did not make significant contributions.

5.6.3 The Most Important Phonological Awareness Levels in English Word Reading

Table 5.13 Regression Analysis with English Word Reading as Output Variable

Step and Independent Variables	Final Standardised Coefficient Beta	R square	R square Change	F Change
Step 1 Non-Verbal Intelligence	 .367*	.135	.135	6.843*
Step 2 Non-Verbal Intelligence Syllable Deletion	 .246* .380**	.265	.130	7.606**
Step 2 Non-Verbal Intelligence Phoneme Deletion	 .315** .542***	.426	.291	21.782***
Step 2 Non-Verbal Intelligence Onset Oddity	 .367* .141	.154	.020	1.006
Step 2 Non-Verbal Intelligence Rime Oddity	 .360* .033	.136	.001	.051

*p < .05 ** p < .01 *** p < .001

When the output variable was changed to English word reading, and the same order of steps as the two previous regressions was repeated, the study found again that participants used phonemes and syllables as the first and second pivotal phonological awareness level, respectively, to read in English. The phoneme deletion score was accounted to make the highest variance to the English word reading when the non-verbal was controlled, with the beta value of .542 and F-value of 21.782. Again, the results indicate that onset and rime do not have a significant impact on participants' English word reading performance.

5.7 Conclusion

This chapter has presented the results of the data analysis for the present study. The beginning of the chapter elaborated on the descriptive statistics for relevant variables and presented the results of the intercorrelations between variables. The chapter then presented the research questions, the steps of data analyses conducted to address the research problems, and explanations of the findings.

This study's data shows that generally, Acehnese spoken-language skills have negative relationships with syllable deletion in Indonesian, Indonesian word reading, and English word reading, but not Acehnese word reading skills. The Kruskal-Wallis Mean comparison tests conducted after the participants were grouped into low and high Acehnese active scores shows that participants with higher Acehnese scores had relatively lower intelligence levels compared to those with minimum Acehnese active use scores. When both English vocabulary and non-verbal scores were used as controlling variables in a partial correlation analysis (Table 5.5), the correlation of the Acehnese passive use score and the Indonesian word reading disappeared, but the relationship with English word reading continued to be negative and significant.

A more positive result favouring Acehnese spoken-language skills was found when intelligence was controlled for. Some Acehnese spoken skill scores were found to have positive relationships with Indonesian vocabulary level. Although both correlations were relatively weak, they were statistically significant.

Moreover, two of the Acehnese spoken-language skills (Acehnese passive use and Acehnese receptive vocabulary) and Indonesian vocabulary skills were found to contribute significantly to Acehnese word reading performance. The regression analysis, which controlled for non-verbal intelligence and Indonesian word reading scores, indicated that Acehnese passive use, Acehnese receptive vocabulary, and Indonesian vocabulary levels contributed unique variances to Acehnese word reading, although the level of significance was relatively low.

Additionally, the study found that English vocabulary was the unique predictor for English word reading for Indonesian second-grade English learners, both before and after non-verbal intelligence and Indonesian reading skills were controlled for

The final result indicated that phonemes and syllables were the most critical phonological levels used by the participants in reading the three languages, while the onset and rime did not play important roles.

CHAPTER 6 DISCUSSION

The primary goal of the present study was to look at the role of Acehnese spoken language experience in phonological awareness abilities and word reading performances among young Indonesian children learning L3 English. Three variables, Acehnese passive use score, Acehnese active use score, and Acehnese receptive vocabulary score were used as the variables representing Acehnese spoken language skills.

In this chapter, I will discuss the findings and link them to other related studies. In the first, second, third and fourth sections of the chapter, I discuss the findings of the four research questions respectively. After that, in the fifth and sixth section, I relate the findings to the previous studies and draw some conclusions.

6.1 Research Problem 1

Are there any significant correlations between the Acehnese spoken language experience and the Indonesian, Acehnese and English phonological awareness and word reading skills among Indonesian children who are exposed to a varied degree of home-language Acehnese?

Hypothesis:

Children with more Acehnese spoken language experience perform better only in the Acehnese phonological awareness tasks and word reading due to their higher Acehnese vocabulary[3]*, but perform the same as other peers in both Indonesian and*

[3] Part one of the hypothesis

English. Their Acehnese vocabulary will not support the Indonesian word reading, nor English word reading[4]. Their mono-literate bilingual status, and the different phonological and orthographic systems between Acehnese and English restrict them from reading the language better than the other peers with lower Acehnese knowledge.

The results of the present study reject part of the hypothesis regarding the Acehnese-exposed children's better performance on the Acehnese language tasks (phonological awareness and word reading). The data from the present study shows that there are no significant relationships between the level of Acehnese spoken language skills with (a) the performance in Acehnese phonological awareness tasks, and (b) the ability to read in the Acehnese transparent alphabetic orthography. The finding regarding this first part of the hypothesis is elaborated in section 6.1.1 below.

The data from the present study also rejects the other part of the hypothesis dealing with the non-significantly different Indonesian and English phonological awareness and word reading performances between the Acehnese low and high-scoring participants. Instead, the present study found significant and negative roles of the Acehnese passive use score in three reading-related variables; Indonesian word reading, English word reading, and Indonesian syllable deletion scores. The finding of the second part of the hypothesis is discussed in section 6.1.2.

6.1.1 The Role of the Acehnese Spoken Language Skills in the Literacy Skills within the Same Language

Contrary to my expectation, my data shows that better Acehnese spoken language skills do not exalt the child's awareness of the Acehnese sound structures, nor raise their Acehnese decoding ability. The children's performance on the Acehnese syllable, phoneme, onset and rime awareness tasks are non-significantly different across

[4] Part two of the hypothesis

the Acehnese low and high groups. Their performance on the Acehnese word reading is also not different.

I propose several possible factors of why Acehnese spoken language skills do not correlate significantly with the Acehnese phonological awareness and word reading skill;

(a) That compared to their Acehnese spoken language skills, the participants' Indonesian first-language orthographic knowledge is more influential in their Acehnese phonological awareness and word reading performance.

(b) That Indonesian and Acehnese are close both phonologically and orthographically. The similar transparent alphabetic writing systems make the transfer of Indonesian orthographic skill to that of Acehnese relatively easy. The languages are also close phonologically, thus understanding Acehnese phonological structures will not be too hard for the Indonesian monolinguals.

(c) That the Indonesian-Acehnese bilinguals were not equipped with better Acehnese orthographic knowledge, thus their Acehnese word reading performance is not that different to that of the Indonesian monolinguals.

I elaborate these three factors below.

The Dominance of L1 Indonesian Orthographic Skill

In Indonesian-Acehnese bilingual context, the Acehnese highly consistent orthography is relatively easy to acquire, especially by those who have already mastered a closely-related orthographic skill like Indonesian alphabet, thus only little support from knowing the spoken version of the language is needed. The non-significant differences in the literacy and phonological awareness performances between monolinguals and mono-literate bilinguals was also reported previously by Janssen and Bosman (2013). Their study of Turkish-Dutch bilinguals resulted in similar results where the Turkish-Dutch mono-literate bilinguals performed as well as their Dutch monolingual counterparts in Dutch phonological awareness and word reading tests. Regarding one of their research questions, whether Turkish-Dutch bilinguals performed differently than the Dutch monolinguals in Dutch phonological awareness and decoding when they were only literate in Dutch, the authors reported that the Turkish-Dutch bilinguals behaved (in literacy) similarly to the Dutch monolinguals (Janssen and Bosman, 2013, p. 9).

My study is also in line with Durgunoglu's statement (1997) in Bialystok (2007, p. 49) about the stronger importance of the L1 orthography than the L2 oral language skill in L2 literacy acquisition.

In the following paragraphs, I give some explanations of how the L1 Indonesian orthography, through the phonemic awareness and the reading strategy, dominantly influence the Acehnese word reading performance.

Equal phonemic awareness. Not only in the Acehnese word reading, the roles of Acehnese spoken language skills were also non-significant in all Acehnese phonological awareness subscores. The equal ability demonstrated by both monolingual and bilingual groups in the Acehnese phonological awareness tasks, especially at the phonemic level, were caused by their Indonesian literate status. Since all participants received the same reading instruction in the Indonesian transparent alphabetic, they reached a similar level of phonemic awareness skill. The introduction to Indonesian letter-phoneme relationships through letter knowledge, along with the practice of phoneme and syllable blending through reading and writing, have supported the children in understanding that words are made of syllables and that syllables are made of phonemes. This understanding is relatively easy to acquire because the Indonesian orthography is highly transparent, the letter names have a direct association with the sound they represent (Winskel, 2013), and the words are mostly constructed with simple consonant-vowel combinations. I believe that these Indonesian phonological awareness skills were then transferred to Acehnese because the participants' Mean value for the

Indonesian phonological awareness is stronger than that for the Acehnese (Table 5.2). So, even with limited or no Acehnese oral vocabulary knowledge, those children can work on the Acehnese syllables and sounds as they do in the L1 Indonesian. That the phonological awareness transferred from the strong (Indonesian) to the weak language (Acehnese) is consistent with Cummins' Interdependence Theory (1979), and findings reported by Anthony et al. (2009) and Laurent and Martinot (2010).

Moreover, the effect of transparent alphabetic instruction on someone's phonological awareness and second language reading, as demonstrated by the Indonesians' orthographic reading skill on the Acehnese literacy skills in the present study, is crucial and has been stressed by a number of researchers (Ellis *et al.*, 2004; Anthony and Francis, 2005; Kuo and Anderson, 2008; Loizou and Stuart, 2003). Although none of these studies investigated Indonesian and Acehnese, their findings in other languages support my suggestion, for example, the transparent orthography of L1 Spanish has been found to support children's L2 English literacy acquisition (Durgunoglu *et al.*, 1993).

Homogenised reading strategy. The phonological or sublexical reading route is commonly developed among transparent alphabetic language readers (Gillon, 2004; Kuo and Anderson, 2008). The strict phoneme-letter relationships in Indonesian orthography leads the readers to rely less on the lexical information and more on the phonological one in processing words (Winskel and Widjaja, 2007). It explains why no significant correlations were found in the present study between the Indonesian vocabulary score and any of the phonological processing subskills (see Table 5.3). This L1 Indonesian phonological reading strategy was then transferred to the L2 Acehnese reading. Therefore, the participants' Acehnese spoken language experience, especially their Acehnese oral vocabulary knowledge, did not have a significant influence on their Acehnese decoding performance. Ziegler et al. (2010) support this view in their statement that "differences in preliterate phonological awareness should become homogenised more quickly in children learning to read transparent scripts than in children learning to read opaque scripts, and this would automatically lead to weaker correlations between phonological awareness and reading in transparent orthography" (p. 556).

The Close Typological Distance of Indonesian and Acehnese

In the previous paragraph, I have elaborated that as a consequence of being literate in the Indonesian alphabetic writing system, participants performed their Acehnese word reading and Acehnese phonological awareness tasks (i.e. the Acehnese syllable deletion, phoneme deletion, onset oddity and rime oddity) similarly regardless of their Acehnese spoken language proficiency levels. This positive transfer from Indonesian is possible because the Indonesian and Acehnese languages share similar orthographic rules and a similar level of phonological complexity.

In the aspect of the consonant cluster, Indonesian is only slightly more complex than Acehnese, where the Indonesian consonant cluster is heavier. For instance, although both languages have many of their syllables constructed from either single consonant + single vowel (CV), double consonant + vowel (CCV), single consonant + vowel + single consonant (CVC), or double consonant + vowel + single consonant (CCVC), Indonesian syllables can become more complex in some low-frequency words. The constructions can be triple consonant + vowel (CCCV), triple consonant + vowel + single consonant (CCCVC), or single consonant + vowel + double consonant (CVCC), as in *stra.ta* 'degree', *struk.tur* 'structure', and *boks* 'box', respectively. The Acehnese simpler consonant combinations in its onsets and codas support the Indonesian readers in manipulating the Acehnese phonemes easily. In other words, learning to read in another phonologically (i.e. consonant cluster aspect) simpler language like Acehnese is relatively easy to the Indonesians. This is consistent with several previous studies in other language pairs (Melby-Lervag and Lervag, 2011; Branum-Martin et al., 2012; Anthony et al., 2009).

Meanwhile, Acehnese may be a bit more complex concerning vowel-combinations (i.e. diphthongs), but the present study did not provide a thorough assessment of the vowel-combination skill within its Acehnese phoneme awareness test, so it is unknown if the Acehnese's richer diphthongs can enrich the Acehnese-Indonesian bilingual children's phoneme awareness.

So far, I have elaborated how Acehnese-Indonesian orthographic and phonological similarities and differences affected the bilinguals' phonological awareness and made their literacy skills similar regardless of their L2 Acehnese spoken language experience. Regarding the non-significant role of the Acehnese spoken language skills in the Acehnese word reading performance, the effect can also be explained by the Indonesian-Acehnese orthographic and phonological distance.

In the aspect of orthography, Acehnese is also alphabetic and transparent. Almost every phoneme is represented by one grapheme. And many of the Acehnese phoneme-grapheme pairs (e.g. single consonants and monophthongs) are also exist in the Indonesian orthographic system. This similarity supports the Indonesian monolinguals in decoding many of the Acehnese words correctly without necessarily acquiring the Acehnese spoken or written language skill.

Nevertheless, more complex diphthong digraphs and trigraphs (e.g. [ie], [ue], [eue]) in Acehnese are difficult to decode both by the children with or without the Acehnese spoken language experience. The reason is because the participants lack the Acehnese orthographic knowledge.

The Weakness of the Acehnese Orthographic Knowledge

The Acehnese and Indonesian do have a similar level of phonological complexity, but they have quite different phonological inventories. From analysing the errors made by the participants in the Acehnese word reading test, I found that the fewer alphabet vowel letters in Indonesian led to sound-generalisation of some of the

Acehnese letters. For example, the participants tended to generalise the sound for the letter <o>, <ô>, and <ö>, to /o/, due to the /o/ sound represented by Indonesian letter <o> in many Indonesian words. Many also exchanged the sounds of letters <è> and <é> (respectively represent /ɛ/ and /e/ sounds), because Indonesian only has a letter <e> for both /ɛ/ and /e/ sounds. Although the L1 and the L2 orthographies are both alphabetic or phoneme-based, if the visual looks of the letters are different, the decoding acquisition may be hindered (Wang *et al.*, 2006), at least until the letter knowledge in the second language is fully mastered. In the Acehnese-Indonesian case, the varied looks of <e> letter variants hinder the Acehnese decoding ability, at least on words consisting the peculiar letters.

Moreover, Acehnese is also rich in aspirated consonants transcripted as consonant + letter <h>, e.g. <ph> and <kh> as in *phôn* /p^{h}on/ and *khôp* /k^{h}op/, respectively mean ‘first’ and ‘face down’. This <consonant + h> digraph feature is indeed available in Indonesian but only in high-frequent Arabic borrowed words like *khidmat* /k^{h}itmat/. The rare appearance of this feature in Indonesian text hinders the Indonesian readers in decoding the similar Acehnese feature. The relatively poor Acehnese orthographic knowledge and the low access to Acehnese literacy also hinder them in decoding the Acehnese words with this feature correctly.

Other than aspirated consonants, compared to that of Indonesian, the Acehnese phonological inventory is also richer in term of diphthongs. However, since Acehnese is only acquired through the spoken context, this feature is not prominently noticed by the language users. At least by the young language users with limited Acehnese proficiency like the participants in the present study. The child only hears or sometimes overhears the Acehnese word in fast speech environment among parents or other adults. Diphthong forms such as /oə/ in word *kloe* ‘deaf' can easily be misidentified as monophthong /o/ by the hearers until they see the standard written version of the word. As a result, they have very little chance to notice the Acehnese sound structures explicitly. Therefore, the awareness of Acehnese's special sound structures was not built well enough and caused their Acehnese phonological awareness ability was not different to those who were gained a more minimum Acehnese for in the daily basis.

The lack of literacy skill in Acehnese, I suspect, is one of the reasons why the participants with more Acehnese spoken language input made as many mistakes as participants with less Acehnese spoken input. The mistakes were caused by their low awareness of the Acehnese orthographic rules that prevent them from comparing the rules from the two languages to maximise the positive transfer and minimise the negative transfer (Jessner, 1999; Jessner, 2010). Which eventually led them to apply the Indonesian orthographic rules on parts where they should not. As a result, even those with better Acehnese spoken language experience could not outperform those with low Acehnese spoken language input in the Acehnese word reading task. Since they did not master the Acehnese orthography, there was no additional orthographic knowledge added to their orthographic processing skills to support their Acehnese phonological processing skills.

Compared to the Acehnese weak orthographic knowledge, the Indonesian orthographic interference perhaps made a larger contribution to the participants' errors. I think it is the Indonesian orthographic interference which has caused some high frequent Acehnese words with diphthongs, e.g. *uet, peugöt, and uleue* were misread in the present study. In Yulia (2009), whose study was conducted on older Acehnese-speaking children residing in a more rural area, negative transfer from Indonesian orthographic knowledge also happened. As in the present study, similar Acehnese diphthong spelling errors were also found in Yulia (2009).

I carried out an error analysis of the Acehnese word reading tasks to get a better picture of how children subconsciously transferred their Indonesian word reading skill to cope with Acehnese words with diphthongs. The error analysis shows that the participants made more mistakes when they decoded words with both closed and open syllable diphthongs (e.g. *uet*, *peugöt*, *uleue*). The diphthong errors mostly occurred because the child inserted a glide consonant between the two vowels and put stress on both vowels. For example, word *kloe* 'deaf' was pronounced /klo. we/ instead of /kloɷ/. As a result, children read monosyllabic words as disyllabic and read disyllabic words as trisyllabic.

This glide-insertion came from one of the Indonesian's orthographic rules. In Indonesian, diphthong digraphs (e.g. <ai>, <au>, and <ei>) occurred only in open syllables (e.g. *'ca.bai'*). If there are two vowel letters in a row followed by a consonant, each vowel stands as different syllable (e.g. '*a.ib'*, *'ku.at', 'bi.as', 'pe.lu.ang'*). Indonesian written words like *'kuat'* or *'bias*' are disyllabic words, not monosyllabic. However, in Acehnese orthography, words like *'uet'* or *'suet'* are monosyllabic words. Inserting glide consonants /w/ or /y/ between the vowels when sounding out that kind of Acehnese syllable will make the Acehnese words difficult to comprehend.

Conclusion for the First Part of the First Hypothesis:

Regarding the first hypothesis stating that the Acehnese spoken language would have a significant role in the Acehnese-related tasks only, the present study has demonstrated that the hypothesis is to be rejected. Acehnese spoken language skills do not have significant roles in the participants' Acehnese phonological awareness and word reading.

I have argued that the Indonesian transparent alphabetic decoding skill has homogenised the participants' level of phonemic awareness regardless of their levels of both Acehnese and Indonesian vocabulary skill. Moreover, the Indonesian transparent phoneme-based orthographic system has also trained the participants to read using the phonological route rather than the lexical one. Therefore, the Acehnese oral vocabulary level becomes less important.

In addition to that, the close orthographic distance between Indonesian and Acehnese, and the Acehnese simpler consonant-cluster system have become other important factors of why Indonesian positive transfers can easily occur. Moreover, the low Acehnese orthographic knowledge combined with the Acehnese richer aspirated consonant and diphthong features have hindered the participants in reading in Acehnese correctly.

To sum up, for the Indonesian reading children who have limited access to written Acehnese, the Acehnese spoken language proficiency is not crucial in supporting them decoding in Acehnese.

6.1.2 The Role of the Acehnese Spoken Language Skills in the Literacy Skills across Different Languages

In this section, I will discuss Research Question 1 further. In section 6.1.1, I elaborated half of the hypothesis; about the Acehnese spoken language role on the Acehnese literacy skills. In this section, I will discuss the answer for the other part of the hypothesis which is about the role of Acehnese spoken proficiency for literacy skills across languages. The full hypothesis for the first research question is as follow:

Children with more Acehnese spoken language experience perform better only in the Acehnese phonological awareness tasks and word reading due to their higher Acehnese vocabulary, but perform the same as other peers in both Indonesian and English. The Acehnese vocabulary will not support the Indonesian word reading, nor English word reading. Their mono-literate bilingual status, and the different phonological and orthographic systems between Acehnese and English restrict them from reading the language better than the other peers with lower Acehnese knowledge.

In my hypothesis above, I stated that I expected the Acehnese spoken proficiency skills to support literacy skills only in Acehnese but not in Indonesian and English. My data rejected this hypothesis. Acehnese spoken language skills do not facilitate the same language (Acehnese) or different language literacy skills (Indonesian and English). Instead, there are several important findings from the present study that demonstrate the significant but negative role of the Acehnese spoken language proficiency in both Indonesian and English literacy.

Acehnese spoken language exposure was found to have no significant impact on Acehnese literacy. However, exposure to spoken Acehnese was found to correlate significantly but negatively with Indonesian and English word reading scores. Also, when the phonological awareness scores were collapsed into languages (e.g. Indonesian syllable deletion, Indonesian phoneme deletion, Indonesian onset oddity, and Indonesian rime oddity), Acehnese passive use was also found to have a negative and significant relationship with Indonesian syllable deletion ($r = -.424$, $p = .003$). The data indicates that being exposed to Acehnese spoken language is related to weaker Indonesian and English word reading skills and poorer Indonesian syllable deletion skill, which is different to what I expected the data to show.

According to some more in-depth analyses I made by median-splitting the samples based on their Acehnese passive use scores, I concluded that those significant negative correlations were caused by participants' different intelligence and English proficiency levels. In fact, the role of L3 English proficiency is stronger than the role of L2 Acehnese proficiency.

Intelligence Factor Bias

The negative correlation between the Acehnese passive use and Indonesian syllable deletion skills (see Appendix 23) relates to the factor of intelligence, because I also found the Indonesian syllable deletion significantly correlated with the non-verbal intelligence skills ($r = .375$, $p =.015$).

This finding raised a question; namely why it is only the Indonesian syllable deletion that makes a significant correlation with the Acehnese passive use score? Why were no significant correlations found with the other syllable deletion scores (Acehnese and English syllable deletion)? The procedure of task presentation and the low item number in each language may have caused this. Indonesian syllable deletion was the first deletion-task given to the participants. Thus, it may require more cognitive effort to work out compared to the next following items presented (in Acehnese and English). Alternatively, maybe because of the item number in each language is very small (only five items) so that each language test could not represent each language-specific phonological structure optimally due to the limited items allowed to include. Indonesian syllable deletion items provided in the present study might be too easy or too difficult compared to the corresponding task items in the other two languages.

Moreover, the Indonesian vocabulary level and non-verbal intelligence skill are also significantly correlated ($r = .495$, $p = .000$). This correlation is even stronger and more significant than that of between the non-verbal intelligence and the Indonesian word reading ($r = .309$, $p = .036$). This suggests that those who have higher nonverbal intelligence have higher L1 Indonesian vocabulary. This may be due to the higher working memory, one of the non-verbal intelligence significant predictors (Mungkhetklang *et al.*, 2016). The correlation between the vocabulary level and working memory was reported by Gathercole and Badley (1989) in Awaida and Beech (1995, p.98), Jones, Gobet and Pine (2008), and Engel de Abreau and Gathercole (2012).

Perhaps, it is the varied level of working memory level that influences the participants' non-verbal intelligence performance, Indonesian vocabulary level, Indonesian syllable awareness ability, Indonesian word reading, and English word reading performances. In future research, it is important to consider this factor.

The Effect of English Knowledge in Indonesian and English Phonological Awareness Skills

Not only with non-verbal intelligence, Indonesian syllable deletion was also found significantly associated with the English vocabulary level ($r = .332$, $p = .024$).

When the participants were median-split into the low and the high English vocabulary levels (Appendix 27), the Mean values of the phonological awareness subscores across the groups were found higher among the participants who have higher English vocabulary levels. Also, there were two phonological awareness skills (Indonesian syllable deletion and English phoneme deletion scores) in which the participants of higher English proficiency were found to perform better compared to those with lower English proficiency, with t values .008, and .032, respectively for the Indonesian syllable deletion and English phoneme deletion. In other words, Indonesian children who know more English words are better in phonological processing (e.g. at least in the syllable and the phoneme deletion tasks) than those who know fewer English words. Or reversely, those who have better phoneme and syllable awareness have higher English vocabulary level. As no longitudinal data available, it is hard to determine which causal relationship is true.

Nevertheless, the positive correlation between English oral vocabulary and phonological awareness performance is in line with the study of Spanish-speaking English learners (Goldenberg *et al.*, 2014) and Korean-speaking English learners (Kang, 2012), where they also found that children with better English proficiency performed better phonological awareness tasks in L2 English than in their L1 Spanish or Korean. Goldenberg et al. (2014) suggested that the benefit was caused by the phonological awareness training given to the Spanish-English bilinguals in the USA as part of literacy instruction, while the Spanish-English bilinguals in Mexico did not receive this training.

While Kang (2012) suggested that the biliteracy of Korean-English is the determinative factor. As in my research, the participants did not receive phonological training when learning to read in English, I tend to assume like Kang (2012) that the better phonological awareness performance was caused by the participants' simultaneous biliteracy acquisition process in L1 Indonesian and L3 English. Other than reading and writing in Indonesian, the participants in the present study also read or write simple words in English once a week in their English classes at school. Some children from a relatively wealthy family might also read more English at home since the correlation between the English vocabulary level and the family income level was also found significant (Table 5.3). Quiroz and Snow's (2010) study on Spanish-English bilingual children provides evidence that the English and Spanish home language use and literacy practices explained the children's Spanish and English vocabulary.

As English is a foreign language for the participants, the learning of the language is rarely encountered in natural or informal circumstances. Instead, I would assume that it is encountered in more formal settings that would typically involve English reading and writing activities. The reason why learning English through natural spoken context is not the norm for the Indonesian children living in Aceh is simply because the language is not widely spoken in the participants' neighbourhood. Access to the English TV channels is limited only to the wealthy families who can afford cable TV.

However, I also think that the positive correlation between English proficiency and phonological awareness is triggered by the higher complexity of English phonological structures. Especially in consonant combinations in which English is more complex (more consonants allowed in its onsets and codas) compared to Indonesian and Acehnese. This similar meta-linguistic benefit of learning a language with complex consonant clusters was once reported by Caravolas and Bruck (1993) when the study compared the English and Czech monolingual children in a consonant isolation test in

English-Russian pseudowords. Czech children outperformed the English peers due to the higher frequency of words with the consonant cluster in the Czech language than in the English language (Caravolas and Bruck, 1993). Furthermore, this study supports Cheung et al. (2001). In Cheung et al. (2001), New Zealand preliterate English-speaking children outperformed Guangzhou and Hongkong preliterate Chinese-speaking children in onset, rime and coda analysis. Meanwhile, the Guangzhou and Hongkong groups achieved a similar level of phonological awareness, suggesting the significant effect of the language phonological characteristics independent from the orthographic role (Cheung et al., 2001).

The combination of the Indonesian and English orthographic knowledge also affects the participants' phonological processing skills in general. Those who have more English knowledge performed better in English phoneme deletion and English onset oddity tasks, which in the present study were intentionally designed to be phonologically more complex than the corresponding tasks in Acehnese and Indonesian to represent the English phonologically complex onsets with double consonant constructions like /sl/ or /sn/. The participants who could work out the elements of the English phonological awareness tasks would be those who have been exposed to phonologically more complex words than those of Indonesian. They would have been those who have been exposed to more English words.

Hence, although failing to prove that Acehnese plays a significant role in Indonesian, Acehnese and English literacy skills, the present study has contributed evidence supporting the theory about the advantage of biliteracy and learning a phonologically complex language in someone's phonological processing skills (Kang, 2012; Goldenberg et al., 2014; Quiroz and Senoz, 2010; Caravolas and Bruck, 1993; Cheung et al, 2001). Instead of finding this benefit from the L1 Indonesian – L2 Acehnese bilingual proficiency, I found this benefit more prominently from the L1 Indonesian – L3 English proficiency. The reason was that, unlike English, Acehnese is not learnt through the written context; and unlike English, Acehnese is not that largely phonologically different to Indonesian L1, at least in the consonant cluster aspect. My finding of the non-significant effect of Indonesian-Acehnese bilingualism on phonological awareness is very similar to Reder et al.'s study, (2013) which found German-French bilingualism did not have a significant effect on French phonological awareness. Reder's et al., (2013) also argued that the results were caused by two factors; (1) similar phonological characteristics of the two languages so that bilinguals did not learn something new or more complicated phonological knowledge from their second language, and (2) that both groups are literate, so they have acquired the phonological awareness equally from the reading instruction.

Since the data indicate a considerable influence from the intelligence and English proficiency levels, it is hard to investigate the role of having Acehnese as the second language on the Indonesian children's general phonological awareness skills. In future studies, it is important to control for intelligence and levels of English proficiency, yet also a preliterate control group will be needed to control the orthographic knowledge influence on the phonological awareness skills.

The Stronger Effect of Indonesian and English Orthographic Knowledge on the Word Reading Skills

As I have mentioned, Acehnese passive use was found to have negative and significant correlations to two out of three word-reading performances. The first one is in relation to the Indonesian and the second one is in relation to the English word reading performance. The correlational data shows that all word reading skills have relatively strong and significant correlations with the non-verbal intelligence score, syllable awareness and phoneme awareness scores. The decoding and phonological awareness relationship is consistent with many previous studies (Anthony and Francis, 2005; Loizou and Stuart, 2003; Ziegler and Goswami, 2006; Caravolas *et al.*, 2005; Kuo and Anderson, 2008; Ouellette and Haley, 2013; Rothou *et al.*, 2013; Deacon, 2012). Especially the role of phoneme awareness in the three word-reading skills confirmed the phonemic awareness significant role in both transparent and opaque alphabetic orthographies reported in Caravolas et al. (2005). My findings are also aligned with Goodrich's et al., (2013) Spanish-English bilingual study which found that phonological awareness skills (syllable and phoneme) and word reading skills were significantly correlated across the bilinguals' languages.

However, other than with the phoneme and syllable awareness scores, the word reading skills, except the Acehnese word reading, also correlated significantly with the English vocabulary. The role of English vocabulary in Indonesian and English word reading seems to be mediated by the English word reading and phoneme awareness because the phoneme awareness and English word reading scores were found significantly associated with English vocabulary. Again, the data indicates that knowing more English has something to do with a better decoding strategy, or reversely; better decoding strategy leads to better English vocabulary acquisition.

I tend to believe in the first causal relationship. I believe that only those who were frequently exposed to phonologically complex constructed words, like English words, could decode exceptional Indonesian words, like *stasiun, khidmat,* and *trenggiling* accurately. And this argument supports other studies about the benefit of learning a linguistically more complex language onto the metalinguistic awareness (Campbell and Sais, 1995; Gutierrrez, 2013; Reder *et al.*, 2013; Gut, 2010; Cenoz, 2013).

To prove that the first suggested causal relationship has a higher possibility of truth, I include three studies; (1) a comparison of monolinguals speaking two different languages with varied level of phonological complexity, Czech and English (Caravolas and Bruck, 1993), (2) a comparison of Hebrew monolingual to Hebrew-Russian bilingual group with a more complex L1, Russian, (Schwartz *et al.*, 2007), and (3) longitudinal study of English-French immersion program (Bruck and Genesee, 1995). In the first, study, Czech-speaking children performed better in a phoneme awareness task because Czech has more complex consonant clusters (Caravolas and Bruck, 1993). In the second study, Russian-Hebrew bilinguals performed better in English phonological awareness and word reading tasks due to the more complex consonant clusters in Russian compared to Hebrew (Schwartz *et al.*, 2007). In the third study (Bruck and Genesee, 1995), English speaking children who were included in English-French immersion program, after one year, performed better on a syllable awareness task compared to their English monolingual peers. Bruck and Genesee (1995) suggested that the bilinguals' higher achievement in syllabic aspect was caused by French higher saliency in the syllabic level compared to English (p. 319). These studies support my assumption on English's higher phonological complexity role among the Indonesian-Acehnese-English multilinguals.

To conclude, for the first research question, whether the Acehnese spoken-language skills affect the literacy skill within the same language (Acehnese), the answer is no. And whether it affects the literacy skills across languages (Indonesian and English), the data is not conclusive. Although the data from the present study indicate that the Acehnese spoken language affects the skills negatively, I can not say whether there is a correlation in this instance. The reasons are as follows: First, there is an imbalance in the way non-verbal intelligence is distributed across the group of participants. Second, the participants had varied levels of English vocabulary experience, and third, I would need a preliterate control group to limit the effects of reading and writing in Indonesian. Had I taken into account these three factors, I would have been able to go into further detail with the question about the role of the Acehnese spoken-language skills.

Another important conclusion from my attempt at answering this first research question is the important role of English vocabulary knowledge. In other words, the data from the present study shows that knowing English is more advantageous than knowing Acehnese as the second language for the Indonesian children's phonological awareness and multi-literacy development. Knowing English expands the children's phonological inventories more than knowing Acehnese. Acquiring the English vocabularies through noticing the written forms of the words also extends the children's orthographic awareness, especially on the knowledge that one letter can represent more than one sounds, and one sound can be represented by more than one letters. The participants in the present study have relatively low both Acehnese and English proficiency, but English has a special role due to its more complex phonology, and the learners' simultaneous acquisition with its orthographic system.

The next conclusion is that the present study has provided evidence that among Indonesian second graders, the general phonological awareness and alphabetic reading skills were determined dominantly by their L1 Indonesian orthographic skill and their L3 English proficiency and perhaps, their level of intelligence, therefore rejecting the Lexical Restructuring Hypothesis (Metsala and Walley, 1998) about the significant role of oral vocabulary in phonological awareness. The literacy effects (either from L1 Indonesian and L3 English) has a stronger effect than the oral proficiency roles in the Indonesian-Acehnese-English trilinguals' phonological awareness.

In the second and third research questions below, I investigated the possibility of Acehnese and English oral vocabulary significant roles if the L1 Indonesian word reading ability being controlled.

6.2 Research Problem 2

Do Acehnese spoken language skills have a significant role in the Acehnese word reading skill once the Indonesian word reading skill is controlled?

Hypothesis:

Acehnese spoken language skills have a significant role in the Acehnese word reading performance after the Indonesian word reading is controlled. The reason is that to read correctly in the Acehnese; one needs to have familiarity with the Acehnese lexicons, too after having the Indonesian word reading skill. Knowledge of features of diphthongs and aspirated consonants gained from the spoken language experience supports the child in decoding words containing these features and help them to avoid producing negative transfer from the Indonesian word reading skill.

The answer to this research question is yes, and the hypothesis is supported. Acehnese spoken language skills do predict the Acehnese word reading performance significantly when the Indonesian word reading ability and the non-verbal intelligence are controlled.

From the previous discussion, we know that the participants' reading performances are all significantly affected by their non-verbal intelligence. Furthermore, they received orthographic instruction in Indonesian, which could have affected their Acehnese word reading more dominantly than their Acehnese spoken language exposure.

In the attempt to answer the second research question, I carefully controlled these two influential factors; Intelligence and Indonesian word reading skills, by using hierarchical regression analysis. The first regression analysis controlling for intelligence shows that Indonesian word reading predicts the Acehnese word reading more strongly and significantly than the Acehnese spoken language skill variables. This finding suggests the importance of orthographic similarities in learning to read in a second language (Melby-Lervag and Lervag, 2011; Branum-Martin *et al.*, 2015; Wang *et al.*, 2006; Ziegler *et al.*, 2010). Once the Indonesian word reading was controlled, the result shows that the Acehnese passive use and Acehnese receptive vocabulary levels contributed unique variances to the Acehnese word reading, although the levels of significance were relatively low.

The high role played by the Indonesian word reading skills in Acehnese word reading confirms the high similarities across Indonesian and Acehnese orthographic rules. Therefore, in decoding Acehnese words, Indonesian literacy skills are more crucial than the level of Acehnese proficiency. However, the Acehnese spoken proficiency still has a significant portion in predicting the Acehnese word reading score if only the non-verbal intelligence and the Indonesian word reading skills are controlled. In the future, longitudinal studies consisting at least two groups of Indonesian monolingual and Acehnese-Indonesian bilinguals can be compared during their kindergarten to year 2 of schooling to see at what point of learning the Acehnese oral vocabulary contribute to Acehnese literacy most significantly.

However, it is unknown in what way this spoken language experience contributes to the Acehnese word reading. It could be the familiarity with Acehnese sound structures like diphthongs and aspirated consonants that have assisted the process of Acehnese word decoding. Still, the present study provides no evidence for that. Based on the error analysis (Appendix 31), regardless of their Acehnese proficiency level, the participants made several similar types of errors due to their L1 Indonesian orthographic knowledge interferences (see section 6.1.1 about the dominance of L1 orthographic knowledge on Acehnese word reading performance).

The determinative factor might be the familiarity with the lexica (knowing the words in the task), but it can also be the familiarity with the sub-lexical characteristics (e.g. aspirated consonants, or diphthongs). However, since Acehnese words are built from approximately the same level of consonant-vowel complexity as those in Indonesian, the Acehnese supports in the Acehnese reading becomes relatively weak. More studies in this direction are needed.

6.3 Research Problem 3

Does the English vocabulary level have a significant role in the English word reading skill once the Indonesian word reading skill is controlled?

Hypothesis:

English vocabulary has a significant role in the English word reading performance after the Indonesian word reading skill is controlled, because English is an opaque language which requires a whole-word strategy to reading, relying on lexical knowledge of the words. The Indonesian alphabetic reading skill is important because it provides strategy to decode words on the phonemic level (i.e. sounding out words by analysing the phonological information letter by letter), but the familiarity with the spoken forms, e.g. rhymes, consonant clusters and the word as a whole is also crucial in the process of decoding English words with inconsistent phoneme-letter relationships.

This hypothesis is supported. According to the regression analysis, even when it is only the non-verbal intelligence being controlled, English receptive vocabulary level has already had a significant contribution to the English word reading score. The significance level is increasing once the Indonesian word reading is also controlled, although the power of contribution is still weaker compared to the Indonesian word reading itself.

Nevertheless, if compared to the L2 Acehnese case (section 6.2), these findings suggest a more significant role of L3 English oral vocabulary in L3 English decoding, than the role of L2 Acehnese oral vocabulary in L2 Acehnese decoding. This contrastive power of Acehnese and English oral language skills within their language literacy performances may be caused by the orthographic-depth factor (Kartz and Frost, 1992). The reduced consistency of the English writing system in both reading and spelling is probably the key factor in explaining why English is a difficult orthography to read (Ziegler and Goswami, 2006).

Unlike Acehnese, English words are written in opaque alphabetic, thus requiring not only sub-lexical but also lexical knowledge (Suggate *et al.*, 2014). Learning to read in English requires multi-strategies (Treiman and Zukowski, 1991; Treiman and Kessler, 1995; Savage and Carless, 2005). For English native speakers learning to read as the first orthography, there are three approaches used, the first one is by focusing on phoneme, second by focusing on the larger unit such as rhyme and onset, and finally by whole word reading (Ziegler and Goswami, 2006).

English's inconsistency is low in phoneme-letter relationships. Therefore, the role of Indonesian alphabetic reading is weaker in reading English alphabetically, compared to reading in Acehnese consistent alphabetic orthography.

The important English oral vocabulary and word reading correlation is accordance with the studies of English reading acquisition that have been conducted previously (Melby-Lervag and Lervag, 2011; Ouellette, 2006; Yeung and Chan, 2013; Nation and Cocksey, 2009). The finding is specifically consistent with the studies by Ouellette (2006) that reported the breadth vocabulary, or receptive vocabulary, as a significant predictor of decoding skill in English.

The findings of the present study about the significant contribution of English oral receptive vocabulary in English word reading and English vocabulary is in line with Cooper et al., (2002), Hipfner-Boucher et al., (2014), Dixon, Chuang and Quiroz (2012), Ouellette (2006, 2009). In Cooper (2002), the significant role of English oral language skills was found in the phonological skills and English literacy skill of children from all levels, kindergarten, year 1 and year 2. The present study only finds the effect in year two children since this study did not include the samples from lower grades. If in Cooper et al. (2002) and Hipfner-Boucher et al., (2014) English was the main language for the participants, in Dixon, Chuang and Quiroz (2012), and in the present study, English was the second and third language, respectively.

Nevertheless, my finding of English vocabulary essential role is in contrast with some previous studies of English. For example, Durgunoglu et al. (1993), found that for Spanish-speaking English learners, English is not a significant predictor of word reading. Furthermore, Muter and Diethlem (2001) also found that oral proficiency in English is not a reliable predictor of reading ability in Geneva multilingual children who are in the beginning stage of their English learning. Muter and Diethlem (2001) believed that it was due to the beginning English language learners still rely on the decoding ability in reading English words (p. 215).

I continue the discussion about English vocabulary and word reading in section 6.5. Before that, I provide the answer first to the last research question which is about the most prominent phonological awareness levels used by the participants in reading the three languages. By shedding light on the prominent phonological processing level used by the participants, a more comprehensive picture of the Indonesian-Acehnese-English multilingual children's decoding and word reading abilities can be gained.

6.4 Research Problem 4

Which phonological level, from the syllable, phoneme, onset and rime, is the most important for Indonesian, Acehnese and English word reading skills among the Year 2 Indonesian-Acehnese bilinguals learning L3 English?

Hypothesis:

Phoneme awareness is the most important factor in reading in all three languages followed by syllable, onset and rime. Like other phoneme-based orthographies, the most important phonological processing level is the phoneme. And because the participants’ strongest literacy skill is Indonesian, and the language is *salient in syllabic level, the second most important phonological processing level should be the syllable. Onset is more important than rime because Indonesian readers are taught to notice more on the first sound of the word than the last sound of the word.*

This hypothesis is partly supported. According to regression analyses done with the three word reading scores as the dependent variables, it was found that out of four phonological measures, phoneme and syllables are the only significant predictors. Onset and rime are not the significant predictors of the Indonesian, Acehnese and English word reading performances for the participants of the present study. Phoneme gives more variance to the three word reading scores compared to syllable awareness. In other words, participants rely mostly on the phonemic level for reading in the three languages.

However, my finding contradicts with the finding reported in Georgiou, Parilla and Papadopoulos (2008) about the phonological unit size used by transparent language readers. Georgiou, Parilla and Papadopoulos (2008), researching Greek reading children found that phonological awareness is less critical in reading transparent orthographies and the readers tend to rely on both small and large phonological grain size units in reading Greek. However, their findings were drawn from two different measures; word reading and reading fluency, while the present study employed only word reading test without calculating the participants' reading fluency. For the word reading results, the present study shows the same results as in Georgiou, Parilla and Papadopoulos (2008); that phoneme awareness is the most prominent phonological processing level used by the transparent language readers.

In the present study, the onset and rime levels have no significant roles in English reading. However, when the samples were median-split into the low and the high based on the English vocabulary scores (Appendix 27), the high group was found to have significantly higher English phoneme and onset awareness. This could indicate the benefit of learning L3 English to support a child in recognizing onsets as part of a word which is different to syllables or phonemes.

Future studies should look more closely at the roles of onset and rime awareness in Indonesian children's English reading production, and better onset and rime measures should be used.

6.5 Discussion of Indonesian-Acehnese Bilingualism and L3 English Learning

I have looked at the four hypotheses. Now I am going to discuss the findings from each hypothesis in detail by relating the findings one to another, and to previous related studies.

6.5.1. The Nature of L1 Transparent Orthographic Reading Children

As the participants in the present study are literate Indonesian transparent alphabetic readers, I will start my discussion with how my findings fit among some of the previous studies that have been conducted on young children reading transparent alphabetic orthographies, especially Indonesian orthography. The only phonological awareness and literacy study ever done on Indonesian readers is that by Winskel & Widjaja (2007). In fact, many of the measures used in the present study were adopted from that study, e.g. Indonesian word reading, and some items for Indonesian phonological awareness tests. The present study, even though has slightly different aims from Winskel and Widjaja's (2007), it demonstrated consistent results. For example, the finding of the phoneme awareness, and followed by the syllable one, as the most prominent levels used by the Indonesian reading children in reading Indonesian is in line with Winskel and Widjaja's finding. What is new from the present study is that this phonemic level is not only used prominently by the Indonesian children in reading Indonesian orthography, but also in reading other alphabetic orthographies, like Acehnese and English. However, the onset and rime of the other important levels reported in Winskel & Widjaja (2007) were not found in the present study. I think the low total item numbers used for each task in the present study is the reason why it did not come out with the same results.

Another important finding that has never been reported regarding the Indonesian reading children is the significant influence from English knowledge in their Indonesian word reading skill (see section 6.1.2).

Not only confirming the findings of the phonemic and syllable awareness importance in reading the transparent alphabetic Indonesian as reported in Winskel & Widjaja (2007), the present study also confirms the findings from many other studies conducted on alphabetic transparent reading children, about the importance of phoneme and syllable awareness. For example, Malay (Liow and Lee, 2004), Finnish (Lyytinen et al., 2006), Spanish (Anthony *et al.*, 2009; Goldenberg *et al.*, 2014), Greek (Rothou et al., 2013; Loizou et al, 2003, Aidinis and Nunes, 2001), Turkey (Durgunoglu and Oney, 1999), and Korean (Kang, 2012).

There is an interesting finding I encountered from comparing the result of the present study and that of Lee and Wheldall's (2010) Malaysian children's literacy study. In Lee and Wheldall's (2010), double vowel letters that come together in the middle of the words was found problematic by the most participants. Vowel letter that appears at the beginning of the word, like in words 'ibu' was read easier than a one that appears in the middle of the word such as in 'soal' /so. ʔal/, 'tiup' /ti.yup/ or 'tua' /tu.wa/, means 'matter', 'blow' and 'old' respectively (Lee and Wheldall, 2010). This type of words is not found problematic by the Indonesian readers in my study. The participants in my study did not have much difficulty in decoding words like 'daun' or 'buas'. I think this different result is caused by the Malaysian children's higher contact with English spoken and written language compared to the Indonesian children. Malaysian children might have confused the disyllabic words as monosyllabic such as those in English; 'soap', 'pour' or 'suit'. Indonesian children, who do not have English as a second language like Malaysians, find the double vowel letters between consonants as relatively easy words to decode since the language do not have diphthongs in closed syllables as English does.

6.5.2. Acehnese-Indonesian Bilingualism Benefit on Acehnese and Indonesian Literacies

The data from the present study implies that being bilinguals of Acehnese and Indonesian in early literacy ages does not offer any positive bilingualism benefit to Indonesian and English literacy skills but might do to the Acehnese word reading only if the Indonesian orthography is controlled. The data from the present study also shows that Indonesian vocabulary level predicts the Acehnese word reading when the Indonesian word reading skill is controlled, but it does not predict the Indonesian and the English word reading. Instead, the Indonesian and English word reading performances are predicted by the English vocabulary level even without the non-verbal and Indonesian word reading being controlled. In other words, English vocabulary level is the only oral spoken language knowledge that is powerful enough to make an impact on the participants' multiliteracy skills. The Acehnese and Indonesian vocabulary skills are not powerful enough to make a difference in the participants' general alphabetic decoding skill at least for this level of age.

Furthermore, previous studies that reported the positive effects of being raised in two spoken languages were mostly used preliterate or kindergarten participants (Metsala and Walley, 1998; Durgunoglu and Oney, 1999b; Caravolas and Bruck, 1993; Hipfner-Boucher *et al.*, 2014; Girard and Girolametto, 2013; Cooper *et al.*, 2002; Chiappe, Chiappe and Gottardo, 2004). Therefore, I assume that the reason why the present study comes out with a different result (Acehnese-Indonesian bilinguals are not significantly better in literacy or phonological awareness skills) is that of the participants are literate instead of illiterate bilinguals.

Moreover, due to the non-verbal imbalance, where the High-Acehnese group was found lower in intelligence, Acehnese proficiency had been found associated negatively with Indonesian word reading skill. On the contrary, Indonesian proficiency is associated positively with the Acehnese word reading skill. This finding temporarily suggests that having more L1 Indonesian proficiency supports the L2 Acehnese word reading, which is consistent with Cummins' Interdependence Hypothesis (1979). Meanwhile, having L2 Acehnese proficiency does not have any impact on the L1 Indonesian or Acehnese word reading skills because Acehnese is weaker and learnt in a non-written context.

Indonesian proficiency supports the Acehnese word reading because the language is introduced not only as a spoken language but also a written one. While Acehnese is only introduced as a spoken language, thus the speakers cannot extract the Acehnese-phonological unique characteristics more easily as they do with Indonesian. Since Indonesian also has transparent orthography like Acehnese and is phonologically similar to the language, the Indonesian orthographic and spoken language skills support the Acehnese word reading. The significant role of Indonesian proficiency level on the Acehnese orthographic decoding is consistent with Yulia (2009). In her study, Yulia compared the Acehnese spelling score of children who came from Acehnese and non-Acehnese speaking families. She found that the latter group spelt the Acehnese words better than the first group. Unfortunately, Yulia (2009) did not compare her subjects' level of intelligence, so it is unknown if the difference was caused by the non-verbal intelligence imbalance between the groups. Temporarily, I can only conclude that in Acehnese-Indonesian bilingualism context, the phonological awareness and literacy benefits was determined by the language in which the children are taught the literacy with, which is Indonesian. The language in which the literacy is not taught, Acehnese, gives less influence or benefit.

6.5.3. Acehnese-Indonesian Bilingualism Benefit on L3 English Literacy

The data from the present study shows that the two out of three word-reading skills is predicted by the L3 English vocabulary level. This is out of my expectation to find the third target language to influence the first language. In my hypothesis, I expected the L2 Acehnese to support L3 English.

There are several reasons why experience with Acehnese spoken language does not have any significant impact on Indonesian children's English literacy acquisition. First, the Acehnese phonological peculiarities (e.g. aspirated consonants and closed syllable diphthongs), which I expected to give positive transfer to the English learning, may not yet be obvious enough to the Acehnese speaking children because they are not taught and conditioned to notice these peculiarities, for example through reading and spelling instructions in Acehnese. For example, in the aspect of diphthongs, Acehnese is slightly more complex than Indonesian, but the effect of this peculiarity might not have grown strong enough on the child's phonological awareness. Firstly, perhaps because the diphthong sounds are usually simplified to monophthongs in urban dialect; and secondly, and most importantly, because the population are not exposed to the standard written texts of the language, thus this diphthong uniqueness cannot be fully acquired by all children who gain Acehnese proficiency. As a result, the Acehnese diphthong digraphs in prints were decoded inaccurately. Most of the participants, including those with relatively high Acehnese vocabulary scores, realised the diphthongs as two syllables rather than one. For example, the diphthong [eu] in word 'teupèh' was inaccurately decoded as /te.ˀu.pɛh/ rather than /tɯ.pɛh/. This phonological word reading error is caused by unfamiliarity with Acehnese diphthong digraphs and the interference of the Indonesian double vowel-monographs. (See section 6.1.2 and 6.5.2 for the details).

Secondly, I suspect the possibility of a high-language similarity effect disadvantage (Reder et al., 2013). Indeed, the similarity of the dominant language (Indonesian) and the weak language (Acehnese) supports the acquisition of the weak language. Yet, this will not necessarily lead to an increase in metalinguistic skills, since the challenge to learn the new linguistic rules is relatively low due to the high similarities between the first and the second languages. This argument is in line with that in Reder et al., (2013) that the similar orthographies of German and French lowered the bilinguals' advantage on phonological aspects of phoneme and syllable deletion. An experimental study involving Acehnese reading instruction is required to prove this argument. Since Acehnese is not that different to Indonesian regarding phonological characteristics, the two languages' knowledge combined would not make a significant difference regarding the bilingual's phonological processing ability, due to the close phonological characteristics.

However, the Acehnese phonological awareness measure given in the present study might also be a problem. There are only five items given for the phoneme deletion, in which only one item for the vowel deletion. Future studies should design a more representative task for each phonological awareness language by including more items, so all the specific language peculiarities can all be embodied.

Third, English is an opaque alphabetic language. Learning to read in an inconsistent orthography like English requires multi-strategies (Treiman and Zukowski, 1991; Treiman and Kessler, 1995; Savage and Carless, 2005).

Previously, I have claimed that phoneme awareness is the most prominent phonological skill used by the participants in the present study in decoding in the three orthographies (Indonesian, Acehnese and English). These findings of the pivotal role of phoneme awareness in transparent Indonesian and Acehnese orthographies and opaque English supports Caravolas, Violin and Hulme (2005) about the significant role of phoneme awareness in reading both consistent and inconsistent alphabetic orthographies. The finding is also consistent with (Pasquarella *et al.*, 2014) regarding the transfer between alphabetic word reading skills. The significant correlations between phonological awareness, particularly the phoneme and syllable, to English word reading also confirms the phonological awareness and English decoding strong association (McBride-Chang *et al.*, 2004; Deacon, 2012).

Although phoneme awareness is the significant predictor to read in English, many researchers believe that it is not the only important level (Treiman and Kessler, 1995; Kirtley *et al.*, 1989; Wise *et al.*, 1990; Wood, 2000; Wimmer and Landerl, 1994). Other than the phoneme, onset-rime awareness is the other useful sub-lexical reading route to read in English (Goswami and Ziegler, 2005). Contrary to Goswami and Ziegler (2005), in the present study, the onset and rime awareness are correlated weakly across languages. Even, the rime awareness scores are not significantly correlated across languages. These findings suggest that, unlike the native English children, Indonesian-speaking children do not rely on onset and rime awareness in processing English words, but on phoneme and syllable awareness solely. The attention on the onset or rime aspects might not have grown yet since they are still in the beginning stage of their English learning. I think this is also the reason why they performed poorest in the L3 English compared to in the L2 Acehnese word reading task; because English word reading requires onset and rime strategies, which have not been mastered yet by the participants.

The low English spoken language exposure might be the cause of why this the participants' onset and rime awareness scores did not predict the participants' word reading performances. Cheung et al. (2001) provide a shred of evidence about the better onset-rime awareness task performance among New Zealand English-speaking children compared to the Chinese English language learner children, which was due to the first group's higher exposure to English oral language forms. Moreover, the English teaching approach used in most Indonesian Primary schools do not emphasise the importance of rhymes in introducing new English words. Even during the Indonesian reading instruction, attention to rime is not emphasised unless the children were taught about poems later in higher grades (grade 3 or 4), where they are to think of Indonesian rhyming words to make poetry.

Other than relying on Indonesian most prominent phonological processing levels (phoneme and syllable) in decoding English words, the participants are also evidenced of having used their English lexical representation, or in this case English receptive vocabularies, as the other support to read in English. English words in the word reading task in the present study were arranged by phonological and orthographic difficulty level (from short words with one-to-one phoneme-letter representations to long words with digraphs or graphemes with inconsistent sounds), without considering the aspect of low-high word frequency. As a result, it is difficult to analyse if the child read the word by sight or by decoding strategy.

As an English teacher myself, I know which words in the task are familiar and which are not to the participants. In Indonesian primary school context, English language introduction is usually started with the Indonesian children being given sets of vocabularies with various topics (e.g. things to find in the classroom, things in the bathroom, body-parts, names of animals or names of fruits). Thus, I based my analysis on this teaching norm. Based on the error analysis (Appendix 30, Table C), the trisyllabic words ‘butterfly' is read correctly by more children than the monosyllabic word like ‘nest'. I assume, ‘butterfly' is more semantically common to the participants than word ‘nest', thus is easier to recognise when encountered in written form. The fact that letter [y] in syllable ‘fly' is realised as /ai/, not /i/ as normally done in Indonesian orthography, did not make the word mispronounced as /bʌtərfli/ by about 20% of the participants (see Appendix 30, Table C to see the percentage). This finding indicates that the familiarity with the L2/L3 spoken form of the words can avoid the children's L1 reading skill negative transfer (Rauch *et al.*, 2013).

On the contrary, the word ‘nest’ is not as popular as the word ‘butterfly’ among these young Indonesian English learners. Unlike ‘butterfly’, which is commonly included in the basic vocabulary set for animals in many flashcards, ‘nest’ is a word acquired at a later stage or grade. In the present study, word ‘nest’ was found harder than the word ‘butterfly’, although ‘butterfly’ has more syllables than ‘nest’ does. It must be the familiarity factor that has caused this phenomenon.

Nevertheless, there are a couple of relatively familiar words like ‘moon’ and ‘sailor’ but still decoded inaccurately by many participants (see Appendix 31). I believe, there are other factors, other than lexical familiarity that has affected the participants’ performance in the English word reading task. For example, the weak English orthographic-phonological regulations; [oo] = /u/, [ee] = /i/, or [ai] = /ei/, that leads to their L1 Indonesian orthographic-phonological regulations to interfere. Consequently, the word ‘moon’ and ‘sailor’ were inaccurately read as /mon/ an /sai.lor/, respectively.

Another problem faced by the participants in reading English words is the articulation problem. Although I have compensated articulation error for certain vowel sounds (see section 4.3.9), the error still occurred, especially in words with multi-consonant codas like ‘sport' and ‘park'. Both words can be categorised as unfamiliar to the participants but should be decodable enough with their Indonesian decoding skill. Unfortunately, although the words have direct letter-phoneme relationships, their articulation limits them in producing the sound combination correctly. Indonesian does not allow multi consonant as codas and does not have /rt/ or /rk/ sounds as consonant combinations as onsets. As a result, many participants decoded the words as /sprot/ and /prak/, respectively. /spr/ and /pr/ consonant clusters are allowed in Indonesian onsets, so this sound replacement is perhaps caused by the participants' Indonesian strong articulation influence.

The other possible factor is the lack of English morphological awareness. Words like ‘ducks', ‘dentists' and ‘flowers' all have an -s suffix that was omitted by many participants. This omission might also be caused by the articulative factor in which the participants are not familiar pronouncing words with double or triple consonants as a coda. However, ‘flower' and ‘duck' are categorised as relatively easy words for this group of children, as is the word ‘butterfly'. They must have pronounced these words many times before in English class. They ignored the -s suffix as they were used to pronounce those words in isolation like how they are always presented for them in the flashcards.

Hence, at this stage of learning, to read in English, they rely heavily on the phoneme and syllable awareness developed from the Indonesian orthographic skill, and slightly on their relatively small English vocabularies.

Lack of L3 English spoken exposure and orthographic knowledge have a greater influence on the participants' English word reading performance than the lack of the Acehnese proficiency level. Gallardo del Puerto (2007) also came to the same conclusion as mine that English competence does not depend on the level of Basque-Spanish bilingual proficiency. The dual spoken language knowledge of Acehnese and Indonesian support the English literacy acquisition merely through the Indonesian L1 orthographic knowledge. Acehnese does not contribute any influence to the English L3 word reading recognition because the participants did not possess any Acehnese orthographic knowledge to transfer into English. And the Acehnese vocabulary skill is not easily transferred across languages as proven by Goodrich, Lonigan and Farver (2013) in their Spanish-English context which reported that L1 Spanish vocabulary skill is not easily transferred across languages because the skill is language-specific, unlike phonological awareness or print decoding that is (to some extent) language general and transferable (p. 11).

On the other hand, although limited, English written language experience contributes significantly to the L1 Indonesian as well as L3 English literacy skill. And I also believe it is English spoken and written learning experience that helps the children grow their metalinguistic awareness (Galambos and Goldin-Meadow, 1990; Jessner, 1999; Parisse, 2002; Basseti, 2007; Proctor and Silverman, 2011; Perfetti and Dunlap, 2008), or the ability to see languages as something an independent system. Based on my observation during the experiment, some children who were told that they were about to read a list of English words would show ‘switching reading mode' when they read the words. For example, the /r/ sound was changed to be less drilled, and letter [c] was pronounced as /k/ sound instead of /ʧ/ sound, suggesting that they no longer used or tried not to use the Indonesian alphabetic letter-phoneme conventions.

This argument about the benefit of language learning experience supports Sparks et al. (2006) and Thompson (2013), which reported a significant correlation between the previous language experience and language aptitude and suggested the language aptitude as something dynamic. The study found out that the experience of language learning and the perceived interaction between languages affect the subsequent language acquisition (Thompson, 2013). Since Indonesian and English are taught through formal settings that involve both spoken and written language, the impacts they make in the multilingual children’s inter-language and within language literacy performances become more noticeable.

The importance of being proficient in not only the spoken but also the written language skill is in line with Schwartz et al. (2007). Russian-Hebrew biliterate bilinguals performed L2 Hebrew and L3 English word reading tasks better than Russian-Hebrew mono-literate bilinguals who were only literate in L2 Hebrew.

The role of bilingualism as an independent factor on literacy and phonological awareness as a cognitive function is not easy to investigate and must be researched intensively because phonological awareness is a skill that is more transferrable than decoding or word recognition skill (Bialystok, 2007b). Bilingualism may have a special role in phonological awareness mediated by the habit of managing two spoken language skills, and that has to be proven at the time literacy or letter knowledge have not acquired yet. But the phonological awareness superiority in preliterate children might also be caused by the child's individual factor instead of their bilingualism.

Concerning bilingualism effect on third language learning (Cenoz, 2003), the finding of the present study is not in line with the theory. Perhaps, the superiority of bilingualism on third language learning in that theory applies only to adult language learners who learn their second and third language subsequently in a formal context. And perhaps, the positive outcome of bilingualism explained in Cenoz (2003) theory is limited only for general third language proficiency, not particularly on decoding or phonological awareness skills. In my study, both Acehnese and English are weak languages for the participants, but even with relatively low English proficiency, a metalinguistic benefit can grow, although it is limited only to phonological awareness and decoding skill level. On the other hand, Acehnese gives no contribution to the participants' metalinguistic aspect. In my assumption, in testing the Cummins' Interdependence Theory (1979), it is important to compare the same type of skill across languages. For instance, general proficiency in L1 to the general proficiency in L2; reading skill in L1 to the reading skill in L2; decoding skill in L1 to the decoding skill in L2. In third language learning contexts, this means that full-proficiency in L1 and L2 should be compared to the general proficiency in L3, not to a specific language skill in L3 like decoding or phonological awareness. If the L3 decoding skill is the target, it is the decoding skill in L1 and L2 that should become the determinative factors. In other words, the determinative factors should be the phonological structures, orthographic transparency, and whether the participants have mastered both decoding skills (biliterate) in the two languages or not. A similar argument was given by Bruck and Genesee (1995) who suggested that bilingualism benefit can occur even in early second language acquisition, not necessarily when a threshold of proficiency has been achieved (p. 319).

CHAPTER 7 CONCLUSION, LIMITATION AND IMPLICATION

7.1 Conclusion

In this study, participants' phonological awareness skills were not significantly correlated with their Acehnese spoken language experience levels. This absence of correlation was due to all participants having developed their phonological awareness skills equally well through alphabetic Indonesian reading instruction. The role of the Acehnese spoken language experience in the development of second grade Indonesian-speaking children's phonological awareness is not fully manifested except when the Indonesian literacy skill is controlled for.

The present study is the first to demonstrate that Indonesian-speaking second grade children's phonological awareness abilities and their L1 Indonesian, L2 Acehnese, and L3 English literacy performances are not significantly correlated with their L2 spoken Acehnese exposure and vocabulary knowledge. L2 Acehnese spoken language skill influenced only Acehnese word reading skill, and then only when controlling for non-verbal intelligence and Indonesian word reading skill. L2 Acehnese made no contribution because the children were not acquiring the language together with its orthographic rules. The present study shows that participants with higher Acehnese spoken language experience score similarly in all phonological awareness abilities: phoneme, syllable, onset, and rime. In contrast, Indonesian oral and written language skills support Acehnese word reading because Indonesian is used in not only spoken but also written learning contexts.

L1 Indonesian was more influential than L2 Acehnese in L3 English word reading performance. Surprisingly, the participants' English proficiency, although still premature, also significantly contributed to Indonesian L1 word reading performance and to English word reading and phonological awareness itself. The relatively complex consonant cluster constructions in English words had trained the young Indonesian readers to decode the low-frequency Indonesian multi-consonant syllables, and at the same time supported their L3 English word reading acquisition. However, the participants showed less reliance on L1 Indonesian word reading skill in English word reading than in L2 Acehnese word reading. In contrast, the participants relied less on L2 Acehnese vocabulary for reading in Acehnese than on L3 English vocabulary for reading in English. In other words, learning to read in Acehnese is much easier once Indonesian literacy is mastered; little support from L2 Acehnese oral vocabulary is needed. The role of L2 Acehnese written language is unknown. Future studies should look at this Acehnese language skill aspect more intensively.

Apart from the role of L3 English lexical knowledge, the present study is also the first to demonstrate that in the L1 Indonesian and L2 Acehnese bilingual context, English language learning in early literacy ages (7-year-olds) depends significantly on phoneme and syllable awareness. The role of onset and rime awareness, however, is not yet known due to the limited items used to measure these phonological awareness skills. Some findings from a closer analysis of the English vocabulary level indicated significant differences in the phoneme and onset awareness scores between those who had higher and lower English proficiency. In other phonological awareness subskills, the English-high group performed better, but the differences were not significant. Higher English proficiency and more phonological awareness training may need to be attained before onset and rime awareness are developed.

Addressing the debate on the extent of universality of phonological awareness in bilingual brains, the present study shows that phonological awareness as a general or universal skill already existed in participants. This skill had been gained through a process of making sense of the relationships between the orthographic system of the Indonesian language (and, to some extent, the orthographic system of English) and Indonesian as a spoken language. The universal phonological awareness of participants is what led to the performances across the three languages being strongly correlated. Regarding the participants' language-specific phonological awareness skills, in this study, the Acehnese phonological awareness skill, as a distinct skill apart from the Indonesian language, was not yet fully developed due to a low Acehnese literacy.

The present study concludes that literacy acquisition in a multilingual context is highly determined by the child's first literacy skill. The influence of the other languages is pivotal only if the language is learnt in written and spoken contexts simultaneously. Learning the spoken and written skills of a second language that is phonologically more complex can support not only the learning of the literacy skill in that particular target language, but also the reading of phonologically intricate words in the L1. This advantage applies only to the language learning direction from L1 transparent to L2 opaque, such as from Indonesian to English. Since Acehnese is more phonologically complex than Indonesian in diphthongs and aspirated consonants, it would be interesting to research this area in the future by targeting subjects who not only have more Acehnese spoken language experience, but also are literate in standard Acehnese orthography.

To conclude, robust Indonesian proficiency in written and spoken registers, combined with weak Acehnese written language skills, explains why Indonesian-Acehnese bilingualism does not yield a metalinguistic benefit for those with higher Acehnese proficiency.

7.2 Limitations and Directions for Future Research

The limitations of the present study are outlined from Sections 7.2.1 to 7.2.7 below.

7.2.1 One-Point-in-Time Data Collection

The present study failed to explain objectively and in detail the role of Acehnese spoken language experience in the development of phonological awareness and multi-literacy skills. This failure was due to the strong influence of the participants' Indonesian orthographic skill. Future research should consider assessing the participants' phonological awareness and literacy skill more than once as the children progress from being illiterate and reliant upon on their spoken language when identifying and manipulating sounds to being fluent readers with varied degrees of written and spoken language skills.

7.2.2 Small Sample Size

The present study had a relatively small number of participants from the same school/area. Future research should be conducted using a larger sample size to control factors such as individual teaching style. In addition, a larger sample would facilitate more statistically significant results.

7.2.3 Limited Phonological Awareness Item Number

Gottardo *et al.* (2013, p. 1087) argued that composite phonological awareness tests, in which all phonological awareness subcomponents are merged in one tap, tend to produce a gross result. In this case, having only a gross result made it difficult to investigate in detail the role of the subcomponents in reading acquisition. Gottardo *et al.* also suggested systematically examining all subcomponents of phonological awareness in each language. Moreover, they implied that it is necessary to make each subcomponent equivalent in each language. For example, Spanish rhyming and English onset-rime awareness tasks are not the same, because Spanish rhyming tasks involve two-syllable words in which the second one is identical to the first (Gottardo *et al.*, 2013, p.1110).

7.2.4 Lack of Non-Word Reading Task

The present study should have included non-word reading tasks for the three languages for a more accurate analysis, especially in investigating the reading route used and the types of errors that occurred.

7.2.5 Unequal Intelligence Level

My reason for conducting this study at a single school was to avoid bias from intelligence level differences, which are commonly caused by different socio-economic levels. Nonetheless, this study still found significant variation in non-verbal intelligence levels among the participants. Moreover, although this intelligence factor can be controlled for in the statistical analysis, future research should avoid a significant difference by pre-assessing the participants' level of intelligence before choosing subjects.

7.2.6 Varied English Exposure

Future studies should control more carefully the participants' English learning experience, for instance, by collecting information about whether participants are taking private English lessons, reading English books with parents, watching English channels on TV, or having any other forms of English exposure. I collected that information from the parents, but since these questions were in the last part of the questionnaire, many parents left this part blank.

Alternatively, if English proficiency cannot be fully equalised among the participants, it is important to carefully consider this individual difference in multilingual research. In other words, in multilingual research, no language knowledge should be neglected.

7.2.7 Working Memory

Studies have shown the significant role of working memory, sometimes referred to as phonological memory or phonological short-term memory, in word reading skill through lexical knowledge (Jones, Gobet, and Pine, 2008; Engel de Abreau and Gathercole, 2012) and in non-verbal intelligence (Mungkethlang, 2016). My data support the importance of working memory and show a strong correlation between the participants’ non-verbal intelligence and Indonesian vocabulary level. The role of working memory in the Indonesian-Acehnese bilingual context should be taken into account in future studies.

7.3 Implications for Policy and Teaching Practice

I summed up the implications of the research to both the teaching of Acehnese as a second language, and English as a third and foreign language.

7.3.1 Implications of Teaching Acehnese Orthography

Children in Indonesia are encouraged to read and speak in Indonesian both at home and at school. Children are also exposed to a foreign language as a subject, commonly English, from a very early age at school. Although Indonesian schools encourage bilingualism and some still teach the Acehnese language as a subject to their primary school students, they devote little time to the Acehnese language in the educational process, especially in early literacy instruction. Children are rarely encouraged to read and write in Acehnese or introduced explicitly to Acehnese orthographic symbols.

According to Jessner (2010), metalinguistic awareness can be increased through explicitly teaching the similarities between languages. Moreover, Hornberger (2006) suggested that the biliterate use of indigenous children’s own language or of a heritage language as a medium of instruction alongside the dominant language mediates the dialogism, meaning-making, access to wider discourse, and taking of an active stance, all of which are dimensions of voice.

The findings from the present study show that the teaching of L3 English through introducing its written forms positively influenced the subjects' general phonological processing and supported their early literacy in both English and Indonesian. Moreover, L1 Indonesian proficiency also benefitted L2 Acehnese word reading because the language is learnt in both spoken and written forms.

Allowing these children to read for the first time in their ethnic language instead of in their L2 Indonesian language would help them to maximally recognise the ethnic language's phonological characteristics, especially as this ethnic language is phonologically more complex than Indonesian. The habit of comparing the rules across the two languages could help the bilinguals to develop a higher metalinguistic awareness (Jessner, 2010).

Literacy in the ethnic language can be taught by introducing graphemes that represent the unique sounds contained in the particular ethnic language. The children could thereby not only learn their first printed words in a more meaningful way but also develop a more defined phonemic awareness from the more phonologically intricate ethnic language.

Investigating literacy use in creole languages, Siegel (2010) compiled the benefits of including creole in an educational context, especially literacy acquisition. A survey and evaluation of the use of Tok Pisin pidgin for preparatory school programmes in Papua New Guinea showed that the programme helped the children to be better learners in primary school compared to children who had learnt to read and write only in English (Siegel, 1997). Siegel (2010, p. 399) also pointed out the importance of teaching creole using ‘the awareness approach' in which one of the components was to help students examine the rule-governed nature and linguistic characteristics of their languages to see how the languages differed from other languages or creoles.

Similarly, the explicit knowledge about differences between languages and writing systems among Indonesian-Acehnese bilinguals can support word reading in both languages, and improved word reading can potentially transfer to other orthographically transparent languages.

7.3.2 Implications for English Teaching and Learning in the Indonesian Context

In English reading acquisition, both lexical and sub-lexical routes are important. English-speaking children start reading acquisition by employing both routes at the same time. The phonological route is used for words that are easily phonologically decodable (e.g. car, box, dog), while the lexical route is used with high-frequency words that are often spelt less consistently (e.g. there, you, she).

L1 Indonesian transparent alphabetic knowledge is beneficial for reading in English because it gives the learners enough phonemic awareness to start learning English orthography. Indeed, Liow and Poon (1998) reported that Singaporean children with Indonesian L1 achieved better phonological awareness compared to children with Mandarin or even English L1.

However, phoneme awareness from learning Indonesian is not enough. The inconsistent rules of English phoneme-letter relationships and the relatively more complex consonant-vowel combinations both in English spoken and written forms requires strategies other than those for phonemes.

English teaching in most of the public primary schools in Indonesia still relies on the lexical route for teaching English pronunciation. Children thus need to remember large vocabularies to read in English. Teaching other reading strategies, such as to use frequent consonant clusters for onsets or to identify words with similar rime sounds, could help Indonesian readers decode English words independently from lexical knowledge. Nowadays, few teachers understand the phonic approach of focusing the learners' attention on not only monograph-sound relationships but also digraph-sounds (e.g. the, ch, ph, ee, oo, and many more) or rhymes (route-fruit). By combining well-developed phoneme and syllable awareness with other strategies, Indonesian English learners would be able to read English more efficiently.

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APPENDICES

Appendix 1

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<u>Formulir Persetujuan Orang Tua</u>

Anak anda diundang untuk berpartisipasi dalam sebuah penelitian tentang hubungan bunyi-tulisan, dan kemampuan membaca antar bahasa. Anak anda terpilih sebagai calon partisipan karena rentang usia dan kemampuan mereka dalam berbahasa Indonesia dan bahasa Aceh. Kami meminta anda untuk membaca informasi ini dan memberikan pertanyaan yang mungkin anda ingin tanyakan sebelum menyetujui keikutsertaan anak anda dalam penelitian ini.

Tujuan penelitian ini adalah untuk mencari tahu kemampuan memanipulasi bunyi dan melihat hubungannya dengan kemampuan anak-anak membaca nyaring dalam bahasa, Aceh, Indonesia yang Inggris. Jika anda setuju, maka anda diminta untuk mengisi jawaban dari beberapa pertanyaan tentang penggunaan bahasa Aceh, Indonesia dan bahasa Inggris pada anak anda, dan mengembalikan dokumen ini kepada wali kelasnya sebelum 22/07/2016. Setelah proses ini, anak anda akan diseleksi untuk berpartisipasi dalam tahap berikutnya dari penelitian ini. Anda akan diberitahukan tentang hal ini dalam kurun waktu satu minggu setelah pengembalian kuisioner. Pada tahapan selanjutnya, anak anda akan diberikan serangkaian aktifitas oleh seorang peneliti dengan ditemani oleh seorang guru. Sebelum proses dimulai, anak anda akan dimintai persetujuannya secara verbal apakah bersedia untuk mengikuti serangkaian kegiatan. Apabila anak anda menolak, maka kami tidak akan mengikutsertakannya meskipun sudah mendapatkan persetujuan dari anda.

Agar anak tidak jenuh, kegiatan-kegiatan akan diberikan dengan media games, dan dalam suasana yang rileks dan menyenangkan. Selain itu setiap tes telah didesain untuk berlangsung tidak lebih dari 15 menit untuk setiap anak. Setelah berhasil menyelesaikan satu games, anak-anak akan diberikan kesempatan memilih sendiri stiker bertemakan anak-anak, dari keranjang yang disediakan. Di akhir program, anak-anak yang berpartisipasi berhak mendapatkan sebuah sertifikat yang dapat diminta pada pihak sekolah 6 minggu setelah program selesai.

Semua dokumentasi dari kegiatan ini, seperti lembar kerja, rekaman suara, surat izin orang tua, dan lain-lain, akan disimpan dengan aman selama 7 tahun sejak penelitian ini dilakukan. Keputusan anda untuk berpartisipasi atau tidak, tidak akan mempengaruhi hubungan anda dengan University of the West of England atau SD IT Al Azhar. Jika anda memilih untuk mengizinkan anak anda untuk berpartisipasi, anda bebas untuk mengundurkan diri apabila anak anda ingin berhenti kapan saja tanpa mempengaruhi hubungan anda dengan University of the West of England atau SD IT Al Azhar. Penulis yang menyusun penelitian ini adalah Septhia Irnanda, MTESOL, mahasiswa PhD dari University of the West of England, Bristol, Inggris. Jika anda memiliki pertanyaan, anda dapat menghubungi penulis pada: (+62) 81370184490 (Ibu Nanda). Atau, pembimbing penelitian ini, Dr. Jeanette Sakel, pada: jeanette.sakel@uwe.ac.uk

Tanda tangan Orang tua ____________________ Tgl_____________

Tanda tangan Peneliti ____________________ Tgl ____________

Appendix 2

PARENTAL CONSENT FORM

Your child is invited to take part in a research study about sounds-scripts relationship and reading across languages. Your child was selected as a possible participant because of their age range and their exposure to Indonesian and/or Acehnese language. We ask that you read this form and ask any questions you may have before agreeing to your child participating in this study.

The purpose of this study is to uncover the ability of manipulating sounds to see its correlation to reading aloud skill among Acehnese-Indonesian bilingual children learning English as a third language. If you agree to have your child participating in this study, you will be asked to complete a questionnaire about your child's usage of Acehnese, Indonesian and English, and return it to your child's classroom teacher before 22/07/2016. Your child may be invited to participate in the next stage of the study. You will be notified about this within two weeks after returning the questionnaire. Together with your child's school teacher, we will arrange a battery of tests for your child at school. At this stage, your child, accompanied by a teacher will be questioned by a trained experimenter. Your children are tested for their languages' vocabulary, sound-manipulation, and reading aloud skills. The first one will be measured through test that uses pictures as media. For the second skill, child will be asked to say some words without a certain syllable, or some syllables, without a certain sound. For the last skill, children will be given a set of words to read aloud.

The only risk involved with this study is the possibility that the child will get bored or feel threaten during the tasks given. To anticipate this, the tasks will be given under a relax atmosphere in the school multimedia room, where I would encourage the child to make them feel comfortable in answering the questions in the tasks. Furthermore, every test is designed not to last more than 15 minutes times for every child. After the completion of each task, the child will be offered to pick a sticker of their favorite character from the provided basket. And when they have completed all the tasks, they will receive a certificate of participation. You can request this from your child's school six weeks after the tasks completion.

The records of this study will be kept private. Consent forms, questionnaire, and the child's worksheets will be kept securely along with results for 7 years after completion of this study. Your decision whether or not to participate will not affect your current or future relations with the University of the West of England or with your child's Primary school. If you decide to allow your child to participate, you are free to withdraw your child at any time without affecting your relationship with the University of the West of England or your child's Primary school. Furthermore, your child may also discontinue participation at any time if they want to by telling their classroom teacher or the researcher. The child who does not finished all the tasks will still be awarded a certificate of participation at the end of the study, and their leaving will not affect their academic grade at all. The researcher conducting this study is Septhia Irnanda, MTESOL, a PhD student at University of the West of England, Bristol, United Kingdom. If you have any questions, you may contact the researcher at 0000000000. Or, the Director of Study for this project, Dr. Jeanette Sakel, at Jeanette.sakel@uwe.ac.uk

Signature of Participant _____________________ Date ______________

Signature of Investigator _____________________ Date _____________

Appendix 3

UWE Bristol University of the West of England

KUISIONER ORANG TUA UNTUK MELIHAT KEMAMPUAN BAHASA ANAK

Kepada yang terhormat orang tua murid, tolong berikan jawaban dari setiap pertanyaan dibawah ini se-akurat mungkin. Isilah tabel yang kosong dan tandai jawaban yang sesuai dengan memberikan tanda silang (X). Tidak ada jawaban yang " benar " atau " salah ". Pilihlah jawaban yang paling sesuai dengan keadaan anda saat ini. Terima kasih atas kerja sama anda.

Nama Anak:	**Tgl Lahir:**
Nama orang yang mengisi formulir ini:	

I. Demografi Keluarga

1. Suku orang tua (contoh, Aceh, Batak, Padang, Aceh-Padang, dll.)		
Ayah		
Ibu		
2. Bahasa orang tua. Jika anda berbicara dua bahasa, tulis kedua bahasa tsb!		
Ayah		
Ibu		
3. Bahasa lain yang mungkin dikuasai orang tua		
Ayah		
Ibu		
4. Usia orang tua		
Ayah	◯ <20 ◯ 20-29 ◯ 30-39 ◯ 40-49 ◯ 50-59 ◯ 60-69	
Ibu	◯ <20 ◯ 20-29 ◯ 30-39 ◯ 40-49 ◯ 50-59 ◯ 60-69	
5. Pendidikan terakhir orang tua		
Ayah	◯ SD ◯ SMP ◯ SMA ◯ D1-D3 ◯ S1 ◯ S2 ◯ S3	
Ibu	◯ SD ◯ SMP ◯ SMA ◯ D1-D3 ◯ S1 ◯ S2 ◯ S3	

6. Penghasilan Orang Tua (Ibu dan Ayah)
◯ <1 juta/bulan ◯ 1 juta-2,99 juta/bulan ◯ 3 juta- 5,99juta/bulan ◯ 6 juta- 8,99 juta/bulan ◯ > 9 juta

II. Bahasa yang digunakan anak dirumah

INDONESIA-ACEH	
Penggunaan aktif	
7. Bahasa apa yang anak anda gunakan jika berbicara dengan ibunya?	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
8. Bahasa apa yang anak anda gunakan jika berbicara dengan ayahnya?	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
9. Bahasa apa yang anak anda gunakan ketika berbicara dengan nenek/kakek dipihak ibunya?	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali

10. Bahasa apa yang anak anda gunakan ketika berbicara dengan nenek/kakek dipihak ayahnya?	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
11. Bahasa apa yang anak anda gunakan ketika berbicara dengan…? *(isilah titik-titik dengan anggota keluarga atau saudara selain yang telah disebutkan diatas yang tinggal dengan anak anda dirumah yang sama atau seringkali bertemu dengan anak anda. Contohnya: pamannya, bibi atau pengasuhnya)*	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesian	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
12. Bahasa apa yang anak anda gunakan ketika berbicara dengan temannya dilingkungan tetangga?	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali

INDONESIA-ACEH	
Penggunaan Pasif	
13. Bahasa apa yang digunakan ibu untuk berbicara dengan anak?	
Aceh	◯ selalu

	◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
14. Bahasa apa yang digunakan ayah untuk berbicara dengan anak?	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
15. Bahasa apa yang digunakan kakak/adik ketika berbicara dengan si anak?	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
16. Bahasa apa yang digunakan nenek/kakek dari pihak ibu ketika berbicara dengan anak?	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali

17. Bahasa apa yang digunakan nenek/kakek dari pihak ayah ketika berbicara dengan anak?	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
18. Bahasa apa yang……………………………gunakan ketika berbicara dengan anak? *(isilah titik-titik dengan anggota keluarga atau saudara selain yang telah disebutkan diatas yang tinggal dengan anak anda dirumah yang sama atau seringkali bertemu dengan anak anda. Contohnya: pamannya, bibi atau pengasuhnya)*	
Aceh	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
Indonesia	◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali

III. Pemahaman Huruf

Aceh
19. Apakah si anak membaca dalam bahasa Aceh? (seperti buku, koran, sms, catatan tertulis, dll) ◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
20. Apakah si anak membaca dalam bahasa Indonesia? (seperti buku, koran, sms, catatan tertulis, dll) ◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang

◯ tidak sama sekali
21. Apakah anak anda menulis dalam bahasa Aceh? (Seperti jurnal, catatan, sms, dll) ◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali
22. Apakah anak anda menulis dalam bahasa Indonesia? (Seperti jurnal, catatan, sms, dll) ◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali

IV. Penilaian Orang Tua

23. Bagaimana menurut anda kemampuan mendengar si anak? *(seberapa mengerti anak pada bahasa yang digunakan dalam konteks berbicara)*	
Aceh	◯ Sangat Kurang ◯ Kurang ◯ Cukup ◯ Baik ◯ Sangat Baik
Indonesia	◯ Sangat Kurang ◯ Kurang ◯ Cukup ◯ Baik ◯ Sangat Baik
24. Bagaimana menurut anda kemampuan berbicara si anak? *(seberapa mampu anak berbahasa dalam konteks berbicara)*?	
Aceh	◯ Sangat Kurang ◯ Kurang ◯ Cukup ◯ Baik ◯ Sangat Baik
Indonesia	◯ Sangat Kurang ◯ Kurang ◯ Cukup ◯ Baik ◯ Sangat Baik
25. Bagaimana menurut anda kemampuan membaca si anak? *(seberapa anak mampu berbahasa dalam konteks tulisan)*?	
Aceh	◯ Sangat Kurang ◯ Kurang ◯ Cukup ◯ Baik

	◯ Sangat Baik
Indonesia	◯ Sangat Kurang ◯ Kurang ◯ Cukup ◯ Baik ◯ Sangat Baik
26. Bagaimana menurut anda kemampuan menulis si anak?? *(seberapa bisa anak menggunakan bahasa dalam komunikasi tertulis)*	
Aceh	◯ Sangat Kurang ◯ Kurang ◯ Cukup ◯ Baik ◯ Sangat Baik
Indonesia	◯ Sangat Kurang ◯ Kurang ◯ Cukup ◯ Baik ◯ Sangat Baik
27. Bahasa apakah yang menurut anda tidak terlalu penting bagi generasi muda masa depan? Jika anda harus membuang salah satu, bahasa apakah itu?	◯ keduanya dengan tambahan bahasa Inggris ◯ Aceh ◯ Indonesia ◯ Tidak ada
28. Jelaskan alasan anda	

V. Pengalaman bahasa Inggris Anak

29. Apakah anak anda berbicara menggunakan bahasa Inggris dengan anggota keluarga, atau apakah ia pernah tinggal atau bersekolah di negara yang berbahasa Inggris?	◯ Ya ◯ Tidak
Jika ‘’iya’’, lanjutkan ke halaman terakhir	
30. Pada usia berapakah si anak mengenal bahasa Inggris? ◯ Sebelum 3 ◯ Antara 3 – 5	

◯ Setelah 5	
31. Apakah anak anda sekarang belajar bahasa Inggris di tempat privat selain di sekolah?	
Ya, ◯ Setiap hari ◯ tiga kali seminggu ◯ dua kali seminggu ◯ sekali seminggu ◯ kurang dari sekali seminggu	Tidak ◯
32. Apakah anda menggunakan bahasa Inggris dirumah kepada anak anda? (Termasuk membaca buku cerita berbahasa Inggris, majalah, menyanyikan lagu bahasa Inggris, memperkenalkan kosa kata bahasa Inggris, dll) ◯ selalu ◯ hampir selalu ◯ kadang-kadang ◯ jarang ◯ tidak sama sekali	
33. Bagaimana prestasi anak anda dalam pelajaran Bahasa Inggris disekolah? ◯ jelek ◯ cukup ◯ Biasa ◯ Bagus ◯ Sangat Bagus	
34. Bagaimana pendapat anda tentang pentingnya bahasa Inggris bagi generasi masa depan? ◯ Sangat Penting ◯ Cukup Penting ◯ Penting ◯ Kurang penting ◯ Sangat tidak penting	

Terima Kasih telah menyempatkan waktu anda untuk mengisi kuisioner ini.

Selanjutnya tolong tuliskan tanggal dan tanda tangan dibawah ini, kemudian silahkan mengembalikan formulir dan kuisioner yang telah ditanda tangani kepada wali kelas paling telat tanggal 22/07/2016.

Nama & Tanda Tangan	Tgl

Appendix 4

<u>PARENTS QUESTIONNAIRE TO EVALUATE A CHILD'S LINGUISTIC PROFILE</u>

Dear Parents! Please respond to the following questions as accurately as possible. Fill in the gaps and mark the appropriate answer with a cross. There are no "right" or "wrong" answers. You choose the answer which best describes your actual situation. Thank you for your cooperation!

Name of the child:	**Date of birth:**
Name of the person filling in the questionnaire:	

Family demographic

1. Parents' ethnicity (e.g. Acehnese, Bataknese, Padangnese, Acehnese-Padangnese, ect.)		
Father		
Mother		
2. Parents' native language(s). If you're grown up bilinguals, write the two languages!		
Father		
Mother		
3. Parents' other languages		
Father		
Mother		
4. Parents' age		
Father	◯ <20 ◯ 20-29 ◯ 30-39 ◯ 40-49 ◯ 50-59 ◯ 60-69	
Mother	◯ <20 ◯ 20-29 ◯ 30-39 ◯ 40-49 ◯ 50-59 ◯ 60-69	
5. Parents' highest level of education		
Father	◯ SD ◯ SMP ◯ SMA ◯ D1-D3 ◯ S1 ◯ S2 ◯ S3	
Mother	◯ SD ◯ SMP ◯ SMA ◯ D1-D3 ◯ S1 ◯ S2 ◯ S3	

6. Family's social economic status

<1 juta/bulan 1 juta-2,99 juta/bulan 3 juta- 5,99juta/bulan

6 juta- 8,99 juta/bulan > 9 juta

The Child Home Language Use

INDONESIAN-ACEHNESE	
Active Use	
7. What language(s) does your child speak to his/her mother?	
Acehnese	all the time most of the time sometimes rarely not at all
Indonesian	all the time most of the time sometimes rarely not at all
8. What language(s) does your child speak to his/her father?	
Acehnese	all the time most of the time sometimes rarely not at all
Indonesian	all the time most of the time sometimes rarely not at all
9. What language(s) does your child speak to grandparents from his/her mother?	
Acehnese	all the time most of the time sometimes rarely not at all
Indonesian	all the time most of the time sometimes rarely not at all
10. What language(s) does your child speak to grandparents from his/her father?	
Acehnese	all the time most of the time

	◯ sometimes ◯ rarely ◯ not at all
Indonesian	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
11. What language(s) does your child speak to___________________________________? *(please fill the blank with any relative/person other than family member mentioned above who live with your child at the same house or having a regular meeting with your child. E.g. their uncle, aunt, or a paid care taker)*	
Acehnese	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
Indonesian	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
12. What language does your child speak to his/her neighbor peers?	
Acehnese	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
Indonesian	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all

INDONESIAN-ACEHNESE	
Passive Use	
13. What language(s) does the mother speak to the child?	
Acehnese	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
Indonesian	◯ all the time ◯ most of the time ◯ sometimes

	◯ rarely ◯ not at all
14. What language(s) does the father speak to the child?	
Acehnese	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
Indonesian	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
15. What language(s) do the grandparents from the child's mother speak to the child?	
Acehnese	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
Indonesian	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
16. What language(s) do the grandparents from the child's father speak to the child?	
Acehnese	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
Indonesian	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
17. What language(s) does the ______________________ speak to the child? *(Please fill the blank with any relative/person other than family member mentioned above who live with your child at the same house or having a regular meeting with your child. E.g. their uncle, aunt, or a paid care taker)*	
Acehnese	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all

Indonesian	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
18. What language do your child neighbor peers speak to your child?	
Acehnese	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
Indonesian	◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all

Literacy

Acehnese
19. Does your child read Acehnese? (This includes books, newspapers, text messages, written notes, etc.) ◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
20. Does your child read Indonesian? (This includes books, newspapers, text messages, written notes, etc.) ◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
21. Does your child write Acehnese? (This includes journals, notes, text message etc.) ◯ all the time ◯ most of the time ◯ sometimes ◯ rarely ◯ not at all
22. Does your child write Indonesian? (This includes journals, notes, text message etc.) ◯ all the time ◯ most of the time ◯ sometimes ◯ rarely

not at all

Parent's Assessment

23. How would you rate your child's listening proficiency? *(How well your child understands the language(s) in spoken context)*	
Acehnese	Poor Fair Average Good Excellent
Indonesian	Poor Fair Average Good Excellent
24. How would you rate your child's speaking proficiency? *(How fluency your child speaks the language(s) to communicate in spoken context)*	
Acehnese	Poor Fair Average Good Excellent
Indonesian	Poor Fair Average Good Excellent
25. How would you rate your child's reading proficiency? *(How well your child understands the language(s) in written context)*	
Acehnese	Poor Fair Average Good Excellent
Indonesian	Poor Fair Average Good Excellent
26. How would you rate your child's writing proficiency? *(How well your child uses the language(s) to communicate in written context)*	
Acehnese	Poor Fair Average Good Excellent
Indonesian	Poor Fair Average Good

	❍ Excellent
27. Which language do you think is less important for the future generation? If you had to sacrifice any, which one would it be?	❍ Both in favor of English ❍ Acehnese ❍ Indonesian ❍ Neither
28. Could you explain your reason?	

VI. The Child English Language Exposure

29. Does your child speak English with any of his/her family member, or have ever lived/gained formal education in an English speaking country?	❍ Yes ❍ No
If yes, please go to page 11,	
30. At what age was s/he introduced to English? ❍ Before 3 ❍ Between 3 – 5 ❍ After 5	
31. Does your child currently learn English at an institution other than school? How often?	
Yes, ❍ Daily ❍ three times a week ❍ twice a week ❍ once a week ❍ less than once a week	No ❍
32. Do you use English to your child at home? (This includes reading English story books, magazines, singing English nursery rhymes, introducing vocabularies, etc.) ❍ all the time ❍ most of the time ❍ sometimes ❍ rarely ❍ not at all	
33. How high is your child achievement in English lessons at school? ❍ Poor ❍ Fair ❍ Average ❍ Good ❍ Excellent	
34. How would you rate the importance of English for the future generation? ❍ Very important ❍ Fairly important ❍ Important	

◯ Slightly important ◯ Not important at all

Thank you for your time filling out this questionnaire.
Please date and sign below, and return this questionnaire, and the signed parental consent form to your child’s classroom teacher before 22/07/2016.

Name & Signature	Date

Appendix 5

FORM PERSETUJUAN ANAK

Hai. Nama ibu Septhia Irnanda, panggil saja ibu Nanda. Ibu adalah seorang guru Bahasa. Sekarang ini, Ibu sedang belajar dan mencari tahu tentang Bahasa anak-anak. Ibu ingin kamu membantu Ibu mempelajari tentang hal ini. Tapi sebelumnya, Ibu akan jelaskan apa yang akan kamu lakukan bila kamu bersedia membantu Ibu.

Kita akan bertemu selama 10 menit setiap hari Senin dan Selasa selama tiga minggu ke depan. Pada kesempatan itu kita akan bermain game bersama. Permainan yang akan kita mainkan antara lain berupa permainan yang menggunakan computer, suara dan kata-kata, dan membaca nyaring susunan kata-kata. Satu permainan berlangsung sekitar kurang lebih 30 menit, sedangkan permainan yang lain hanya berlangsung masing-masing 15 menit saja. Pada akhir setiap permainan, kamu akan diberikan sebuah stiker yang bisa kamu pilih sendiri dari sebuah keranjang. Setelah semua permainan selesai kamu mainkan, kamu akan menerima bingkisan berisi mainan yang edukatif yang boleh kamu bawa pulang.

Beberapa kegiatan kita ini akan Ibu rekam suaranya. Tujuannya untuk nantinya ibu gunakan dalam meneliti tentang Bahasa anak-anak. Ibu akan merahasiakan hasil permainan yang kamu mainkan. Ibu tidak akan memberitahu orang-tuamu, gurumu maupun teman-temanmu. Ibu juga tidak akan menulis terang-terangan namamu dalam laporan hasil penelitian Ibu tentang Bahasa anak-anak ini. Dengan terlibat dalam kegiatan ini, kamu dapat membantu Ibu memahami tentang Bahasa anak-anak dalam bunyi dan tulisan dengan lebih baik.

Orang tuamu telah mengizinkan kamu mengikuti kegiatan ini. Tapi kalua kami tidak ingin ikut, kamu tidak perlu ikut. Ikut ataupun tidak, tidak akan mempengaruhi masalah nilai pelajaran Bahasa kamu. Ibu juga tidak akan marah, tidak ada seorangpun akan marah kalau kamu tidak mau ikut. Kalau kamu ingin ikut tapi nanti tidak jadi juga tidak apa-apa. Kamu boleh minta berhenti sama Ibu atau sama Ibu Guru kelas kamu paling telat besok (2 agustus 2016), jadi kami punya waktu untuk mencari anak lain sebagai ganti. Dengan memutuskan tidak jadi ikut, tidak akan mempengaruhi nilai sekolah kamu. Kalau ada yang kamu tidak paham, tanyakan pada Ibu agar Ibu jelaskan.

Kamu bisa bertanya apa saja tentang kegiatan ini. Kalau kamu nanti tiba-tiba ingin bertanya, kamu bisa hubungi Ibu atau meminta orang tua kamu atau guru kamu untuk menghubungi Ibu lewat telepon atau email.

Apa kamu mau bertanya sesuatu sekarang?

Apa kamu bersedia ikut dalam kegiatan ini?

Anak harus menjawab salah satu, “Ya” atau “Tidak”. Hanya jawaban “Ya” yang bisa dianggap sebagai kebersediaan keikutsertaan anak.

Nama Anak: ______________________________**Izin Orang Tua terlampir:** ☐ Ya ☐ Tidak

(Jika tidak, jangan lanjutkan dengan prosedur persetujuan ini)

Kesukarelaan Anak Ikut Serta: ☐ Ya ☐ Tidak

Tanda tangan Peneliti: ______________________________ **Tanggal:** -___________________

(Tidak Wajib) Tanda Tangan Anak: ______________________________

Appendix 6

CHILD ASSENT FORM

Hi. My name is Septhia Irnanda. I'm a language teacher. Right now, I'm trying to learn about the children language. I would like to ask you to help me by being in a study, but before I do, I want to explain what will happen if you decide to help me.

We will be meeting for about 15 minutes every Monday to Thursday for the next three weeks. On those days, I will ask you to join some games. The games will involve computer and pictures; playing with sounds of the words, and reading aloud a list of words. One game will last for about 30 minutes, and the rest will only takes about 15 minutes each. At the end of every game, you will receive a sticker that you can choose from a basket.

Some of the activities will be audio-taped, so I can use them later to learn further about the children language. I will keep them secret. I will not tell your parents, your teacher, and your friends. When I write the result of my study, I will not use your name in there. By being in the study, you will help me understand better about children spoken and written language.

Your parents says it's okay for you to be in my study. But if you don't want to be in the study, you don't have to be. What you decide won't make any difference with your grades. I won't be upset, and no one else will be upset, if you don't want to be in the study. If you want to be in the study now, but change your mind later, that's okay. You can let me or you classroom teacher know so we can find another child to replace you. Leaving this study will not make any differences with your grade. If there is anything you don't understand you should tell me so I can explain it to you.

You can ask me questions about the study. If you have a question later that you don't think of now, you can call me or ask your parent or your teacher to call me or send me an email.

Do you have any questions for me now?

Would you like to be in my study and play the games?

The child should answer "Yes" or "No." Only a definite "Yes" may be taken as assent to participate.

Name of Child: ________________________________ **Parental Permission on File:**
☐ Yes ☐ No

(If "No," do not proceed with assent or research procedures.)

Child's Voluntary Response to Participation: ☐ Yes ☐ No

Signature of Researcher: ______________________________ **Date:** ___________________

(Optional) Signature of Child: ______________________________

Indonesian Version:

Appendix 7

HALA BODY PART WORD NAMING PERFORMANCE SHEET

Name :

Gender :

Date of Birth :

Class :

Dd/mm/yyyy :

Trials
t-shirt
book
hat
mug
bowl
pen

1. INDONESIAN

No	Indonesian	English	
1	muka	face	
2	punggung	back	
3	mulut	mouth	
4	lidah	tongue	
5	kaki	foot	
6	rambut	hair	
7	jari	fingers	
8	telinga /kuping	ear	
9	gigi	teeth	
10	kepala	head	
11	tungkai kaki	leg	
12	bahu	shoulder	
13	bibir	lips	
14	mata	eye	
15	lutut	knee	
16	hidung	nose	
17	perut	stomach	
18	tangan	hand	
19	leher	neck	
20	telapak tangan	palm	

2. ACEHNESE

No	Acehnese	English	
1	muka	face	
2	rueng	back	
3	babah	mouth	
4	lidah	tongue	
5	gaki	foot	
6	ôk	hair	
7	aneuk jaroe	fingers	
8	geulinyueng pinyueng	ear	
9	gigoe	teeth	
10	ulèe	head	
11	gaki	leg	
12	bahô	shoulder	
13	bibi	lips	
14	mata	eye	
15	tu'ot	knee	
16	idông	nose	
17	pruet	stomach	
18	jaroe	hand	
19	takue	neck	
20	paleuet	palm	

Appendix 8

ACEHNESE RECEPTIVE BODY-PART WORD NAMING PERFORMANCE SHEET

Name :
Gender :
Date of Birth :
Class :

Dd/mm/yyyy :

No	Item in Acehnese (read aloud to the child)	Meaning	Tick
Trial 1	*tangan*	hand	
Trial 2	*kepala*	head	
Trial 3	*mata*	eyes	
1	idông	nose	
2	babah	mouth	
3	jaroe	hand	
4	gaki	legs/feet	
5	gigoe	teeth	
6	ulèe	head	
7	geulunyueng	ears	
8	ôk	hair	
9	bahô	shoulder	
10	rueng	back	
11	takue	neck	
12	pruet	stomach	
13	tu'ot	knee	
14	aneuk gaki	toes	
15	keu'ieng	waist	
16	gukèe	nails	
17	sapai	arms	
18	mieng	cheeks	
19	kheueng	chin	
20	paleuet	palm	

Appendix 9

(See Dunn, L., M., Dunn, L., M, Whetton, C. and Burley, J. (1997) *British Picture Vocabulary Scale*. 2nd ed. Windsor, England: NFER-Nelson.)

Appendix 10

(See Raven, J., Raven, J.,C. and Court, J.H. (1996) *Standard Progressive Matrices*. Oxford, England: Oxford Psychologist Press.)

Appendix 11

Syllable Deletion Task

Name :
Gender :
Date of Birth :
Class :
Dd/mm/yyyy :

trial	***bu**ta*	*ta*		*v*
trial	***ca**ri*	*ri*		
trial	***ke**lapa*	*lapa*		
1	**a**yu	yu		
2	bu**kan**	bu		
3	**jem**pol	pol		
4	**ram**butan	butan		
5	terom**pet**	terom		
6	**a**bèe	bèe		
7	ja**roe**	ja		
8	**bu**ngoeng	ngoeng		
9	siku**reueng**	siku		
10	i**ta**ngèn	ingèn		
11	**dough**nut	nut		
12	ice**cream**	ice		
13	**foot**ball	ball		
14	**pine**apple	apple		
15	motor**bike**	motor		

Appendix 12

Phoneme Deletion Task

Name :
Gender :
Date of Birth :
Class :
Dd/mm/yyyy :

trial	***a***pi	*pi*		
trial	***s***api	*api*		
trial	***c***air	*air*		
1	**b**ulat	ulat		
2	**k**arung	arung		
3	bala**i**	bala		
4	pinta**r**	pinta		
5	ba**n**tu	batu		
6	**b**ulèe	ulèe		
7	**p**lueng	lueng		
8	gata**i**	gata		
9	kué**h**	kué		
10	b**l**ang	bang		
11	**f**at	at		
12	**s**top	top		
13	kee**p**	key		
14	sea**t**	sea		
15	p**l**ane	pain		

Appendix 13

ONSET-RIME ODDITY TASK

Name :
Gender :
Date of Birth :
Class :
Dd/mm/yyyy :

ONSET DETECTION TASK				Response
10.	tikus	tiga	**garam**	
11.	**becak**	kota	kaki	
12.	mata	**laci**	muda	
13.	kasô	karu	**malèe**	
14.	grak	griek	**pruet**	
15.	brat	**trôh**	brôh	
16.	bus	bun	**rug**	
17.	fat	food	**pet**	
18.	snow	**slow**	snail	
RIME DETECTION TASK				
19.	lap	cap	**cat**	
20.	**ingat**	rumah	lebah	
21.	bukan	**bekas**	teman	
22.	kah	pah	**nan**	
23.	paneuk	mantôk	batôk	
24.	puléh	patéh	***cèh***	
25.	say	day	**paw**	
26.	tell	bell	**deal**	
27.	fry	tie	**take**	

Onset DetectionTrials:

Bis, ban, lap
Rumah, rakus, mobil
Bantu, bingung, Tarik

Rime Detection Trials:

Gas, tas, map
Panjang, sarang, patuh
Suka, bila, gelap

Appendix 15

UWE Bristol | University of the West of England

INDONESIAN WORD READING TEST

No	Item
1.	ibu
2.	aku
3.	bola
4.	cuci
5.	guru
6.	intan
7.	enak
8.	cabut
9.	buas
10.	daun
11.	pisau
12.	kecap
13.	rumah
14.	sampah
15.	kancil
No	Item
16.	bangku
17.	mangga
18.	khidmat
19.	stasiun
20.	trenggiling
21.	kemudi
22.	kurung
23.	bagaimana
24.	caci-maki
25.	lauk-pauk
26.	tulislah
27.	dilakukan
28.	bepergian
29.	membutuhkan
30.	disempurnakan

Appendix 16

UWE Bristol
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ACEHNESE WORD READING TEST

No	Item
1.	bu
2.	karu
3.	uet
4.	apui
5.	kuwéh
6.	ngon
7.	troe
8.	teupèh
9.	brôh
10.	gurèe
11.	uleue
12.	phét
13.	peugöt
14.	bungoeng
15.	rinyeun
No	Item
16.	ureueng
17.	cukèh
18.	kloe
19.	jidhöt
20.	beungöh
21.	manyang
22.	cangklak
23.	peungeut
24.	seumiké
25.	keumawé
26.	seumampôh
27.	geulinyueng
28.	jimeukreuh
29.	beuseumatéh
30.	neupeumeu’ah

Appendix 17

UWE Bristol | University of the West of England

ENGLISH WORD READING TEST

No	Item
1.	fan
2.	jet
3.	pig
4.	pot
5.	cat
6.	kid
7.	lock
8.	melt
9.	gift
10.	nest
11.	king
12.	ducks
13.	helps
14.	blink
15.	moon
No	Item
16.	park
17.	sport
18.	rabbit
19.	bathtub
20.	bucket
21.	dentist
22.	flowers
23.	Sunday
24.	butterfly
25.	nation
26.	active
27.	sailor
28.	dictionary
29.	conclusion
30.	blueberries

Appendix 18

Kappa Intra-Reliability Test Results for Indonesian, Acehnese and English WR Scores (N=10)

Table 1. Kappa Intra-Reliability Test Results for Indonesian WR Test (30 Items)

Sample No	K value	t value	Level of Reliability
1	.865	.000	Moderate
2	1.0	.000	Very Good
3	1.0	.000	Very Good
4	1.0	.000	Very Good
5	.600	.001	Moderate
6	1.0	.000	Very Good
7	.651	.000	Good
8	.636	.000	Good
9	1.0	.000	Very Good
10	.839	.000	Very Good

Table 1. Kappa Intra-Reliability Test Results for Acehnese WR Test (30 Items)

Sample No	K value	t value	Level of Reliability
1	.870	.000	Very Good
2	.706	.000	Good
3	.933	.000	Very Good
4	.726	.000	Good
5	1.0	.000	Very Good
6	.591	.001	Moderate
7	.710	.000	Good
8	.670	.000	Good
9	.658	.000	Good
10	.595	.001	Moderate

Table 1. Kappa Intra-Reliability Test Results for English WR Test (30 Items)

Sample No	K value	t value	Level of Reliability
1	1.0	.000	Very Good
2	.701	.000	Good
3	.800	.000	Good
4	.791	.000	Good
5	1.0	.000	Very Good
6	.561	.001	Moderate
7	.754	.000	Good
8	.762	.000	Good

9	.911	.000	Very Good
10	.911	.000	Very Good

Kappa *k* value according to Altman (1991)

Value of *K*	**Strength of agreement**
< 0.20	Poor
0.21 - 0.40	Fair
0.41 - 0.60	Moderate
0.61 - 0.80	Good
0.81 - 1.00	Very good

Appendix 19

UWE Bristol University of the West of England

<u>DATA COLLECTION SCHEDULE</u>

Researcher's Name : Septhia Irnanda

Director of Study: Jeanette Sakel

Month/Year	**Day/Date**	**Agenda**	**Activity**
July 2016	Mon/11	Preliminary visit	Meeting with Head Teacher Meeting with Classroom Teachers Observing Teaching Learning process
	Tue/12	Pilot Tests for Questionnaire	Some parents from Year 3, 4 and 5 students
Week II	Wed/13	Validating Word List	Done by classroom teachers of the samples
	Thu/14	Piloting the battery of tests	Five children from Year 3
	Fri/15	Questionnaire	Sending questionnaire, Information sheet and Parental Consent to parents through classroom teachers.
7	Sun/17		
July 2016	Mon/18		
	Tue/19		
Week III	Wed/20		
	Thu/21		
	Fri/22		
	Sat/23		
	Sun/24		

July 2016 Week IV	Mon/25		
	Tue/26		
	Wed/27		
	Thu/28		
	Fri/29	Questionnaire Deadline	
	Sat/30	Questionnaire and consent forms assessments.	-Eliminating children speaking or being exposed to a different ethnic language than Acehnese. -Eliminating unfilled questionnaires and consent forms.
	Sun/31		
August 2016 Week I	Mon/01	Result	The parents are given a notification that their child is invited to the next stage of participation.
	Tue/02	-Child consent Recording batch I -Indonesian vocabulary test batch I	5 minutes – administered individually 5 minutes – administered individually
	Wed/03	Acehnese vocabulary test batch I	5 minutes – administered individually
	Thu/04	Call for more participants	I contact and meet more parents and then help them answering the questionnaires.
	Fri/05	-Child consent Recording batch II -Indonesian vocabulary test batch II -Acehnese vocabulary test batch II	5 minutes – administered individually 5 minutes – administered individually 5 minutes- administered individually
	Sat/06		
	Sun/07		
August 2016 Week II	Mon/08	Result for batch II Non-Verbal Test- Group I and II English vocabulary test	The parents are given a notification that their child is invited to the next stage of participation. 15 minutes –administered collectively during break times. 5 minutes – administered individually
	Tue/09	English vocabulary test- continued	5 minutes –administered individually
	Wed/10	Phonological Awareness Task Syllable and Phoneme Deletion.	15 minutes –administered individually

	Thu/11	Phonological Awareness Task Syllable and Phoneme Deletion- continued	15 minutes –administered individually
	Fri/12	Phonological Awareness Task Syllable and Phoneme Deletion- continued	15 minutes –administered individually
	Sat/13		
	Sun/14		
August 2016	Mon/15	Phonological Awareness Task Onset-Rime Oddity	15 minutes –administered individually
Week III	Tue/16	Phonological Awareness Task Onset-Rime Oddity- continued	15 minutes –administered individually
	Wed/17	Phonological Awareness Task Onset-Rime Oddity- continued	15 minutes –administered individually
	Thu/18	Indonesian & English word reading	15 minutes –administered individually
	Fri/19	Indonesian & English word reading	15 minutes –administered individually
	Sat/20		
	Sun/21		
	Mon/22	Indonesian & English word reading	15 minutes –administered individually
August 2016	Tue/23	Acehnese word reading	10 minutes -administered individually
	Wed/24	Acehnese word reading	10 minutes -administered individually
Week IV	Thu/25	Acehnese word reading	10 minutes -administered individually
	Fri/26		
	Sat/27		
	Sun/28		
	Mon/29		
	Tue/30		

Appendix 20

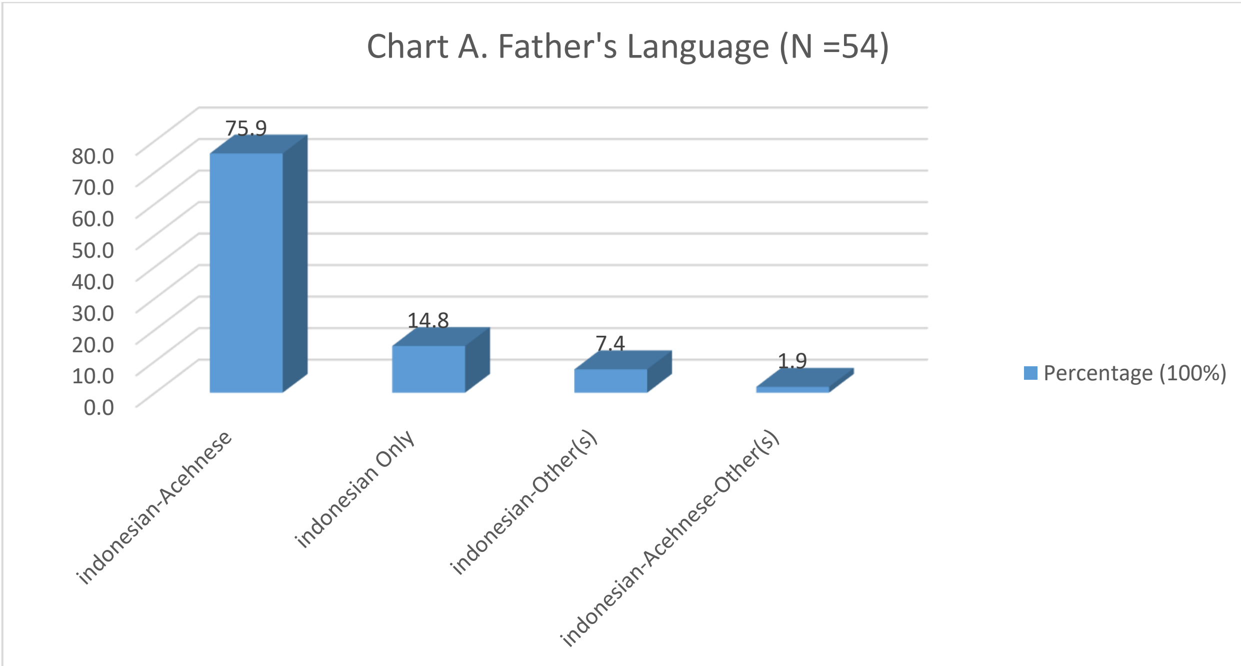


Chart A. Father's Language (N =54)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
75.9
14.8
7.4
1.9
indonesian-Acehnese
indonesian Only
indonesian-Other(s)
indonesian-Acehnese-Other(s)
Percentage (100%)

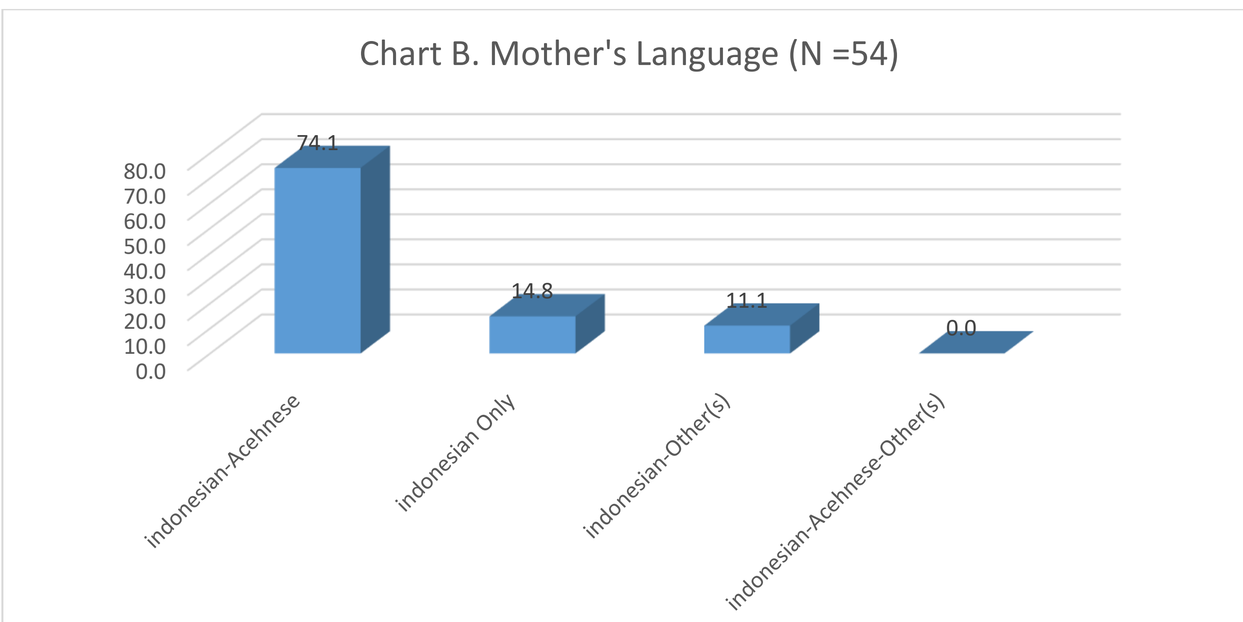


Chart B. Mother's Language (N =54)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
74.1
14.8
11.1
0.0
indonesian-Acehnese
indonesian Only
indonesian-Other(s)
indonesian-Acehnese-Other(s)

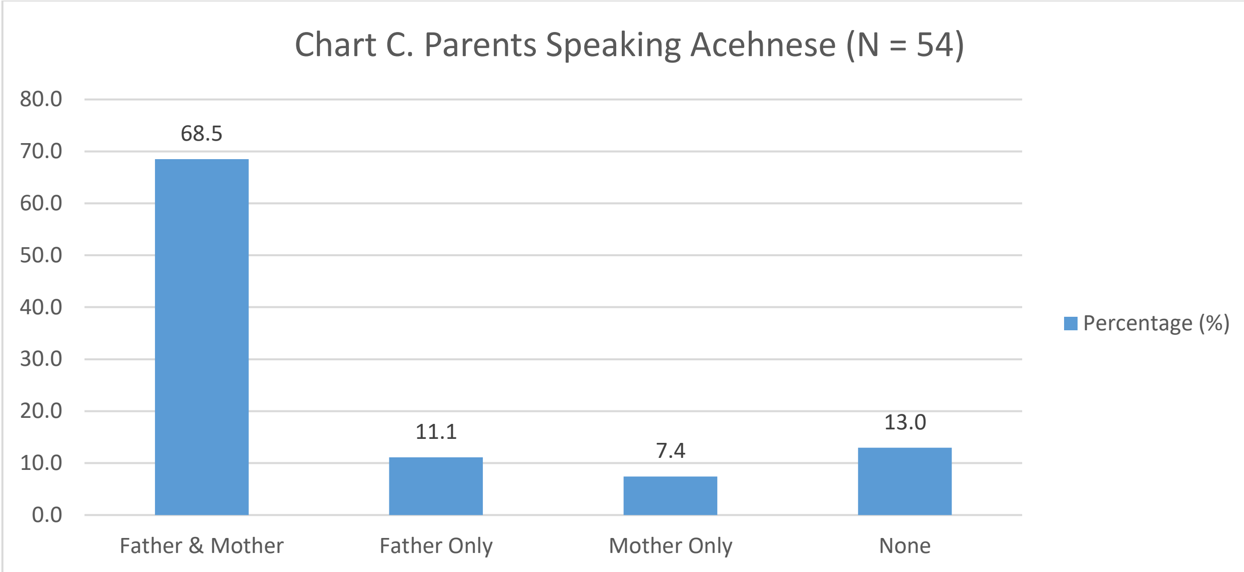


Chart C. Parents Speaking Acehnese (N = 54)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
68.5
11.1
7.4
13.0
Father & Mother
Father Only
Mother Only
None
Percentage (%)

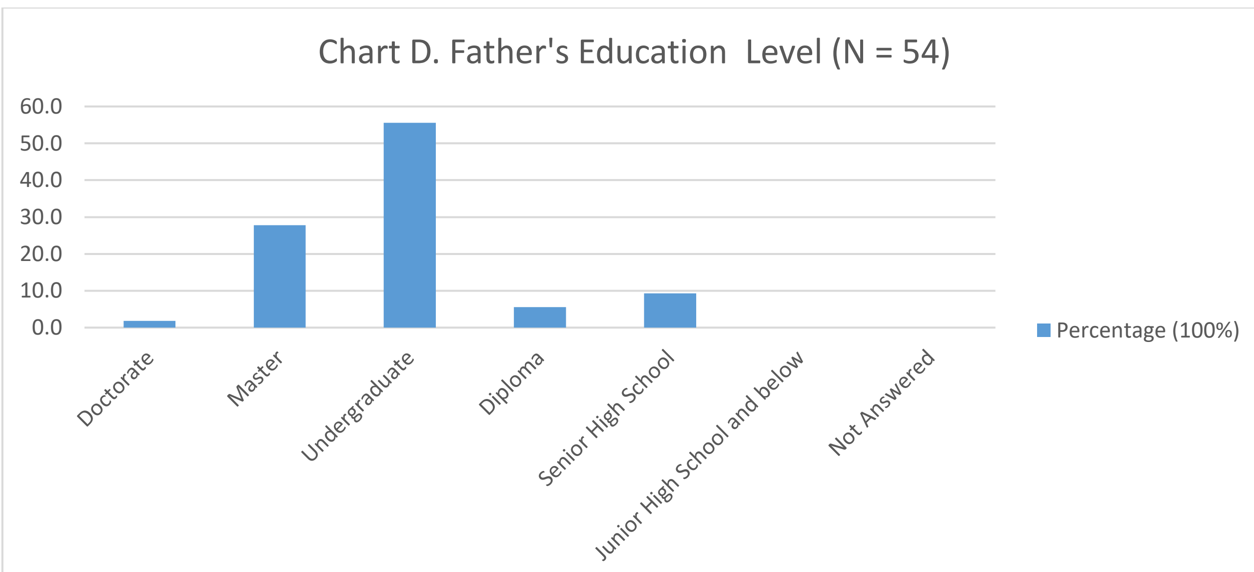


Chart D. Father's Education Level (N = 54)
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Doctorate
Master
Undergraduate
Diploma
Senior High School
Junior High School and below
Not Answered
Percentage (100%)

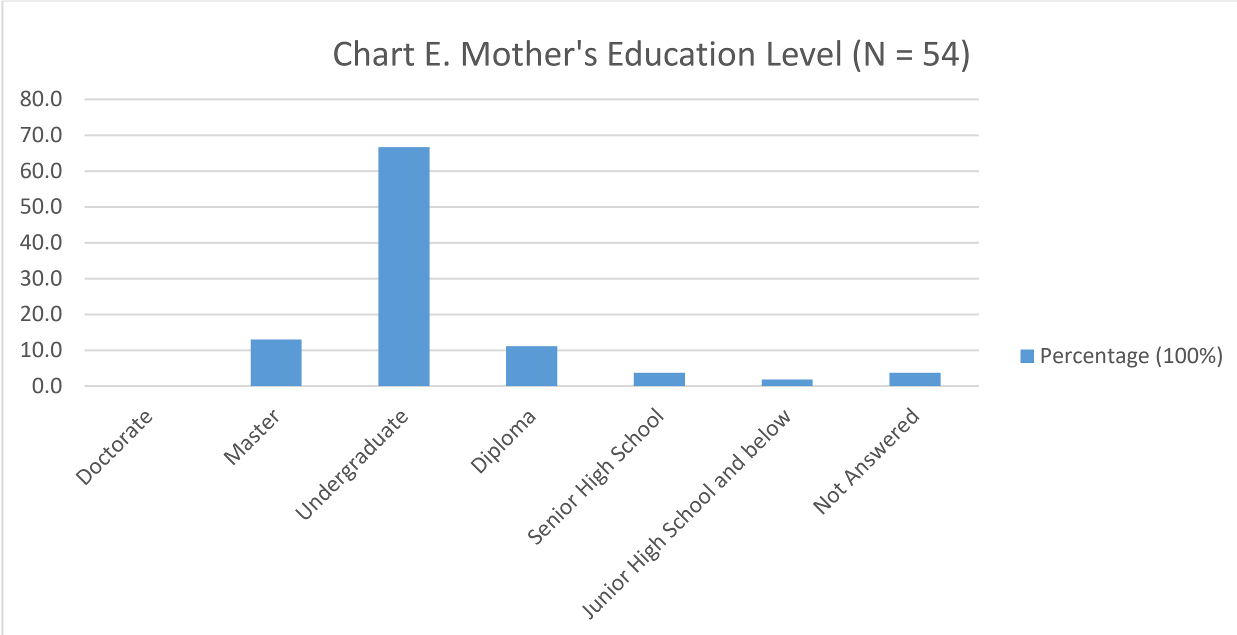


Chart E. Mother's Education Level (N = 54)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Doctorate
Master
Undergraduate
Diploma
Senior High School
Junior High School and below
Not Answered
Percentage (100%)

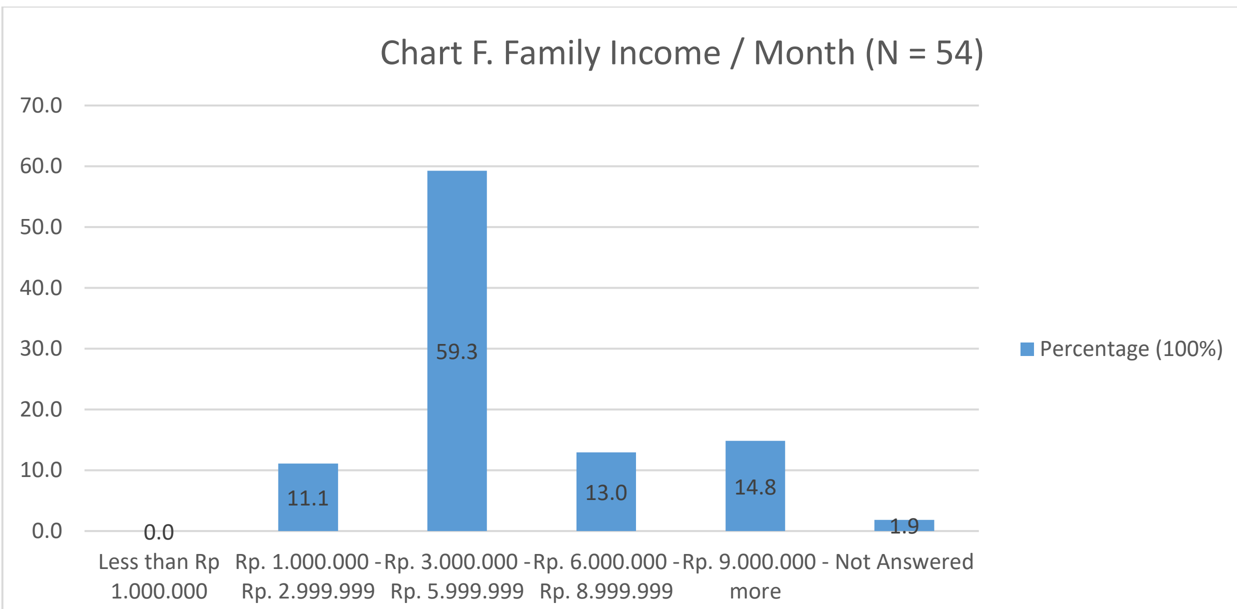


Chart F. Family Income / Month (N = 54)
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0.0
11.1
59.3
13.0
14.8
1.9
Less than Rp 1.000.000
Rp. 1.000.000 - Rp. 2.999.999
Rp. 3.000.000 - Rp. 5.999.999
Rp. 6.000.000 - Rp. 8.999.999
Rp. 9.000.000 - more
Not Answered
Percentage (100%)

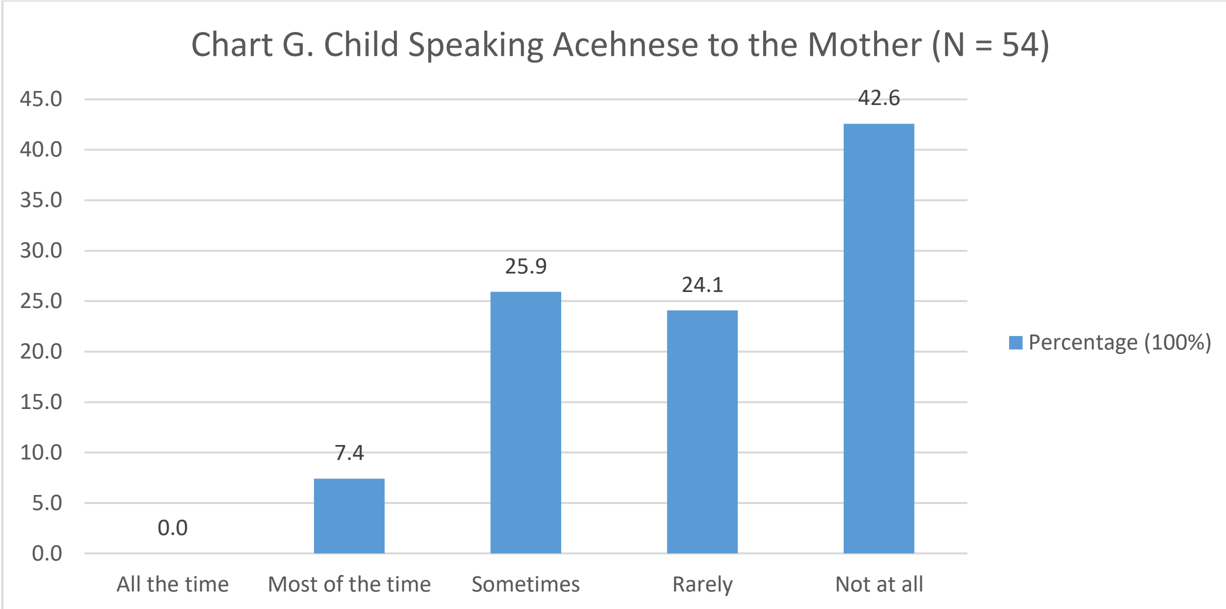


Chart G. Child Speaking Acehnese to the Mother (N = 54)
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
0.0
7.4
25.9
24.1
42.6
All the time
Most of the time
Sometimes
Rarely
Not at all
Percentage (100%)

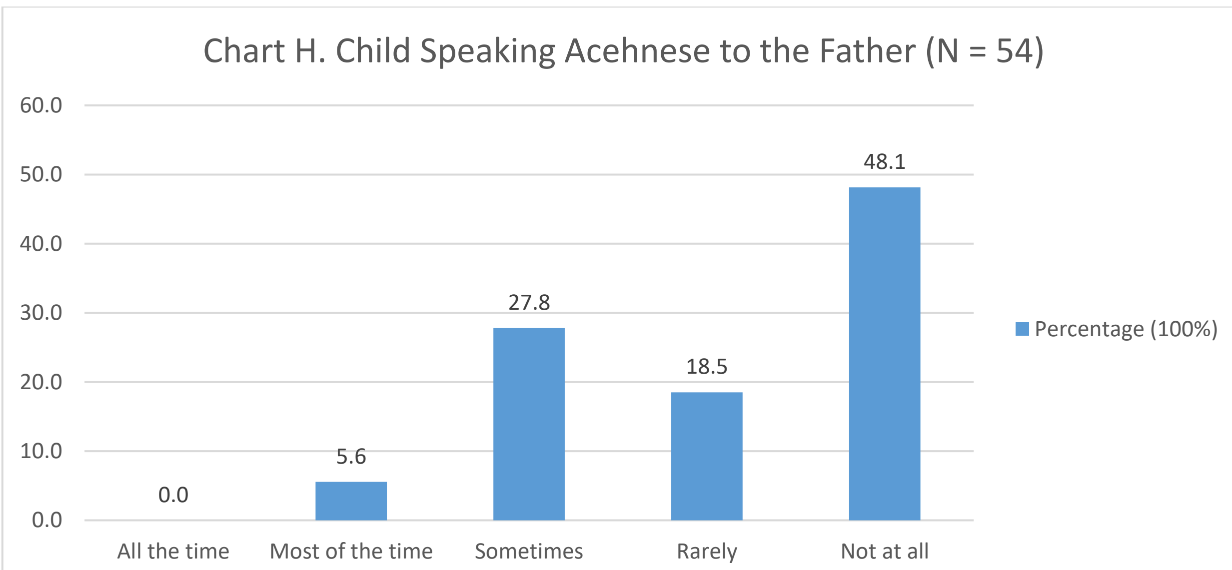


Chart H. Child Speaking Acehnese to the Father (N = 54)
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0.0
5.6
27.8
18.5
48.1
All the time
Most of the time
Sometimes
Rarely
Not at all
Percentage (100%)

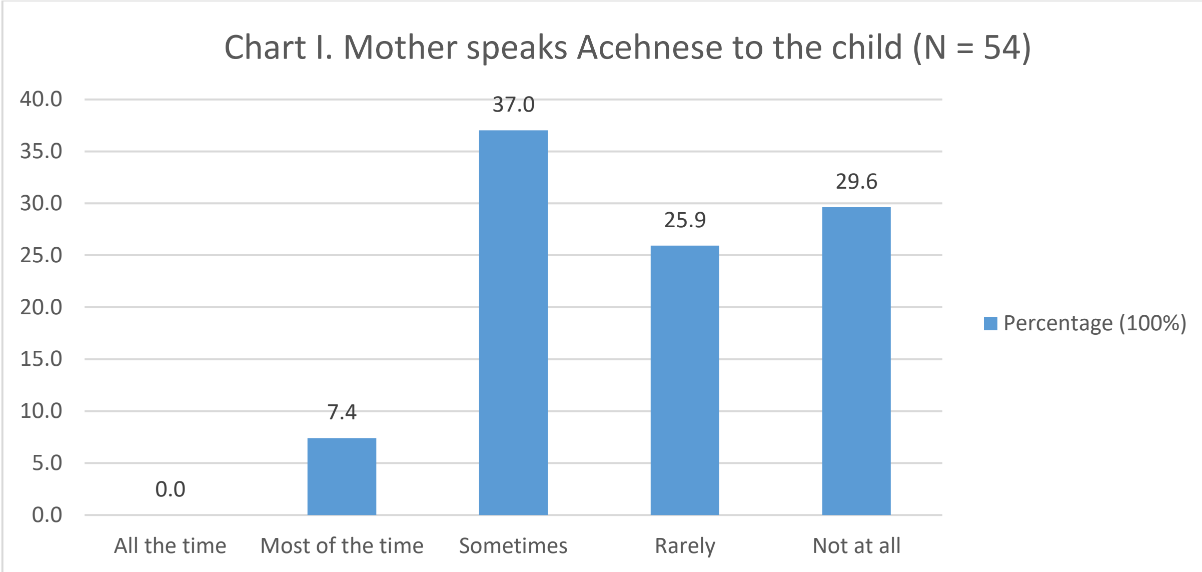


Chart I. Mother speaks Acehnese to the child (N = 54)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
0.0
7.4
37.0
25.9
29.6
All the time
Most of the time
Sometimes
Rarely
Not at all
Percentage (100%)

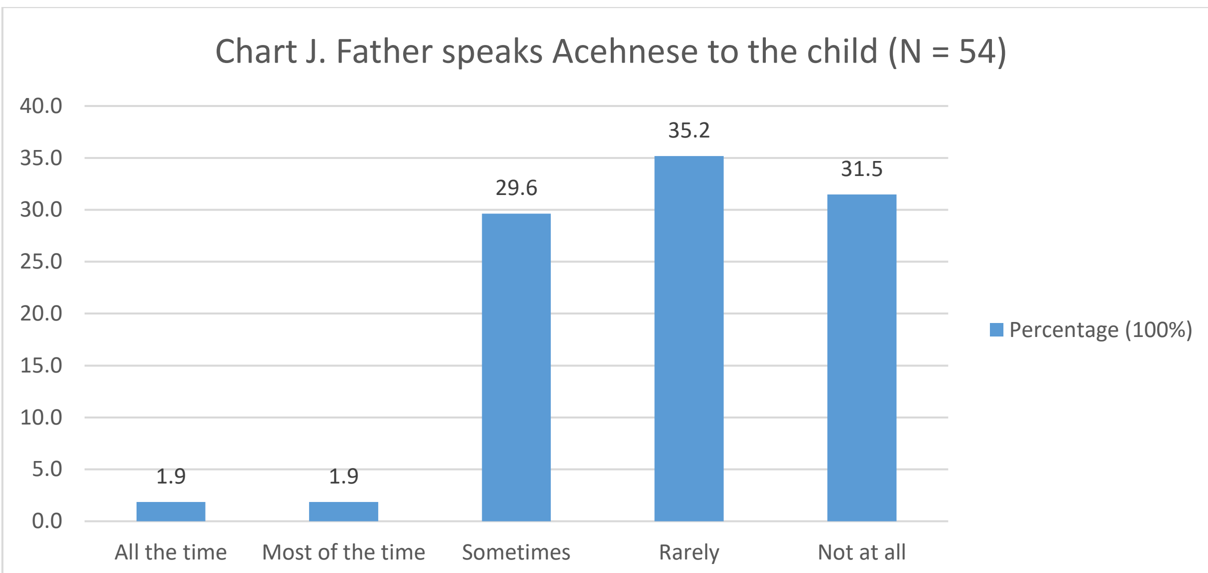


Chart J. Father speaks Acehnese to the child (N = 54)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1.9
1.9
29.6
35.2
31.5
All the time
Most of the time
Sometimes
Rarely
Not at all
Percentage (100%)

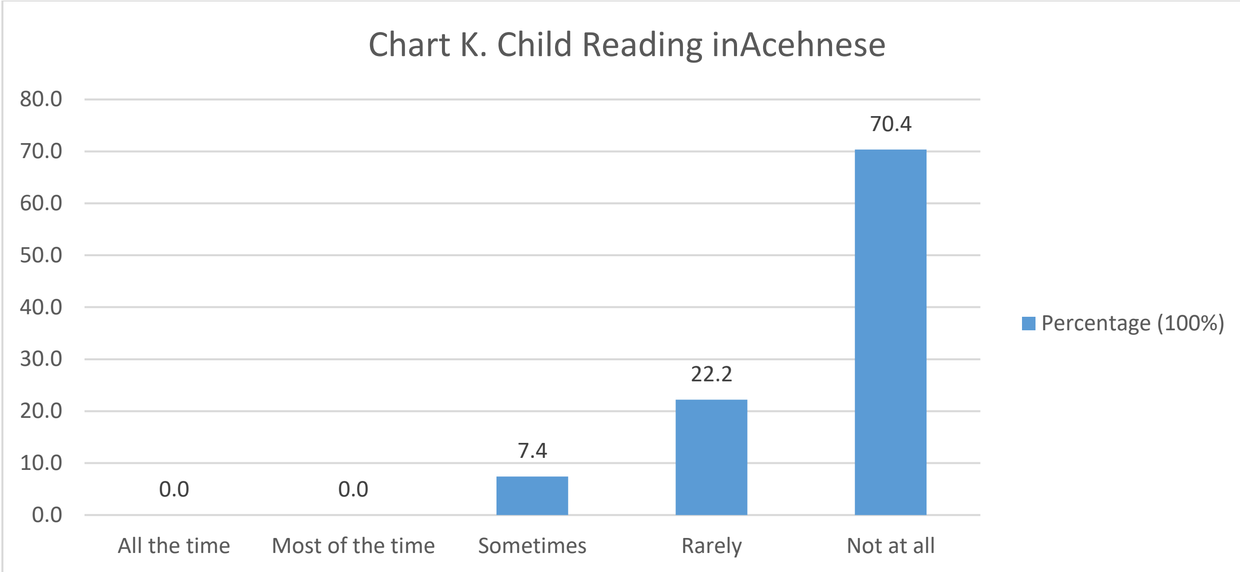


Chart K. Child Reading inAcehnese
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
70.4
22.2
7.4
0.0
0.0
All the time
Most of the time
Sometimes
Rarely
Not at all
Percentage (100%)

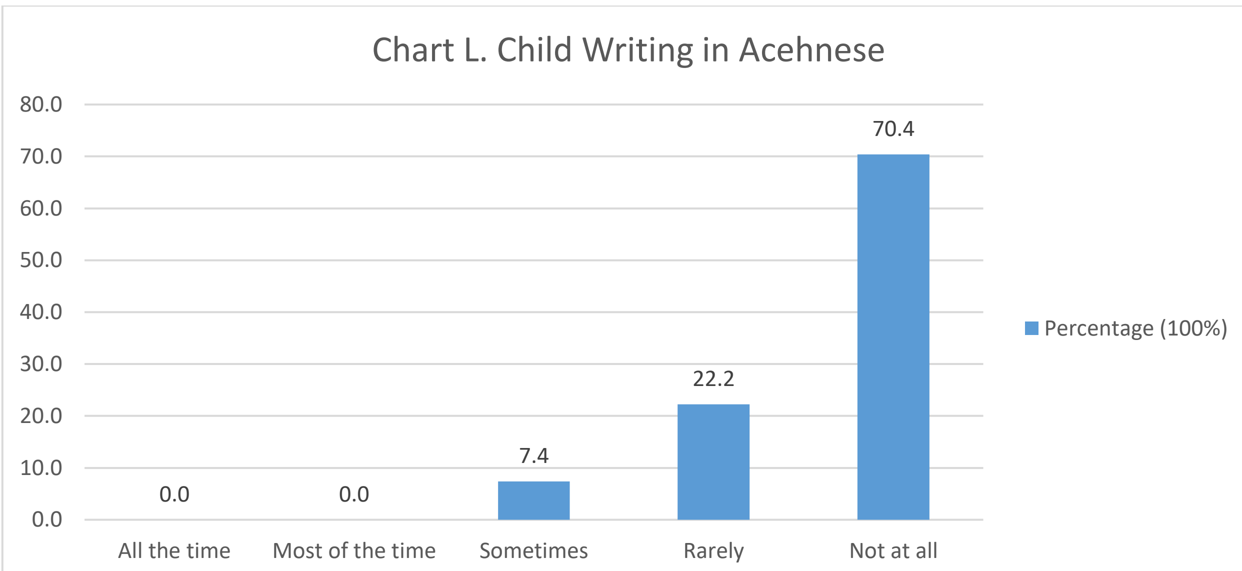


Chart L. Child Writing in Acehnese
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
70.4
22.2
7.4
0.0
0.0
All the time
Most of the time
Sometimes
Rarely
Not at all
Percentage (100%)

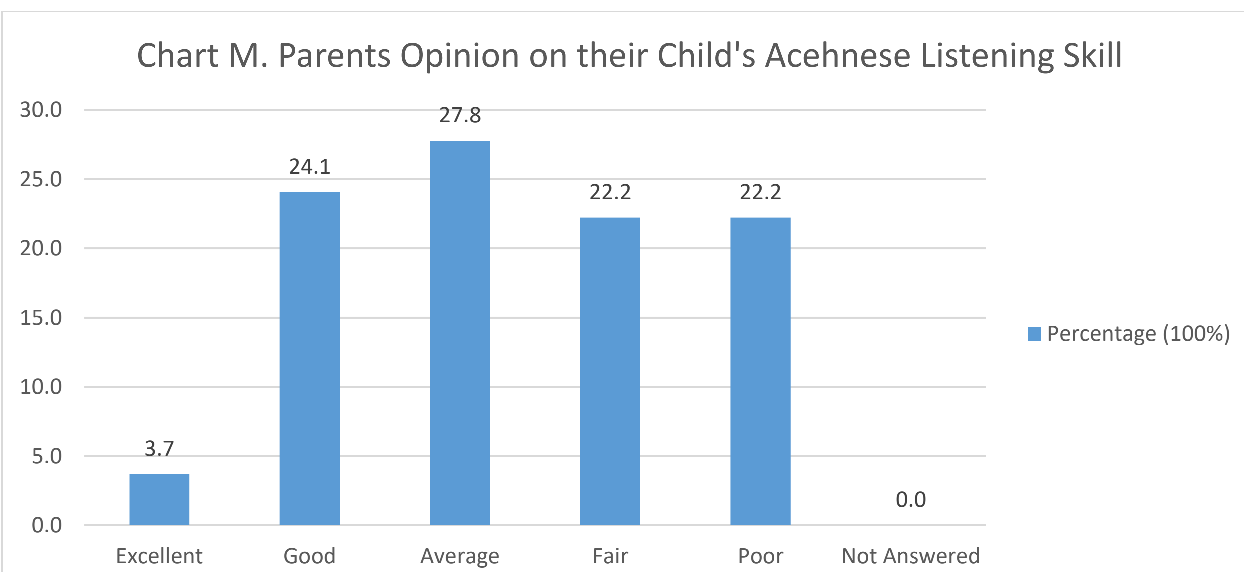


Chart M. Parents Opinion on their Child's Acehnese Listening Skill
30.0
25.0
20.0
15.0
10.0
5.0
0.0
3.7
24.1
27.8
22.2
22.2
0.0
Excellent
Good
Average
Fair
Poor
Not Answered
Percentage (100%)

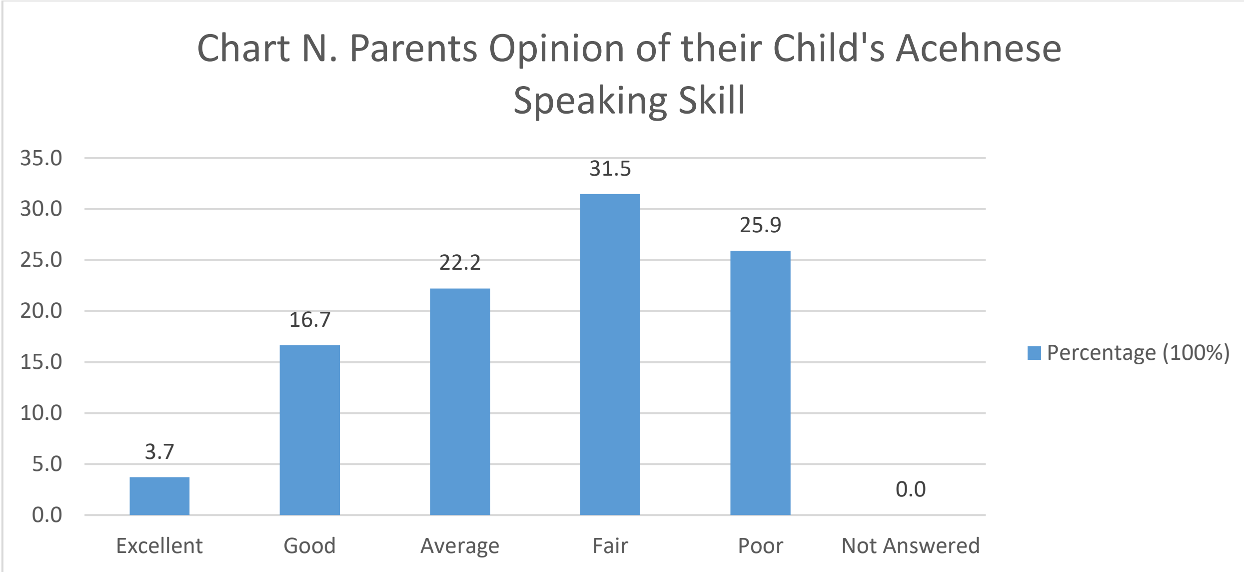


Chart N. Parents Opinion of their Child's Acehnese Speaking Skill
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
3.7
16.7
22.2
31.5
25.9
0.0
Excellent
Good
Average
Fair
Poor
Not Answered
Percentage (100%)

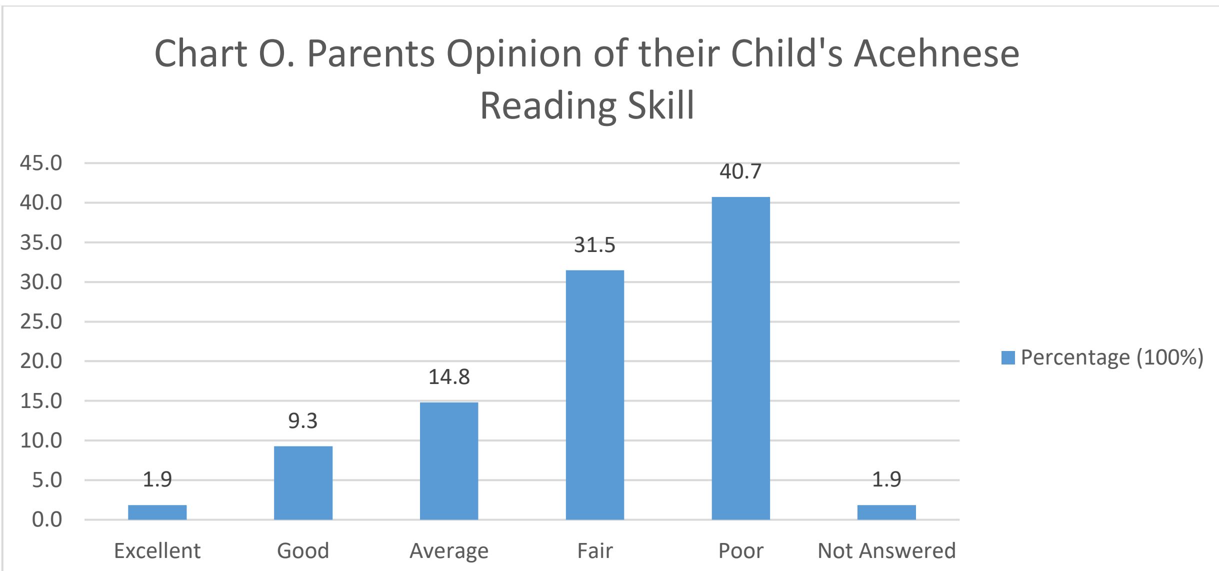


Chart O. Parents Opinion of their Child's Acehnese Reading Skill
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1.9
9.3
14.8
31.5
40.7
1.9
Excellent
Good
Average
Fair
Poor
Not Answered
Percentage (100%)

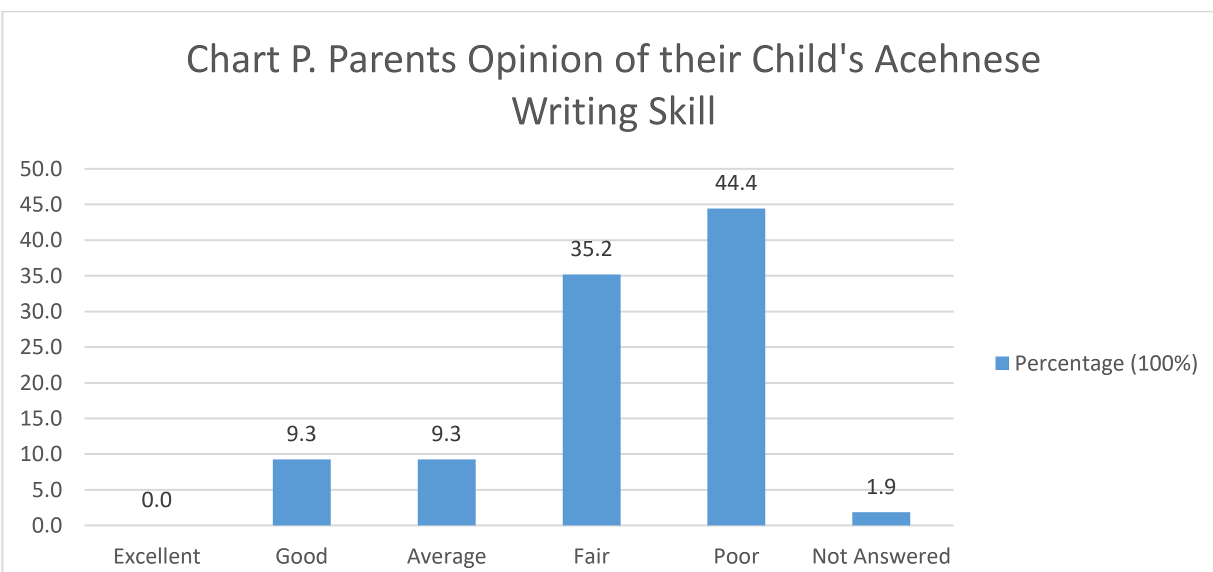


Chart P. Parents Opinion of their Child's Acehnese Writing Skill
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
0.0
9.3
9.3
35.2
44.4
1.9
Excellent
Good
Average
Fair
Poor
Not Answered
Percentage (100%)

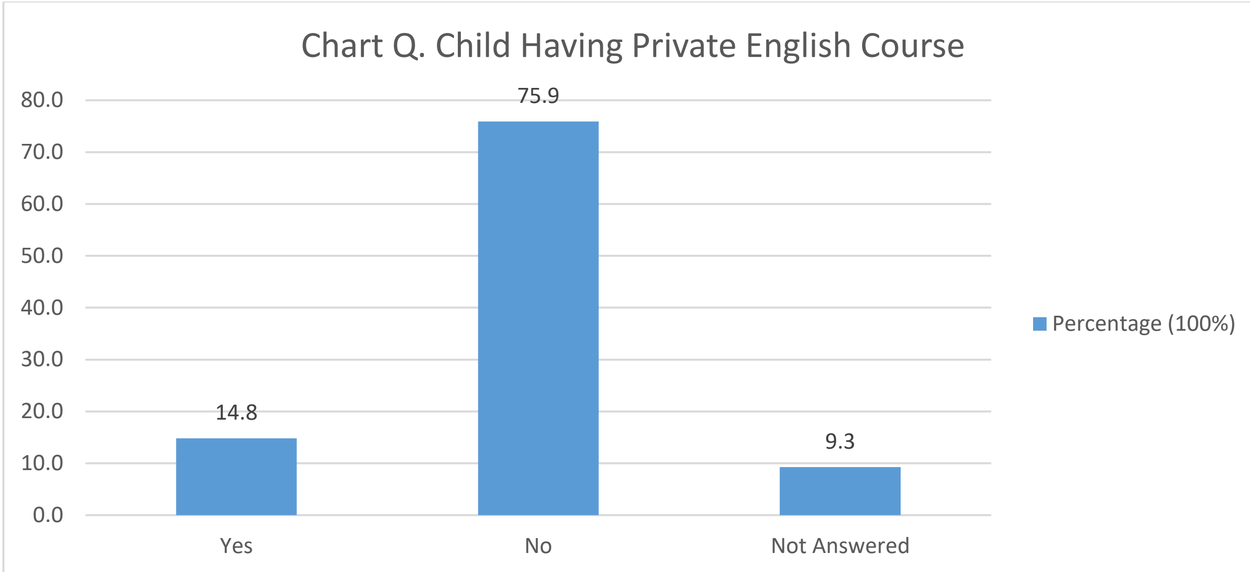


Chart Q. Child Having Private English Course
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
75.9
14.8
9.3
Yes
No
Not Answered
Percentage (100%)

Appendix 21

Table A

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Age	.106	46	.200*	.966	46	.204
Non-Verbal (24)	.124	46	.074	.970	46	.280
ActiveAce	.147	46	.014	.901	46	.001
PassiveAce	.114	46	.168	.944	46	.028
Acehnese Vocabulary (20)	.125	46	.071	.934	46	.012
Voc-Ind (20)	.205	46	.000	.928	46	.007
Voc-Eng (12)	.099	46	.200*	.962	46	.138
PA Syl (15)	.282	46	.000	.679	46	.000
PA Pho (15)	.151	46	.010	.940	46	.019
PA Ons (9)	.234	46	.000	.886	46	.000
PA Rim(9)	.187	46	.000	.900	46	.001
WR Ind (30)	.243	46	.000	.771	46	.000
WR Ace (30)	.118	46	.113	.974	46	.402
WR Eng (30)	.101	46	.200*	.976	46	.448

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table B

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Indonesian Syllable Deletion (5)	.437	46	.000	.607	46	.000
Indonesian Phoneme Deletion (5)	.334	46	.000	.745	46	.000
Indonesian Onset Oddity (3)	.369	46	.000	.696	46	.000
Indonesian Rime Oddity (3)	.342	46	.000	.724	46	.000
Acehnese Syllable Deletion (5)	.352	46	.000	.694	46	.000
Acehnese Phoneme Deletion (5)	.198	46	.000	.875	46	.000
Acehnese Onset Oddity (3)	.412	46	.000	.647	46	.000
Acehnese Rime Oddity (3)	.252	46	.000	.799	46	.000
English Syllable Deletion (5)	.501	46	.000	.389	46	.000
English Phoneme Deletion (5)	.200	46	.000	.895	46	.001
English Onset Oddity (3)	.268	46	.000	.744	46	.000
English Rime Oddity (3)	.434	46	.000	.607	46	.000

a. Lilliefors Significance Correction

Appendix 22

Table A

			Indonesian Syllable Deletion (5)	Indonesian Phoneme Deletion (5)	Indonesian Onset Oddity (3)	Indonesian Rime Oddity (3)	Acehnese Syllable Deletion (5)	Acehnese Phoneme Deletion (5)	Acehnese Onset Oddity (3)	Acehnese Rime Oddity (3)	English Syllable Deletion (5)	English Phoneme Deletion (5)	English Onset Oddity (3)	English Rime Oddity (3)
Spearman's rho	Indonesian Syllable Deletion (5)	Correlation Coefficient	1.000	.205	.113	.131	.542**	.312*	.049	.303*	.487**	.580**	.085	.128
		Sig. (2-tailed)	.	.171	.453	.384	.000	.035	.744	.040	.001	.000	.573	.395
		N	46	46	46	46	46	46	46	46	46	46	46	46
	Indonesian Phoneme Deletion (5)	Correlation Coefficient	.205	1.000	.330*	.244	.260	.412**	-.046	.103	.105	.289	.363*	.172
		Sig. (2-tailed)	.171	.	.025	.103	.081	.004	.763	.496	.488	.052	.013	.254
		N	46	46	46	46	46	46	46	46	46	46	46	46
	Indonesian Onset Oddity (3)	Correlation Coefficient	.113	.330*	1.000	-.006	.216	.246	.174	.045	.099	.370*	.299*	-.070
		Sig. (2-tailed)	.453	.025	.	.967	.149	.099	.248	.768	.514	.011	.043	.644
		N	46	46	46	46	46	46	46	46	46	46	46	46
	Indonesian Rime Oddity (3)	Correlation Coefficient	.131	.244	-.006	1.000	-.070	.045	-.027	.254	-.159	-.095	-.011	.092
		Sig. (2-tailed)	.384	.103	.967	.	.644	.765	.857	.088	.292	.528	.943	.542
		N	46	46	46	46	46	46	46	46	46	46	46	46
	Acehnese Syllable Deletion (5)	Correlation Coefficient	.542**	.260	.216	-.070	1.000	.420**	-.068	.231	.429**	.520**	.093	.032
		Sig. (2-tailed)	.000	.081	.149	.644	.	.004	.654	.123	.003	.000	.539	.834
		N	46	46	46	46	46	46	46	46	46	46	46	46
	Acehnese Phoneme Deletion (5)	Correlation Coefficient	.312*	.412**	.246	.045	.420**	1.000	.031	.030	.319*	.657**	.312*	.207
		Sig. (2-tailed)	.035	.004	.099	.765	.004	.	.839	.844	.031	.000	.034	.167
		N	46	46	46	46	46	46	46	46	46	46	46	46
	Acehnese Onset Oddity (3)	Correlation Coefficient	.049	-.046	.174	-.027	-.068	.031	1.000	-.138	.033	.059	.278	-.073
		Sig. (2-tailed)	.744	.763	.248	.857	.654	.839	.	.362	.826	.699	.061	.629
		N	46	46	46	46	46	46	46	46	46	46	46	46
	Acehnese Rime Oddity (3)	Correlation Coefficient	.303*	.103	.045	.254	.231	.030	-.138	1.000	.157	.075	.037	.211
		Sig. (2-tailed)	.040	.496	.768	.088	.123	.844	.362	.	.297	.618	.805	.159
		N	46	46	46	46	46	46	46	46	46	46	46	46
	English Syllable Deletion (5)	Correlation Coefficient	.487**	.105	.099	-.159	.429**	.319*	.033	.157	1.000	.442**	.166	.059
		Sig. (2-tailed)	.001	.488	.514	.292	.003	.031	.826	.297	.	.002	.271	.695
		N	46	46	46	46	46	46	46	46	46	46	46	46
	English Phoneme Deletion (5)	Correlation Coefficient	.580**	.289	.370*	-.095	.520**	.657**	.059	.075	.442**	1.000	.341*	.069
		Sig. (2-tailed)	.000	.052	.011	.528	.000	.000	.699	.618	.002	.	.021	.650
		N	46	46	46	46	46	46	46	46	46	46	46	46
	English Onset Oddity (3)	Correlation Coefficient	.085	.363*	.299*	-.011	.093	.312*	.278	.037	.166	.341*	1.000	.025
		Sig. (2-tailed)	.573	.013	.043	.943	.539	.034	.061	.805	.271	.021	.	.867
		N	46	46	46	46	46	46	46	46	46	46	46	46
	English Rime Oddity (3)	Correlation Coefficient	.128	.172	-.070	.092	.032	.207	-.073	.211	.059	.069	.025	1.000
		Sig. (2-tailed)	.395	.254	.644	.542	.834	.167	.629	.159	.695	.650	.867	.
		N	46	46	46	46	46	46	46	46	46	46	46	46

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix 23

Table A

			Indonesian Syllable Deletion (5)	Indonesian Phoneme Deletion (5)	Indonesian Onset Oddity (3)	Indonesian Rime Oddity (3)	Non-Verbal (24)	ActiveAce	PassiveAce	Acehnese Vocabulary (20)	Voc-Ind (20)	Voc-Eng (12)	WR Ind (30)	WR Ace (30)	WR Eng (30)	Father's Qualification	Mother's Level of Education	Monthly Income
Spearman's rho	Indonesian Syllable Deletion (5)	Correlation Coefficient	1.000	.205	.113	.131	.357*	-.357*	-.424**	-.187	.140	.332*	.524**	.467**	.535**	.071	-.039	.107
		Sig. (2-tailed)	.	.171	.453	.384	.015	.015	.003	.213	.354	.024	.000	.001	.000	.638	.798	.486
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Indonesian Phoneme Deletion (5)	Correlation Coefficient	.205	1.000	.330*	.244	-.091	-.098	-.172	.067	.027	.018	.389**	.244	.374*	.233	.256	.137
		Sig. (2-tailed)	.171	.	.025	.103	.548	.517	.252	.660	.861	.905	.008	.102	.010	.120	.086	.371
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Indonesian Onset Oddity (3)	Correlation Coefficient	.113	.330*	1.000	-.006	-.114	.139	.097	.270	.171	-.075	.296*	.422**	.145	.176	.352*	-.020
		Sig. (2-tailed)	.453	.025	.	.967	.450	.356	.523	.069	.257	.622	.046	.003	.336	.242	.016	.897
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Indonesian Rime Oddity (3)	Correlation Coefficient	.131	.244	-.006	1.000	.170	.088	-.071	.062	-.075	-.044	-.029	-.026	.096	.435**	.000	-.022
		Sig. (2-tailed)	.384	.103	.967	.	.258	.560	.638	.684	.622	.769	.848	.865	.525	.003	1.000	.887
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Non-Verbal (24)	Correlation Coefficient	.357*	-.091	-.114	.170	1.000	-.282	-.240	-.253	.495**	.182	.309*	.367*	.325*	.084	.106	-.052
		Sig. (2-tailed)	.015	.548	.450	.258	.	.058	.109	.090	.000	.226	.036	.012	.027	.579	.483	.732
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	ActiveAce	Correlation Coefficient	-.357*	-.098	.139	.088	-.282	1.000	.835**	.724**	.177	-.185	-.236	-.088	-.342*	.220	-.052	.185
		Sig. (2-tailed)	.015	.517	.356	.560	.058	.	.000	.000	.238	.218	.115	.560	.020	.142	.730	.224
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	PassiveAce	Correlation Coefficient	-.424**	-.172	.097	-.071	-.240	.835**	1.000	.576**	.097	-.204	-.365*	-.066	-.412**	.064	-.063	-.008
		Sig. (2-tailed)	.003	.252	.523	.638	.109	.000	.	.000	.520	.174	.013	.664	.004	.672	.677	.960
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Acehnese Vocabulary (20)	Correlation Coefficient	-.187	.067	.270	.062	-.253	.724**	.576**	1.000	.106	-.151	-.183	.043	-.153	.255	.045	.048
		Sig. (2-tailed)	.213	.660	.069	.684	.090	.000	.000	.	.484	.316	.224	.777	.309	.088	.769	.756
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Voc-Ind (20)	Correlation Coefficient	.140	.027	.171	-.075	.495**	.177	.097	.106	1.000	-.102	.182	.381**	.273	.238	.095	-.107
		Sig. (2-tailed)	.354	.861	.257	.622	.000	.238	.520	.484	.	.499	.227	.009	.066	.111	.531	.486
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Voc-Eng (12)	Correlation Coefficient	.332*	.018	-.075	-.044	.182	-.185	-.204	-.151	-.102	1.000	.291*	.104	.365*	-.021	.171	.399**
		Sig. (2-tailed)	.024	.905	.622	.769	.226	.218	.174	.316	.499	.	.050	.491	.013	.890	.255	.007
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	WR Ind (30)	Correlation Coefficient	.524**	.389**	.296*	-.029	.309*	-.236	-.365*	-.183	.182	.291*	1.000	.651**	.665**	.051	.264	.123
		Sig. (2-tailed)	.000	.008	.046	.848	.036	.115	.013	.224	.227	.050	.	.000	.000	.739	.077	.421
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	WR Ace (30)	Correlation Coefficient	.467**	.244	.422**	-.026	.367*	-.088	-.066	.043	.381**	.104	.651**	1.000	.578**	.025	.194	-.072
		Sig. (2-tailed)	.001	.102	.003	.865	.012	.560	.664	.777	.009	.491	.000	.	.000	.870	.195	.637
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	WR Eng (30)	Correlation Coefficient	.535**	.374*	.145	.096	.325*	-.342*	-.412**	-.153	.273	.365*	.665**	.578**	1.000	.220	.197	-.134
		Sig. (2-tailed)	.000	.010	.336	.525	.027	.020	.004	.309	.066	.013	.000	.000	.	.142	.188	.379
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Father's Qualification	Correlation Coefficient	.071	.233	.176	.435**	.084	.220	.064	.255	.238	-.021	.051	.025	.220	1.000	.402**	.123
		Sig. (2-tailed)	.638	.120	.242	.003	.579	.142	.672	.088	.111	.890	.739	.870	.142	.	.006	.420
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Mother's Level of Education	Correlation Coefficient	-.039	.256	.352*	.000	.106	-.052	-.063	.045	.095	.171	.264	.194	.197	.402**	1.000	.082
		Sig. (2-tailed)	.798	.086	.016	1.000	.483	.730	.677	.769	.531	.255	.077	.195	.188	.006	.	.593
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Monthly Income	Correlation Coefficient	.107	.137	-.020	-.022	-.052	.185	-.008	.048	-.107	.399**	.123	-.072	-.134	.123	.082	1.000
		Sig. (2-tailed)	.486	.371	.897	.887	.732	.224	.960	.756	.486	.007	.421	.637	.379	.420	.593	.
		N	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table B

			Acehnese Syllable Deletion (5)	Acehnese Phoneme Deletion (5)	Acehnese Onset Oddity (3)	Acehnese Rime Oddity (3)	Non-Verbal (24)	ActiveAce	PassiveAce	Acehnese Vocabulary (20)	Voc-Ind (20)	Voc-Eng (12)	WR Ind (30)	WR Ace (30)	WR Eng (30)	Father's Qualification	Mother's Level of Education	Monthly Income
Spearman's rho	Acehnese Syllable Deletion (5)	Correlation Coefficient	1.000	.420**	-.068	.231	.083	.032	-.081	.141	.057	.009	.426**	.364*	.358*	.084	.151	-.044
		Sig. (2-tailed)	.	.004	.654	.123	.582	.835	.591	.350	.705	.954	.003	.013	.015	.579	.315	.777
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Acehnese Phoneme Deletion (5)	Correlation Coefficient	.420**	1.000	.031	.030	.187	.003	-.042	.166	.178	.195	.523**	.534**	.585**	-.123	.065	-.151
		Sig. (2-tailed)	.004	.	.839	.844	.214	.985	.780	.270	.236	.194	.000	.000	.000	.417	.668	.323
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Acehnese Onset Oddity (3)	Correlation Coefficient	-.068	.031	1.000	-.138	.123	-.275	-.166	-.123	-.072	.102	-.060	.018	.025	.028	.269	-.170
		Sig. (2-tailed)	.654	.839	.	.362	.416	.064	.269	.416	.636	.501	.693	.904	.869	.852	.071	.265
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Acehnese Rime Oddity (3)	Correlation Coefficient	.231	.030	-.138	1.000	.259	-.059	-.112	-.126	.163	.035	.226	.015	.218	.297*	.006	.138
		Sig. (2-tailed)	.123	.844	.362	.	.082	.695	.458	.405	.278	.815	.131	.919	.145	.045	.970	.366
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Non-Verbal (24)	Correlation Coefficient	.083	.187	.123	.259	1.000	-.282	-.240	-.253	.495**	.182	.309*	.367*	.325*	.084	.106	-.052
		Sig. (2-tailed)	.582	.214	.416	.082	.	.058	.109	.090	.000	.226	.036	.012	.027	.579	.483	.732
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	ActiveAce	Correlation Coefficient	.032	.003	-.275	-.059	-.282	1.000	.835**	.724**	.177	-.185	-.236	-.088	-.342*	.220	-.052	.185
		Sig. (2-tailed)	.835	.985	.064	.695	.058	.	.000	.000	.238	.218	.115	.560	.020	.142	.730	.224
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	PassiveAce	Correlation Coefficient	-.081	-.042	-.166	-.112	-.240	.835**	1.000	.576**	.097	-.204	-.365*	-.066	-.412**	.064	-.063	-.008
		Sig. (2-tailed)	.591	.780	.269	.458	.109	.000	.	.000	.520	.174	.013	.664	.004	.672	.677	.960
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Acehnese Vocabulary (20)	Correlation Coefficient	.141	.166	-.123	-.126	-.253	.724**	.576**	1.000	.106	-.151	-.183	.043	-.153	.255	.045	.048
		Sig. (2-tailed)	.350	.270	.416	.405	.090	.000	.000	.	.484	.316	.224	.777	.309	.088	.769	.756
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Voc-Ind (20)	Correlation Coefficient	.057	.178	-.072	.163	.495**	.177	.097	.106	1.000	-.102	.182	.381**	.273	.238	.095	-.107
		Sig. (2-tailed)	.705	.236	.636	.278	.000	.238	.520	.484	.	.499	.227	.009	.066	.111	.531	.486
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Voc-Eng (12)	Correlation Coefficient	.009	.195	.102	.035	.182	-.185	-.204	-.151	-.102	1.000	.291*	.104	.365*	-.021	.171	.399**
		Sig. (2-tailed)	.954	.194	.501	.815	.226	.218	.174	.316	.499	.	.050	.491	.013	.890	.255	.007
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	WR Ind (30)	Correlation Coefficient	.426**	.523**	-.060	.226	.309*	-.236	-.365*	-.183	.182	.291*	1.000	.651**	.665**	.051	.264	.123
		Sig. (2-tailed)	.003	.000	.693	.131	.036	.115	.013	.224	.227	.050	.	.000	.000	.739	.077	.421
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	WR Ace (30)	Correlation Coefficient	.364*	.534**	.018	.015	.367*	-.088	-.066	.043	.381**	.104	.651**	1.000	.578**	.025	.194	-.072
		Sig. (2-tailed)	.013	.000	.904	.919	.012	.560	.664	.777	.009	.491	.000	.	.000	.870	.195	.637
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	WR Eng (30)	Correlation Coefficient	.358*	.585**	.025	.218	.325*	-.342*	-.412**	-.153	.273	.365*	.665**	.578**	1.000	.220	.197	-.134
		Sig. (2-tailed)	.015	.000	.869	.145	.027	.020	.004	.309	.066	.013	.000	.000	.	.142	.188	.379
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Father's Qualification	Correlation Coefficient	.084	-.123	.028	.297*	.084	.220	.064	.255	.238	-.021	.051	.025	.220	1.000	.402**	.123
		Sig. (2-tailed)	.579	.417	.852	.045	.579	.142	.672	.088	.111	.890	.739	.870	.142	.	.006	.420
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Mother's Level of Education	Correlation Coefficient	.151	.065	.269	.006	.106	-.052	-.063	.045	.095	.171	.264	.194	.197	.402**	1.000	.082
		Sig. (2-tailed)	.315	.668	.071	.970	.483	.730	.677	.769	.531	.255	.077	.195	.188	.006	.	.593
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Monthly Income	Correlation Coefficient	-.044	-.151	-.170	.138	-.052	.185	-.008	.048	-.107	.399**	.123	-.072	-.134	.123	.082	1.000
		Sig. (2-tailed)	.777	.323	.265	.366	.732	.224	.960	.756	.486	.007	.421	.637	.379	.420	.593	.
		N	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

I.

Table C

			English Syllable Deletion (5)	English Phoneme Deletion (5)	English Onset Oddity (3)	English Rime Oddity (3)	Non-Verbal (24)	ActiveAce	PassiveAce	Acehnese Vocabulary (20)	Voc-Ind (20)	Voc-Eng (12)	WR Ind (30)	WR Ace (30)	WR Eng (30)	Father's Qualification	Mother's Level of Education	Monthly Income
Spearman's rho	English Syllable Deletion (5)	Correlation Coefficient	1.000	.442**	.166	.059	.120	-.049	-.038	-.061	-.016	.152	.371*	.279	.258	-.210	.000	.021
		Sig. (2-tailed)	.	.002	.271	.695	.429	.744	.802	.689	.917	.314	.011	.060	.083	.161	1.000	.890
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	English Phoneme Deletion (5)	Correlation Coefficient	.442**	1.000	.341*	.069	.143	-.102	-.179	.016	.160	.353*	.618**	.584**	.547**	-.083	.115	-.014
		Sig. (2-tailed)	.002	.	.021	.650	.342	.498	.235	.916	.287	.016	.000	.000	.000	.584	.446	.928
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	English Onset Oddity (3)	Correlation Coefficient	.166	.341*	1.000	.025	-.024	.042	-.018	.116	-.017	.239	.273	.138	.241	.031	.159	.202
		Sig. (2-tailed)	.271	.021	.	.867	.873	.781	.904	.443	.911	.110	.066	.362	.107	.839	.290	.183
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	English Rime Oddity (3)	Correlation Coefficient	.059	.069	.025	1.000	-.023	.188	.140	.142	.248	-.075	-.005	-.026	-.072	.109	-.170	.175
		Sig. (2-tailed)	.695	.650	.867	.	.878	.210	.352	.346	.096	.622	.973	.865	.633	.469	.258	.250
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Non-Verbal (24)	Correlation Coefficient	.120	.143	-.024	-.023	1.000	-.282	-.240	-.253	.495**	.182	.309*	.367*	.325*	.084	.106	-.052
		Sig. (2-tailed)	.429	.342	.873	.878	.	.058	.109	.090	.000	.226	.036	.012	.027	.579	.483	.732
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	ActiveAce	Correlation Coefficient	-.049	-.102	.042	.188	-.282	1.000	.835**	.724**	.177	-.185	-.236	-.088	-.342*	.220	-.052	.185
		Sig. (2-tailed)	.744	.498	.781	.210	.058	.	.000	.000	.238	.218	.115	.560	.020	.142	.730	.224
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	PassiveAce	Correlation Coefficient	-.038	-.179	-.018	.140	-.240	.835**	1.000	.576**	.097	-.204	-.365*	-.066	-.412**	.064	-.063	-.008
		Sig. (2-tailed)	.802	.235	.904	.352	.109	.000	.	.000	.520	.174	.013	.664	.004	.672	.677	.960
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Acehnese Vocabulary (20)	Correlation Coefficient	-.061	.016	.116	.142	-.253	.724**	.576**	1.000	.106	-.151	-.183	.043	-.153	.255	.045	.048
		Sig. (2-tailed)	.689	.916	.443	.346	.090	.000	.000	.	.484	.316	.224	.777	.309	.088	.769	.756
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Voc-Ind (20)	Correlation Coefficient	-.016	.160	-.017	.248	.495**	.177	.097	.106	1.000	-.102	.182	.381**	.273	.238	.095	-.107
		Sig. (2-tailed)	.917	.287	.911	.096	.000	.238	.520	.484	.	.499	.227	.009	.066	.111	.531	.486
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Voc-Eng (12)	Correlation Coefficient	.152	.353*	.239	-.075	.182	-.185	-.204	-.151	-.102	1.000	.291*	.104	.365*	-.021	.171	.399**
		Sig. (2-tailed)	.314	.016	.110	.622	.226	.218	.174	.316	.499	.	.050	.491	.013	.890	.255	.007
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	WR Ind (30)	Correlation Coefficient	.371*	.618**	.273	-.005	.309*	-.236	-.365*	-.183	.182	.291*	1.000	.651**	.665**	.051	.264	.123
		Sig. (2-tailed)	.011	.000	.066	.973	.036	.115	.013	.224	.227	.050	.	.000	.000	.739	.077	.421
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	WR Ace (30)	Correlation Coefficient	.279	.584**	.138	-.026	.367*	-.088	-.066	.043	.381**	.104	.651**	1.000	.578**	.025	.194	-.072
		Sig. (2-tailed)	.060	.000	.362	.865	.012	.560	.664	.777	.009	.491	.000	.	.000	.870	.195	.637
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	WR Eng (30)	Correlation Coefficient	.258	.547**	.241	-.072	.325*	-.342*	-.412**	-.153	.273	.365*	.665**	.578**	1.000	.220	.197	-.134
		Sig. (2-tailed)	.083	.000	.107	.633	.027	.020	.004	.309	.066	.013	.000	.000	.	.142	.188	.379
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Father's Qualification	Correlation Coefficient	-.210	-.083	.031	.109	.084	.220	.064	.255	.238	-.021	.051	.025	.220	1.000	.402**	.123
		Sig. (2-tailed)	.161	.584	.839	.469	.579	.142	.672	.088	.111	.890	.739	.870	.142	.	.006	.420
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Mother's Level of Education	Correlation Coefficient	.000	.115	.159	-.170	.106	-.052	-.063	.045	.095	.171	.264	.194	.197	.402**	1.000	.082
		Sig. (2-tailed)	1.000	.446	.290	.258	.483	.730	.677	.769	.531	.255	.077	.195	.188	.006	.	.593
		N	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45
	Monthly Income	Correlation Coefficient	.021	-.014	.202	.175	-.052	.185	-.008	.048	-.107	.399**	.123	-.072	-.134	.123	.082	1.000
		Sig. (2-tailed)	.890	.928	.183	.250	.732	.224	.960	.756	.486	.007	.421	.637	.379	.420	.593	.
		N	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix 24

Mann-Whitney Test of Acehnese Passive Use Median-Split Groups.

Table A

	Passive2	N	Mean Rank	Sum of Ranks
Age	1.00	23	26.13	601.00
	2.00	23	20.87	480.00
	Total	46		
Non-Verbal (24)	1.00	23	24.89	572.50
	2.00	23	22.11	508.50
	Total	46		
Voc-Ind (20)	1.00	23	22.37	514.50
	2.00	23	24.63	566.50
	Total	46		
EngVocGroup	1.00	23	24.00	552.00
	2.00	23	23.00	529.00
	Total	46		
PA Syl (15)	1.00	23	25.85	594.50
	2.00	23	21.15	486.50
	Total	46		
PA Pho (15)	1.00	23	26.50	609.50
	2.00	23	20.50	471.50
	Total	46		
PA Ons (9)	1.00	23	24.17	556.00
	2.00	23	22.83	525.00
	Total	46		
PA Rim(9)	1.00	23	22.46	516.50
	2.00	23	24.54	564.50
	Total	46		
WR Ind (30)	1.00	23	28.11	646.50
	2.00	23	18.89	434.50
	Total	46		
WR Ace (30)	1.00	23	25.33	582.50
	2.00	23	21.67	498.50
	Total	46		
WR Eng (30)	1.00	23	27.98	643.50
	2.00	23	19.02	437.50
	Total	46		
Indonesian Syllable Deletion (5)	1.00	23	26.85	617.50
	2.00	23	20.15	463.50
	Total	46		
Indonesian Phoneme Deletion (5)	1.00	23	26.85	617.50
	2.00	23	20.15	463.50
	Total	46		
Indonesian Onset Oddity (3)	1.00	23	23.43	539.00
	2.00	23	23.57	542.00
	Total	46		
Indonesian Rime Oddity (3)	1.00	23	23.26	535.00
	2.00	23	23.74	546.00
	Total	46		
Acehnese Syllable Deletion (5)	1.00	23	24.02	552.50
	2.00	23	22.98	528.50
	Total	46		
Acehnese Phoneme Deletion (5)	1.00	23	24.33	559.50
	2.00	23	22.67	521.50
	Total	46		
Acehnese Onset Oddity (3)	1.00	23	24.13	555.00
	2.00	23	22.87	526.00
	Total	46		
Acehnese Rime Oddity (3)	1.00	23	23.39	538.00
	2.00	23	23.61	543.00
	Total	46		
English Syllable Deletion (5)	1.00	23	23.37	537.50
	2.00	23	23.63	543.50
	Total	46		
English Phoneme Deletion (5)	1.00	23	26.24	603.50
	2.00	23	20.76	477.50
	Total	46		
English Onset Oddity (3)	1.00	23	24.20	556.50
	2.00	23	22.80	524.50
	Total	46		
English Rime Oddity (3)	1.00	23	22.13	509.00
	2.00	23	24.87	572.00
	Total	46		

Table B[a]

	Age	Non-Verbal (24)	Voc-Ind (20)	EngVocGroup	PA Syl (15)	PA Pho (15)	PA Ons (9)	PA Rim(9)	WR Ind (30)	WR Ace (30)	WR Eng (30)	Indonesian Syllable Deletion (5)	Indonesian Phoneme Deletion (5)	Indonesian Onset Oddity (3)	Indonesian Rime Oddity (3)	Acehnese Syllable Deletion (5)	Acehnese Phoneme Deletion (5)	Acehnese Onset Oddity (3)	Acehnese Rime Oddity (3)	English Syllable Deletion (5)	English Phoneme Deletion (5)	English Onset Oddity (3)	English Rime Oddity (3)
Mann-Whitney U	204.000	232.500	238.500	253.000	210.500	195.500	249.000	240.500	158.500	222.500	161.500	187.500	187.500	263.000	259.000	252.500	245.500	250.000	262.000	261.500	201.500	248.500	233.000
Wilcoxon W	480.000	508.500	514.500	529.000	486.500	471.500	525.000	516.500	434.500	498.500	437.500	463.500	463.500	539.000	535.000	528.500	521.500	526.000	538.000	537.500	477.500	524.500	509.000
Z	-1.337	-.705	-.586	-.292	-1.301	-1.530	-.351	-.543	-2.355	-.926	-2.273	-2.153	-1.883	-.038	-.137	-.302	-.437	-.387	-.061	-.113	-1.429	-.395	-.877
Asymp. Sig. (2-tailed)	.181	.481	.558	.771	.193	.126	.725	.587	.019	.354	.023	.031	.060	.970	.891	.762	.662	.698	.952	.910	.153	.693	.381

a. Grouping Variable: Passive2

Appendix 25

Krusskal-Wallis Test of Acehnese Passive Use Median-Split Groups.

Table A

	Passive3	N	Mean Rank
Age	1.00	15	28.43
	2.00	16	19.13
	3.00	15	23.23
	Total	46	
Non-Verbal (24)	1.00	15	27.40
	2.00	16	23.41
	3.00	15	19.70
	Total	46	
Voc-Ind (20)	1.00	15	22.37
	2.00	16	23.63
	3.00	15	24.50
	Total	46	
Voc-Eng (12)	1.00	15	26.90
	2.00	16	23.13
	3.00	15	20.50
	Total	46	
PA Syl (15)	1.00	15	24.77
	2.00	16	25.22
	3.00	15	20.40
	Total	46	
PA Pho (15)	1.00	15	25.73
	2.00	16	24.53
	3.00	15	20.17
	Total	46	
PA Ons (9)	1.00	15	19.83
	2.00	16	29.91
	3.00	15	20.33
	Total	46	
PA Rim(9)	1.00	15	21.97
	2.00	16	26.88
	3.00	15	21.43
	Total	46	
WR Ind (30)	1.00	15	27.67
	2.00	16	25.50
	3.00	15	17.20
	Total	46	
WR Ace (30)	1.00	15	23.63
	2.00	16	24.38
	3.00	15	22.43
	Total	46	
WR Eng (30)	1.00	15	30.77
	2.00	16	21.00
	3.00	15	18.90
	Total	46	
Indonesian Syllable Deletion (5)	1.00	15	26.63
	2.00	16	25.88
	3.00	15	17.83
	Total	46	
Indonesian Phoneme Deletion (5)	1.00	15	25.03
	2.00	16	24.94
	3.00	15	20.43
	Total	46	
Indonesian Onset Oddity (3)	1.00	15	18.33
	2.00	16	30.25
	3.00	15	21.47
	Total	46	
Indonesian Rime Oddity (3)	1.00	15	24.70
	2.00	16	22.59
	3.00	15	23.27
	Total	46	
Acehnese Syllable Deletion (5)	1.00	15	22.90
	2.00	16	23.44
	3.00	15	24.17
	Total	46	
Acehnese Phoneme Deletion (5)	1.00	15	25.33
	2.00	16	21.13
	3.00	15	24.20
	Total	46	
Acehnese Onset Oddity (3)	1.00	15	23.33
	2.00	16	26.97
	3.00	15	19.97
	Total	46	
Acehnese Rime Oddity (3)	1.00	15	22.80
	2.00	16	27.50
	3.00	15	19.93
	Total	46	
English Syllable Deletion (5)	1.00	15	23.40
	2.00	16	23.53
	3.00	15	23.57
	Total	46	
English Phoneme Deletion (5)	1.00	15	24.27
	2.00	16	26.38
	3.00	15	19.67
	Total	46	
English Onset Oddity (3)	1.00	15	21.93
	2.00	16	25.75
	3.00	15	22.67
	Total	46	
English Rime Oddity (3)	1.00	15	21.17
	2.00	16	25.66
	3.00	15	23.53
	Total	46	

Table B[a,b]

	Age	Non-Verbal (24)	Voc-Ind (20)	Voc-Eng (12)	PA Syl (15)	PA Pho (15)	PA Ons (9)	PA Rim(9)	WR Ind (30)	WR Ace (30)	WR Eng (30)	Indonesian Syllable Deletion (5)	Indonesian Phoneme Deletion (5)	Indonesian Onset Oddity (3)	Indonesian Rime Oddity (3)	Acehnese Syllable Deletion (5)	Acehnese Phoneme Deletion (5)	Acehnese Onset Oddity (3)	Acehnese Rime Oddity (3)	English Syllable Deletion (5)	English Phoneme Deletion (5)	English Onset Oddity (3)	English Rime Oddity (3)
Chi-Square	3.774	2.485	.202	1.763	1.437	1.461	5.963	1.658	5.220	.165	6.772	6.466	1.440	8.846	.253	.089	.899	3.121	3.061	.004	2.138	.897	1.391
df	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Asymp. Sig.	.151	.289	.904	.414	.487	.482	.051	.436	.074	.921	.034	.039	.487	.012	.881	.957	.638	.210	.216	.998	.343	.638	.499

a. Kruskal Wallis Test

b. Grouping Variable: Passive3

Appendix 26

Table A

Control Variables			ActiveAce	PassiveAce	Acehnese Vocabulary (20)	Voc-Ind (20)	Voc-Eng (12)	PA Syl (15)	PA Pho (15)	PA Ons (9)	PA Rim(9)	WR Ind (30)	WR Ace (30)	WR Eng (30)	Indonesian Syllable Deletion (5)	Indonesian Phoneme Deletion (5)	Indonesian Onset Oddity (3)	Indonesian Rime Oddity (3)	Acehnese Syllable Deletion (5)	Acehnese Phoneme Deletion (5)	Acehnese Onset Oddity (3)	Acehnese Rime Oddity (3)	English Syllable Deletion (5)	English Phoneme Deletion (5)	English Onset Oddity (3)	English Rime Oddity (3)
Non-Verbal (24)	ActiveAce	Correlation	1.000	.873	.708	.355	-.190	.056	.007	-.066	.137	-.198	.107	-.222	-.183	-.085	.077	.147	.163	.129	-.281	.024	.075	-.039	.057	.117
		Significance (2-tailed)	.	.000	.000	.017	.210	.715	.964	.665	.370	.192	.485	.142	.229	.577	.617	.336	.284	.399	.062	.878	.624	.802	.710	.444
		df	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
	PassiveAce	Correlation	.873	1.000	.595	.254	-.156	-.044	-.091	-.082	-.051	-.300	.075	-.348	-.297	-.202	.008	-.037	.036	.065	-.161	-.111	.089	-.102	-.024	.052
		Significance (2-tailed)	.000	.	.000	.092	.305	.777	.550	.591	.740	.046	.626	.019	.048	.183	.956	.807	.814	.672	.292	.467	.562	.504	.874	.736
		df	43	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
	Acehnese Vocabulary (20)	Correlation	.708	.595	1.000	.318	-.135	.060	.147	.101	.118	-.116	.179	-.024	-.076	.075	.221	.171	.159	.235	-.086	-.034	-.005	.041	.086	.118
		Significance (2-tailed)	.000	.000	.	.034	.376	.694	.337	.510	.441	.449	.238	.877	.621	.623	.144	.262	.297	.119	.574	.826	.974	.791	.576	.441
		df	43	43	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
	Voc-Ind (20)	Correlation	.355	.254	.318	1.000	-.099	-.020	.150	.084	-.033	.029	.262	.199	-.062	.146	.259	-.254	.019	.086	-.081	.021	-.032	.136	.015	.151
		Significance (2-tailed)	.017	.092	.034	.	.519	.897	.327	.585	.832	.850	.082	.191	.687	.340	.085	.092	.902	.575	.597	.891	.836	.372	.924	.321
		df	43	43	43	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
	Voc-Eng (12)	Correlation	-.190	-.156	-.135	-.099	1.000	.104	.209	.155	-.087	.042	.104	.371	.320	.055	-.034	-.075	-.022	.134	.086	-.023	.047	.306	.257	-.082
		Significance (2-tailed)	.210	.305	.376	.519	.	.498	.168	.310	.572	.783	.495	.012	.032	.719	.824	.623	.886	.379	.575	.880	.761	.041	.088	.592
		df	43	43	43	43	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
	PA Syl (15)	Correlation	.056	-.044	.060	-.020	.104	1.000	.547	.151	.202	.491	.399	.388	.733	.305	.181	.035	.919	.478	.000	.269	.825	.532	.141	.091
		Significance (2-tailed)	.715	.777	.694	.897	.498	.	.000	.324	.183	.001	.007	.009	.000	.042	.234	.821	.000	.001	1.000	.074	.000	.000	.356	.553
		df	43	43	43	43	43	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
	PA Pho (15)	Correlation	.007	-.091	.147	.150	.209	.547	1.000	.386	.184	.571	.595	.580	.481	.721	.414	.135	.492	.873	.007	.072	.393	.832	.398	.174
		Significance (2-tailed)	.964	.550	.337	.327	.168	.000	.	.009	.225	.000	.000	.000	.001	.000	.005	.376	.001	.000	.963	.639	.008	.000	.007	.254
		df	43	43	43	43	43	43	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
	PA Ons (9)	Correlation	-.066	-.082	.101	.084	.155	.151	.386	1.000	.058	.119	.202	.151	.209	.333	.733	.056	.093	.241	.630	.097	.105	.369	.769	-.039
		Significance (2-tailed)	.665	.591	.510	.585	.310	.324	.009	.	.707	.437	.182	.321	.169	.026	.000	.717	.542	.110	.000	.528	.493	.013	.000	.797
		df	43	43	43	43	43	43	43	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
	PA Rim(9)	Correlation	.137	-.051	.118	-.033	-.087	.202	.184	.058	1.000	.075	-.112	.034	.273	.260	.076	.641	.176	.183	-.135	.752	.065	.020	.170	.636
		Significance (2-tailed)	.370	.740	.441	.832	.572	.183	.225	.707	.	.623	.464	.822	.069	.084	.619	.000	.247	.229	.377	.000	.672	.895	.264	.000
		df	43	43	43	43	43	43	43	43	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43
	WR Ind (30)	Correlation	-.198	-.300	-.116	.029	.042	.491	.571	.119	.075	1.000	.608	.681	.414	.358	.254	.036	.468	.490	-.157	.194	.329	.531	.158	-.091
		Significance (2-tailed)	.192	.046	.449	.850	.783	.001	.000	.437	.623	.	.000	.000	.005	.016	.092	.812	.001	.001	.302	.201	.028	.000	.301	.551
		df	43	43	43	43	43	43	43	43	43	0	43	43	43	43	43	43	43	43	43	43	43	43	43	43
	WR Ace (30)	Correlation	.107	.075	.179	.262	.104	.399	.595	.202	-.112	.608	1.000	.596	.390	.305	.428	-.048	.354	.529	-.042	-.129	.259	.593	.068	-.044
		Significance (2-tailed)	.485	.626	.238	.082	.495	.007	.000	.182	.464	.000	.	.000	.008	.042	.003	.753	.017	.000	.786	.397	.086	.000	.658	.774
		df	43	43	43	43	43	43	43	43	43	43	0	43	43	43	43	43	43	43	43	43	43	43	43	43
	WR Eng (30)	Correlation	-.222	-.348	-.024	.199	.371	.388	.580	.151	.034	.681	.596	1.000	.440	.415	.229	.034	.345	.488	-.089	.130	.192	.503	.181	-.102
		Significance (2-tailed)	.142	.019	.877	.191	.012	.009	.000	.321	.822	.000	.000	.	.003	.005	.130	.826	.020	.001	.561	.396	.206	.000	.234	.504
		df	43	43	43	43	43	43	43	43	43	43	43	0	43	43	43	43	43	43	43	43	43	43	43	43
	Indonesian Syllable Deletion (5)	Correlation	-.183	-.297	-.076	-.062	.320	.733	.481	.209	.273	.414	.390	.440	1.000	.319	.200	.211	.512	.287	.108	.211	.434	.558	.141	.134
		Significance (2-tailed)	.229	.048	.621	.687	.032	.000	.001	.169	.069	.005	.008	.003	.	.033	.188	.165	.000	.056	.481	.164	.003	.000	.354	.382
		df	43	43	43	43	43	43	43	43	43	43	43	43	0	43	43	43	43	43	43	43	43	43	43	43
	Indonesian Phoneme Deletion (5)	Correlation	-.085	-.202	.075	.146	.055	.305	.721	.333	.260	.358	.305	.415	.319	1.000	.395	.301	.286	.460	-.047	.148	.154	.350	.358	.091
		Significance (2-tailed)	.577	.183	.623	.340	.719	.042	.000	.026	.084	.016	.042	.005	.033	.	.007	.045	.057	.001	.761	.333	.313	.018	.016	.554
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	0	43	43	43	43	43	43	43	43	43	43
	Indonesian Onset Oddity (3)	Correlation	.077	.008	.221	.259	-.034	.181	.414	.733	.076	.254	.428	.229	.200	.395	1.000	.090	.164	.219	.186	.173	.090	.402	.414	-.116
		Significance (2-tailed)	.617	.956	.144	.085	.824	.234	.005	.000	.619	.092	.003	.130	.188	.007	.	.558	.282	.148	.220	.256	.555	.006	.005	.447
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	43	0	43	43	43	43	43	43	43	43	43
	Indonesian Rime Oddity (3)	Correlation	.147	-.037	.171	-.254	-.075	.035	.135	.056	.641	.036	-.048	.034	.211	.301	.090	1.000	.005	.094	-.106	.263	-.100	-.041	.128	.085
		Significance (2-tailed)	.336	.807	.262	.092	.623	.821	.376	.717	.000	.812	.753	.826	.165	.045	.558	.	.976	.539	.490	.081	.512	.788	.402	.578
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	0	43	43	43	43	43	43	43	43
	Acehnese Syllable Deletion (5)	Correlation	.163	.036	.159	.019	-.022	.919	.492	.093	.176	.468	.354	.345	.512	.286	.164	.005	1.000	.457	-.065	.285	.658	.441	.101	.049
		Significance (2-tailed)	.284	.814	.297	.902	.886	.000	.001	.542	.247	.001	.017	.020	.000	.057	.282	.976	.	.002	.674	.058	.000	.002	.508	.748
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	0	43	43	43	43	43	43	43
	Acehnese Phoneme Deletion (5)	Correlation	.129	.065	.235	.086	.134	.478	.873	.241	.183	.490	.529	.488	.287	.460	.219	.094	.457	1.000	-.003	.027	.424	.637	.290	.259
		Significance (2-tailed)	.399	.672	.119	.575	.379	.001	.000	.110	.229	.001	.000	.001	.056	.001	.148	.539	.002	.	.982	.861	.004	.000	.053	.086
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	0	43	43	43	43	43	43
	Acehnese Onset Oddity (3)	Correlation	-.281	-.161	-.086	-.081	.086	.000	.007	.630	-.135	-.157	-.042	-.089	.108	-.047	.186	-.106	-.065	-.003	1.000	-.191	.003	.061	.177	.030
		Significance (2-tailed)	.062	.292	.574	.597	.575	1.000	.963	.000	.377	.302	.786	.561	.481	.761	.220	.490	.674	.982	.	.208	.984	.693	.246	.843
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	0	43	43	43	43	43
	Acehnese Rime Oddity (3)	Correlation	.024	-.111	-.034	.021	-.023	.269	.072	.097	.752	.194	-.129	.130	.211	.148	.173	.263	.285	.027	-.191	1.000	.148	.012	.215	.211
		Significance (2-tailed)	.878	.467	.826	.891	.880	.074	.639	.528	.000	.201	.397	.396	.164	.333	.256	.081	.058	.861	.208	.	.331	.936	.157	.163
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	0	43	43	43	43
	English Syllable Deletion (5)	Correlation	.075	.089	-.005	-.032	.047	.825	.393	.105	.065	.329	.259	.192	.434	.154	.090	-.100	.658	.424	.003	.148	1.000	.359	.126	.067
		Significance (2-tailed)	.624	.562	.974	.836	.761	.000	.008	.493	.672	.028	.086	.206	.003	.313	.555	.512	.000	.004	.984	.331	.	.015	.409	.660
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	0	43	43	43
	English Phoneme Deletion (5)	Correlation	-.039	-.102	.041	.136	.306	.532	.832	.369	.020	.531	.593	.503	.558	.350	.402	-.041	.441	.637	.061	.012	.359	1.000	.327	.067
		Significance (2-tailed)	.802	.504	.791	.372	.041	.000	.000	.013	.895	.000	.000	.000	.000	.018	.006	.788	.002	.000	.693	.936	.015	.	.029	.660
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	0	43	43
	English Onset Oddity (3)	Correlation	.057	-.024	.086	.015	.257	.141	.398	.769	.170	.158	.068	.181	.141	.358	.414	.128	.101	.290	.177	.215	.126	.327	1.000	-.005
		Significance (2-tailed)	.710	.874	.576	.924	.088	.356	.007	.000	.264	.301	.658	.234	.354	.016	.005	.402	.508	.053	.246	.157	.409	.029	.	.974
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	0	43
	English Rime Oddity (3)	Correlation	.117	.052	.118	.151	-.082	.091	.174	-.039	.636	-.091	-.044	-.102	.134	.091	-.116	.085	.049	.259	.030	.211	.067	.067	-.005	1.000
		Significance (2-tailed)	.444	.736	.441	.321	.592	.553	.254	.797	.000	.551	.774	.504	.382	.554	.447	.578	.748	.086	.843	.163	.660	.660	.974	.
		df	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	0

Appendix 27

Table A

	EngVocGroup	N	Mean Rank	Sum of Ranks
Age	1.00	23	22.50	517.50
	2.00	23	24.50	563.50
	Total	46		
Non-Verbal (24)	1.00	23	21.15	486.50
	2.00	23	25.85	594.50
	Total	46		
ActiveAce	1.00	23	25.11	577.50
	2.00	23	21.89	503.50
	Total	46		
PassiveAce	1.00	23	25.74	592.00
	2.00	23	21.26	489.00
	Total	46		
Acehnese Vocabulary (20)	1.00	23	23.89	549.50
	2.00	23	23.11	531.50
	Total	46		
Voc-Ind (20)	1.00	23	23.78	547.00
	2.00	23	23.22	534.00
	Total	46		
PA Syl (15)	1.00	23	21.76	500.50
	2.00	23	25.24	580.50
	Total	46		
PA Pho (15)	1.00	23	19.54	449.50
	2.00	23	27.46	631.50
	Total	46		
PA Ons (9)	1.00	23	20.26	466.00
	2.00	23	26.74	615.00
	Total	46		
PA Rim(9)	1.00	23	24.43	562.00
	2.00	23	22.57	519.00
	Total	46		
WR Ind (30)	1.00	23	20.13	463.00
	2.00	23	26.87	618.00
	Total	46		
WR Ace (30)	1.00	23	23.30	536.00
	2.00	23	23.70	545.00
	Total	46		
WR Eng (30)	1.00	23	18.96	436.00
	2.00	23	28.04	645.00
	Total	46		

Table B[a]

	Age	Non-Verbal (24)	ActiveAce	PassiveAce	Acehnese Vocabulary (20)	Voc-Ind (20)	PA Syl (15)	PA Pho (15)	PA Ons (9)	PA Rim(9)	WR Ind (30)	WR Ace (30)	WR Eng (30)
Mann-Whitney U	241.500	210.500	227.500	213.000	255.500	258.000	224.500	173.500	190.000	243.000	187.000	260.000	160.000
Wilcoxon W	517.500	486.500	503.500	489.000	531.500	534.000	500.500	449.500	466.000	519.000	463.000	536.000	436.000
Z	-.508	-1.190	-.820	-1.136	-.198	-.147	-.963	-2.018	-1.689	-.487	-1.722	-.099	-2.306
Asymp. Sig. (2-tailed)	.611	.234	.412	.256	.843	.884	.335	.044	.091	.627	.085	.921	.021

a. Grouping Variable: EngVocGroup

Table C

	EngVocGroup	N	Mean Rank	Sum of Ranks
Indonesian Syllable Deletion (5)	1.00	23	20.83	479.00
	2.00	23	26.17	602.00
	Total	46		
Indonesian Phoneme Deletion (5)	1.00	23	22.11	508.50
	2.00	23	24.89	572.50
	Total	46		
Indonesian Onset Oddity (3)	1.00	23	23.57	542.00
	2.00	23	23.43	539.00
	Total	46		
Indonesian Rime Oddity (3)	1.00	23	23.28	535.50
	2.00	23	23.72	545.50
	Total	46		
Acehnese Syllable Deletion (5)	1.00	23	23.35	537.00
	2.00	23	23.65	544.00
	Total	46		
Acehnese Phoneme Deletion (5)	1.00	23	21.02	483.50
	2.00	23	25.98	597.50
	Total	46		
Acehnese Onset Oddity (3)	1.00	23	21.00	483.00
	2.00	23	26.00	598.00
	Total	46		
Acehnese Rime Oddity (3)	1.00	23	23.61	543.00
	2.00	23	23.39	538.00
	Total	46		
English Syllable Deletion (5)	1.00	23	22.57	519.00
	2.00	23	24.43	562.00
	Total	46		
English Phoneme Deletion (5)	1.00	23	18.39	423.00
	2.00	23	28.61	658.00
	Total	46		
English Onset Oddity (3)	1.00	23	19.85	456.50
	2.00	23	27.15	624.50
	Total	46		
English Rime Oddity (3)	1.00	23	24.24	557.50
	2.00	23	22.76	523.50
	Total	46		

Table D[a]

	Indonesian Syllable Deletion (5)	Indonesian Phoneme Deletion (5)	Indonesian Onset Oddity (3)	Indonesian Rime Oddity (3)	Acehnese Syllable Deletion (5)	Acehnese Phoneme Deletion (5)	Acehnese Onset Oddity (3)	Acehnese Rime Oddity (3)	English Syllable Deletion (5)	English Phoneme Deletion (5)	English Onset Oddity (3)	English Rime Oddity (3)
Mann-Whitney U	203.000	232.500	263.000	259.500	261.000	207.500	207.000	262.000	243.000	147.000	180.500	247.500
Wilcoxon W	479.000	508.500	539.000	535.500	537.000	483.500	483.000	538.000	519.000	423.000	456.500	523.500
Z	-1.720	-.783	-.038	-.124	-.088	-1.310	-1.536	-.061	-.808	-2.665	-2.072	-.473
Asymp. Sig. (2-tailed)	.086	.434	.970	.901	.930	.190	.124	.952	.419	.008	.038	.636

a. Grouping Variable: EngVocGroup

Appendix 28

Table A

	nonverbalgroup	N	Mean Rank	Sum of Ranks
Age	1.00	23	22.20	510.50
	2.00	23	24.80	570.50
	Total	46		
ActiveAce	1.00	23	25.50	586.50
	2.00	23	21.50	494.50
	Total	46		
PassiveAce	1.00	23	24.80	570.50
	2.00	23	22.20	510.50
	Total	46		
Acehnese Vocabulary (20)	1.00	23	24.87	572.00
	2.00	23	22.13	509.00
	Total	46		
Voc-Ind (20)	1.00	23	17.04	392.00
	2.00	23	29.96	689.00
	Total	46		
Voc-Eng (12)	1.00	23	19.85	456.50
	2.00	23	27.15	624.50
	Total	46		
PA Syl (15)	1.00	23	20.26	466.00
	2.00	23	26.74	615.00
	Total	46		
PA Pho (15)	1.00	23	20.91	481.00
	2.00	23	26.09	600.00
	Total	46		
PA Ons (9)	1.00	23	22.78	524.00
	2.00	23	24.22	557.00
	Total	46		
PA Rim(9)	1.00	23	22.07	507.50
	2.00	23	24.93	573.50
	Total	46		
WR Ind (30)	1.00	23	18.67	429.50
	2.00	23	28.33	651.50
	Total	46		
WR Ace (30)	1.00	23	17.72	407.50
	2.00	23	29.28	673.50
	Total	46		
WR Eng (30)	1.00	23	18.37	422.50
	2.00	23	28.63	658.50
	Total	46		

Table B[a]

	Age	ActiveAce	PassiveAce	Acehnese Vocabulary (20)	Voc-Ind (20)	Voc-Eng (12)	PA Syl (15)	PA Pho (15)	PA Ons (9)	PA Rim(9)	WR Ind (30)	WR Ace (30)	WR Eng (30)
Mann-Whitney U	234.500	218.500	234.500	233.000	116.000	180.500	190.000	205.000	248.000	231.500	153.500	131.500	146.500
Wilcoxon W	510.500	494.500	510.500	509.000	392.000	456.500	466.000	481.000	524.000	507.500	429.500	407.500	422.500
Z	-.663	-1.020	-.662	-.694	-3.347	-1.866	-1.794	-1.319	-.374	-.747	-2.466	-2.933	-2.604
Asymp. Sig. (2-tailed)	.507	.308	.508	.488	.001	.062	.073	.187	.708	.455	.014	.003	.009

a. Grouping Variable: nonverbalgroup

Table C

	EngVocGroup	N	Mean Rank	Sum of Ranks
Indonesian Syllable Deletion (5)	1.00	23	20.83	479.00
	2.00	23	26.17	602.00
	Total	46		
Indonesian Phoneme Deletion (5)	1.00	23	22.11	508.50
	2.00	23	24.89	572.50
	Total	46		
Indonesian Onset Oddity (3)	1.00	23	23.57	542.00
	2.00	23	23.43	539.00
	Total	46		
Indonesian Rime Oddity (3)	1.00	23	23.28	535.50
	2.00	23	23.72	545.50
	Total	46		
Acehnese Syllable Deletion (5)	1.00	23	23.35	537.00
	2.00	23	23.65	544.00
	Total	46		
Acehnese Phoneme Deletion (5)	1.00	23	21.02	483.50
	2.00	23	25.98	597.50
	Total	46		
Acehnese Onset Oddity (3)	1.00	23	21.00	483.00
	2.00	23	26.00	598.00
	Total	46		
Acehnese Rime Oddity (3)	1.00	23	23.61	543.00
	2.00	23	23.39	538.00
	Total	46		
English Syllable Deletion (5)	1.00	23	22.57	519.00
	2.00	23	24.43	562.00
	Total	46		
English Phoneme Deletion (5)	1.00	23	18.39	423.00
	2.00	23	28.61	658.00
	Total	46		
English Onset Oddity (3)	1.00	23	19.85	456.50
	2.00	23	27.15	624.50
	Total	46		
English Rime Oddity (3)	1.00	23	24.24	557.50
	2.00	23	22.76	523.50
	Total	46		

Table D[a]

	Indonesian Syllable Deletion (5)	Indonesian Phoneme Deletion (5)	Indonesian Onset Oddity (3)	Indonesian Rime Oddity (3)	Acehnese Syllable Deletion (5)	Acehnese Phoneme Deletion (5)	Acehnese Onset Oddity (3)	Acehnese Rime Oddity (3)	English Syllable Deletion (5)	English Phoneme Deletion (5)	English Onset Oddity (3)	English Rime Oddity (3)
Mann-Whitney U	203.000	232.500	263.000	259.500	261.000	207.500	207.000	262.000	243.000	147.000	180.500	247.500
Wilcoxon W	479.000	508.500	539.000	535.500	537.000	483.500	483.000	538.000	519.000	423.000	456.500	523.500
Z	-1.720	-.783	-.038	-.124	-.088	-1.310	-1.536	-.061	-.808	-2.665	-2.072	-.473
Asymp. Sig. (2-tailed)	.086	.434	.970	.901	.930	.190	.124	.952	.419	.008	.038	.636

a. Grouping Variable: EngVocGroup

Appendix 29

Table A

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.676[a]	.457	.432	4.7632	.457	18.112	2	43	.000
2	.713[b]	.509	.474	4.5848	.052	4.412	1	42	.042

a. Predictors: (Constant), WR Ind (30), Non-Verbal (24)

b. Predictors: (Constant), WR Ind (30), Non-Verbal (24), Voc-Ind (20)

Table B[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-12.937	4.623		-2.799	.008	-22.260	-3.615
	Non-Verbal (24)	.237	.158	.178	1.500	.141	-.082	.556
	WR Ind (30)	.911	.182	.596	5.016	.000	.544	1.277
2	(Constant)	-27.983	8.433		-3.318	.002	-45.001	-10.965
	Non-Verbal (24)	.082	.169	.061	.483	.632	-.260	.423
	WR Ind (30)	.900	.175	.589	5.148	.000	.547	1.253
	Voc-Ind (20)	1.081	.515	.257	2.100	.042	.042	2.119

a. Dependent Variable: WR Ace (30)

Appendix 30

Table A

	Ac.Actgroup	N	Mean Rank	Sum of Ranks
Age	1.00	23	25.52	587.00
	2.00	23	21.48	494.00
	Total	46		
Non-Verbal (24)	1.00	23	27.89	641.50
	2.00	23	19.11	439.50
	Total	46		
Voc-Ind (20)	1.00	23	20.80	478.50
	2.00	23	26.20	602.50
	Total	46		
Voc-Eng (12)	1.00	23	26.22	603.00
	2.00	23	20.78	478.00
	Total	46		
WR Ind (30)	1.00	23	28.61	658.00
	2.00	23	18.39	423.00
	Total	46		
WR Ace (30)	1.00	23	25.63	589.50
	2.00	23	21.37	491.50
	Total	46		
WR Eng (30)	1.00	23	28.24	649.50
	2.00	23	18.76	431.50
	Total	46		
Indonesian Syllable Deletion (5)	1.00	23	27.80	639.50
	2.00	23	19.20	441.50
	Total	46		
Indonesian Phoneme Deletion (5)	1.00	23	24.67	567.50
	2.00	23	22.33	513.50
	Total	46		
Indonesian Onset Oddity (3)	1.00	23	21.52	495.00
	2.00	23	25.48	586.00
	Total	46		
Indonesian Rime Oddity (3)	1.00	23	22.33	513.50
	2.00	23	24.67	567.50
	Total	46		
Acehnese Syllable Deletion (5)	1.00	23	24.54	564.50
	2.00	23	22.46	516.50
	Total	46		
Acehnese Phoneme Deletion (5)	1.00	23	24.48	563.00
	2.00	23	22.52	518.00
	Total	46		
Acehnese Onset Oddity (3)	1.00	23	26.00	598.00
	2.00	23	21.00	483.00
	Total	46		
Acehnese Rime Oddity (3)	1.00	23	24.00	552.00
	2.00	23	23.00	529.00
	Total	46		
English Syllable Deletion (5)	1.00	23	24.48	563.00
	2.00	23	22.52	518.00
	Total	46		
English Phoneme Deletion (5)	1.00	23	25.28	581.50
	2.00	23	21.72	499.50
	Total	46		
English Onset Oddity (3)	1.00	23	24.20	556.50
	2.00	23	22.80	524.50
	Total	46		
English Rime Oddity (3)	1.00	23	21.22	488.00
	2.00	23	25.78	593.00
	Total	46		

Table B[a]

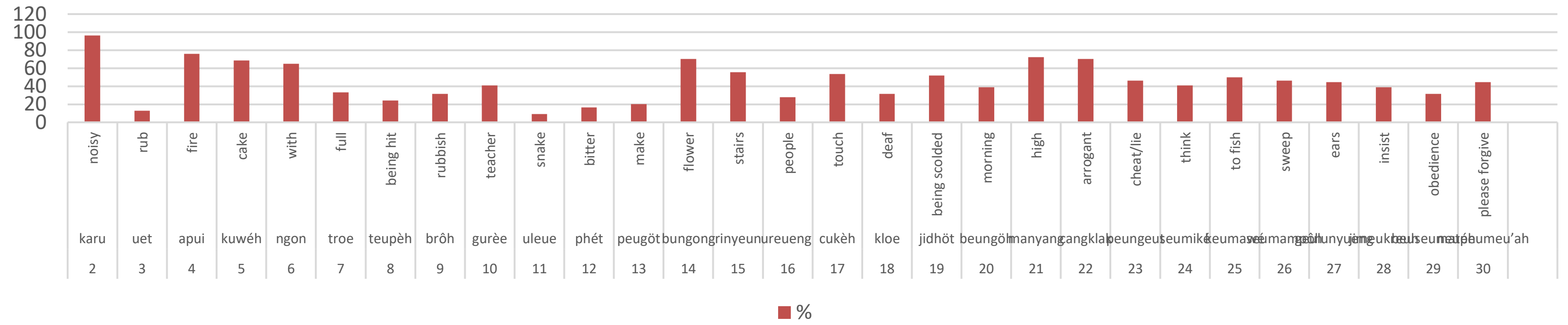
	Age	Non-Verbal (24)	Voc-Ind (20)	Voc-Eng (12)	WR Ind (30)	WR Ace (30)	WR Eng (30)	Indonesian Syllable Deletion (5)	Indonesian Phoneme Deletion (5)	Indonesian Onset Oddity (3)	Indonesian Rime Oddity (3)	Acehnese Syllable Deletion (5)	Acehnese Phoneme Deletion (5)	Acehnese Onset Oddity (3)	Acehnese Rime Oddity (3)	English Syllable Deletion (5)	English Phoneme Deletion (5)	English Onset Oddity (3)	English Rime Oddity (3)
Mann-Whitney U	218.000	163.500	202.500	202.000	147.000	215.500	155.500	165.500	237.500	219.000	237.500	240.500	242.000	207.000	253.000	242.000	223.500	248.500	212.000
Wilcoxon W	494.000	439.500	478.500	478.000	423.000	491.500	431.500	441.500	513.500	495.000	513.500	516.500	518.000	483.000	529.000	518.000	499.500	524.500	488.000
Z	-1.027	-2.226	-1.398	-1.388	-2.610	-1.081	-2.405	-2.768	-.660	-1.156	-.672	-.605	-.517	-1.536	-.278	-.845	-.930	-.395	-1.461
Asymp. Sig. (2-tailed)	.304	.026	.162	.165	.009	.280	.016	.006	.509	.248	.502	.545	.605	.124	.781	.398	.352	.693	.144

a. Grouping Variable: Ac.Actgroup

Appendix 31

Chart A. Indonesian Word Reading Item Comparison (%)
120.0
100.0
80.0
60.0
40.0
20.0
0.0
mother
I
ball
wash
teacher
diamond
yummy
pull out
fierce
leaf
knife
ketchup
house
rubbish
deer
bench
mango
submissive
station
pangoline
wheel (to drive)
imprison
how
scorn
side dishes
write down
been done
travelling
need
enhanced
ibu
aku
bola
cuci
guru
intan
enak
cabut
buas
daun
pisau
kecap
rumah
sampah
kancil
bangku
mangga
khidmat
stasiun
trenggiling
kemudi
kurung
bagaimana
caci-maki
lauk-pauk
tulislah
dilakukan
bepergian
membutuhkan
disempurnakan
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
%

Chart B. Acehnese Word Reading Item Comparison (%)



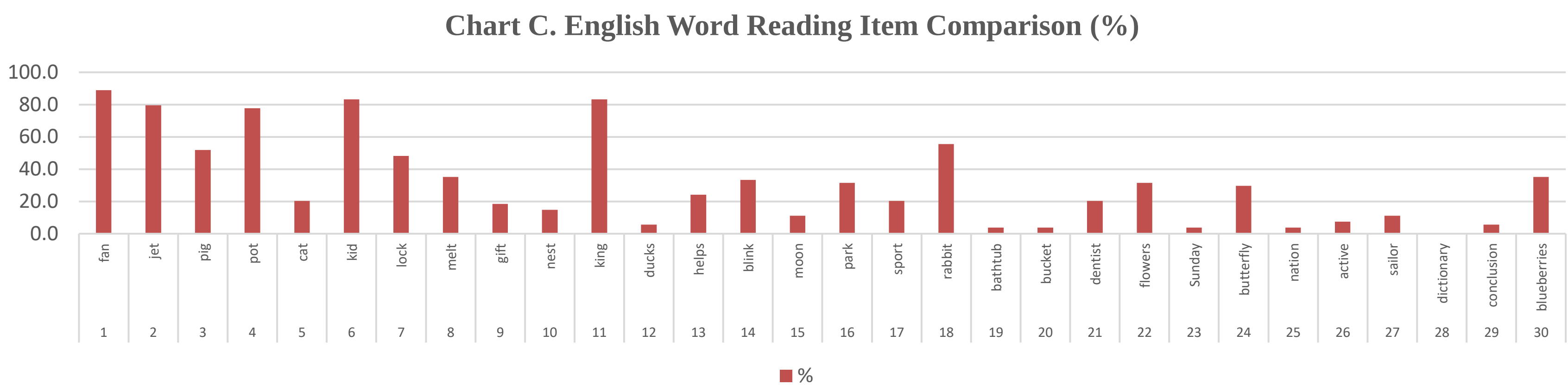


Chart C. English Word Reading Item Comparison (%)
100.0
80.0
60.0
40.0
20.0
0.0
fan
jet
pig
pot
cat
kid
lock
melt
gift
nest
king
ducks
helps
blink
moon
park
sport
rabbit
bathtub
bucket
dentist
flowers
Sunday
butterfly
nation
active
sailor
dictionary
conclusion
blueberries
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
%

Appendix 32

Re: Indonesian Phonological Awareness Tasks

Heather Winskel <[redacted]>

Mon 08/02/2016 13:58

To:Septhia Irnanda [redacted]>;

Cc:Jeanette Sakel (Staff - HLSS) <[redacted] Anna Piasecki (Staff - HLSS) <[redacted]>;

Hi Septhia,
Your PhD project sounds very interesting. You certainly have my permission to use the assessment stimuli in the different tasks. For the syllable deletion task, the first syllable of the word was deleted and for the phoneme deletion task, the first phoneme was deleted. You could do it differently but that would likely confuse the young children. Happy to help in any way I can. All the best with the PhD.
Best wishes,
Heather.

From: Septhia Irnanda <[redacted]
Sent: Tuesday, 9 February 2016 2:23 AM
To: Heather Winskel
Cc: Jeanette Sakel (Staff - HLSS); Anna Piasecki (Staff - HLSS)
Subject: Indonesian Phonological Awareness Tasks

Dear Dr. Winskel,

My name is Septhia Irnanda, an Indonesian PhD student at University of the West of England, Bristol, United Kingdom. My PhD project is entitled "Phonological Awareness Development and Word Reading Acquisition in Acehnese-Indonesian Bilinguals Learning L3 English". I am interested to investigate how being a bilingual and exposed to two phonological systems will make impact on one's L3 English word reading acquisition. This project is under the supervision of Dr. Jeanette Sakel (Jeanette.sakel@uwe.ac.uk) and Dr. Anna Piasecki (anna.piasecki@uwe.ac.uk).

Your collaborative research on Indonesian children's phonological awareness, letter knowledge, and literacy development has been one of my main references. Not only giving up-to-date insight on Indonesian phonological and orthographical systems, your research provides a crucial contribution in ways to measure phonological awareness and word reading in Indonesia. I plan to incorporate both your phonological awareness tasks (syllable and phoneme deletion), and word reading tasks (real and non-word reading) to my research project, and would like to ask for your permission. However, is it possible if I can have the access to the complete version of the tasks? I'm afraid the attachment from the journal article does not provide information about which part of syllable/phoneme is deleted in every item.

I'm looking forward to hearing from you. Many thanks.

With all the best,

Appendix 33

Re: Access to HALA Project Language Loss Assessment

Amy Schafer <[redacted]>

Mon 14/09/2015 10:23

To:Septhia Irnanda <[redacted]>;

Cc:William O'Grady <[redacted]>;

Dear Septhia,

Thank you for your positive reaction to the HALA project. I've just added you as a user to the electronic space that hosts the HALA materials. You should have received a separate message from the Laulima system with instructions about how to log in. Once logged in, you can find videos, manuals, and so forth. Some of this material still represents work in progress, so apologies in advance for any roughness.

If you use any of the HALA materials, we ask that you cite the LDC paper:
O'Grady, W., Schafer, A.J., Perla, J., Lee, O.-S., & Wieting, J. (2009). A psycholinguistic tool for the assessment of language loss: The HALA project. Language Documentation and Conservation, 3, 100-112. [abstract & PDF]

All best wishes to you on your project!
Best,
Amy

- Amy Schafer
Webpage, contact information, & link for office hours
Schedule information

On Sat, Sep 12, 2015 at 1:57 AM, Septhia Irnanda <[redacted]> wrote:

> Dear Dr. Schafer,
>
> My name is Septhia Irnanda, a PhD student from University of the West of England, Bristol, UK. I am doing a PhD project entitled 'Phonological Awareness in Acehnese-Indonesian bilingual children'. Acehnese is an ethnic language, a member of Chamic languge subfamily, spoken in Aceh, Indonesia. Before measuring the children's phonological awareness, I need to group them according to their Acehnese language strength. Then I am suggested by my supervisor, Dr. Jeanette Sakel, to learn about your and Dr. O'Grady's HALA project language loss assessment, so I researched about this. After reading the description of the test, and after looking directly at my other supervisor's laptop screen how the tool works, I am pretty confident that this is what I really wanted for my project. Your tool measures not only the accuracy of the answers but also the speed of reaction. I have faith that your tool can help me categorising my project participants based on their heritage language strength.
>
> I'd be really grateful if I am granted an access to this test material. If you have any questions please do not hesitate to contact me, or my Supervisor on the following email address:

Appendix 34

Mail – Septhia2.Irnanda@live.uwe.ac.uk Page 1 of 3

Re: Permission for Using the Materials

Walter Hodges Henley Jr (whenley) <[redacted]>

Mon 01/01/2018 09:19

To:Casey LaFoe <[redacted]>;

Cc:Nanda Irnanda <[redacted]>;

Hi Septhia,

Yes, you can use Reading Bear for your graduate research study. We are glad to help you. Reading Bear.org is the #1 Googled global website for "free phonic reading program."

Please send an abstract when you are starting your study and when you are finished. Please also copy your main Professor at UWE at the same time. Curious as to your results!!

FYI, Reading Bear is currently being used by not only standard early childhood reading students, but also by non-tradional ESL/ELL learners that you plan to study.

Feel free to reach out to Casey or myself if you need help using the website. There are several Instructional videos on the website to help explain how to use Reading Bear.

I am not sure which format that you use for citing - I usually use APA. Probably best to cite our URL and name us Reading Bear.org. You can ask your local librarian for help too.

Best!

Walt

UofM
logo

Walter Henley Ph.D.
PhD Marketing Program
University of Memphis
901.238.7910

From: Casey LaFoe <[redacted]>
Sent: Sunday, December 31, 2017 12:12:08 PM
To: Walter Hodges Henley Jr (whenley)
Cc: [redacted]
Subject: Fw: Permission for Using the Materials

https://outlook.office365.com/owa/?realm=live.uwe.ac.uk&path=/mail/search 12/04/2018

Appendix 35

Messages - Academia.edu   Page 1 of 1

A Search... ADVANCED   HOME ANALYTICS SESSIONS MENTIONS UPLOAD

All Messages

Get help or give feedback

Graham Thurgood Aug 27
You: Dear Prof. Thurgood, Many tl

Graham Thurgood
California State University, Chico Department Member, English

Septhia Irnanda Jul 2

Dear Professor Thurgood,

My name is Septhia Irnanda, a PhD Candidate at University of the West of England, B ristol, UK. I am an Acehnese and is doing a research on Acehnese children biliteracy.

In my thesis, I need to include some information on Acehnese language for the litera ture review. I read your paper entitled 'The historical place of Acehnese: the known a nd the unknown. I found your suggestion to study the Acehnese dialects and their in teractions to understand where the Acehnese come from is an important statement to support my ideas about the Acehnese language origin.

However, on the paper, it says that it is not permitted to cite without your permission as the author. Therefore, I am writing to you to kindly ask your permission to include the information from your related paper into my thesis and perhaps into a paper I mi ght write from it later in the future.

I'd be really thankful if you happily allow me to do the citation.

Kind regards,
Septhia

Graham.Thurgood Aug 25

Dear Septhia,

Feel free to cite any part of the paper you wish. Your thesis sounds quite interesting.

Graham

Septhia Imanda Aug 27

Dear Prof. Thurgood,

Many thanks for the permission. I'm looking forward to read your next publication o n Southeast Asian languages.

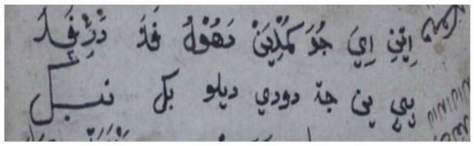
Regards,
Septhia,

Reply

https://www.academia.edu/Messages   12/04/2018

Appendix 36

dalam blog saudara seperti dibawah ini, beserta penjelasannya untuk saya lampirkan di dalam laporan disertasi saya?



Atas bantuan saudara, saya ucapkan terima kasih.

Wasalam,
Nanda

Hermansyah . <herman.atjeh@gmail.com> 00.56 (9 jam yang lalu)

ke saya

Waalaikumsalam.

Terimakasih telah berkunjung ke webblog saya. Silahkan dikutip dan digunakan utk penelitian anda dgn menyebut sumber. Semoga bermanfaat.

Wassalam.

Appendix 37

Copyright Clearance Center

Confirmation Number: 11713643
Order Date: 04/25/2018

Customer Information

Customer: Septhia Irnanda
Account Number: 3001278859
Organization: University of the West of England
Email: septhia.irnanda@gmail.com
Phone: +44 7405726841
Payment Method: Invoice

This is not an invoice

Order Details

Course: DOCTOR OF PHILOSOPHY Edit Course

University/Institution: UNIVERSITY OF THE WEST OF ENGLAND
Start of term: 01/01/2018
Course number:
Number of students: 54

Instructor: Dr Jeanette Sakel
Your reference: QUESTIONNAIRE123
Accounting reference:
Order entered by:

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Billing Status: **Not Billed**

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ISBN: 9780415343862 (hbk.)
Publication Type: Book
Publisher: Routledge
Rightsholder: ROUTLEDGE (UK) - BOOKS
Author/Editor: Wigglesworth, Gillian ; Ng, Bee Chin

Permission Status: Granted
Permission type: Use in electronic course materials
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Total number of pages: 3
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	Total Amount	$44.00
	Total Discounts	$0.00
	Balance Due	$44.00

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Visit www.copyright.com/payment to view our credit & payment policy.
FEDERAL ID # 13-2922432
Detail is available online at www.copyright.com.

Appendix 38

GL Assessment

Ms Septhia Irnanda
Ground Floor Flat
424 Fishponds Road
Bristol
BS16 3DU

15th May 2018

Dear Ms Irnanda,

RE: Permission to use British Picture Vocabulary Scale: Third Edition (BPVS3)

This letter sets forth the terms and conditions of a License Agreement between GL Assessment of 1st Floor, Vantage London, Great West Road, Brentford, TW8 9AG, a corporation organised under the laws of the United Kingdom ('Licensor') and Ms Septhia Irnanda. When signed, this letter will constitute the formal written agreement to the following terms and conditions ('Agreement').

1. Licensor hereby grants Ms Septhia Irnanda a non-exclusive, world-wide rights, non-transferable license ('License') to use the materials identified on the attached Exhibit A ('Materials').

2. The License grants the right to use the Materials as part of the research study entitled *'Phonological Awareness and Word Reading Development in Acehnese-Indonesian Bilinguals Learning English as a Third Language'* with 46 children.

3. Ms Septhia Irnanda's use of the Materials will be such that the Materials are:

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    iv. only used by members of the research team and not distributed to third parties (either for pay or gratis).

4. Ms Septhia Irnanda will include the appropriate copyright statement on all Materials, and such statement shall conform to the following '© Lloyd M Dunn, Douglas M Dunn and National Foundation for Educational Research, 2009. Reproduced by permission of GL Assessment.'

5. This Agreement represents the entire agreement of the parties with respect to the use of the Materials by Ms Septhia Irnanda.

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GL Assessment

Kindly indicate your acceptance of these terms and conditions by signing two copies of this letter. Please send one back to me and keep the other for your records.

Yours sincerely

LH

Lucy Hadfield
Associate Publisher
020 8996 3343

I hereby agree to the above terms.

Signed ......Septhia Irnanda......
Date ......21/05/2018......

Name of Licensee

Exhibit A to License Agreement

	Resource Title	Author(s)	Credit Line
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Tel: +44 (0) 20 8996 3333 Fax: +44 (0) 20 8742 8767 Email:
gl-assessment.co.uk

Appendix 39

Gmail Septhia Irnanda <septhia.irnanda@gmail.com>

Re: Permissions Request
2 pesan

Licensing, 19 Mei 2018 20.35
Kepada

Dear Ms. Septhia Irnanda,

Thank you for your honesty.

Because the assessment numbers were so small I will not be preparing a settlement agreement with a minimum license fee of US$1,500.00.

In this case, in exchange for your good will, Pearson has made the following decision regarding your case.

Pearson has no objection, and you have retroactive permission to use the Beck Depression Incentory-II (BDI-II) in your student research study.

For your further information, Pearson Licensing and Permissions department will be permanently closed on August 1, 2018, and I do not yet have been notified of an alternate site.

Regards,

William H. Schryver
Senior Legal Licensing Specialist

Please respond only to

On Fri, Apr 20, 2018 at 2:39 PM wrote:

The following is feedback submitted via the Contact Us page on:

www.PearsonClinical.com

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Contact Information

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Appendix 40

<u>Analysis 1.</u>

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Non-Verbal (24)[b]	.	Enter
2	PassiveAce[b]	.	Enter

a. Dependent Variable: WR Ace (30)

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.374[a]	.140	.120	5.9284	.140	7.141	1	44	.011
2	.380[b]	.144	.105	5.9802	.005	.241	1	43	.626

a. Predictors: (Constant), Non-Verbal (24)

b. Predictors: (Constant), Non-Verbal (24), PassiveAce

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	250.989	1	250.989	7.141	.011[b]
	Residual	1546.424	44	35.146		
	Total	1797.413	45			
2	Regression	259.606	2	129.803	3.630	.035[c]
	Residual	1537.807	43	35.763		
	Total	1797.413	45			

a. Dependent Variable: WR Ace (30)

b. Predictors: (Constant), Non-Verbal (24)

c. Predictors: (Constant), Non-Verbal (24), PassiveAce

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	7.199	2.853		2.523	.015	1.449	12.949			
	Non-Verbal (24)	.497	.186	.374	2.672	.011	.122	.871	.374	.374	.374
2	(Constant)	6.208	3.516		1.766	.085	-.882	13.298			
	Non-Verbal (24)	.520	.193	.391	2.689	.010	.130	.909	.374	.379	.379
	PassiveAce	.099	.202	.071	.491	.626	-.308	.507	-.023	.075	.069

a. Dependent Variable: WR Ace (30)

Analysis 2.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Non-Verbal (24)[b]	.	Enter
2	ActiveAce[b]	.	Enter

a. Dependent Variable: WR Ace (30)

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.374[a]	.140	.120	5.9284	.140	7.141	1	44	.011
2	.387[b]	.149	.110	5.9627	.010	.495	1	43	.485

a. Predictors: (Constant), Non-Verbal (24)

b. Predictors: (Constant), Non-Verbal (24), ActiveAce

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	250.989	1	250.989	7.141	.011[b]
	Residual	1546.424	44	35.146		
	Total	1797.413	45			
2	Regression	268.595	2	134.298	3.777	.031[c]
	Residual	1528.818	43	35.554		
	Total	1797.413	45			

a. Dependent Variable: WR Ace (30)

b. Predictors: (Constant), Non-Verbal (24)

c. Predictors: (Constant), Non-Verbal (24), ActiveAce

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	7.199	2.853		2.523	.015	1.449	12.949			
	Non-Verbal (24)	.497	.186	.374	2.672	.011	.122	.871	.374	.374	.374
2	(Constant)	5.914	3.401		1.739	.089	-.945	12.773			
	Non-Verbal (24)	.536	.195	.403	2.747	.009	.142	.929	.374	.386	.386
	ActiveAce	.132	.188	.103	.704	.485	-.247	.511	-.011	.107	.099

a. Dependent Variable: WR Ace (30)

Analysis 3

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Non-Verbal (24)[b]	.	Enter
2	Acehnese Vocabulary (20)[b]	.	Enter

a. Dependent Variable: WR Ace (30)

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.374[a]	.140	.120	5.9284	.140	7.141	1	44	.011
2	.409[b]	.167	.129	5.8996	.028	1.431	1	43	.238

a. Predictors: (Constant), Non-Verbal (24)

b. Predictors: (Constant), Non-Verbal (24), Acehnese Vocabulary (20)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	250.989	1	250.989	7.141	.011[b]
	Residual	1546.424	44	35.146		
	Total	1797.413	45			
2	Regression	300.783	2	150.391	4.321	.019[c]
	Residual	1496.630	43	34.805		
	Total	1797.413	45			

a. Dependent Variable: WR Ace (30)

b. Predictors: (Constant), Non-Verbal (24)

c. Predictors: (Constant), Non-Verbal (24), Acehnese Vocabulary (20)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	7.199	2.853		2.523	.015	1.449	12.949			
	Non-Verbal (24)	.497	.186	.374	2.672	.011	.122	.871	.374	.374	.374
2	(Constant)	4.619	3.566		1.295	.202	-2.572	11.810			
	Non-Verbal (24)	.554	.191	.417	2.900	.006	.169	.940	.374	.404	.404
	Acehnese Vocabulary (20)	.200	.167	.172	1.196	.238	-.137	.537	.067	.179	.166

a. Dependent Variable: WR Ace (30)

Excluded Variables[a]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Acehnese Vocabulary (20)	.172[b]	1.196	.238	.179	.936

a. Dependent Variable: WR Ace (30)

b. Predictors in the Model: (Constant), Non-Verbal (24)