Instructing Malaysian Children with HFASD in English as a Second Language

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Abstract

Autism awareness has recently increased globally, as evidenced by the increasing numbers of parents reported to be seeking advice on raising children with autism. In Malaysia, it is still unclear how children with autism spectrum disorder (ASD) acquire English in the ESL context. To shed some light on the issue, this paper examines how three high-functioning Malaysian children with ASD (HFASD) acquired English morphology, specifically the English plural structures from the *Developmentally Moderated Focus-on-Form* (DMFonF) instruction. DMFonF is an instructional approach introduced by Di Biase, which combines Pienemann's Processability Theory developmental stages and Long's Focus on Form feedback. Using DMFonF for sixteen weeks, the children were taught to produce English lexical and phrasal plural structures (noun + suffix- *s* and plural agreement within the NP) in the appropriate contexts. Data were collected at 4 points; T1 (week 5), T2 (week 9), T3 (week 13), and T4 (week 16). Results show that they acquired the English lexical and grammatical plurals taught in the DMFonF lessons faster than normally developing children did in past studies. The findings suggest that DMFonF not only effectively facilitates the acquisition of English lexicon but

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also activates grammatical development among children with ASD in the Malaysian context.

Keywords
children with autism, English as a second language, plural structures, DMFonF instruction, Malaysian context

Introduction

According to American Psychiatric Association (49), Autism Spectrum Disorder (ASD) is broadly defined as a lifelong neurodevelopmental disorder characterised by a persistent deficit in social interaction and communication as well as obsessive repetitive and restricted behaviours. In the current Fifth Edition of American Psychiatric Association (DSM-5), deficit in structural language has been de-emphasised in ASD diagnosis. However, language impairment has been commonly associated with ASD. In fact, language delay is the most frequent symptom or cause for parents to consult specialist services for children with ASD (McMahon et al.). Globally, it is estimated that there are at least 52 million cases of autism, affecting around 1%-2% of children (Hahler and Elsabbagh). In Malaysia, awareness of autism has increased exponentially in the current times, as evidenced by the report from the *National Autism Society of Malaysia* (NASOM), which registers an increased intake of children with ASD in their organisation (Kaur et al.). A recent public survey by Low et al. indicated that although there is an increased awareness about ASD among the Malaysian public, they are, however, less familiar with the diagnostic features and remedial needs of individuals with ASD.

Similarly, in a comparative review of the prevalence, diagnosis, treatment, and research on ASD in Singapore and Malaysia (Neik et al.), it was also reported that public awareness, knowledge and scholarly research on ASD is very limited in Malaysia compared to Singapore. Consequently, the lack of knowledge regarding ASD may result in confusion among affected parents in Malaysia, leading to late diagnosis. One of the main confusion reported is the parents' assumption that delay in communication skills their children exhibit is part of the language developmental process (Chu et al.).

As for language development among children with ASD, studies on second language (L2) acquisition and bilingual acquisition on children with ASD are very few (Ohashi et al.). In the Malaysian context, there is a dearth of literature investigating the language development of this population. The exact nature of language delays affecting children with ASD, especially those in bilingual/multilingual environments like Malaysia, remains unclear. The case for children with ASD in the country is different from those in English-speaking countries; this is because it is a multiethnic and multilingual society. Malay (*Bahasa Melayu*) is the official language of the nation. Other ethnic (e.g., Tamil, Mandarin,

Telugu) and indigenous languages are actively spoken in the respective community. English is not the L1 of the nation; however, due to Malaysia's colonial history, English is regarded as the 'second' strong language, manifested in its inclusion as a compulsory subject in the Malaysian educational curriculum (Gill). Hence, given the exposure to the various languages of the nation, we may consider Malaysian children, including children with ASD, to be bilingual/multilingual speakers.

Due to the limited empirical studies on L2 and bilingual acquisition of children with ASD, there are suggestions that these children should avoid learning a second language because their deficit in pragmatic and social interaction skills would make them poor L2 learners (Jellinek et al.). Parents and educators are understandably concerned that exposing children with ASD to multiple languages might delay their "already impaired" language development (Kay-Raining Bird, Lamond and Holden). However, a growing body of evidence has shown that bilingual/multilingual exposure does not negatively impact children with ASD (Dai et al.; Gonzalez-Barrero and Nadig). While this new evidence and findings are reassuring, fundamental information on how Malaysian children with ASD acquire English in the local context is still inadequate. This knowledge is essential to inform childrearing and educational decisions for the growing number of families with children with ASD.

Given the above premises, this study aims to address this gap by investigating the development in English as a Second Language (ESL) context among Malaysian children with ASD. Our study examines the children's acquisition of English plural structures using a new instructional approach, the *Developmentally Moderated Focus-on-Form* (DMFonF) instruction. The following research question will guide the paper:

How effective is the *Developmentally Moderated Focus-on-Form* (DMFonF) instruction on the acquisition of English plural structures among Malaysian children with ASD?

The remainder of this paper is organised into several sections. The next section reviews previous studies on the grammatical development among children with ASD, followed by studies on children's acquisition of English plurality and the current research's theoretical framework. The methodology section outlines the participants' background and the research procedure. Next, the results and discussion section present the empirical results and a discussion of the findings in light of our theoretical framework for interpreting second language development in children with ASD. The paper concludes with the limitation of the study as well as suggestions for future research.

Grammatical Development Among Children with ASD

The development of grammar among children with ASD has been scrutinised in recent years. Several studies investigating grammar in English as a first language

(L1) in the ASD population have shown that children with ASD's morphosyntactic development in English are unharmed. Their grammatical development was found to be similar to normally developing children. For example, in a cross-sectional study, Waterhouse and Fein found that the development of English morphemes by participants with ASD is comparable to the developmental sequence found by Brown. In a longitudinal analysis by Tek et al., similar findings were reported. In their study, however, those children with ASD and high verbal skills were found to be comparable to typically developing children on most morphosyntactic measures. In contrast, children with ASD with low verbal skills were found to be delayed. The possible reason for the language delay found in children with ASD with low verbal skills is attributable, according to Tek et al., to *global* impairment in expressive language; the language delay is not due to structural language acquisition issues *per se* but rather a combination of impairments in other areas of development, coupled with the severity of autism itself.

As for L2 grammatical development in children with ASD, Ohashi et al. compared early language development between monolingual and bilingual children with ASD. The researchers found no statistical significance between the two groups on any language measures observed. This leads to the conclusion that bilingual environments do not affect the grammatical attainment of children with ASD. Agostini and Best's study further corroborate this finding. In their case study, the ASD child's Italian L2 development progressed over the same route as typically developing Italian children. The researchers also noted that the child's Italian acquisition pace was faster than his typically developing peers. Much documented evidence from several studies (Gonzalez-Barrero and Nadig; Meir and Novogrodsky) suggests that bilingualism does not affect language development of children on the autism spectrum.

However, there seems to be scant information on how Malaysian children with ASD growing up in bilingual/multilingual environments, acquire English in the ESL context. Based on an extensive literature search, only two English language acquisition studies were conducted in the Malaysian setting. In a case study by Mohd Yusoff et al. ("English morphosyntactic performance"), the authors reported on the English morphosyntactic acquisition of an 8-year-old Malaysian child with HFASD. It was found that despite Malay being the predominant input in the child's linguistic environment, her English grammatical skills were comparable to typically developing L1 English-speaking children. In an earlier group case study by Mohd Yusoff et al. ("An Account of High-Functioning ASD"), all three Malay-English bilingual children with HFASD in the study were reported to speak English with a native-like accent. The children in Mohd Yusoff's studies appear to have had no difficulty acquiring English as their L2; they struggled, however, with social and behavioural aspects of communication. There are other studies on children with ASD in Malaysia.

However, the focus is not on their English language development. For instance, Yahya et al., in several investigations ("Facilitating ESL students"; "Helpful practices"; "Instructional practices"), reported on teachers' practices of teaching English to ESL children with ASD.

Therefore, based on the reviewed studies, there is not much information on children with ASD's English grammatical development in the Malaysian context. Understanding the development from an ASD perspective might contribute to a better understanding of the processing problems that might contribute to delays in language development. To date, the study presented in this paper is the first to examine the development of English among children with ASD in an instructed setting, thus making a valuable contribution to ASD research in Malaysia.

Children's Acquisition of English Plurals

The concept of one versus many is expressed differently in many languages. In English, plurality is grammaticised on countable nouns through the use of suffix *-s* (e.g., *dogs*, *books*). For L1 English-speaking children, the plural suffix *-s* was found to be one of the earliest grammatical morphemes to be acquired, typically emerged at age 1:6 (one year and six months) up to 2:6 (two years and six months) (see studies by Berko-Gleason; Bloom and Wynn ; Cazden ; de Villiers and de Villiers; Feigenson et al.; Ferenz and Prasada; Mervis and Johnson). In a more recent study, Clark and Nikitina investigated plural acquisition in English L1 children (age two to three years old) both longitudinally and cross-sectionally. The findings indicate that before acquiring the grammatical plural structures (e.g., plural suffix *-s,* as in *cats* or plural noun phrase (NP) agreement as in *many cats)*, the children produced unconventional forms of plurals, which were non-adult-like, such as quantifier + default form (e.g., *two blanket, more cookie*) and some children used iteration with pointing gestures (e.g., *lamp lamp lamp*). In several longitudinal studies on the Japanese L1-English L2 primary school-aged child by Yamaguchi as well as Di Biase et al., it was found that, similar to English L1 children, the child first acquired plural marker *-s* on nouns (e.g., *cats*) followed by the plural noun phrase agreement (e.g., *three cats*, *many cats*).

With regard to bilingual children, studies investigating Malay-English bilinguals are limited, as evidenced in a systematic review on bilingualism and language processing from 2015 up till 2019 (see Soh et al. 18). In very few investigations conducted on this language pair, such as by Mohamed Salleh et al. ("The development of plural expressions"), the findings show that the bilingual child started to produce English plural *-s* at age 3:6 (three years and six months). Although this acquisition's timing might be considered 'late' compared to English L1 children, the developmental trajectory of the Malay-English bilingual child indicated that the English plural *-s* was among the earliest grammatical markers to be acquired in the child's morphological acquisition.

Based on our knowledge to date, there is no research conducted to investigate the acquisition of plurality from the ESL perspective on the population with ASD. Thus, this longitudinal investigation would further enrich our understanding of how children with ASD develop their English plurality and whether there are differences compared to typically developing children in the literature. The following section will describe Processability Theory (Pienemann) and Focus on Form (Long), the two theoretical underpinnings that led to the creation of the instructional method used in this study, the *Developmentally Moderated Focus-on-Form* (DMFonF) instruction.

Processability Theory, Focus On Form and DMFonF

Processability Theory (PT) is the primary framework used in this study for dual purposes: (a) the creation of lessons used in teaching the children with ASD and (b) the grammatical analysis of the plural output produced by them over the duration of the research. PT is a theoretical framework initially devised for second language acquisition. In this framework, language acquisition is regarded as a hierarchical process where learners will follow a certain developmental trajectory in an implicational and cumulative way. According to PT, there are four stages of morphological development in English second language acquisition. The following table summarises the universal sequence in the development of morphology in PT as proposed by Di Biase et al. (85) after Pienemann (89) (See Table 1).

Table 1
Developmental Stages Hypothesis for L2 English Morphology (Di Biase et al. 85; Pienemann 89)

Processing Procedure		Structure	Example
4. Sentence Procedure		SV agreement: 3rd person sg *-s*	*Peter loves rice.*
3.Phrasal Procedure	NP Procedure	phrasal plural marking	*these girls.* *three black cats.* *many cats.*
	VP Procedure	AUX + V: have + V-*ed* MOD + V be + V-*ing*	*they have jumped.* *you can go.* *I am going.*
2.Category Procedure		past *-ed* plural *-s* possessive'*s* verb *-ing*	*Mary jumped.* *my brothers working. Mary's car.* *he eating.*

1. Lemma Access	single words, formulas	*station here.* *my name is Pim.*

In each processing procedure in PT, there are several linguistic structures outlined. According to Di Biase et al., the linguistic structures are not required to emerge simultaneously for learners to be considered to have reached a particular stage. The first stage is the Lemma Access where in learning a second language, the learner will first produce single words and fixed expressions in the language, such as *my name is Pim, station here.* In this stage, the lexical items and expressions are retrieved directly from the mental lexicon (i.e., learners memorise the words and expressions as single chunks). These words are not yet annotated for any grammatical features. The second stage is the Category Procedure and it emerges when the learner begins producing words containing certain grammatical features such as the past tense *-ed* (e.g., *Mary jumped*), plural *-s* (e.g., *my brothers*), possessive *'s* (e.g., *Mary's car*) and verb-*ing* (e.g., *he eating*). It is worth noticing that in the example for verb *-ing*, the auxiliary *is/are* is absent. This is because, at the Category Procedure stage, the learner focuses on producing the suffix *-ing* on a word root which helps them marking this word as 'verb' (thus beginning to differentiate verbs from nouns). This marking requires no grammatical unification with other constituents of the phrase or sentence at this stage of learning. If a learner produces *he is eating*, we consider them to have reached the next (third) stage of PT, i.e., the Phrasal Procedure stage. In this stage, the learner is able to produce phrases with the correct word order and grammatical agreement, i.e., plural agreement as in *three cats, many dogs,* in the Noun Phrase as well as the use of some auxiliaries with verbs, e.g., *you can go* and *I am going* in the Verb Phrase. The final morphological stage, the Sentence Procedure, is reached when the learner is able to construct grammatical agreement across phrase boundaries such as Subject-Verb agreement in English, e.g., *Peter loves rice,* where the grammatical person and number of the subject Noun Phrase (*Peter*) is unified with the same features of the verb in the Verb Phrase (*loves*) (contrast with, e.g., *Amal and Peter love rice*).

Many studies investigating learners' second language acquisition from a wide range of languages have used PT as their framework. These include Arabic (Mansouri), Chinese (Zhang), English (Pienemann; Zhang and Widyastuti), Italian (Di Biase and Bettoni), Japanese (Kawaguchi), Spanish (Bonilla), Swedish (Pienemann and Håkansson), among others. Despite the different typologies of the languages in all these studies, learners' second language development was shown to follow the universal stages hypothesised by PT.

For child L2 acquisition, PT has been used by Hardini et al. in a study investigating the acquisition of English as a Foreign Language (EFL) in Indonesian children. In the Malaysian context, several investigations on typically developing Malay-English bilingual children by Mohamed Salleh et al. ("The Acquisition of English Grammar;" "Lexical and grammatical development")

reported that these children's English acquisition followed the sequence predicted by PT.

Regarding the instructional practice of teaching English in Malaysia, the approach has essentially been aligned with Communicative Language Teaching (CLT) (Che Musa et al.; Azman). CLT is a meaning-based pedagogical method in language teaching which focuses on developing learners' communicative skills via the use of language in context. In CLT, grammar learning is minimised. CLT is evidently manifested in Malaysian public schools by the separate scheduling of English communicative lessons and grammar lessons which are regarded as two separate lessons (Ministry of Education). However, in Focus on Form (FonF), Long maintains that a syllabus based on grammatical forms is not effective for language learning. Instead, in their feedback to the student, the teacher should "overtly draw […] attention to the linguistic elements as they arise incidentally in lessons whose overriding focus is on meaning or communication" (45). Focus on Form depends, then, on the incidental emergence of linguistic forms in the course of the communicative meaning-based lesson. The teacher gives feedback on a grammatical form only if a communication problem happens to arise. Ellis (405) supported Focus on Form, stating that it is an effective pedagogical method because the learners are not only able to identify the use of grammatical units but also to apply the structure in a meaningful context.

The current study employed a new approach in the L2 programme, which Di Biase refers to as the *Developmentally Moderated Focus-on-Form instruction* (DMFonF). DMFonF is a combination of two psycholinguistic theories, Pienemann's Processability Theory and Long's Focus on Form strategy. The programme/lessons for this research are developmental in the sense that they are designed based on the stages outlined in PT (refer to Table 1) and the pedagogical method employed by the researchers in delivering the lessons is based on Long's Focus on Form strategy. DMFonF hence amalgamates traditional grammar teaching (moderated by the developmental readiness of the learner) and the communicative approaches. Communicative language teaching principles are, in any case, applied in the classroom, and at the same time, there is also the occasional and overt feedback on the grammatical forms that learners are taught (Di Biase). So, one significant difference between Long's Focus on Form and Di Biase's DMFonF is that the latter advocates a proactive role within instruction by the teacher. Rather than waiting for the grammatical forms to 'incidentally arise' in the lesson, knowing the learners' current stage of development helps the teacher designs a lesson focusing on specific forms to be introduced, gradually and communicatively, in the classroom. Naturally, this assumes that the teacher is familiar with the developmental schedules the learner is hypothesised to follow according to PT. To ensure that the lesson is developmentally moderated, Di Biase further states that the teacher's feedback should focus only on the specific

grammatical forms taught in the lesson and ignore other linguistic errors. Figure 1 shows the key components that constitute DMFonF:

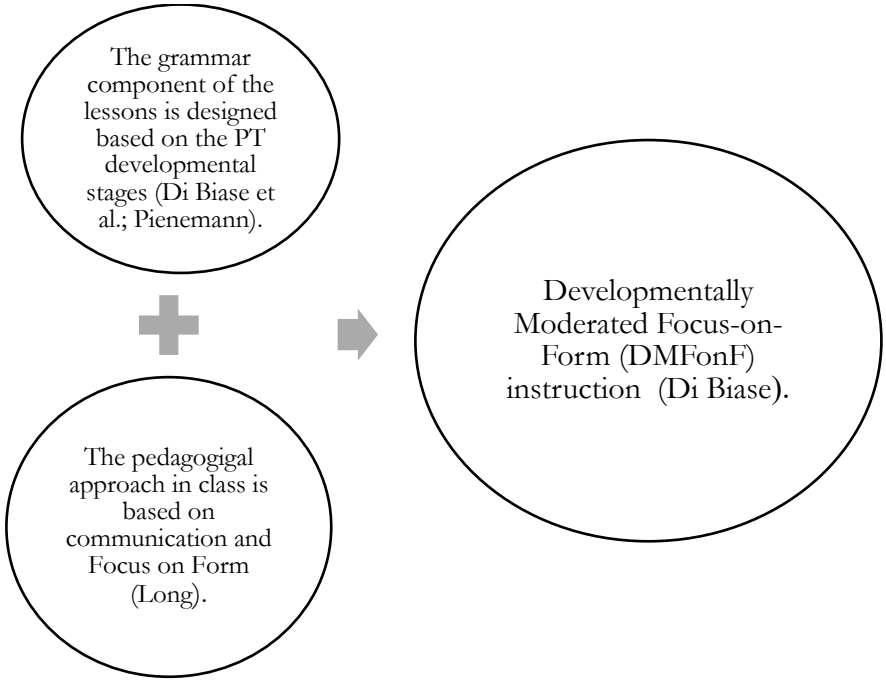

Figure 1 Key components of DMFonF

The use of DMFonF has been shown to lead to successful L2 learning, as evidenced by previous research conducted by Di Biase on Australian English background children learning Italian L2 in primary school and Hardini et al. on Indonesian EFL kindergarten children. Their findings indicate that learners exposed to these two elements in L2 learning acquire the grammatical structures under investigation faster and more accurately than learners exposed to generic communicative methods without DMFonF. Therefore, we are also testing the effectiveness and applicability of DMFonF on a special population: children with ASD. After we have explained the framework in the preceding discussion, what follows will describe the methodology used in the study.

Methodology

Participants

The three children who participated in this study are classified as High-Functioning Autism Spectrum Disorder (HFASD) learners named Aron (male, twelve years old), Danny (male, ten years old) and Zaff (male, eight years old) (not their real names). HFASD is a term used by researchers and clinicians to refer to children diagnosed with ASD without intellectual impairment, that is, with IQ

above 70 (Hartley and Sikora 485). They were diagnosed with HFASD by child psychiatrists at Malaysian government hospitals. All of them were enrolled in a non-profit centre catering to children with special needs in Kuala Lumpur. They were selected for this study because of their ability to comprehend spoken English. All the participants are of Malay ethnicity, from middle-class families; and based on reports by the teachers at the centre, these children are learning English as their L2. In terms of overall English proficiency, based on the teachers' assessments, Aron and Danny are classified as intermediate English learners, while Zaff is an advanced learner. The following section further describes the participants' background.

a) Aron

Aron is a 12-year-old boy and an intermediate English learner. He has been with the centre for three years and, at the time of this study, he was just beginning to read whole sentences. It was observed that Aron encountered difficulties when engaging in activities and in following verbal instructions. He required guidance to follow simple instructions. Nonetheless, he was able to learn once he understood what was being taught. One of his habits was to hold his napkin during the lessons and playtime constantly. He was also easily distracted by what occurred around him and would spontaneously ask questions and communicate, most often in Malay. However, during the DMFonF sessions, it was observed that he tended to use English.

b) Danny

Danny is a 10-year-old boy and also an intermediate English learner. Like Aron, Danny has been attending the centre for three years. In terms of his reading ability, at the time of this study, he could read words but had yet to reach the sentence level. While Danny demonstrated weak reading skills, he seemed to have excellent memorisation skills. He is always shy towards strangers and takes considerable time to get along with other people (e.g., he took one week to engage with the researchers). In terms of behaviour, Danny tended to make some sounds during classes, though he cooperated well during play activities. He demonstrated excellent eye contact and engaged in spontaneous speech with the researchers. Compared to that of other participants, Danny's performance during the class mainly depended on his mood. He would produce a low volume of speech if he was tired or bored and would produce a higher volume of speech and show excellent behaviour if he was in a good mood.

c) Zaff

Zaff is an 8-year-old boy and is considered to be an advanced English learner. In terms of his proficiency skills, at the time of this study, Zaff could read at sentence level but showed low comprehension skills. On the other hand, he showed major behavioural issues during the class. For instance, he was always active in class, which could sometimes be disruptive to other students. He was always running around, playing with the microphone and sometimes singing aloud. While Zaff showed inconsistent eye contact with the researchers, we found that he was able to cooperate and understood the lessons well.

In terms of English lessons, the school states that the participants learn English once a week. The duration of each class is 30 minutes. The students are taught reading using whole-word approach, while the comprehension activities include filling in the blanks.

Research Procedure

The study is a quasi-experimental investigation on the effectiveness of DMFonF on the acquisition of English plurals in children with ASD. The duration of the study was sixteen weeks, which included the pre-test (T0), the DMFonF intervention (twelve weeks), test one (T1, week five), test two (T2, week nine), test three (T3, week thirteen), and post-test four (T4, week sixteen). The pre-test was conducted prior to the intervention to check the participants' knowledge of English plurals. Every four weeks, the researchers tested the participants on items they have been learning within that particular month. At the end of the study, a post-test was administered to evaluate the participants' overall acquisition of singular/plural lexicon and grammar. All the sessions, both the teaching and testing sessions, were audio and video recorded. Once recorded, all the sessions were transcribed using ELAN (Sloetjes and Wittenburg) for analysis. Figure 2 shows the flow of the research:

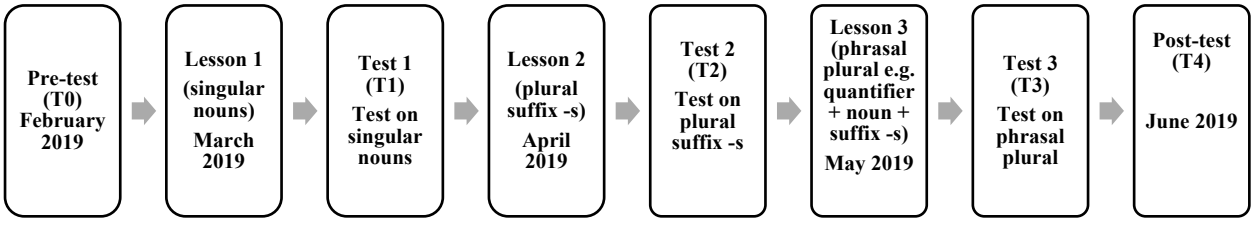

Figure 2 Flow of the research from February 2019 to June

DMFonF Lessons

After the pre-test, the children received the DMFonF instruction in their English lessons for twelve weeks. One of the researchers taught the children at the centre every week. The DMFonF lessons designed by the researchers are shown in Table 2.

Table 2
The DMFonF lessons

Theme/PT stages	**March (Lemma Access)**	**April (Category Procedure)**	**May (Phrasal Procedure)**
1st week Theme: Animals	*E.g., dog, rabbit.*	*E.g., dogs, rabbits.*	*E.g., two dogs, many rabbits.*
2nd week Theme: Objects	*E.g., book, pencil.*	*E.g., books, pencils.*	*E.g., three books, many pencils.*
3rd week Theme: Vegetables	*E.g., tomato, carrot.*	*E.g., tomatoes, carrots.*	*E.g., five tomatoes, many carrots.*
4th week Theme: Fruits	*E.g., banana, mango.*	*E.g., bananas, mangoes.*	*E.g., nine bananas, many mangoes.*

Tests and Data Analysis

All the tests (T0, T1, T2, T3, T4) were in the form of picture elicitation task. In every test, the researchers showed twenty-nine pictures of singular entities and twenty-nine pictures of plural entities to the participants in order to elicit the targeted structures. Example of the prompts are in Figure 3:

Figure 3 Examples of prompts used in the tests.

The singular and plural expressions produced by the participants in the tests were coded based on categories adapted from Mohamed Salleh et al. ("A case study on the acquisition of plurality" 30), shown in Table 3.

Table 3
Plural categories coded in the participants' output

Plural Categories	**Definition**	**Example from the corpus**
Default form	The participants used singular noun when a picture of more than one item was shown.	*Apple.*
Counting	The participants counted the items in the picture, without mentioning the noun.	*One, two, three, four.*
Counting + noun + suffix -*s*	The participants used noun + suffix *-s,* accompanied by counting.	*One, two, three, four, five, six ducks.*
Suffix -*s*	The participant produced noun with the suffix *-s.*	*Apples.*
Indefinite quantifier *many* + default form	The participants used the quantifier *many* with the default form of noun to describe plural items.	*Many lemon.*
Indefinite quantifier *many* +noun + suffix -*s*	The participant used quantifier *many* with noun and suffix *-s* to describe plural items.	*Many carrots.* *Many rabbits.*
Numeral quantifier + default form	The participant used a numeral quantifier with the default form of noun to describe plural items.	*Two orange.* *Three chair.*
Numeral quantifier + suffix -*s*	The participant used a numeral quantifier with noun and suffix *-s* to describe plural items.	*Two cats.* *Three rabbits.*

In determining the acquisition of a grammatical structure, the emergence criteria (Pallotti) were used in this study instead of accuracy counts. Following the emergence criteria, acquisition does not, in any case, mean that the learner will use that structure consistently. There is usually a time over which production of the structure will be variable. Unlike accuracy criteria, which are arbitrarily set at some percentage of production of the appropriate structure, e.g., at 80% or 60% correct (Pallotti 362). PT uses emergence criteria to determine whether a structure is acquired, stipulating that there must be lexical and structural variation. In other

words, the structure must appear more than once in different structural contexts and with different lexical items. These criteria ensure that formulaic expressions are flushed out from the acquisitional analysis.

Results and Discussion

The following discussion elaborates the findings based on the research question posed earlier**:**

How effective is the *Developmentally Moderated Focus-on-Form* (DMFonF) instruction on the acquisition of English lexical and phrasal plural structures among Malaysian children with ASD?

To establish the English singular and plural baseline knowledge for the participants, a pre-test (T0) was conducted. Findings from T0 revealed that when the participants were shown pictures of a singular item, they were able to produce the default form; for example, all of them produced *"apple"* to describe one apple. When shown pictures of plural entities, on the other hand, their strategies in pluralising nouns involved counting. For instance, Aron described a picture of many apples as "*One, two, three, four apple*" (counting + default form). Zaff also used a similar strategy when describing the same picture, but he marked the plural on the noun, "*one, two, three, four, four apples*" (counting + noun + suffix *-s*). Danny, on the other hand, said "*four apples*" (numeral quantifier + suffix *-s*). This counting strategy is similar to the findings in Mohamed Salleh et al. ("A case study on the acquisition of plurality" 32), in which the bilingual participant was found to use counting strategy prior to acquiring the grammatical structures of English plural. Wood et al. also substantiated this finding, affirming that children from many cultures typically use counting strategies before learning the grammatical plural structures in a language. Therefore, based on the findings from T0, we may assume that, at the conceptual level, all the participants were able to distinguish between one versus more-than-one items. However, some of them have yet to acquire English grammatical plural at this point.

The DMFonF instruction began after T0. From week one to week four, the children were taught singular nouns for animals, fruits, vegetables, and objects, in line with the Lemma Access stage outlined in PT (refer to Table 3). Table 4 shows the participants' results in T1, T2, T3 and T4. The number appearing immediately after the symbol '**/**' in the table indicates the total number of nominal prompts in the test; the number after '**+**' indicates appropriate production, such as "*orange*" for singular noun, "*oranges*" for noun + suffix -s and "*many oranges*" for phrasal plural (*many* + *noun* + *suffix -s*); '**-**' signifies the lack of production where required; and '**>**' shows over-suppliance of the required marker, for example, "*one oranges*".

Table 4

Results in T1, T2, T3 and T4

Participant	T1 (test on singular noun)	T2 (test on noun+ suffix-*s*)	T3 (test on quantifier+ noun+ suffix -*s*)	T4 (session a)	T4 (session b)
Aron	+29/29	+28>1/29	+28-1/29	+25-4/29	+27-2/29
Danny	+29/29	+24-5/29	+26-1>1/29	+27-2/29	+28-1/29
Zaff	+28>1/29	+24>5/29	+28-1/29	+22-7/29	+27-2/29

At T1, from the twenty-nine items tested on singular entities, Aron and Danny were able to produce the default form for all items correctly. Zaff, on the other hand, had all the nouns in the default form except for one overextension. The following illustrates Zaff's answer in T1.

Researcher: What is this? (showing a picture of a horse)
Zaff: Horses

Zaff's response for that one noun (*horse*) is parallel to the findings by Agostini and Best. Their HFASD participant had produced one plural noun in a singular context. However, in Zaff's case, he had yet to be introduced to the plural suffix *-s*, whereas the participant in Agostini and Best had received three weeks of instruction when the child made the over-suppliance in a singular-noun context in which he had produced the noun suffix *-e* in "*galline*" (hens) instead of "*gallina*" (one hen).

At T2, Aron produced twenty-eight utterances containing noun+ suffix -s (e.g., *flowers*) when shown pictures of plural entities. There was one counting + noun + suffix *-s* occurrence, reflected in his utterance *"one, two chairs*" when he described a picture of two chairs. He produced the plural for all nouns correctly except for the word "*book*", which he pronounced as "*bookses*". In the recording, prior to uttering "*bookses"*, Aron produced "*horses*" and "*foxes*" in describing the plural prompts. We postulate that "*bookses*" was Aron's overgeneralisation of the suffix *-es*. Zaff adopted a similar strategy when he overgeneralised the suffix *-es* on several items. This is shown in the following conversation:

Researcher: What are these, Zaff? (showing a picture of two ducks)
Zaff: Duckses
Researcher: How about these? (showing a picture of two watermelons)

Zaff: Watermelonses

Danny, on the other hand, had difficulty in producing the plural form for nouns ending with the sound "*o*" and reverted to the default form (reflected in five occurrences of default form in T2). The following conversation illustrates Danny's difficulty at T2.

Researcher: What are these? (showing a picture of two mangoes)
Danny: Mango.
Researcher: How about these? (showing a picture of two tomatoes)
Danny: Tomato.

Zaff's and Aron's overgeneralisation of the suffix *-es* on those nouns also occurred in Di Biase et al.'s study on the morphological development of an early ESL Japanese learner. Di Biase et al.'s participant, Kumi, was found to be 'obsessed' with the suffix *-s* when she made over-suppliance in all singular contexts except in two occurrences. As explained by the authors, this occurrence was due to Kumi's acquisition of the plural suffix *-s* that led to over-suppliance. In our study, it is possible that the over-suppliance was due to Zaff's and Aron's perception of 'echo' on plural-sounding English words like *fox* and *box*, which are actually singular. Then, in learning the plurals (*foxes, boxes*), they may be led to believe that in pluralising nouns, the suffix *-es* must be added. The *-es* plural suffix, which is restricted to nominals ending in sibilants, is generalised to other nominals.

In the T3 test, all participants produced the correct phrasal plural structures using mainly *many* + noun + suffix *-s* constructions (e.g., *many bananas).* Results in T3 is very interesting because previous studies investigating plural development among typically developing L1 children (e.g., Clark and Nikitina) and bilingual children (e.g., Hardini et al.; Mohamed Salleh et al. "The development of plural expressions") have found that when children start to mark plural with quantifiers, they tend to drop the suffix *-s* on nouns, hence marking plural on only one element in the noun phrase (NP). Typically developing children tend to use the quantifiers + default form (e.g., *many duck, two blanket*) first before they acquire the grammatical phrasal plural agreement.

However, in this study, the children appeared to acquire phrasal plural structures in an expeditious manner – their abundant suppliance of the construction suggests that they managed to acquire the structure as a grammatical plural marking in English only four weeks of instruction using DMFonF. At this point, it is unclear whether the rapid acquisition was mainly due to DMFonF instructional practice or perhaps, because children with ASD on the high-functioning spectrum, as documented in some studies (e.g., Mohd Yusoff et al. "English morphosyntactic performance"; Tsatsanis "Heterogeneity in learning

style"), are "quick" language learners, more so than typically developing children due to their exceptional memorisation/recalling skills. We surmise that the rapid acquisition may be attributed to both factors: the DMFonF instruction and their exceptional recall ability.

Finally, after twelve weeks of DMFonF instruction, the post-test was conducted to gauge the overall effectiveness of the approach. For the post-test (T4), two sessions were conducted; session A, in which the participants were shown pictures of singular and plural items, and session B, in which they were only shown pictures of plural entities. The two sessions were administered in such a way as to elicit the lexical plural (noun + suffix *-s*) and phrasal plural (quantifier + noun + suffix *-s*).

In session A, the three participants were able to describe singular items using singular nouns. The difference lies in their strategies in pluralising the nouns: Aron and Zaff primarily deployed the numeral quantifier + noun + suffix *-s* (e.g., *two pineapples*) strategy to mark plurality while Danny, whose performance significantly improved in this session compared to T2 and T3, mainly used noun + suffix *-s* (e.g., *rabbits*). Default form (e.g., *tomato*) and numeral quantifier + default form (e.g., *two apple*) were used by the participants to describe plural entities but only in a few items.

In Session B, the indefinite quantifier *many* + noun + suffix *-s* (e.g., *many cats, many chairs)* was the main strategy used by the participants to pluralise nouns. In the DMFonF lessons, they were also taught to use numeral quantifier+ noun+ suffix-*s* (e.g., *two cats*) to indicate plurality. However, based on the findings, the participants seemed to have strongly associated the phrasal plural agreement with indefinite quantifiers *many*. This could possibly be attributed to the frequent use of *many* during the DMFonF instruction. This finding echoes the evidence in many studies that when it comes to rote learning, HFASD learners are more likely to have a higher recall ability. Similar to T3, in session B of the post-test, the participants demonstrated a remarkable ability in producing English grammatical phrasal plural structures, which their typically developing counterparts might find difficult. For typically developing children, the acquisition of this structure was found to be extended in terms of time. The development was also found to be in a piecemeal and sporadic manner as the combination of several elements in the NP might cause some cognitive overload; hence children tend to resort to a simpler strategy, i.e., using the quantifier with the default form (e.g., *many cat)*. However, for children with ASD, at least in this study, a different acquisition pattern is shown – their speed of acquisition appears to be quicker than other children – which corroborates the findings in Agostini's and Best's study.

To summarise, based on the results, DMFonF instruction appears to be an effective pedagogical method to assist children with ASD in developing their grammatical skills in the L2, specifically in this case, the acquisition of English plural structures. The results at each test (T1, T2, and T3) and the post-test (T4)

show that the participants managed to learn the targeted structures quickly. These findings suggest that the effectiveness of DMFonF instruction is not only applicable to typically developing children, as shown in earlier studies on Italian (Di Biase) and Indonesian children (Hardini et al.), but it may also be extended to children with ASD. However, the findings here must be treated with caution – the children in this study were taught in a very small class. It is possible that there would be different results if DMFonF is used in a big class of learners.

Conclusion

This study investigates English plural development of children with ASD in the Malaysian context using a new L2 approach, DMFonF, which had not been done previously. Our results show that the three children in the study acquired the English vocabulary and plural marking structures according to the lessons taught. It can be concluded that since the acquisition criteria were satisfied (and fully supported by remarkable overall accuracy), the DMFonF instruction had a positive effect on their language development. Over sixteen weeks, they acquired the English lexicon and grammatical plural structures, namely, noun + suffix *-s* (e.g., *tigers*) followed by the phrasal plural, which is the use of numeral quantifiers + noun + suffix *-s* (e.g., *three apples*) and indefinite quantifiers many + noun + suffix-*s* (e.g., *many birds*) in a rapid manner. These children's development follows the same trajectory reported in other plural acquisition studies.

However, in terms of the speed of acquisition, we found that our participants acquired the targeted structures possibly faster than their typically developing peers. At this juncture, we posit that it is not solely DMFonF that might be responsible for the rapid acquisition; these children, being high-functioning children with ASD, have an advantage in terms of their recall ability in rote learning. Also, being in Malaysia, they are not exactly in a foreign language context. To further confirm this finding, however, we suggest future research to use DMFonF with several groups: the high-functioning and the low functioning children with ASD, together with typically developing control groups. This may enable the pattern of acquisition to be more clearly discerned. In addition, future research should also include female participants with ASD since gender differences may turn out to be a contributing factor. The findings of the present study are limited by the small sample size; hence they may not be generalisable. However, as this is the first study to use DMFonF on the population with ASD, the results are significant and may form the basis of understanding the L2 development and processing among children with ASD in Malaysia.

Works Cited

Agostini, T. G, and C. Best. "Exploring Processability Theory-Based Hypotheses in the Second Language Acquisition of a Child with Autism Spectrum Disorder." *Grammatical Development in Second Languages : Exploring the Boundaries of Processability Theory*. Eds. Bettoni, Camilla and B. Di Biase. Italy: Eurosla, 2015.

American Psychiatric Association. "Autism Spectrum Disorder." *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. Washington: American Psychiatric Association, 2013. 50-60.

Azman, H. "Implementation and Challenges of English Language Education Reform in Malaysian Primary Schools." *3L: The Southeast Asian Journal of English Language Studies* 22.3 (2016): 65-78.

Berko-Gleason, J. "The Child's Learning of English Morphology." *Word* 14 (1958): 150-77.

Bloom, Paul, and Karen Wynn. "Linguistic Cues in the Acquisition of Number Words." *Journal of Child Language* 24 (1997): 511-33.

Bonilla, Carrie L. "From Number Agreement to the Subjunctive: Evidence for Processability Theory in L2 Spanish." *Second Language Research* 31.1 (2015): 53-74.

Brown, Roger. *A First Language: The Early Stages*. Cambridge: Harvard University Press, 1973. Print.

Cazden, C.B. "The Acquisition of Noun and Verb Inflections." *Child Development* 39.2 (1968): 433-48.

Che Musa, Normazidah , Y.L. Khoo, and Hazita Azman. "Exploring English Language Learning and Teaching in Malaysia." *Gema Online Journal of Language Studies* 12.1 (2012): 35-51.

Chu, Shin Ying, et al. "Challenges Faced by Parents of Children with Autism Spectrum Disorder in Malaysia." *Speech, Language and Hearing* 23.4 (2020): 221-31.

Clark, Eve V, and Tatiana V Nikitina. "One Vs. More Than One: Antecedents to Plural Marking in Early Language Acquisition." *Linguistics* 47.1 (2009): 103-39.

Dai, Yael G, et al. "Language Abilities in Monolingual-and Bilingual-Exposed Children with Autism or Other Developmental Disorders." *Research in autism spectrum disorders* 55 (2018): 38-49.

de Villiers, J., and P. de Villiers. "A Cross-Sectional Study of the Acquisition of Grammatical Morphemes in Child Speech." *Journal of Psycholinguistic Research* 2 (1973): 267-78.

Di Biase, B. "Focus-on-Form and Development in L2 Learning." *Processability Approaches to Second Language Development and Second Language Learning*. Ed. Kessler, Jorg-U. Newcastle: Cambridge Scholar Publishing, 2008. 197-219.

Di Biase, Bruno , Satomi Kawaguchi, and Yumiko Yamaguchi. "The Development of English as a Second Language." *Grammatical Development in Second Languages:Exploring the Boundaries of Processability Theory*. Italy: EuroSLA, 2015. 85-116.

Di Biase, Bruno, and Camilla Bettoni. "The Development of Italian as a Second Language." *Grammatical Development in Second Languages: Exploring the Boundaries of Processability Theory*. Eds. Bettoni, Camilla and Bruno Di Biase. Italy: Eurosla, 2015. 117-48.

Ellis, Rod. "Focus on Form: A Critical Review." *Language Teaching Research* 20.3 (2016): 405-28.

Feigenson, Lisa., S. Dehaene, and E. Spelke. "Core Systems of Number." *TRENDS in Cognitive Sciences* 8.7 (2004): 307-14.

Ferenz, Krag S., and Sandeep Prasada. "Singular or Plural? Children's Knowledge of the Factors That Determine the Appropriate Form of Count Nouns." *Journal of Child Language* 29 (2002): 49-70.

Gao, X. "Noun Phrase Morphemes and Topic Development in L2 Mandarin Chinese : A Processability Perspective.". University of Victoria, 2005.

Gill, Saran Kaur. *Language Policy Challenges in Multi-Ethnic Malaysia*. New York: Springer, 2014.

Gonzalez-Barrero, Ana Maria, and Aparna Nadig. "Brief Report: Vocabulary and Grammatical Skills of Bilingual Children with Autism Spectrum Disorders at School Age." *Journal of autism and developmental disorders* 49.9 (2019): 3888-97.

Hardini, Isriani, et al. "The Effect of Developmentally Moderated Focus on Form Instruction in Indonesian Kindergarten Children Learning English as a Foreign Language." *Instructed Second Language Acquisition* 4.1 (2020): 49-61.

Hartley, Sigan L, and Darryn M Sikora. "Which Dsm-Iv-Tr Criteria Best Differentiate High-Functioning Autism Spectrum Disorder from Adhd and Anxiety Disorders in Older Children?" *Autism* 13.5 (2009): 485-509.

Jellinek, Michael S., et al. "Severe Developmental Disorders and Bilingualism." *Journal of the American Academy of Child & Adolescent Psychiatry* 38.9 (1999): 1197.

Kaur, Jasvindar, et al. "Technical Report Autism Spectrum Disorder Research in Malaysia." Kuala Lumpur: Institute for Public Health, Ministry of Health, Malaysia, 2015.

Kawaguchi, Satomi. "The Development of Japanese as a Second Language." *Grammatical Development in Second Languages :Exploring the Boundaries of Processability Theory*. Eds. Bettoni, Camilla and Bruno Di Biase. Italy: Eurosla, 2015. 149-72.

Kay-Raining Bird, E., E. Lamond, and J. Holden. "Survey of Bilingualism in Autism Spectrum Disorders." *International Journal of Language & Communication Disorders* 47 (2012): 52-64.

Long, M. H. "Focus on Form: A Design Feature in Language Teaching Methodology. " *Foreign Language Research in Cross-Cultural Perspective*. Eds. K. D. Bot, C. Kramsh and R. Ginsberg. Amsterdam: John Benjamins, 1991.

Low, Hui Min, et al. "A Survey of Lay Knowledge of Autism Spectrum Disorder in Malaysia." *Jurnal Sains Kesihatan Malaysia* 19.1 (2021): 49-57.

Mansouri, F. "Agreement Morphology in Arabic as a Second Language: Typological Features and Their Processing Implications." *Cross-Linguistic Aspects of Processability Theory*. Ed. Pienemann, Manfred. Amsterdam: John Benjamins, 2005. 117-53.

Mansouri, Fethi, and Gisela Håkansson. "Conceptualising Intra-Stage Sequencing in the Learner Language." *Second Language Acquisition Research: Theory-Construction and Testing*. Ed. Mansouri, Fethi. Cambridge: Cambridge University Press, 2007. 95-119.

McMahon, Caitlin R, et al. "Parents of Children with Autism Spectrum Disorders Have Merited Concerns About Their Later-Born Infants." *Research & Practice for Persons with Severe Disabilities* 32.2 (2007).

Meir, Natalia, and Rama Novogrodsky. "Syntactic Abilities and Verbal Memory in Monolingual and Bilingual Children with High Functioning Autism (Hfa)." *First Language* 40.4 (2020): 341-66.

Mervis, C.B., and K.E. Johnson. "Acquisition of the Plural Morpheme: A Case Study." *Developmental Psychology* 27.2 (1991): 222-35.

Ministry of Education. *Malaysia Education Blueprint 2013-2025 (Preschool to Post Secondary Education)*. Putrajaya, Malaysia: Ministry of Education Malaysia, 2013.

Mohamed Salleh, Rabiah Tul Adawiyah, B., Di Biase, and Ramlan, W.N.M "The Acquisition of English Grammar among Malay-English Bilingual Primary School Children." *GEMA Online® Journal of Language Studies* 20.4 (2020): 166-85.

Mohamed Salleh, Rabiah Tul Adawiyah, Bruno Di Biase, and Satomi Kawaguchi. "Lexical and Morphological Development: A Case Study of Malay English Bilingual First Language Acquisition." *Psychology of Language and Communication* 25.1 (2021): 29-61.

Mohamed Salleh, Rabiah Tul Adawiyah, Satomi Kawaguchi, and B., Di Biase. "A Case Study on the Acquisition of Plurality in a Bilingual Malay-English Context-Bound Child." *GEMA Online®Journal of Language Studies* 19.3 (2019): 22-42.

Mohamed Salleh, Rabiah Tul Adawiyah, et al. "The Development of Plural Expressions in a Malay-English Bilingual Child." *Asiatic* 10.2 (2016): 60-81.

Mohd Yusoff, Yusniza, et al. "An Account of High-Functioning Autism Spectrum Disorder (ASD) Children Focusing on Their Language Abilities." *Journal of Advanced Research in Dynamical & Control Systems* 10.6 (2018): 15-22.

Mohd Yusoff, Yusniza, et al. "English Morphosyntactic Performance of a High-Functioning Asd Child: Implications on Elt." *Malaysian Journal of Learning and Instruction*.1 (2019): 155-79.

Neik, Tina Ting Xiang, et al. "Prevalence, Diagnosis, Treatment and Research on Autism Spectrum Disorders (Asd) in Singapore and Malaysia." *International Journal Of Special Education* 3 (2014).

Ohashi, J. Kaori, et al. "Comparing Early Language Development in Monolingual- and Bilingual- Exposed Young Children with Autism Spectrum Disorders." *Research in Autism Spectrum Disorders* 6.2 (2012): 890-97.

Pienemann, Manfred. *Language Processing and Second Language Development: Processability Theory*. Philadelphia: John Benjamins Publishing Company, 1998.

Pienemann, Manfred, and G. Håkansson. "A Unified Approach Towards the Development of Swedish as L2: Processability Account." *Studies in Second Language Acquisition* 21 (1999): 383-420.

Sloetjes, Han, and Peter Wittenburg. *Elan*. Vers. 4.9.3. Computer software, 2008.

Soh, Or-Kan, Hazita Azman, and Su Mei Ho. "A Systematic Review on Bilingualism and Language Processing from 2015-2019." *3L: The Southeast Asian Journal of English Language Studies* 26.1 (2020): 18-31.

Tek, Saime, et al. "Longitudinal Analyses of Expressive Language Development Reveal Two Distinct Language Profiles among Young Children with Autism Spectrum Disorders." *Journal of autism and developmental disorders* 44.1 (2014): 75-89.

Tsatsanis, Katherine D. "Heterogeneity in Learning Style in Asperger Syndrome and High-Functioning Autism." *Topics in Language Disorders* 24.4 (2004): 260-70.

Waterhouse, Lynn, and Deborah Fein. "Language Skills in Developmentally Disabled Children." *Brain and Language* 15.2 (1982): 307-33.

Wood, J., S. Kouider, and S. Carey. "Acquisition of Singular-Plural Morphology." *Developmental Psychology* 45.1 (2009): 202-06.

Yahya, S., M. Md Yunus, and H. Toran. " Facilitating Esl Students with Autism Learn Sight Vocabulary: Teachers' Practices and Voices." *International Journal of Sciences: Basic and Applied Research* 11.1 (2013): 90-98.

Yahya, S., M. Md Yunus, and H. Toran. "Helpful Practices in Teaching Sight Vocabulary to Esl Students with Autism: The Malaysian Experience." *Pensee Journal* 75.10 (2013): 355-64.

Yahya, S., M. M. Yunus, and H. Toran. "Instructional Practices in Enhancing Sight Vocabulary Acquisition of Esl Students with Autism. ." *Procedia - Social and Behavioral Sciences* 93 (2013): 266-70.

Yamaguchi, Y. *Child Second Language Learning: A Study of English as a Second Language Acquisition*. Saarbrücken, Germany: LAP Lambert Academic Publishing, 2013.

Zhang, Y. "Processing and Formal Instruction in the L2 Acquisition of Five Chinese Grammatical Morphemes." *Cross-Linguistic Aspects of Processability Theory*. Ed. Pienemann, Manfred. Germany: John Benjamins, 2005. 155-77.

Zhang, Y., and I. Widyastuti. "Acquisition of L2 English Morphology: A Family Case Study." *Australian review of applied linguistics* 33.3 (2010): 29.1-29.17.