Effects of Pedagogical Translanguaging on Grammar Learning for Chinese Primary School Students in Early Foreign Language Learning

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However, I alone am responsible for all the errors that may occur in this study.

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Abstract

This intervention study investigates effects of pedagogical translanguaging on grammar development among 145 sixth-grade Chinese primary school students who are at the early stages of learning English as a foreign language (EFL). In a pre-post design, the participants were randomly allocated to a Translanguaging group, an English-only group, and a Control group to learn the target "there be" structure by watching the same video. The Translanguaging group and the English-only group later practiced the target sentence structure in a "spot-the-difference" activity within the same amount of time. The three groups were evaluated based on a translation test and a grammaticality judgement test presented aurally. Observation of the practice activity and focus group interviews with the Translanguaging and English-only group were also conducted. Results show significant gains for all three groups from pre-tests to post-tests, but no significant difference between the gains of the three groups. However, as reflected in the practice activity and the interviews, the Translanguaging group practiced the target sentences more and with higher accuracy and expressed more positive attitudes towards the learning. These findings demonstrate that pedagogical translanguaging at least does not harm grammar learning. It allows learners to have more opportunities to practice, which suggests that it might be effective in boosting learning over a longer intervention.

Keywords: Pedagogical translanguaging, Chinese EFL learners, grammar development

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I. Introduction

Monolingual strategy has been traditionally seen as the norm in foreign language (FL) learning and teaching (Makalela, 2015; McMillan & Rivers, 2011; Wang, 2014) and the monolingual ideology has long been in the minds of teachers, language learners, and even policy makers (Lin, 2015). The monolingual view was adopted to reduce mistakes in the target language caused by negative linguistic transfer from the first language (L1) and to give students the most exposure to the target language (Cenoz et al., 2021). Based on this traditional view of language separation, using L1 in FL learning has been seen as signs of disfluency (Bergmann et al., 2015). However, as the linguistic landscape is becoming more complex in various contexts and social domains (Creese & Blackledge, 2010), the strict separation of languages has been gradually questioned (Cummins, 2007). To break away from the monolingual restraints, the last few decades witnessed a shift towards bilingualism and multilingualism that gradually emphasized the dynamism of language learning (Blommaert, 2010; Canagarajah, 2011; Hornberger & Link, 2012). Among the new notions and theories established in this shift, translanguaging is one of the most fluid and flexible notions that puts multilingualism at its center (Cenoz & Gorter, 2021; García & Li, 2014; Lin, 2015).

When translanguaging was coined by Cen Williams (Williams, 1994), it was used to describe a bilingual education context where learners alternate between their first language (L1) and their second language (L2) for productive and receptive use of the language. In his thesis (Williams, 1994), he argued that translanguaging allows students to understand and development Welsh better. Since first being coined, the term has become an umbrella term that covers a variety of theories and practices and has been used for different purposes (Cenoz & Gorter, 2020; Leung & Valdes, 2019). Baker and Wright (2017) focused on natural translanguaging that takes place in paired or group oral tasks and found it facilitated communication. García and Lin (2017) emphasized translanguaging and social justice as well as the empowerment of minority students. However, the diverse meanings of translanguaging as mentioned above have been criticized by some researchers to be confusing (Jaspers, 2018). The

concept is expanding faster than the studies evaluating its effectiveness (Poza, 2017).

To have a more focused discussion on the effectiveness of translanguaging in the context of instructed foreign language (FL) teaching, this study will only examine the effectiveness of pedagogical translanguaging (PTL), which refers to the use of learners' whole linguistic repertoire that includes different languages for input and output under teacher instructions (Cenoz, 2017). This instructed FL context should be distinguished from situations where multiple languages occurred spontaneously in bilingual contexts with a focus on other content (Cenoz & Gorter, 2021).

Evaluating the effectiveness of PTL can not only help develop diverse practices that is most beneficial to learners in bilingual and multilingual contexts (Cenoz, 2017), but also advance the theoretical understandings of bilingual and multilingual education (García & Otheguy, 2020). PTL has generally been hypothesized to be effective because it activates the language resources in a multilingual speaker and improves language learning with the help of the learners' whole linguistic repertoire (Duarte & Kirsch, 2020; Tedick & Lyster, 2020). Studies on PTL have mostly been on qualitative effects of translanguaging, for example, description of translanguaging practices (e.g. Wang, 2019), teachers' and students' attitudes and perceptions (e.g. Canagarajah, 2011; Daniel et al., 2019), and translanguaging and learner identity (e.g. Creese & Blackledge, 2015). Among the few intervention studies on PTL, most investigated vocabulary as the target of learning (e.g. Busse et al., 2019; Chalmers, 2019; Galante, 2020). The impact of translanguaging on grammar learning has rarely been explored (Hopp et al., 2021). Therefore, this study aims to examine whether and how PTL would influence grammar learning for Chinese EFL learners in early foreign language learning through an experiment on sixth-grade students who learned the target grammatical structure "there be" in a pre-post design.

The structure of this dissertation is as follows: Chapter 2 reviews the theoretical basis for PTL and the empirical studies on PTL to reveal the research gap and propose the research questions. Chapter 3 and 4 states the empirical design of the study and reports the quantitative and qualitative results, follows by discussions in Chapter 5. Chapter 6 concludes this study with an overview of the findings, limitations and

future directions, and implications.

II. Literature review

This chapter begins by introducing the origins and definitions of translanguaging and then narrows the definitions down to PTL that will be adopted in this study. This is followed by an overview of two theories informing PTL to better understand the concept and its relations with language learning and teaching. Then, this chapter critically reviews the intervention studies on PTL and point out the research gap based on their findings and limitations. Against this background, the current study and the research questions are elaborated at the end of this chapter.

2.1 Origins and definitions of translanguaging

The concept of translanguaging was initially coined as *trawsieithu* by the Welsh educator Cen Williams (1994) to refer to a pedagogical practice where students in Welsh-English bilingual classrooms were asked to alternate languages for receptive or productive language use. This term was later translated into English by Baker (2011) as *translanguaging*, referring to learners' use of two languages to make meaning, to obtain understanding and to gain knowledge. Since first being introduced, translanguaging has attracted researchers from various fields because it provides a new perspective of the complexity of language learning and communicating (Li, 2021). Different researchers have provided different definitions of this concept from their research perspectives. Baker (2011) defined translanguaging as learners' ability to use two languages to construct meaning, structure experience, and to understand the world. Lewis and his colleagues (2012) elaborated that in translanguaging, the functionally integrated use of two languages goes beyond language learning and can mediate the mental process in daily communications. These definitions, although transcending the traditional view of stigmatizing the use of L1 in L2 settings (Macaro, 2001; Shohamy, 2006), still adhered to the language separation perspective, which represents the structuralist ideology that believes there are clear-cut boundaries between named languages (Catherine & Claudia, 2015).

Some researchers disagreed with this structuralist view (e.g. Cook, 2007; García & Li, 2014; Palmer et al., 2014). García and Li (2014) proposed that the different

autonomous languages (such as English, Japanese, etc.) are sociopolitical constructs and are just linguistic features. In addition, language in this definition is a process that uses mixed and fluid linguistic codes for communication, rather than an entity (Li, 2011). Under this dynamic perspective of bilingualism, García and Li (2014) defined translanguaging as the practices of bilinguals to use linguistic features to maximize communicative potential and to achieve communicative effect (García, 2009; García & Li, 2014). Li and Shen (2021) further explained that "trans" in "translanguaging" emphasized its cross-boundary nature; "ing" suggested that it is dynamic and interactive; and "language" does not refer to the traditional concept of linguistic codes, but refers to the meaning-making process.

This dynamic view of translanguaging has attracted global attention across different research fields (Canagarajah, 2011; García, 2009; Hornberger & Link, 2012; Palmer et al., 2014) and has provided a new theoretical perspective for bilingualism and multilingualism (Cenoz & Gorter, 2015; Creese et al., 2018; Lewis et al., 2012; Vallejo, 2018). However, as a theory, translanguaging seems to be built on the basis of deconstructing existing ideas (e.g. the boundaries between languages, the sociopolitical factors in bilingualism) without constructing a theory or a practice that is concrete and practical to follow. In addition, proponents of the concept attempted to apply translanguaging to various contexts, e.g. social justice, bilingualism and multilingualism, pedagogical translanguaging, multimodal interaction (expanding the linguistic features to include numbers, emojis, etc.), language governance, etc (Li & Shen, 2021). Such ambitious development had left many concepts in the definitions vague and unclarified. In some empirical studies that attempted to test the efficacy of this theory which will be reviewed later, researchers have their own interpretations and applications of translanguaging in research designs that did not actually reflect or follow the principles of translanguaging, which could leave the research findings in doubt.

For the purpose of this study, the extensions of translanguaging in other fields will be omitted. To lead the design and discussion, translanguaging will only be seen as a pedagogical practice (focusing on student translanguaging under teacher

instruction) that refers to the theoretical and instructional approach that uses a learner's whole linguistic repertoire to facilitate language learning in instructed FL contexts. The next section will discuss in more details the theories that inform the conceptualization of PTL.

2.2 Theoretical foundations of pedagogical translanguaging

Theoretically, the two most influential approaches to pedagogical translanguaging are from languaging (Becker, 1991; Swain, 2006) and bilingual pedagogy (Williams, 1994; García, 2009). By examining the theoretical foundations, we could form a better understanding of how pedagogical translanguaging informs language learning.

2.2.1 Translanguaging and bilingualism

As aforementioned, the earliest defined translanguaging as from Cen Williams referred to a pedagogical practice of switching between languages in bilingual classrooms. The switching and combining in this case are strategic and deliberate, involving the use of one language to reinforce the other to help learners understand and improve both languages (Williams, 2002). In this way, one language helps scaffold the other, which means that the use of L1 enables the learners to concentrate on the second language (L2) elements within their range of language competence, especially when the elements that are initially beyond their capacity is controlled (Wood et al., 1976). Although most studies on scaffolding see it as a teachers' technique that uses the target language to scaffold language learning in multilingual classrooms (e.g. Saxena, 2010; van de Pol et al., 2015), learners' use of multiple languages for scaffolding is also gaining attention, addressing the importance of the diverse and dynamic linguistic repertoires learners could bring to language learning. Along this line, translanguaging also emphasizes the dynamism of bilingualism and multilingualism and brings in multiple language practices in communicative situations (García & Flores, 2014).

Furthermore, the *common underlying proficiency* theory (Cummins, 1981) and the *linguistic multicompetence* theory (Cook, 1991) that both suggest a fluid view of

languages also formed the context in which translanguaging was developed. Cummins (1981) proposed the common underlying proficiency theory, whereby people are all assumed to have a reservoir of knowledge that can be used to develop different languages. This was proposed in contrast to the *separate underlying proficiency hypothesis* (L1 and L2 are in competition) and emphasized that languages are interrelated. Cook (1991), on the other hand, used linguistic multicompetence to redefine what language and language learner means. He believed that every language user is a language learner because nobody can fully master everything about a language (Cook, 2007; 2015). These theories that view languages and learners dynamically formed the context in which translanguaging was developed, suggesting a fluid view of how languages are identifiable (in a socially-constructed sense) but inseparable (because there are not separate linguistic systems in a learners' mind) (Ho, 2018). They also laid the foundation for translanguaging to argue that the languages are the whole linguistic repertoires that we use to communicate efficiently but not the structural knowledge of separate specific languages (Li, 2018).

2.2.2 Translanguaging and languaging

Translanguaging also echoes the concept of *languaging* in sociocultural theory in second language acquisition (SLA). When Baker (2011) translated the term *trawsieithu*, he borrowed the existing notion of "languaging" from the sociocultural theory and added "trans-" as a prefix (Li & Shen, 2021). Sociocultural theory was initially proposed by Vygotsky (1987) who argued that social interactions are essential for human cognition. Language, as a form of social interaction, can mediate cognitive processes. Based on this theory that language completes thought, Becker defined languaging as an ongoing process that emphasizes the agency of language learners in meaning-making. Bagga-Gupta (2014) also argued that languaging is a social activity. Swain (2006) used the term languaging to refer to the process of making meaning and shaping knowledge and experience through language. All these definitions supported the claim that language is a process rather than an object. It is also a tool used by multilingual language users strategically to learn (Ho, 2018). Swain had provided

pedagogical evidence showing that languaging, in the form of collaborative dialogue, facilitates communication and could be a source of second language learning (Swain, 2006; 2010). This idea of languaging is incorporated in the central principles of translanguaging that language is something people do, but not something people have (García & Li, 2014). The prefix "trans", which represents "trans-system, trans-formative nature, and trans-disciplinary" according to García and Li (2014, p.3) adds to the multilingual and multimodal nature of both languaging and translanguaging. The "trans" features suggest that by using language to make meanings, translanguaging transcends the boundaries of languages, which provides a new and dynamic perspective of the cognitive abilities of bilinguals and could be effective in pedagogy.

To conclude this section, pedagogical translanguaging is against the monolingual teaching practices that were accepted in many language learning institutions that intended to avoid confusion and to give students maximum exposure of the target language (Cenoz & Gorter, 2021). Pedagogical translanguaging has its roots in bilingual pedagogy and languaging. It promotes an integrated approach to languages that allows students to use all their language resources for learning. The next section will review some empirical studies on the integrated teaching approaches under other terms and pedagogical translanguaging.

2.3 Pedagogical translanguaging in intervention studies

As the concept of translanguaging is gaining ground, research on translanguaging pedagogy has proliferated (Creese & Blackledge, 2015; Gort & Sembiante, 2015; Menken et al., 2018). However, the number of intervention studies on translanguaging has not matched the attention it received since it was coined (Ho, 2018). To explore pedagogical translanguaging, current studies have mainly focused on describing the practices in L2 and FL teaching and learning contexts (e.g. Annabell, 2020; Daniel et al., 2019; Wang, 2019), exploring learners' and teachers' beliefs and attitudes towards it (e.g. Canagarajah, 2011; Raja et al., 2022; Wang, 2019), investigating translanguaging and learner identity (e.g. Creese & Blackledge, 2015), and analyzing

it as an alternate to the English-only policy (e.g. Menken, 2013; Menken & Sanchez, 2019; Wiley, 2010). These studies mainly collected data through qualitative means, including classroom observations (e.g. Duarte, 2020; Menken & Sanchez, 2019), questionnaires (e.g. Canagarajah, 2011; Wang, 2019), and interviews (e.g. Al-Bataineh & Gallagher, 2018; Wang, 2019). These studies have reported overall positive attitudes towards pedagogical translanguaging, suggesting that translanguaging could balance power relations in the classroom (Allard, 2017), promote minority languages (Cenoz, 2017), improve comprehensibility (Latisha & Young, 2017), help achieve meaningful communication (Hornberger & Link, 2012), and raise learner confidence and motivation (Creese & Blackledge, 2010).

However, compared to the above-mentioned studies that mostly used qualitative methods, there are fewer intervention studies examining the effectiveness of PTL (Hopp et al., 2021). In addition, some intervention studies that have examined the use of L1 in L2 or FL learning referred to the practice with different terms, for example, language interaction (e.g. Hicks, 2021; Sheng et al, 2012), linguistic diversity (e.g. Storch & Wigglesworth, 2003), classroom code-switching (e.g. Gulzar, 2010; Lee & Macaro, 2013), and L1 translation (e.g. Camo & Ballester, 2015; Sieh, 2008). Although these studies did not call themselves pedagogical translanguaging studies, the ones that essentially studied the same thing as PTL and have adopted interventions similar to those in PTL studies will still be included in the review. Understanding their designs and results can also help understand L1 in L2 learning and better inform this study. Taking these studies into account, current intervention studies have examined the effects of pedagogical translanguaging on limited aspects of language learning, mostly on vocabulary development. The next paragraphs will critically review the intervention studies according to the aspects of learning they focused on.

One of the earliest empirical studies that explored the influence of L1 on L2 learning was done by Storch and Wigglesworth (2003). In their study, 24 university English as second language (ESL) students of similar age, educational background, ESL proficiency level (intermediate) were divided into 12 pairs, 6 with shared L1 (which enabled them to communicate using their L1) and 6 with different L1s (which

restricted the possibility of using L1 to communicate). However, only pairs with shared L1 were the focus of this study. These pairs were asked to discuss and then complete an English text reconstruction task and a short joint English composition task. Halfway through the data collection, researchers noticed that despite the shared L1, the first three pairs rarely used their L1 during the task. Therefore, the other 3 pairs were given instructions that explicitly said they could use their L1 when discussing the tasks if they felt it would be helpful. Participants were audio-recorded during the tasks and interviewed afterwards on their attitudes. Coding of the task recordings revealed that 1) two pairs (among those that were encouraged to use their L1) used their L1 actively, for an average of 39% of the discussion time while the other 4 pairs used their L1 minimally, only for odd words and phrases; 2) L1 was mainly used for task management, task clarification, and clarification of vocabulary. Although this study did not have a pre-post design, it is included in the review because there were still two conditions that differed in the amount of L1 used in the task. This study is valuable because as a pioneer in studying the use of L1 in L2 learning, it had several highlights which informed the current study. First, pairing participants up to complete tasks created a natural scenario where participants had the needs to use all their linguistic repertoire to engage in communications, which elicited participants' natural use of L1 in L2 learning and cleverly put PTL into practice. Second, this study collected data on the proportion translanguaging during the tasks, which revealed when and how much translanguaging was actually needed. However, as an early attempt in this field, this study has limitations. First, the task outcome was not analyzed, which made it impossible to compare the conditions and evaluate the impact of translanguaging. In addition, the instructions within the shared-L1 group were inconsistent: three pairs were instructed explicitly that they could use L1 while the others were not, which harms the reliability of the results.

Unlike Storch and Wigglesworth (2003), later studies on PTL mostly focused on one particular aspect of L2 learning. Among them, vocabulary learning is most commonly studied when investigating the effectiveness of translanguaging in L2 or FL teaching (e.g. Arteagoitia & Howard, 2015; Busse et al., 2019; Galante, 2020;

Makalela, 2015). One of the most influential studies is Busse et al. (2019), which designed an intervention on 42 3rd-grade primary school EFL students from diverse linguistic backgrounds (mostly German). Both the intervention group and the control group participated in five 45-minute learning units on human body vocabulary. The intervention group learned the vocabulary through different translation activities, for example, poster-aided learning of the target vocabulary and their L1 translations, comparison between the target words and their translations, softball game of naming body parts and their translations, and memory game using word cards with pictures and L1 translations. These activities provided the L1 translations of the target English vocabulary, compared the English and L1 vocabulary, and explicitly pointed out the phonological and spelling similarities. The control group also had activities to learn body-related phrases, including singing body songs, listening to body poems, and acting out dialogues from textbooks that reinforced vocabulary. But these activities were English-only and did not direct attention to the word form. Both groups were tested in a pre-test, an immediate post-test (after the five learning units) and a delayed post-test (4 weeks after the immediate post-test). The test comprised of 4 parts on both productive and receptive vocabulary knowledge: writing English words based on a picture, translating the human body vocabulary from L1 to L2, matching the English human body words to pictures, and matching written instructions related to body movements to pictures. Findings showed that the translanguaging group performed significantly better in both the immediate and delayed post-test. As one of the most influential pioneer studies on effects of PTL, this study provided evidence that translanguaging could be effective for vocabulary learning. However, the results should be taken with caution because there are limitations in their design. First, the treatments for the intervention and the control group were not maximally similar, for example, only activities in the intervention group directed learners' attention to explicit word form. In addition, the tests in this study included translations that have been directly practiced by the translanguaging group during the treatment thus might favor the translanguaging group. These limitations leave open whether the better performance of the intervention group was the result of translanguaging or other

variables that were not controlled.

With older and more proficient learners, Galante (2020) also investigated vocabulary growth affected by PTL. 129 adult students between 18 and 21 from diverse L1s in an academic English training programme were divided into a treatment group and a comparison group. Both groups were taught in a 12-week academic curriculum. During the 12 weeks, the treatment group received three 30-to-40-minute translanguaging tasks: "code-switching task" on Week 3 that "legitimized the practice of translanguaging"; "idioms in different languages task" on Week 5 that "focused on vocabulary" and "raised awareness of cross-language commonalities and differences"; and "discourse markers (DMs) task" on Week 7 that compared DMs across languages (p. 303). The comparison group received a "small talk strategy task" on Week 3, an "idioms in English task" on Week 5, and a "DMs in English task" on Week 7, all in monolingual English. Data were collected through a vocabulary test immediately after the 12-week programme on the receptive meaning of idiomatic expressions and DMs. Participants from both groups were given incomplete sentences and were required to complete the sentences using vocabulary items from a given list. Results showed that participants in the translanguaging group had significantly better command of the academic expressions after the 12-week programme. Qualitative data from classroom observation provided an explanation of why the learning was boosted in the translanguaging group: students in that group were observed to take a more active role in meaning-making across languages during the three tasks. However, the translanguaging participants were directly given translations of the target vocabulary and were allowed to discuss the meanings and to compare the target words and the translations in pairs or groups. The English monolingual group, on the other hand, was only given the target vocabulary and had to work individually to figure out the word meanings in sentences. This translanguaging activity is therefore more similar to using translation to learn, rather than actual PTL where students use fluid linguistic codes to make meaning. The benefit to the translanguaging group likely came from being directly given the translation of the target vocabulary and being allowed to further discuss them. In sum, the studies reviewed above are generally consistent in

finding that PTL is effective for vocabulary learning, although this may be due to provision of direct translations, rather than the actual effect of PTL.

For grammar learning, fewer studies have examined the effectiveness of PTL (Hopp et al., 2021). In a series of studies, McManus and Marsden (2017, 2019) explored whether explicit instruction on meta-linguistic differences between L1 and the target FL could aid the learning of tense and aspect in French Imperfect. 53 English native university students learning French were recruited and divided into three groups in a 4-week-intervention with a 45-minute-session each week. The three groups were a L2-only group that was only given the French L2 examples, a L2+L1 group that was given the French L2 examples and L1 explicit information the grammatical rules, and a control group (tests only). The three groups were tested in week 1 (pre-test), week 5 (post-test), and week 12 (delayed post-test) on two judgement tests (in listening and reading) on whether the given French stimuli (that used Imperfect) matches the given English context. Results suggested that only the L2+L1 group who received L1 explicit information (explicit form-to-function mappings) outperformed others significantly in L2 accuracy, speed, and automaticity as manifested in the tests. As one of the pioneer studies on PTL and grammar learning, this study has provided evidence that PTL could aid the learning of French Imperfect. However, the results need to be taken cautiously. Since the L2+L1 group was given additional L1 explicit information, their better performance might not be the result of PTL, but of explicit exposure to grammar rules.

Hopp and Thoma (2021), on the other hand, focused on grammar learning by primary school students at early stages of language-learning and used wh-questions, relative clauses, and passivization as the target structures for learning. Their intervention involved 258 4th-grade EFL students from 8 intact classes in 4 German public primary schools. Both the experiment and the control group received two 45-minute lessons as treatment. The experimental group undertook picture identification activity and production activity to learn and to practice all three structures. They were also provided with additional comparisons between the English structures and the L1 counterparts, and explanation of the grammar rules in L1. For

the control group, participants undertook similar learning and practicing activities on all three structures but did not receive the additional language comparisons. As shown in the tests (circle the animals in the pictures based on the given relative clauses, passive and active sentences, and wh-questions), the experiment group had larger learning gains for the wh-questions and comparable gains for passivization compared to the control group. However, treatments in this study were similar to those in McManus and Marsden (2017, 2019). Both used L1 to increase meta-linguistic awareness, which is not translanguaging as originally intended. In the same series of studies but with longer interventions (Hopp et al., 2021), 6 months of 35 45-minute lessons were administered. The longer intervention extended the target of learning compared to Hopp and Thoma (2021) and aimed to test the effectiveness of PTL in the school curriculum. Both vocabulary and grammar that occurred in 4 units in the regular English textbook (Playway 4, widely used across German) were the target of learning. The PTL group in this intervention was taught with 20% of the lesson time being multilingual elements, specifically in the form of comparing grammars in the target language and in L1 and using cognates between the target language and L1 to introduce new vocabulary. The control group, on the other hand, learned all the grammar and vocabulary under English-only instructions. However, the treatment again used L1 for language comparisons to raise cross-linguistic awareness but did not follow the original intention of PTL. Immediately after the 6-month treatment, participants were tested on their English vocabulary, grammar, and meta-linguistic awareness. Results in this study were different from Hopp and Thoma (2021). The vocabulary, grammar, and meta-linguistic awareness development after 6 months of intervention were all significant through stages but not between groups. According to the authors, explanations were that 20% might be too few for the effects to show. Qualitative data also showed that only 7 out of the 67 PTL group participants remembered there were multilingual elements in the English classes without being prompted.

Although these two series of studies were the firsts to examine the influence of PTL on grammar learning and have spanned learners of different ages, the limitations

in their treatments could leave the results open for more discussion. For McManus and Marsden (2019), the better performance could be explained by the clearer and easily-comprehensible information provided in L1 explicit information. In this way, the use of L1 only served as an additional source of information that increased learners' cross-linguistic awareness, but not as a means to achieve better communicative effect as originally intended by translanguaging. Similarly, for Hopp et al. (2021), the stimuli are more similar to cross-linguistic comparisons and translations, which are not in line with the pedagogical practices of translanguaging. Therefore, the studies still leaved a gap in exploring the effectiveness of PTL that is administered according to its definition: using all linguistic repertoire to achieve communicative effect in language learning and practicing in FL instructed contexts.

To conclude, emerging research has generally reported neutral to positive effects of PTL on vocabulary learning (Busse et al., 2019). However, it is still an open question as to whether and how PTL would influence grammar learning, especially during early stages of L2 and FL learning. In addition, the interventions in many empirical studies understood translanguaging as providing L1 explicit information or translation to improve students' learning efficiency (e.g. Holdway & Hitchcock, 2018; Tang & Peng, 2019). However, these interventions are, in essence, about increasing meta-linguistic awareness of the grammatical structures, rather than examining translanguaging as originally intended: using the whole linguistic repertoire in L2 learning. Against the backdrop of previous studies and the research gap, this study is motivated to look at PTL in the sense of allowing fluid communication with all languages a learner knows. When being allowed to use all linguistic repertoire to learn and practice L2, it might be easier for learners to focus on the target structure without being distracted by the elements unknown in the target language.

2.4 The current study and research questions

To fill the research gap and to examine the effectiveness of PTL on grammar learning among early FL learners, the researcher conducted an intervention study in a pre-post design in a primary school in Jiaozuo, China. 151 sixth-grade participants

were divided into three groups: the Translanguaging group, the English-only group, and the Control group through randomized controlled trials to reduce bias and balance participant characteristics (Sibbald & Roland, 1998). Early FL learners from grade six were chosen because they have only mastered a limited number of L2 words. The gaps in their L2 knowledge made it reasonable for them to resort to L1 and use their whole linguistic repertoire to make meaning and communicate while learning and practicing L2. According to the curriculum, when students are to learn "there be" sentences (in grade seven), the target grammatical structure in this study, they will have a limited vocabulary. The vocabulary lists in their textbook from grade three (their first English classes) to grade six only add up to 848 English words (Zheng, 2018), which means at the point where the structure is practiced, students often have a very limited vocabulary and are likely to encounter words they do not know. Therefore, translanguaging under this circumstance is reasonable and possible in actual learning. All three groups first learned the English grammatical structure "there be" by watching the same tutorial video. Then the Control group waited while participants from the Translanguaging group and the English-only group were paired up within their own groups to practice the structure in a "spot-the-difference" activity where they initiated conversations to complete the task. Instructions for the two groups were maximally similar and only differed in the language they were allowed to use: the Translanguaging group could use Chinese (for unknown English nouns and adverbs of place) while the English-only group was instructed to use monolingual English. During the intervention, each pair was recorded for later analysis on their use of language and how well they practiced the target structure. All three groups were tested in a Chinese-to-English translation test and a grammaticality judgement test presented aurally before learning the structure (as pre-tests) and after the practice activity (as post-tests). Participants were also interviewed after the experiment on their attitudes towards translanguaging and English-only ways of practicing.

This design allowed the researcher to address the following research questions (RQs):

RQ1: Do participants in the translanguaging group improve more in their

accuracy in the translation tests and the grammaticality judgement tests than participants in the English-only group and participants in the Control group?

In addition to measuring accuracy as in RQ1, this study also measured participants' reaction time (RT) in the grammaticality judgement test that was presented aurally. Since it is possible that regardless of accuracy, participants may get more fluent after practicing the structure in the speaking activity, examining how fast participants reacted to the items might reveal a different dimension of learning gains.

RQ2: Do participants in the translanguaging group become faster (as measured by reaction time) in judging the grammaticality of the items in the grammaticality judgement tests than participants in the English-only group and participants in the control group?

Participants' performance during the treatment might not always be reflected in the pre-to-post change. There may be interesting differences between the use of the structure of the translanguaging and non-translanguaging groups as well. Therefore, this study also examines the performance of the two groups during the practice activity:

RQ3:

a) As a check of fidelity, do participants in the translanguaging group engage in pedagogical translanguaging in the practice activity while participants in the English-only group do not?

b) Do participants in the translanguaging group use the target structure more than participants in the English-only group during the practice activity?

c) Do participants in the translanguaging group use the target structure more correctly than participants in the English-only group during the practice activity?

This study is also interested in participants' perceptions and attitudes towards the intervention, which could provide a holistic evaluation of the treatment and potential explanations of the quantitative results.

RQ4: What are participants' attitudes towards the translanguaging and English-only way of practicing respectively?

III. Methodology

3.1 Participants

This study was conducted in a public primary school in Jiaozuo, China[1]. The primary school in this study is one of the township schools in suburb Jiaozuo. All students started studying English 4.4 hours a week from grade three as a compulsory part of their curriculum (Wu, 2014).

According to the results of a power analysis using G*Power (Faul et al., 2007), a total number of 158 participants from three groups would be required to achieve medium effects (Cohen's f=.25) for the interaction in a mixed between-within-subjects design with error probability (α) of 0.05 and power (1-β) of 0.8. The benchmark of medium effect size (Cohen's f=.25) was accepted in Busse et al. (2020) whose experiment structure is similar to that in this research. Due to practicality issues, 151 participants were eventually recruited, 6 of whom were participants for a small pilot and the remaining 145 were participants for the main experiment.

The 151 sixth-grade students (aged between 12 and 13) from 4 classes were recruited using an opt-out consent form (Appendix 1). 74 were female (49.01%) and 77 were male (50.99%). They all speak Mandarin Chinese as their first language and have received three years of compulsory English education as part of their curriculum. According to their English curriculum, they will learn the sentence structure "there be" in grade seven.

Other than 6 pilots, the remaining 145 participants were randomly divided into three groups, the Translanguaging (TL) group (n=50), the English-only (EO) group (n=50), and the Control group (n=45). The numbers of participants in the TL group and the EO group were set to be even numbers before the randomization because participants in these two groups will need to complete a task in pairs as part of their treatment. Table 1 gives the background information of participants from the three groups as a whole. It can be seen that the EFL education is matched across the groups

[1] Jiaozuo is a fourth-tier city in Henan Province in central China, where educational resources were limited and unbalanced, especially in the suburbs (Wu, 2008)

and the proportion of males and females and ages are roughly matched.

Table 1 Basic information of participants.

	Male	Female	Mean Age (Years)	Mean time of EFL education received (Years)
TL group	26	24	12.67	3
English-only group	25	25	12.5	3
Control group	23	22	12.85	3
All	74	71	12.67	3

3.2 Target sentence structure

This study chose the sentence structure “there be” as the target grammatical structure. This structure is consistently difficult for Mandarin L1 learners of English due to transfer from the L1: in Mandarin, the equivalent for “there be” is “有”, which literally translates as “there have”. For example, “there is an apple in the basket” would be “篮子里有一个苹果”(directly translates as “in the basket there have an apple”) in Mandarin. Such negative transfer has been mentioned by several researchers as the reason for Chinese EFL students to make mistakes (Dai & Liang, 2007; Wu, 2020; Yu & Su, 2011). In terms of schooling, this structure is introduced as a grammar point that requires students to use correctly in the curriculum in grade seven. But before the official introduction, the affirmative, negative, and question forms of this structure have appeared in the textbooks of grade five and grade six and students are required to know their meanings. Therefore, participants have come across the structure and could understand its meanings but are unable to produce the structure correctly yet, which leaves room for them to learn to produce the structure.

3.3 Data collection instruments

The dependent variables (DVs) of this experiment were the data collected through a translation test (TT) and a grammaticality judgement test (GJT) presented aurally on the target structure “there be”. Based on one of the most authoritative English grammar books for Chinese EFL learners, *A Practical English Grammar* (Zhang,

2002), there are three points worth paying attention to when learning this structure in present simple tense: 1) agreement in number between “be” and the subject; 2) this agreement not being influenced by the subject that does not closely follow “be”; 3) transformation from the affirmatives into negatives or questions.

Based on this book, both TT and GJT assessed participants knowledge on the affirmative, negative, and question forms of the target structure. The GJT was presented aurally to also test participants’ RT. According to De Jong et al. (2012), RT could be used to measure learners’ cognitive fluency in comprehending a sentence structure, which is linked to the utterance fluency that reflects how efficiently a speaker can plan and execute his speech. Segalowitz and Freed (2004) measured RT in a repetition task and found that RT is positively correlated with the utterance fluency measured by an oral proficiency interview. Since participants in this study practiced the target structure in a speaking activity, which might improve fluency in speaking and processing (Derakhshan, 2016; Kinkade, 2022; Yang, 2014), RT was also collected to reflect possible changes in that regard.

3.3.1 The translation test

Specifically, the TT is comprised of 12 sentences. Participants were required to write down the English translations of the given Chinese sentences using “there be” structure. To alleviate difficulties caused by unknown vocabulary and ensure that performance was based on knowledge of the structure, the English translation of the noun phrases and adverbials of place were given after each Chinese original text. Some examples are as follows (see full version in Appendix 2):

1. 动物园里有老虎。（动物园里 in the zoo, 老虎 tigers）
2. 篮子里有哪些水果？（篮子里 in the basket, 水果 fruits）

Of the 12 translation sentences, there is a balance between affirmative sentences (n=4), negative sentences (n=4), and questions (2 general questions and 2 special questions), as well as a balance between countable nouns (n=7) and uncountable nouns (n=5), guaranteeing that all aspects of the knowledge regarding this structure could be tested. The answers to the TT were prepared by the researcher and were

examined by 2 native English speakers to be correct. A different version of this set of TT was also created to counterbalance the pre-to-post practice effect. Details about the different version will be elaborated in the next section.

3.3.2 The grammaticality judgement test presented aurally

The GJT presented in the form of listening has 23 items. Generally, participants click on the "play" button to listen to the audio and then click "correct" or "incorrect" to make their judgement. Their answers and RTs were recorded as DVs.

The 23 sentences also achieved a balance between affirmatives (n=8), negatives (n=8), and questions (4 general questions and 3 special questions), as well as a balance between correct (n=13) and incorrect (n=12) sentences (see Appendix 3 for the text-version sentences). To minimize the possible influence on correct rates caused by unknown vocabulary, all words in the sentences were from the Oxford 3000 vocabulary list, a collection of frequently used words (based on word frequency in language corpora) and of less frequent but "familiar" words (Oxford University Press, 2019). This vocabulary list has been used to develop many teaching resources for students from A1 to B1 level (Hsu, 2013) and is therefore reasonable to be used for early FL learners. Moreover, all the words were checked by two English teachers from the participants' school to be appropriate for their age and linguistic development. The audio of the sentences was recorded by the researcher, a Chinese EFL learner at the advanced level (IELTS overall band 8.0). The speed of the recordings was consistent: with 7-11 words per sentence, each recording was between 3000 and 4000 milliseconds. The recordings were checked by native English speakers to be intelligible, comprehensible, and at a normal speed. All audio files were edited in Praat to start at 500 milliseconds into the recordings to control for the onset time of each sentence and to give participants some time to react after clicking "play". Answers to the questions were also generated by the researcher and checked by 2 native English speakers.

The tests were made possible online through Gorilla.sc, an online experiment building platform (see Appendix 4 for screenshots of the tests). There was no time

limit on the tests so participants would not be under the pressure of time, which might influence their performances. For TT, there was one question on each page, comprised of the original Chinese sentence, the prompt words, and a box for the English translation. Participants need to click “next page” to move to the next translation. They were not able to go backwards to revise their answers once they moved on to the next page. For GJT, the audios were not automatically played. Participants were required to click “play” to play the recordings of the sentences before making their judgement. This could avoid them being unprepared for the recordings or making the judgement without listening to the sentences. The recordings could only be played once. The “correct” and “incorrect” buttons were activated as soon as the sentence started to play. Participants did not need to wait until the sentence finished to make their judgement since the judgement for some sentences, especially the incorrect ones, did not require participants to listen through the sentence to know the answer (for example, for sentence “there is five apples in the basket”, judgement could be made as soon as participants hear “there is five apples”). This design allowed the recorded RT to reflect more authentically the actual time it took for participants to make the judgement. Participants worked on the TT first and then the GJT. In this way, the incorrect sentences in the GJT would not influence their performances in translations negatively. The sequence of questions within each test type was randomized. The answers of GJT were also uploaded to Gorilla.sc so automatic judgement on the answers could be made.

Two versions of both TT and GJT that differed in the choice of vocabulary (all from the Oxford 3000 list) were developed to avoid practice effect between pre-test and post-test. The two sets of tests would be referred to as set 1 and set 2. To counterbalance the potential difference between the two sets of tests across the intervention groups and the control group, half of the participants within each condition took set 1 as pre-test and the other half took set 2 as pre-test and for post-test, vice versa.

All tests were piloted with Chinese EFL learners at the advanced level (IELTS overall band 7.0 and above) and English native speakers to check if the sentences and

answers were correct.

3.3.3 Focus group interview

To collect qualitative data on participants' emotions and attitudes towards the intervention activities and their use of language, semi-structured focus group interviews were carried out.

The form of focus group interview was chosen because compared to interviews with individual participants, a more relaxing environment could be created since the participants have their peers around. The goal was that they would feel that their views and experiences were valued and were therefore more likely to speak up. Moreover, in a focus group interview, a large amount of data relevant to the topic and the questions could be generated. The interviewees can also interact with and inspire each other and might generate opinions that they would not have been able to come up with during individual interviews (Rabiee, 2004).

The guiding questions for the interview were all in Chinese. This was to reduce participants' pressure of speaking a FL to achieve more efficient communication. However, participants were allowed to use whatever language to answer. All interviewees eventually spoke Chinese only.

5 open-ended questions (see Appendix 5) were prepared as the guideline for the interviews. The questions were piloted with adult Chinese EFL learners and 6 six-graders to clarify any ambiguities.

3.4 Stimuli

3.4.1 Tutorial video

To guarantee that all participants know the correct use of the target structure before practicing it, and to better simulate what might happen in an actual teaching episode, the researcher recorded a 12-minute tutorial video teaching "there be" structure. The video was watched by the participants before they paired up to practice the sentence structure in a "spot-the-difference" activity.

The content of the video was informed by the chapter on "there be" from the

previously-mentioned grammar book, *A Practical English Grammar* (Zhang, 2002), feedback from participants' English teachers, and studies researching Chinese EFL learners' commonly made mistakes on this structure. The researcher started the video by comparing the meaning and usage of "there be" with the use of "someone has something" since Chinese EFL learners are likely to use "there have" instead of the correct form (Wu, 2020). The researcher then moved on to explain the affirmative sentence structure with three examples involving single nouns, plural nouns, and uncountable nouns and emphasized how "there is" or "there are" should match the noun that follows it. After summarizing the structure of affirmative sentences, the researcher explained structures of the negatives, general questions, and special questions and gave examples to show how affirmative sentences can be transformed into these forms. To provide a visual aid for students, a PowerPoint slide was used throughout the video with the example sentences, relevant and age-appropriate pictures to attract attention, and circles and arrows to make the illustration more engaging. For details, see script in Appendix 6.

When recording the video, the researcher used a platform called Tencent Meeting that allows both the face of the speaker and the slide to be presented on the same screen (See Appendix 7 for screenshots of the video).

Both English and Chinese were used in video and the slide. The beginning of the video compared the English target structure and the Chinese counterpart. Throughout the video, example sentences were in English while the explanations were in Chinese to explain the grammar rules more clearly. In this way, this video is more similar to what previous empirical studies on PTL and grammar learning (e.g. Hopp et al., 2021; McManus & Marsden, 2019) understood as PTL, i.e. giving meta-linguistic information about language comparisons and directly explaining L2 grammar rules in L1. Although this research mainly focuses on students' translanguaging, i.e. students' use of L1 in L2 sentences to make meaning and to practice, the fact that this video is similar to the translanguaging treatments in previous studies will be noted for later discussion.

All three groups watched this same video as the first part of the stimuli. They

watched the video individually on a phone and were allowed to take notes if they wanted.

3.4.2 Practice activity "spot-the-difference"

Participants from the Translanguaging group and the English-only group were paired up randomly within their group to complete a "spot-the-difference" activity. The two participants in one pair were given two largely similar pictures that have 12 minor differences. They were not allowed to see each other's pictures and were instructed to use the previously learned "there be" structure to describe their picture and to ask and answer questions to find the 12 differences. Structures of affirmative, negative, general question, and special question "there be" were listed next to the picture to help them try and use the right sentence form in practice.

The two pictures were adapted from a set of two pictures purchased on Twinkl.com, a website with teaching materials for students from 0 years old to over 14 years old. The original pictures have 10 differences that were all about countable nouns. In a pilot of this activity with sixth-graders, the average time of using either English-only or translanguaging to find all 10 differences was less than 9 minutes, which is likely to be too short to generate any effect. In order for the participants to practice the sentence structure with both countable and uncountable nouns, and to extend the time of the activity to give participants more opportunities to practice, the original pictures were photo-shopped by the researcher. 8 of the previous differences were kept. 2 were changed into differences of objects that are uncountable: "water" and "orange juice". 2 extra differences on "money" and "honey" were added into the picture. The final pictures had 8 differences of countable nouns and 4 differences of uncountable nouns. The adapted version was consulted with sixth-graders and the differences were confirmed to be reasonable and discernible. In addition to the pictures, the sentence structures of "there be" in affirmative, negative, and questions were also provided in the handouts as a reference to help the participants practice the structures more correctly (see Appendix 8 for the handouts).

Before the activity, participants from both groups watched an instruction video

recorded by the researcher. The instruction was given in Chinese for them to better understand the requirements of this activity. Both groups were told that they need to find the 12 differences between the pictures by asking questions, answering questions, or stating using the sentence structure they just learned. They have 10 minutes to discuss without looking at each other's pictures and then 2 minutes to look at both pictures and take turns to report the differences. However, the Translanguaging group was instructed to use Chinese if they encounter a word they don't know in English as long as the "there be" and the "some" or "any" part remain in English while the English-only group was told to use English throughout the activity. At the end of the instruction, both groups were encouraged to speak up and communicate as much as they can (see Appendix 9 for the instructions and their English translations).

To illustrate the activity more clearly and make sure that participants will be able to practice as instructed, an example video showcasing the activity was played to the participants after the instruction video. The example video was recorded through Tencent Meeting by a pair of Chinese EFL learner at the advanced level (the researcher and another learner) using a set of pictures different from the participants' pictures as materials. Two versions of the example video (for the Translanguaging group and the English-only group respectively) were made. The two versions were of similar length (60 seconds for the English-only video and 64 seconds for the translanguaging video). The content was the same, both exchanging information to find one difference in the pictures using 2 affirmative sentences, 1 negative sentence, 2 general questions, one affirmative answer and one negative answer to the general questions. Examples of the sentences in the videos can be seen in Table 2. Full transcription of the two versions of example video could be seen in Appendix 10. The videos were shown to both adult pilots sixth-grade pilots and were confirmed to be clear.

Table 2 Example sentences from the example videos for the TL group and the EO group respectively.

Sentence type	TL group example video	EO group example video
Affirmative	There is a *沙滩车* on the beach. There is a dune buggy on the beach.	There is a dune buggy on the beach.
Negative	There aren't any *沙滩车* in my picture. There aren't any dune buggies in my picture	There aren't any dune buggies in my picture.
General question	Are there any *红黄条纹的旗子在你图片的右手边*? Are there any flags with red and yellow stripes on the right-hand side of your picture?	Are there any flags with red and yellow stripes on the right-hand side of your picture?

3.5 Procedures

3.5.1 Obtaining consent

This research first obtained ethical clearance from the Central University Research Ethics Committee of the University of Oxford (Appendix 11). Since participants in this study are under the age of 18 and are therefore seen as unable to give voluntary informed consent (Ethical Guidelines for Educational Research, 2011), consent was then obtained from the participants' parents or legal guardians. The school teachers helped send out an information sheet and a consent form (Appendix 1) to parents. The consent forms adopted an opt-out protocol. If parents do not return the signed consent forms to the school teacher, they have given consent for their children to participate. No parent chose to opt out their child from the study. After obtaining consent from the parents, participants were also asked verbally for their assent before all tests and tasks. For the adult pilots, their consent was directly obtained using the opt-out consent form.

3.5.2 Piloting

Pilots were made possible after obtaining the ethical clearance. The pilot was

conducted with both the target population (i.e. sixth-graders from the same primary school who did not take part in the main study) and with adult Chinese EFL learners (aged 18-20) to test the designed instruments and stimuli.

8 adult Chinese EFL learners at the advanced level first participated in this pilot to test whether the materials are comprehensible and correct. They completed two sets of the tests, corrected several typos and then reviewed the tutorial video. Feedback from them suggested that the video was clear and easy to follow. After watching the video, they checked whether the differences in the "spot-the-difference" pictures could be spotted and whether they could recognize the object (for example, recognize that the orange liquid in the bottle is orange juice) and find the word (regardless in English or Chinese) to describe what they see.

After the pilot with adult learners, 6 sixth-grade students from the same school as those in the main experiment participated in a pilot that simulated the actual experiment procedure. The 6 students were randomly selected from the 151 students that gave consent to participate and were divided into three pairs. They first went to a computer room to complete the TT and GJT on the computer. One person from each pair took set 1 and the other took set 2 as pre-test. A teacher was in the room helping them with technical issues. The average time for them to finish the tests was 37 minutes. After the pre-test, the three pairs watched the tutorial video. They were allowed to take notes but were not allowed to pause or re-watch the video. Then, the three pairs were taken into three different rooms. The Translanguaging pair and the English-only pair watched their instruction and the example videos for the practice activity and then started the activity. The control pair was in their room doing nothing while waiting. It took 7 minutes for the Translanguaging pair and 9 minutes for the English-only pair to find all the differences. When both groups finished the activity, all 6 pilots returned to the computer room to take the post-tests. The average time to finish the tests was 35 minutes. Following the tests, the researcher conducted a quick follow-up interview with the three pairs respectively regarding their feelings towards the activity and their feedback on the tests and activity.

One major problem was noticed in this pilot and three adjustments were made

accordingly. The time pilots spent on pre- and post-tests was much longer than that of the intervention, which could lead to fatigue and was not conducive to learning. In the interview with pilots, they also mentioned that they wasted much time on the TT because they were not familiar with typing on a computer, which was confirmed by the teacher's feedback. But on the other hand, students mentioned that they do not have problems typing on a cellphone. Therefore, 16 new cellphones were borrowed and put into the computer room for the main experiment.

Moreover, TT in the pilot had 20 questions, which might have been another reason for the long time of test-taking. To reduce the time spent on tests without reducing the amount of data collected, the number of translation questions was reduced from 20 to 12 while the number of questions for GJT was increased from 15 to 23, forming the final version of tests that were described in earlier sections. To further balance the time spent on tests and intervention, the researcher also extended the "spot-the-difference" activity (see section 3.4.2 for details). Adjusted tests and pictures were again consulted with the adult pilots to make sure that they were correct and comprehensible before administered in the main experiment.

3.5.3 Main experiment

After the instruments and stimuli were adjusted with piloting, the main experiment started. Due to the COVID-19 policy of the school and international travel restrictions, data collection was carried out online. There was one class teacher on site who helped organize participants and oversaw the entire procedure (approved in the ethical clearance).

The participants were first randomly divided into three groups, the Translanguaging group (N=50), the English-only group (N=50), and the Control group (N=45) as mentioned earlier. They were each given a unique participant number that was used to identify them throughout the research. For the convenience of organization, the pre-test was carried out according to the classes participants were originally from but not the conditions they were assigned to. Due to the restriction of the number of cellphones, a maximum of 16 participants could take the test at the

same time. Pre-tests were completed in two days and details can be seen in Table 3.

After all the pre-tests were finished, the intervention began on May 25th. Participants within the Translanguaging group and the English-only group were randomly paired up. They were only informed of their partners immediately before the "spot-the-difference" activity to avoid any possible communications that might influence the activity. Three spare classrooms were prepared for the Translanguaging group, the English-only group, and the Control group respectively. Within each room, there were two chairs, a phone fixed on a phone holder connected to Tencent Meeting with the camera on, and another phone behind the chairs on recording mode in case Tencent Meeting got disconnected due to Internet problems. The researcher joined online through Tencent Meeting and video-recorded the activities through the meeting-record function of the platform.

To guarantee that there was a parallel gap between pre-test and intervention across all three groups, a pair of participants from each group (6 participants in total) watched the tutorial video together in the same room and went into the room for their group. In their room, the Translanguaging group and the English-only group pair watched the instruction video, example video, and did the activity. The teacher handed them the picture for the activity and reminded them again about the time before leaving the room. After the ten-minute conversation, the teacher went into the room and reminded them to start the 2-minute exchange and report. The Control group pair only waited in their room. When both the Translanguaging group and the English-only group finished their activity, the teacher went into the three rooms, gathered the students, and brought them back to the computer room to finish the post-test. Specific date and number of participants that completed the intervention and post-test can be seen in Table 3. The average gap between pre-test and post-test is 3.42 days for the Translanguaging group, 3.54 days for the English-only group, and 3.51 days for the Control group, which could be considered as balanced between conditions (see Table 3).

Table 3 Information on the schedule of the three groups in the main experiment.

	Date	TL group	EO group	Control group	Total
Pre-test (number of participation)	May 23rd	23	24	14	61
	May 24th	27	26	31	83
Intervention and post-test (number of participation)	May 25th	2	2	2	6
	May 26th	12	12	10	34
	May 27th	16	14	16	46
	May 28th	20	22	21	63
Pre-Post gap (days)		3.42	3.54	3.51	3.49

Since the participants all had a school exam on June 2nd, a week of holiday from June 3rd to June 10th, and a weekend off from June 11th to June 12th, the teacher suggested that the follow-up interview to be carried out after the exam. The follow-up focus group interviews were then carried out as soon as the participants were back on Monday, June 13th on Tencent Meeting. Audio recordings were only made after getting verbal consent from the interviewees. The interviewees were selected randomly from the translanguaging group (n=16) and the English-only group (n=17). The semi-structured focus group interviews were carried out with 3 to 5 participants from the same condition in a focus group. The length of the interviews ranged from 24 to 40 minutes. After 9 groups, information was saturated so no more groups were interviewed (see Table 4 for details about the interviews).

Table 4 Detailed information about the interviews.

Date	Length	Group	Number of participants
June 13th	40 minutes	EO group	5
June 13th	32 minutes	EO group	4
June 13th	37 minutes	EO group	5
June 14th	29 minutes	TL group	3
June 14th	38 minutes	TL group	4
June 14th	38 minutes	TL group	3
June 14th	25 minutes	TL group	3
June 15th	27 minutes	TL group	3
June 15th	24 minutes	EO group	3

3.5.4 Online safety and anonymity

To protect participants while they use the cellphones for the tests, the phones

were put on teen-safe mode and the browser was set to block all advertisements in case they were exposed to risky content while using the phone.

Participants' test results were all obtained from Gorilla.sc in an Excel sheet. The sheet includes participants' numbers, answers, test-taking time, RT, participant device, and participant browser (automatically recorded by Gorilla). The devices were not participants' own cellphones so the information on participant device and participant browser would not lead to information leakage. Although participants were video recorded via online meetings during the "spot-the-difference" activity, they were mainly identified using a sticker on their shoulder with their participant number on it. The recordings were kept securely in a password-protected file for data analysis.

3.6 Data cleaning and coding

Raw data of test answers and RT were downloaded from Gorilla.sc. Tencent Meeting recordings for the "spot-the-difference" activity were directly saved on the researcher's password-protected laptop. Audio recordings of the interview were moved from the researchers' recording pen to the password-protected laptop before the original files on the pen were deleted. To prepare the data for analysis, four steps were involved: grading the TT, calculating the participants' correct rate for the TT and the GJT and the RT for the GJT, transcribing the interview recordings, and counting the total sentences, incorrect sentences, and translanguaging sentences in the "spot-the-difference" activity video recordings.

The grading of the TT was done by the researcher alone based on a uniform standard: the English translation would not be considered as incorrect if there were only mistakes in spelling or capitalization. Only when participants made mistakes on the choice of "there is" or "there are" and on the use of "some" or "any" will the sentence be considered incorrect. The grading was done blindly for both the conditions and the test sessions: the researcher worked on a separate file that only had the answers in it but not information about the participant number, the conditions, or the test sessions (pre- or post-test) to avoid being biased. The correct answers were marked by 1 and incorrect answers were marked by 0. After the grading was done, the

score of each question for each participant was put into an excel with the information of participants' number, condition, pre-or post-test, set of tests, and date of test.

To calculate the correct rates of the TT and the GJT, invalid data were first deleted from the results. For the TT, since all answers were typed out by the participants and typing required them to pay attention, no answer was deleted. For the GJT, in an effort to ensure that the participants had listened to at least some parts of the sentences before responding, the researcher had set up the Gorilla.sc program so that participants could only respond after they had pressed the "play" button to hear the sentence. However, unfortunately, it was clear from the RTs that some participants had responded very quickly without listening to or paying attention to the audio: some participants had RTs less than 500 milliseconds, by which the sound in the audio had not yet started. These responses were clearly invalid and should be removed from the dataset. On the other hand, for many sentences, it was indeed possible for the participants to make a judgement before the end of the sentence was reached. For example, for the sentence "*there are one apple on the table", listeners will be able to know that it is incorrect as soon as they hear "one apple" following "there are". To determine which responses were valid, the researcher went through each of the recordings (23 for one set and 46 in total) and used Praat to work out how many milliseconds it was necessary to hear before making a judgement for each recording. After obtaining the least time required to make a response, responses where participants' RTs were shorter than this minimum time required were then deleted from the dataset. This led to the deletion on 352 out of 6670 data nodes across pre- and post-test. Only the 6318 nodes left were taken into consideration when calculating the correct rates.

The researcher also watched the practice activity recordings to count the number of "there be" sentences practiced per pair within the Translanguaging group and the English-only group and to mark the number of incorrect sentences each pair produced. The standard for "incorrectness" was the same as that for the TT. In addition, to better describe participants' translanguaging practices and to ensure the fidelity of the treatment, the number of all translanguaging sentences generated was also counted.

The standard for a sentence to count as translanguaging sentence is as follows: if at least one word that plays a function in the sentence is in a different language (either L1 or L2) than the majority of the sentence, the entire sentence would be considered as a translanguaging sentence. The sentence counts were recorded for each pair.

The interview recordings were also transcribed by the researcher. A second transcriber was not involved because the transcription only focused on the content of the interview and could be completed by the researcher alone. Then, the transcripts were coded using a thematic coding scheme generated by the researcher (Appendix 12). The coding scheme was generated using a bottom-up grounded approach after three times' reading the transcripts. To ensure the reliability of coding, 5% of the transcripts were coded by two independent coders (both Chinese EFL learners at the advanced level) under the coding scheme and achieved 96% inter-coder agreement. The transcriptions were not all translated from Chinese to English. Only sentences that were quoted in the data analysis were translated into English by the researcher. The interviewees who were quoted were given pseudo names. These pseudo names were taken from the Chinese solar terms and could in no way be linked to their real names so the interviewees could be kept from being identified.

IV. Data Analysis

4.1 Preliminary analysis: Do participants in the same pair influence each other's performance?

Before answering the research questions, a preliminary analysis was conducted on the relationship between participants' progress in the same pair. Since the "spot-the-difference" practice activity in the intervention was completed in pairs, there was the possibility that the participants' performances in each pair could be influenced by their partners in the practice (for example, how well they engaged with each other, how much attention they paid to the construction of sentences, etc.). Ideally, to answer the research questions considering this design, an analysis that -- for the TL and EO groups -- could take into account both random variance at the participant level and at the level of pairs (for example, a mixed model with participants nested within pairs) is needed. However, within the scope of this project, mastering this type of analysis was not possible. Two options were therefore to run ANOVA by "participant" or by "pair", i.e. treating a pair as a data point and computing their average performance at pre-test and post-test. The first option was preferable in that there could be more power. But the assumption behind this option was that the performance of the participants in the same pair is independent of each other. Therefore, a Pearson's correlation analysis was run to find out whether there were correlations between the gains of a participant and his/her partner in the practice activity to decide how to analyze and interpret participants' performance in pre-tests and post-tests. As in Table 5, for TT correct rate, there was no significant correlation between the two participants in the same pair for either the Translanguaging group ($r=.078$, $p=.711$) or the English-only group ($r=.141$, $p=.502$). For GJT correct rate, there was no significant correlation between the partners in either the Translanguaging group ($r=.141$, $p=.502$) or the English-only group ($r=-0.024$, $p=.909$). Since there was no significant correlation, which suggested that there was no evidence that the performance of participants in the same pair was related, the analyses in the following sections will treat each participant's score as an independent data point. However, for robustness, an ANOVA with average performance of each

pair as the DV was also conducted (see more details in Appendix 13).

Table 5 Correlation analysis of TT and GJT gains between two participants in the same pair.

	TT			GJT		
	Pearson's correlation (r)	**Sig.**	**N**	**Pearson's correlation (r)**	**Sig.**	**N**
TL group	.078	.711	25	.093	.657	25
EO group	.141	.502		-.024	.909	

4.2 Research question 1: ***Do participants in the Translanguaging group improve more in their accuracy in the translation tests and the grammaticality judgement tests than participants in the English-only group and participants in the Control group?***

Two mixed ANOVAs were conducted on the pre-test and post-test correct rates in TT and GJT respectively. Two one-way ANOVAs and Helmert Contrasts on participants' gains from pre-test to post-test in TT and GJT were also conducted respectively.

For TT, data from each group at pre-test and post-test are shown in Figure 1. For GJT, data from each group at pre-test and post-test are shown in Figure 2. On inspection, participants generally improved from pre- to post-test in both TT and GJT. Before analyzing this statistically using mixed ANOVA, the assumptions of ANOVA were tested. As DVs, correct rates and gains of correct rates in both TT and GJT met the assumptions of normal distribution and homogeneity of variance (see Appendix 14 for detailed analysis of normality and Appendix 15 for information on the homogeneity tests of the variables).

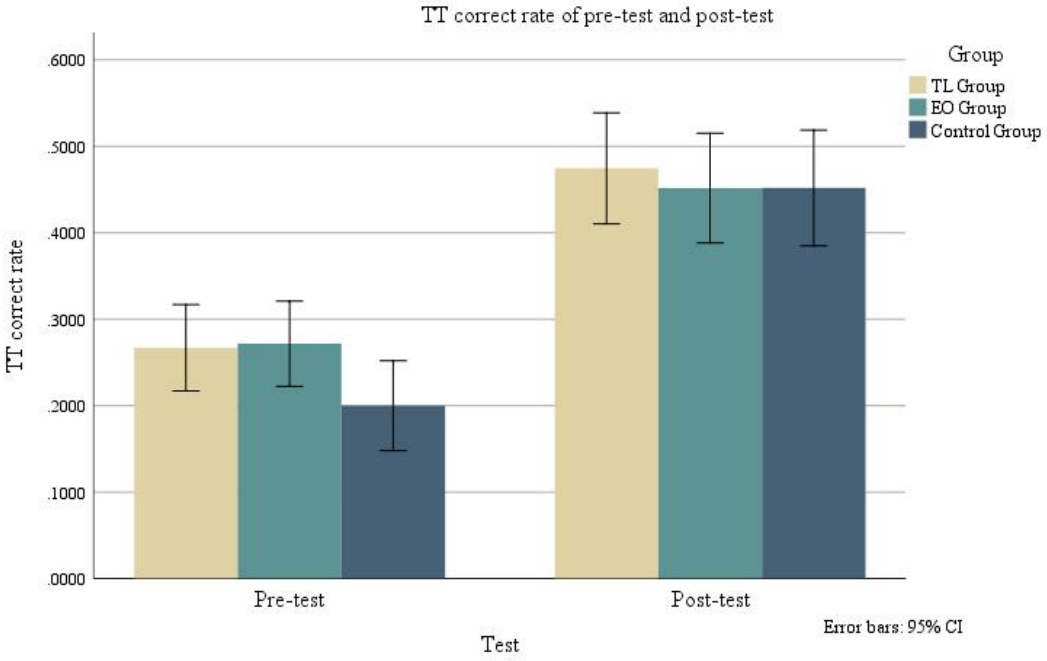


Figure 1 Bar chart of TT correct rate.

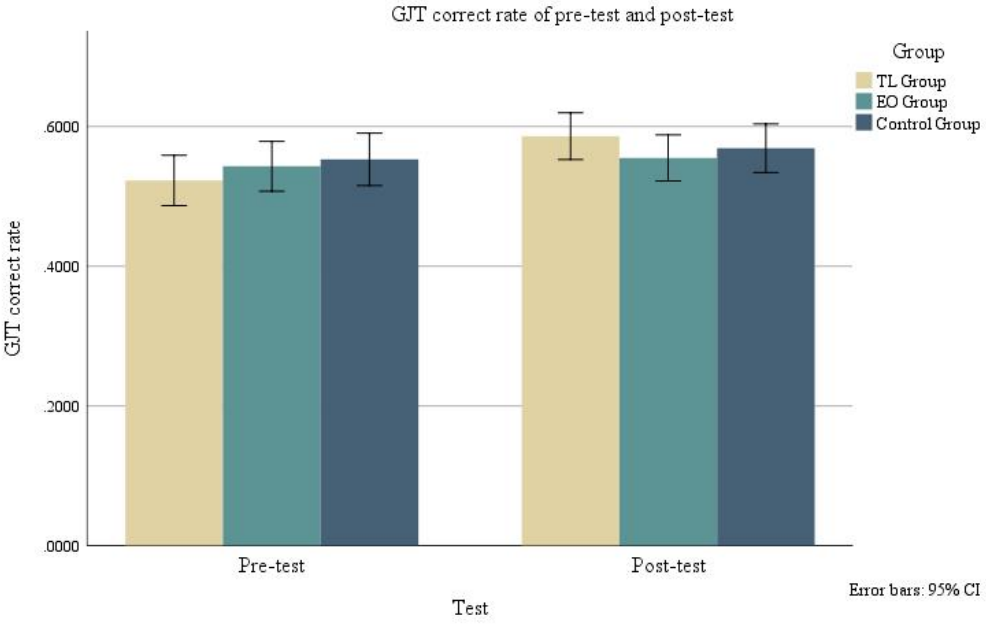


Figure 2 Bar chart of GJT correct rate.

After the assumptions were met, it was possible to conduct mixed ANOVAs and one-way ANOVAs, which could compare the development in the target sentence structure at the two testing sessions (pre-test and post-test) between the three groups (the TL group, the EO group, and the Control group) for the two tests respectively.

As shown in Table 6, for the correct rates of the TT, there was a significant effect of "Test" as a within-subject variable (F=155.248, p<.001, η^2_p=.522), which indicated a significant difference between pre-test and post-test with a medium effect size (η^2_p between 0.25 and 0.64) (Ferguson, 2009). However, there was no significant effect of "Group" as a between-subject factor (F=.657, p=.867, η^2_p=.009). Most critically, there was no evidence of the interaction effect of "Group" and "Test" (F=1.509, p=.225, η^2_p=.021). In sum, there was evidence that all three groups improved significantly from pre to post-test in the TT but there was no evidence that this increase differed by group.

For the correct rates of the GJT, there was a marginally significant effect of "Test" (F=3.870, p=.051, η^2_p=.027). However, there was no significant effect of "Group" (F=.240, p=.787, η^2_p=.003) and no interaction between "Group" and "Test" (F=.914, p=.403, η^2_p=.013). Therefore, there was only tentative evidence for improvement from pre- to post-test for the GJT, and there was no evidence that this improvement differed by group.

Table 6 Mixed ANOVA of TT correct rate and GJT correct rate.

	TT				GJT			
	F	**Sig.**	**Effect size (η^2_p)**	**Power**	**F**	**Sig.**	**Effect size (η^2_p)**	**Power**
Group (Between-Subject)	.657	.520	.009	.159	.240	.787	.003	.087
Test (Within-Subject)	155.248	.000	.522	1.000	3.870	.051	.027	.498
Test * Group	1.509	.225	.021	.317	.914	.403	.013	.206

To take a closer look at the contrasts in the gains made by the different conditions, gains (post-test minus pre-test) in TT and GJT were used as DVs in an ANOVA using Helmert contrast coding to compare the TL group against the non-TL groups (EO and Control) and the experiment groups (TL and EO) against the Control group. No significant differences were found for any of the contrasts as shown in Table 7. Therefore, there was no evidence that the treatments had improved different groups' performance differently.

Table 7 One-way ANOVA of gains of correct rate in TT and GJT and contrast test.

	TT			GJT		
	F	**t**	**Sig.**	**F**	**t**	**Sig.**
Group (between-subject)	1.509		.225	.914		.403
TL group vs. English only group & Control Group		-.352	.725		1.342	.182
TL group vs. English only group		.571	.569		1.234	.219
TL group & English only group vs. Control Group		1.641	.103		.552	.582

Although there was no evidence that partners in the same pair of the practice activity would influence each others' performance (as in section 4.1), an ANOVA on the average gains of participants in the same pair was still administered to increase robustness. The results were qualitatively identical with those on individual participants (see Appendix 13 for the results).

4.3 Research question 2: *Do participants in the Translanguaging group become faster (as measured by reaction time) in judging the grammaticality of the items in the grammaticality judgement tests than participants in the English-only group and participants in the Control group?*

After the data were cleaned to remove invalid data as per section 3.6, 1 participant in the TL group was left with no data point and was therefore removed from this analysis. As shown in Figure 3, participants from the three groups generally became faster in judging the grammaticality of items from GJT pre-test to post-test. To analyze their performance statistically using mixed ANOVA, the assumptions of ANOVA were tested. To achieve normality, the natural logarithms of the RT (in millisecond) were taken to smooth the data out (Field, 2013) (see Appendix 16). In addition, the variances in the groups were not significantly different (see Appendix 17 for information on the homogeneity tests of RT).

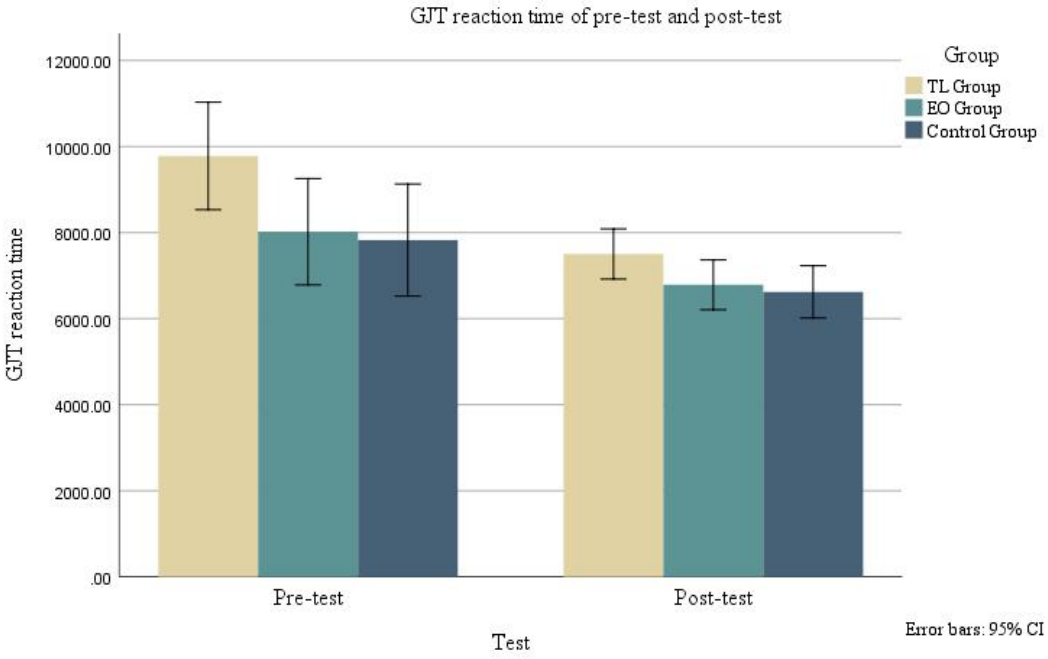


Figure 3 Bar chart of GJT reaction time.

After meeting the assumptions, it was possible to conduct mixed ANOVA and one-way ANOVA to compare the logged RT at the two testing sessions (pre-test and post-test) between the three groups (the TL group, the EO group, and the Control group).

In the mixed ANOVA (see Table 8), the main effect of "Test" was significant with a small effect size (F=19.421, p=<.001, η^2_p=.121). The between-subject factor "Group" also affected the RT marginally significantly with a small effect size (F=3.049, p=.051, η^2_p=.041). However, the interaction between "Test" and "Group" was not significant (F=.767, p=.466, η^2_p=.011). Therefore, there was no evidence that the decrease in RT from pre- to post-test differed for the different conditions.

Table 8 Mixed ANOVA of GJT reaction time.

	Ln GJT reaction time		
	F	**Sig.**	**Partial eta squared (η^2_p)**
Group (between-subject)	3.049	.051	.041
Test (within-subject)	19.421	.00	.121
Test * Group	.767	.466	.011

To further analyze the contrasts between groups and conditions, one-way ANOVA and Helmert contrast (coded the same way as in section 4.2) were tested. As presented in Table 9, no significant differences were found for any of the contrasts. This analysis showed that there was no evidence that the three groups made different progress in RT.

Table 9 One-way ANOVA of gains of RT in GJT and contrast test.

	GJT reaction time		
	F	**t**	**Sig.**
Group (between-subject)	.767		.466
TL group contrasts EO group & Control group		-1.237	.218
TL group contrasts EO group		-1.096	.275
TL group & EO group contrasts Control group		-.583	.561

4.4 Research question 3

4.4.1 *As a check of fidelity, do participants in the Translanguaging group engage in pedagogical translanguaging in the practice activity while participants in the English-only group do not?*

To guarantee the fidelity of the treatment, the researcher checked whether the two experiment groups did what they were asked to do in the intervention. For the TL group, two types of translanguaging practices were observed. The first was translanguaging in the target sentence structure as instructed. Some examples include "there is a 七星瓢虫 in the tree", in which "七星瓢虫", the Chinese word for "ladybug" was used when the participant did not know the English word for it. Among the 25 pairs, the average percentage of translanguaging (for each pair, the percentage was calculated as: number of translanguaging sentences/number of total target sentences*100%) was 38%, which indicates that the speakers used translanguaging when practicing the target sentence structure.

A second type of translanguaging was including Chinese to achieve meta-cognitive functions. Participants used Chinese in their English communications to plan the time of the activity, allocate turns, propose methods to help complete the

tasks, etc. For example, participants said “赶紧” (hurry up), “拿指头记一下” (We can use our fingers to mark the numbers), “你先问,等会儿我再问” (You can ask questions first and I’ll ask later). However, this type of sentences was not direct practice of the target sentence structure, thus, was not analyzed in this research.

For the EO group, participants followed the instruction and did not use Chinese words within the “there be” sentences except for one person. That participant used Chinese Pinyin for the word “squirrel” that he did not know. However, he pronounced it in an English way. In addition, similar to the second type of translanguaging for the TL group, some EO participants also used Chinese in their planning of the activity, commenting on the tasks, etc., which were not direct practice of the target structure. In sum, the fidelity of treatment could generally be guaranteed.

4.4.2 *Do participants in the Translanguaging group use the target structure more than participants in the English-only group during the practice activity?*

Descriptive statistics were calculated and independent samples t-test was conducted to compare the number of total target sentences generated per pair between the TL group and the EO group. Due to technical issues, the activity of one pair in the EO group was not successfully recorded. Only 24 pairs were analyzed in the EO group.

The total target sentences generated were normally distributed (see skewness and kurtosis in Table 10) so independent samples t-test was made possible. Results of the t-test suggested that at 95% confidence level, there was a statistically significant difference in total sentences generated between the TL group and the EO group ($t=4.294$, $p<.001$, $df=47$). Participants in the TL group generated significantly more target sentences ($M=69.800$, $SD=19.281$) than participants in the EO group ($M=42.670$, $SD=24.720$).

Table 10 Descriptive and t-test of total target sentences generated by the TL and the EO group.

		N	Mean (sd.)	Skewness (se.)	Kurtosis (se.)	df	t	sig.
Total sentences	TL group	25	69.800 (19.281)	.071** (.464)	-.706** (.902)	47	4.294	.000
	EO group	24	42.670 (24.720)	.698** (.472)	.106** (.918)			

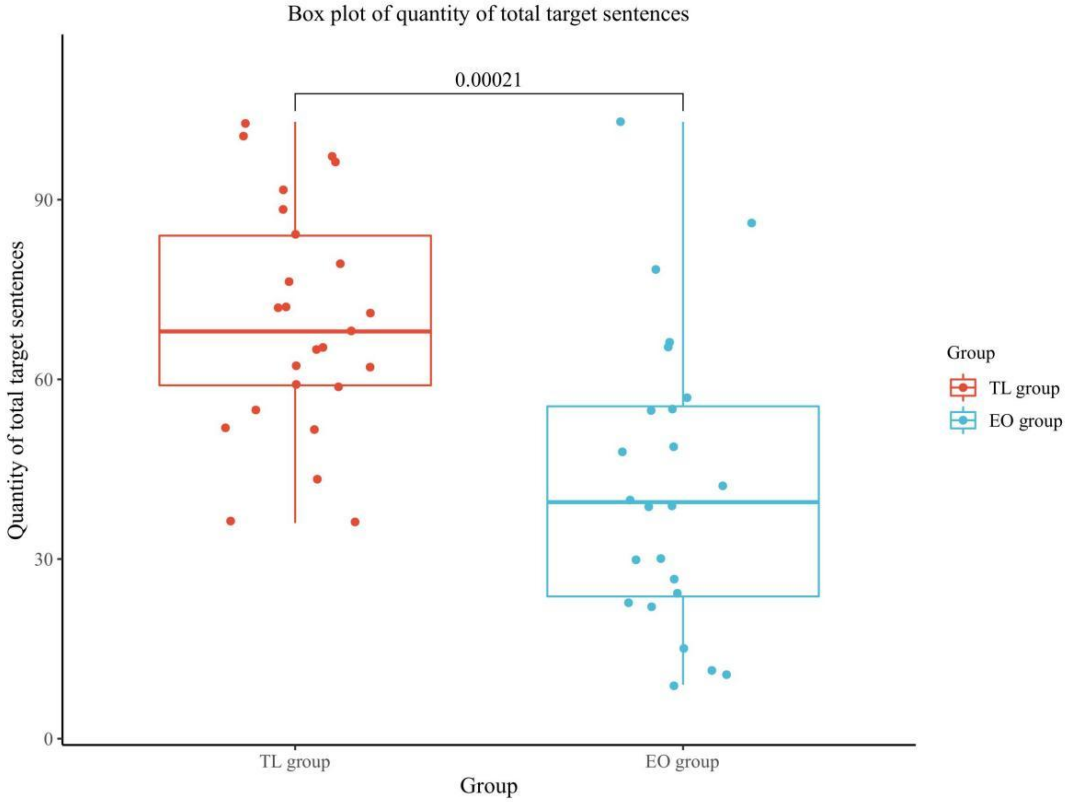


Figure 4 Box-plot of total target sentences generated by the TL and the EO group.

4.4.3 *Do participants in the Translanguaging group use the target structure more correctly than participants in the English-only group during the practice activity?*

A further t-test was carried out on the percentage of "incorrect sentences" (defined in terms of misuse of the target structure -- see section 3.6) the pair generated to examine whether the two groups paid attention to the sentence they generated and practiced the target sentence structure correctly. As in Table 11, the percentage of incorrect sentences in both groups were normally distributed, which met the

assumption of t-tests. The results of the independent samples t-test indicated that the EO group produced significantly more incorrect sentences than the TL group (t=-1.885, p=.033, df=47). It was strong evidence that pairs in the EO group made significantly more mistakes than pairs in the TL group when practicing the structure.

Table 11 Descriptive and t-test of the percentage of incorrect sentences in the TL group and the EO group.

		N	Mean (sd.)	Skewness (se.)	Kurtosis (se.)	df	t	sig.
Percentage of incorrect sentences	TL group	25	.259 (.137)	.701** (.464)	-.234** (.902)	47	-1.885	.066
	EO group	24	.338** (.157)	.635** (.472)	-.306** (.918)			

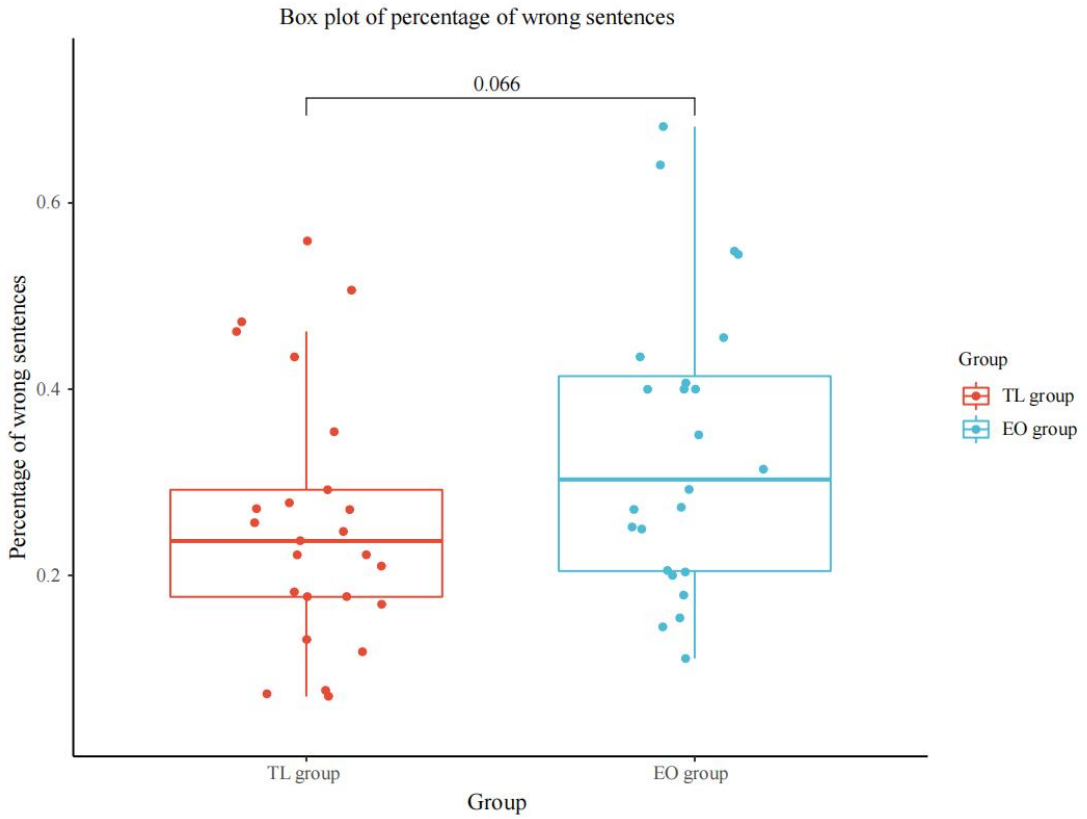


Figure 5 Box-plot of the percentage of incorrect sentences during activity in the TL group and the EO group.

4.5 Research question 4: ***What are participants' attitudes towards the translanguaging and English-only way of practicing respectively?***

The coding of the focus-group interviews revealed two major themes to answer this question: participants' emotions and evaluation of effectiveness of the practices, which are presented in details in the next sections.

4.5.1 Emotions towards translanguaging and English-only practices

Emotions towards the practices are largely different between the TL group and the EO group. Therefore, the emotions will be presented following the sequence of groups.

For the TL group, 13 out of 16 interviewees in the TL group were "nervous" towards the practice activity, which is the most frequently mentioned emotion. For most interviewees (n=8) who mentioned being nervous, it was due to the form of the activity, i.e. because the researcher was present in the online meetings recording their performance and because their teacher was checking their progress occasionally from the door. See the following excerpt (quote translated from the Chinese original transcripts and participants given pseudo names as mentioned in section 3.6):

> *Chunfen (TL group): ...I was nervous about my performance...I don't know what to say...It feels like an exam we've never had before, especially with the phones and the cameras, I found myself checking the recordings and feeling nervous about all those going on.*

Another negative emotion expressed by the TL group under similar reasons is "afraid" (n=2), as illustrated in the following excerpt:

> *Jingzhe (TL group): I was slightly scared by the whole thing... never got tested and then do activities as formal as this one. I'm afraid of tests.*

Interviewees from the TL group also felt "strange" towards the use of Chinese in English sentences (n=5):

Qiufen (TL group): (the sentences with Chinese words in them)...sound a bit weird, not like the usual English people would say.

Hanlu (TL group): It is strange (to include the Chinese words). These sentences are not the English sentences that we will eventually use in exams.

Other than the above-mentioned negative feelings, participants from the TL group also experienced positive emotions towards the translanguaging activity. First, more than half of the interviewees (n=9) found the activity "*搞笑*(funny/amusing)", which could be seen from the following statement:

Qingming (TL group): I don't know why but my partner and I just couldn't stop laughing... Thinking about it now, it is still really funny.

Similar to "amusing", 5 interviewees from the TL group also felt the translanguaging activity was "enjoyable". The task of spotting the difference was interesting to them and being allowed to use Chinese words in the English "there be" sentence was a novel way of speaking that gradually became natural:

Dashu (TL group): I like this activity a lot...Me and my partner, we played with the sentences for a while. We developed several ways of combining Chinese words into the target sentences and we were having fun and enjoying ourselves. It was nice to have this activity.

For the EO group, participants also felt "nervous" (n=17) and "afraid" (n=10) most frequently. However, the reasons to have these feelings are different from those for the TL group. 14 interviewees in the EO group mentioned they were nervous because they found the English-only requirement "intimidating" and the English expressions unfamiliar while 10 interviewees felt "afraid" also because they had to practice the target sentence structure using monolingual English.

Xiazhi (EO group): When I saw the picture, I panicked, there were so many things that I don't know the English word of...I was really nervous and I don't know what to do.

Yushui (EO group): There were so many words that I don't know! I was afraid to speak, afraid to make mistakes, afraid because it was so difficult to say everything in English!

Another negative emotion from the EO group was "confused" (n=4). Interviewees reported that only using English has caused much confusion in their communication:

Chushu (EO group): I couldn't understand my partner's English! I think she didn't understand what I said either...I was saying "three bears three bears" repeatedly. But it seems she was replying with "three birds" the whole time. This was really confusing!

Other than the negative emotions which were more dominant, the EO group interviewees also expressed positive emotions. Similar to the TL group, 4 interviewees from the EO group also mentioned that the activity was "amusing":

Mangzhong (EO group): Because we don't know how to say some words in English, we had to come up with all kinds of ways to express the meaning... We were using Pinyin[2], our body language, or trying to squeeze in a Chinese word or two when the teacher wasn't checking on us...It was hilarious!

In addition, when EO interviewees were asked how they would have felt if they were allowed to use Chinese for words they did not know, 8 of them said that they would feel "relaxed" and relieved, because they don't have to think hard and worry about not knowing the word:

Chushu (EO group): I would be so relieved! I'd trade anything to be in the group

[2] the official romanization system for Mandarin Chinese that represents the spelt sounds of words

that could speak Chinese! I was already jealous of them being given the "easier task". If I were in that group, I wouldn't be nervous at all. I'll just relax myself. I could do much better.

In general, interviewees from both groups have expressed more positive emotions towards the translanguaging practice, including it being funny, enjoyable, and relaxing. Interviewees from the EO group, on the other hand, have experienced more negative emotions during their intervention activity, including being nervous, afraid, and perplexing because of the requirement to use monolingual English.

4.5.2 Effectiveness of translanguaging and English-only practices

Participants also evaluated to what extent they found the activity and the instructed way of using language helpful in practicing the target sentence structure.

First, participants from different groups paid attention to different aspects of English during the activity. EO group participants focused more on the expression of words while the TL group focused more on sentence construction. All interviewees in the EO group mentioned they "focused on the word meaning" and none of them mentioned paying attention to sentence construction. According to their interviews, they spent most of the time trying to deal with expressions they were not familiar with, solving the problem of communication breakdown, or hesitating over whether to skip some potential differences they spotted because they did not know the English expression for them. Some illustrative examples are the following:

Liqiu (EO group): We have to come up with ways to get pass the unfamiliar words, which took most of the time!

Shuangjiang (EO group): There were so many words I don't know... And I was thinking hard the whole time to find ways to express the meanings. Sometimes even when I've finally come up with a genius way to replace the word I don't know, for example,

saying seven-star[3] instead of "ladybugs", my partner could not always get it.

Yushui (EO group): For the words I don't know... I just stayed silent... sometimes I pretended I did not see it in my picture.

Since they did not pay attention to sentence construction, the EO participants also practiced the target structure less correctly. 3 EO group interviewees reported that there were "fixed chunks" in their expressions, for example, always starting the sentences with the same chunk "there is" without thinking much about the noun that follows it:

Daxue (EO group): Sometimes I wasn't thinking about what I said. I wasn't even aware of what I said. I always started with "there is", leave it (the chunk) there, and then start thinking about how to find the right expression of the nouns.

However, having "fixed chunks" isn't exclusive the EO group. Though less frequent, it was also reported by one interviewee in the TL group who mentioned similar experience of saying without thinking:

Guyu (TL group): Sometimes it (there is) just slipped out of my mouth. I wasn't even thinking about it. It was almost like a habitual way of starting all the sentences.

In Guyu's explanation, she focused much on spotting the differences during the activity and was therefore not attentive to practicing sentences. Despite the exception of Guyu, nearly 90% of TL group interviewees reported that they "focused more on 'there be' construction" (n=14). Participants were able to think and choose the correct sentence structure. Self-correction or correcting partners' use of sentences were also reported:

Dashu (TL group): When we were halfway through the activity, my partner said

[3] In Chinese, the word-for-word translation of the most commonly seen ladybug is "seven-star-bug".

several incorrect sentences like "there is two cups", "there is many trees". She started every sentence with "there is". I wasn't aware of that in the beginning. But as she made more mistakes like these, I heard it and pointed that out to her. She quickly realized she wasn't thinking about the change of form of the verb "be"...but could then get them right.

Lidong (TL group): With the help of the sentence structures alongside the pictures, and not having to worry about the English words, I was indeed able to think more about how the sentence structure should match the word that follows it, just like what we learned in the tutorial video.

Compared to the EO group, fewer interviewees in the TL group focused on word meaning (n=2). Even for the two interviewees who reported paying attention to word meaning, their attention quickly turned into "the path of least resistance", i.e. not willing to think about the English word even when the word was known to them. They mentioned that at first, they strictly followed the instruction and only used Chinese for elements they did not know. However, this focus on word expressions soon shifted and they soon became reliant on the use of Chinese because it took less effort. Although the main sentence structure remained in English as required, all the other words in the sentences were gradually expressed in Chinese, as explained in the following statement:

Xiaoman (TL group): There are words that I know how to say in English, like orange juice, honey, etc. But as the activity goes on, I just said every word in Chinese and did not even bother thinking about the English word...It was faster to use Chinese. I don't have to think about it and the Chinese word fits naturally.

This natural inclusion of Chinese words regardless of knowing or not knowing the English equivalents might reduce the opportunities for students to practice and consolidate their vocabulary knowledge. But for grammar learning, participants were actually able to practice more within a fixed period of time because "it was faster".

Although the above suggested that the TL group focused more on practicing the target sentence structure than the English-only group, there was one concern raised by participants during the interview. 6 interviewees in the TL group reported that they experienced "negative transfer of L1" when practicing the target grammatical structure using translanguaging. In Chinese, speakers do not distinguish between countable nouns and uncountable nouns. However, the countability of nouns could influence the use of "there be" structure. See the following excerpt:

Hanlu (TL group): Some information that could have been observed in English, i.e. the countability of nouns, are lost in Chinese. Without that information, it was troublesome for me to practice the sentences. I have to either think about its countability in English, or risk making mistakes.

In terms of the future choice of language in grammar practices, voices were mixed in both groups. 3 participants in the TL group and 3 participants in the EO group reported that they would not combine Chinese and English to practice:

Chunfen (TL group): I'm not sure if practicing with Chinese words in the English sentences would help because eventually I have to say everything in English.

Mangzhong (EO group): I might still use English-only. The English-only practice is challenging but I might learn more from the challenges!

13 interviewees in the TL group and 14 interviewees in the EO group reported that they might consider translanguaging for future practices. Some example statements are as following:

Qingming (TL group): Compared to only using English, using both Chinese and English is definitely less intimidating. At least I wouldn't be too scared to speak....It is also a good chance for me to find out what words I don't know without getting in the way of practicing. I could note the words and look them up after practicing the structures.

Xiaoxue (EO group): If I could use both Chinese and English to practice, I wouldn't be stuck with the words I don't know. When I encounter unfamiliar words during daily practices, I usually look them up in dictionaries. In this case, it might delay the practice.

In sum, despite the concerns towards translanguaging in practicing this particular sentence structure because of the negative transfer from L1, participants generally perceived translanguaging to be effective for grammar learning.

V. Discussion

The quantitative and qualitative data tested effects of translanguaging practice on grammatical development in EFL learning among Chinese primary school students. This section interprets the data collected through tests, observation of the practice activity, and focus group interviews and discusses the results of this study in relation to the research questions.

5.1 Correlation between the performance of partners in paired activity

Preliminary analysis on the correlation between partners in the same pair is discussed first because it sets the premise for analyzing test performances. It was predicted that the post-test performance -- and thus the gains -- of the participants within the same pair might be related since paired activities are generally believed to play a facilitative role in L2 learning by allowing learners to pool their linguistic resources and providing collective scaffolding (Kim, 2008; Scott & de la Feunte, 2008; Wigglesworth & Storch, 2009). Therefore, participants could influence each other during the practice activity in this intervention. If so, the data from the two participants in a pair is not independent.

However, a Pearson's correlation analysis found no evidence of a significant correlation of gains in TT or GJT between partners in the same pair under both TL and EO conditions. Based on these results, the later analyses were administered treating data from individual participants as independent although for robustness, analyses were repeated using averaged scores from pairs as the DV. Despite the fact that Pearson's correlation suggested that participants' performance at test may be independent, qualitative results in the interviews and observation of the practice activity suggested more broadly that having a partner indeed influenced the effects of the practice. In the practice activity, it was observed that sometimes one participant in a pair took the lead, initiated conversations, and asked questions more than the other. Or when one participant was less active, the other also became less engaged in the activity because they did not receive responses. During the interview, participants also mentioned that *"I could not understand what my partner was saying*", "*I pointed that*

(the mistakes in her sentence) out to my partner...she could then get them right", and "*We were just sitting there in silence because nobody started the conversation*", which showed that pairing up at least influenced interactions between partners.

The fact that no relationship was within the pairs for gains at post-test should be interpreted in the context of the results which found no evidence that the practice activity led to pre-to-post improvement (the results and the possible reasons for this will be discussed in the next section). However, it is important to note that if the practice activity has an effect, we might expect to see participants in the same pair not being independent in their performances. In that case, statistical techniques which can capture the design where participants are nested inside pairs need to be used.

5.2 Performance and reaction times during tests

Data presented in 4.2 and 4.3 can shed light on RQ1 and RQ2, which are the key questions in this study. The hypotheses are that taking part in the translanguaging activities could lead to greater improvement in accuracy of the structure and in greater fluency in processing the structure.

Data showed that all three groups had increasing correct rates in both TT and GJT. However, statistical analyses found no evidence that the groups differed in the extent of pre-to-post improvement. Although numerically the TL group made larger gains (mean=.52) than the other groups (EO mean=.012, Control group mean=.16) in GJT and the TL group made larger gains (mean=.203) than the EO group (mean=.18) in TT, the researcher did not find evidence for these differences to be significant in any statistical analyses. The results indicate that there is no evidence the translanguaging condition and the English-only condition influenced participants' performances differently in either the TT or GJT, which found no evidence that PTL can help learners learn the target grammatical structure more accurately. Importantly, the researcher not only found no evidence that the TL group outperformed the EO group, but also no evidence that the TL and EO groups (who had an extra practice activity compared to the Control group) together outperformed the control. This suggested that regardless of the languages used, the practice itself may not influenced

improvements in the post-tests. Instead, it seems likely that it was the tutorial video that all groups watched that led to the increase in performance. Interestingly, this tutorial video, as mentioned in section 3.4.1, was Chinese and English combined, providing participants with direct L1 translations and explanations of the L2 target structure, which was more similar to the translanguaging practices as in Hopp et al. (2021) and McManus and Marsden (2019).

This result stands in contrast to previous findings in Hopp and Thoma (2021) and McManus and Marsden (2017, 2019) that reported at least some positive influence of PTL and the inclusion of L1 explicit information on grammar learning. However, the treatments in this intervention were quite different from those in the previous studies in terms of how translanguaging was manifested in the conditions. Hopp and Thoma (2021) had students discuss the differences and similarities of the same structure in the target language and their native languages. McManus and Marsden (2017) directly used L1 to provide the explicit information on grammar rules. Although explicit information and cross-linguistic comparisons were also provided in the tutorial video in the intervention of this study, it was not the condition that distinguished between the groups. What distinguished between the groups was the practice activity where the Translanguaging group was instructed to practice the target English grammar and use Chinese for unknown English words that might cause communication to break down or hinder the practice while the English-only group had to use monolingual English. In this way, this study controlled for more variables, for example, meta-linguistic awareness, form-function mapping, additional information, etc. that could have contributed to language acquisition (Thomas, 1992) and therefore could reflect more authentically the influence of student translanguaging on grammar development.

Despite the different results that might have been caused by the different treatments, the results in this study are in line with Hopp et al. (2021) who reported a significant increase in grammar skills from pre-test to post-test for both the translanguaging group (who received 20% class time in multilingual elements) and the monolingual-English group but no difference between the groups. Hopp et al. (2021) explained the null results by stating that the translanguaging elements were

"too few or too diverse in scope" for the direct intervention effects to show (p.18). For the present study, the practice activity in the intervention was only one session of 12-minute-practice. Participants in the TL group and the EO group might have not benefited much from the activity itself, especially compared to the tutorial video they watched before the activity that was reported by some interviewees to be very helpful. The small amount of time spent on translanguaging and the strong impact of the video could render the potential effects of translanguaging, if existing, statistically undetectable. With longer intervention sessions providing more chances to practice with translanguaging, it is more likely that the effects of translanguaging could play out. However, from the significant increase from pre-test to post-test for all three groups, one might argue that the translanguaging tutorial video (teacher translanguaging) was what helped students learn the grammar better. In fact, the practices in the tutorial video, i.e. comparing the Chinese structure to the English structure and explicitly explaining the "there be" grammar rules in Chinese, were similar to how translanguaging was operationalized in previous studies, i.e. comparison between L1 and L2 grammar (Hopp et al., 2021) or explicit information on the grammar rules (McManus & Marsden, 2017; 2019). Students might have already benefited from teacher's translanguaging practice in the tutorial video, which is a side note on the effects of teacher translanguaging.

Another reason for the null results might be attributed to the target sentence structure chosen as the object of study. "There be" sentences might not be the most suitable choice for L1 Chinese speakers to practice using all their linguistic repertoire. As mentioned in the interview data, the TL group interviewees were negatively influenced since there is no distinguishing between countable nouns and uncountable nouns in Chinese. But such difference plays an important role in "there be" sentences. When constructing the sentences with the prompt of Chinese vocabulary, participants still had to think about the countability of the noun that follows "there be" or risked making mistakes in the sentence and not being able to practice correctly. However, it is worth noting that the TL group did not do worse than the other groups despite this potential negative influence. Future research can choose a target grammatical

structure free from potential negative influence of including L1 in the structure to practice. This is not to avoid any structures where the equivalent L1 and L2 are different, but rather to specifically avoid cases where using borrowed L1 vocabulary could lead to negative influence in L2 structures.

Extending the previous studies that only examined correct rates in grammar learning, this study also tested how fluent participants were in processing the target structure (RQ2). Fluency was tested to match the spoken form of the practice activity. Even if gains in correct rates were not significantly different between groups, the hypothesis was that translanguaging could help students develop automaticity when processing, which could be reflected by the shorter reaction time to make correct judgement on "there be" sentences (de Jonh et al., 2013). Similar to the accuracy data, the statistical analyses showed that although all groups responded faster in the post-test, there was no evidence that translanguaging improved or impeded the development on RT. These results suggested that participants indeed became more fluent after the treatment, at least in cognitive fluency (Segalowitz & Freed, 2004). But conditions across the three groups were not supported by any evidence to have brought different effects.

However, since there are many factors that could influence RT (for example, being left- or right-handed, fatigue, affect, distraction, etc.) (García et al., 2021; Kosinski, 2008), the effect of PTL on fluency in grammar still remains an open question that requires more studies to investigate. In this research, the participants were likely to have relatively high levels of attention due to the novelty of participating in an event outside of their daily routines and with the teacher there overlooking the test procedure. However, during post-test, participants from the TL group and the EO group had gone through the tutorial video and the "spot-the-difference" activity without much break. They could be fatigued, and more so than the control group. This could potentially offset any benefits which they would have shown compared with the controls. Moreover, as mentioned in the earlier section of data cleaning, there were many invalid nodes deleted from RT. Although there was already restriction in the test that only allowed them to make the choice after the

audio started to play, it is still possible that participants did not pay any attention. For some participants (n=6, all from either the TL or the EO group), after the deletion, only less than half of the original data were kept. It is reasonable to infer that they might not have taken the test seriously and the RTs were not the true reflection of their fluency. In addition, although the author had made great attempts to collect data that could reflect fluency within the practicality of this study, the RT collected here might not be the most matching instrument to collect data on the effectiveness of a spoken-form practice activity (which practice speaking fluency more than fluency in processing). Speech rate, filled and unfilled pauses, self-repetitions, etc. could later be used to measure a more matching speaking fluency as practiced in the activity.

In sum, it is not easy to interpret the null results and arrive at a definite conclusion. On the one hand, there is indeed no measurable effect of translanguaging on improving accuracy and fluency in grammar learning after comparing the translanguaging and non-translanguaging groups. On the other hand, even with the negative transfer of Chinese nouns not having countability features or with less contact with English, practicing with translanguaging did not come at the expense of grammar development. In this study, the practice has no effects, which suggests that at least in this paradigm, translanguaging did not impede foreign language learning. It is possible that with a longer intervention and more delicate designs, translanguaging might be tested to have a benefit in grammar learning.

5.3 Sentence construction in the "spot-the-difference" practice activity

Although there was no evidence that the translanguaging practice impacted grammar performance as reflected in the tests, this does not necessarily indicate that the TL group and the EO group performed in the same way during the intervention. Despite the statistically non-significant test performances, it can still be hypothesized that the TL group might have practiced the sentences in larger numbers and more correctly during the "spot-the-difference" activity (RQ3).

To begin with, the TL group participants indeed used translanguaging during the intervention, which supports the fidelity of the treatment. On average, the participants

used translanguaging in 38% of the sentences that used the target sentence structure. Although 38% may not seem like a large percentage, it should be born in mind that this percentage was out of the total number of sentences including some that were not possible or appropriate to use translanguaging (for example, responses to questions such as “yes, there is” or “no, there isn’t”). In addition, this proportion parallels what Storch and Wigglesworth (2003) found in the proportion of L1 used when a pair collaborated to complete an L2 task: an average of 39% of the time for the pairs that were instructed and encouraged to use L1 in their conversations. However, Storch and Wigglesworth (2003) did not specify the method they used to calculate the proportion and simply used the percentage of “time” using L1 to describe students’ translanguaging practices during the activity. Future research should establish norms to describe the translanguaging practices to allow easier comparisons across studies.

For specific sentence construction during the activity, the translanguaging pairs generated significantly more “there be” sentences than the English-only pairs within the same amount of time. Moreover, the EO pairs are more likely to make mistakes and generate incorrect sentences than the TL pairs with a marginally significant difference ($p=.066$). In this way, effects of translanguaging surfaced in the process of the activity. Without the time spent on panicking about the unknown word, trying to find the right expressions, or looking for ways to circumlocute (as mentioned in the interviews), participants from the TL group could practice more efficiently targeting the “there be” sentences. In addition, when attention is not distracted from sentence construction to word meaning, it is more likely that the participants could notice the sentences they are saying, avoid mistakes, or even help their partners point out the mistakes (see interview excerpts in 4.5.2). This may explain why translanguaging group participants made less errors than the EO group, though this result must be treated as tentative given that the difference here was only marginally significant. When being allowed to practice the grammatical structure using all their linguistic repertoire, learners are able to focus on the structure itself and avoid being distracted by other elements (for example, vocabulary, pronunciation, etc.) that were not crucial to grammar itself. The differences were not yet translated into learning gains, at least

according to the post-tests. But if given more time to practice, there is a possibility that the differences during the practice activity will be reflected on test scores.

In sum, although quantitatively in test results, there were no significant effects of PTL on grammar learning, the process of the practice activity still revealed that translanguaging influenced how much and how tentatively correctly participants practiced the target grammar. Using all the language resources in students' whole linguistic repertoire created more chances for language learning. It is reasonable to predict that the difference in quantity and quality between practicing in the translanguaging way and the English-only way might influence language learning in the long run.

5.4 Translanguaging or English-only: emotions and evaluation of effectiveness

The last research question was primarily answered with interview data. Answers to this question can also to some extend provide explanations for other research questions.

Generally, participants expressed negative feelings towards the English-only practices. Most of them were nervous and afraid, intimidated by the pressure to speak only in English. Although some interviewees in the TL group also displayed nervousness during the task, it mainly came from the pressure of being recorded and being supervised by teachers. English-only requirements have caused participants to be afraid of speaking up and anxious of making mistakes, which are emotions that could negatively influence language learning (Gardner & MacIntyre, 1993). This might also explain the smaller number of sentences generated by the English-only pairs. In addition, only using English caused communication to break down at certain point, which impedes the completion of the task and the practice of the sentence.

On the other hand, participants reported more positive emotions towards translanguaging. The positive affects range from amusing, relaxing, to enjoyable. The mix of Chinese words in English sentences not only helped participants practice better, but also generated positive emotions that could increase and enhance language learning motivation (MacIntyre & Gregersen, 2012; Méndez López & Peña Aguilar,

2013) and eventually bring positive influence on the learning outcomes (Pekrun, 2014).

Other than bringing positive affects, translanguaging was also perceived to be more effective by participants. More than 80% of interviewees from the Translanguaging group reported that translanguaging allowed them to focus on "there be" construction, rather than on word meaning, which took up the attention of all EO group interviewees. Other than 3 from the TL group and 3 from the EO group, all other interviewees reported that they preferred the translanguaging way of practicing, which could increase their chances of participation and improve efficiency in the practice.

These findings on students' emotions and evaluation of effectiveness towards translanguaging and English-only practices are consistent with previous research on students' attitudes towards PTL that found PTL could result in positive attitudes that boost students' confidence (Masood, 2019) and increase student engagement (Zhou & Mann, 2021). Despite the non-significant test results, participants have perceived translanguaging to be more pleasant and helpful. However, we should acknowledge that participants may be under a novelty effect here, i.e. something that seems different from business as usual may tend to be perceived positively when it is first introduced.

However, there is one concern raised by the interviewee which was rarely discussed in previous qualitative studies. One of the interviewees who was not supportive towards translanguaging explained that it was because the translanguaging sentences are not the ultimate sentence forms that they will be tested on or could use to communicate in the conventional settings of language use. Indeed, from a practical point of view, writing English sentences with Chinese words in it in an exam would not be approved of, at least when boundaries between languages are still taken for granted in all aspects of daily lives. Neither will it make sense to monolingual speakers in communication. It seems that the concept of translanguaging is restricted to a transition and this transition eventually needs to be adapted to the ultimate form, which is pure foreign language. In this case, this statement falls back to the perception

of languages with distinct boundaries, in conflict with one of the core beliefs of translanguaging.

To conclude, the present findings extend previous research on the effects of PTL on vocabulary learning (e.g. Leonet et al., 2020) to grammar learning. In the intervention, after watching a tutorial video on "there be" sentences, translanguaging was used by one group to practice the target structure in pairs and was compared to a group that used monolingual English to practice and a control group that did not practice. The results showed that the Translanguaging group did not have larger learning gains (in either the correct rate or RT) than the English-only group or the Control group, indicating that there is no evidence that translanguaging pedagogy is more effective than the monolingual way in grammar learning (RQ1 and RQ2) but also not harmful to grammar development. This result parallels those in Hopp et al. (2021) but is not in line with Hopp and Thoma (2021) and McManus and Marsden (2017, 2019) that has different instructional treatments. Although there was no statistically significant difference in test results, observation of the activity and interviews revealed that when students were allowed to use their whole linguistic repertoire, they could practice more efficiently and with more positive attitudes, which in the long run might benefit the language learning outcome.

VI. Conclusions

6.1 Major findings

This study adds to the intervention studies on the effects of PTL by conducting an experiment to investigate the effects of PTL on grammar learning for EFL learners in early FL learning. Through the intervention, this study had the following findings. First, translanguaging participants were not found to perform significantly better than the English-only or the control group participants in any test, nor did they perform worse than the other two groups. This is consistent with Hopp et al. (2021) that studied German primary school students for six months and found no significant difference in grammar development between the translanguaging and the comparison group. However, comparison between the two experiment groups (who watched the tutorial video and engaged in the practice activity) and the control group (who only watched the tutorial video) found no evidence of any effect of any type of practice, suggesting that the quantity of practice session may not be sufficient to see any effects in this paradigm. Second, compared to English monolingual practices, translanguaging enabled participants to have more chances to practice and to practice more tentatively correctly. Third, translanguaging was perceived by participants to be more enjoyable and more effective than English-only ways of practicing.

Compared to previous intervention studies on PTL and grammar learning (e.g. Hopp & Thoma, 2021; McManus & Marsden, 2019), the intervention instructions are more rigid, ruling out many confounding variables, for example, cross-linguistic awareness, additional information, etc. that could skew the results. Moreover, this study not only compared the correct rates to reflect the command of grammar knowledge, but also the RT to attempt to reflect participants' fluency in processing the target structure as well. In addition, this study conducted a complex set of qualitative analyses alongside the quantitative analyses to reveal what might have been concealed in the statistics, to provide evidence-supported explanations of the statistics, and to establish better description of the translanguaging practices for future reference.

The findings of this study are necessarily restricted to the specifics of the context of Chinese EFL primary school students and the intervention treatments in this study.

Several explanations of these findings have also been presented throughout Chapter 5. Null results in test scores could be attributed to the fact that the practice activity only lasted for 12 minutes, which is too short to generate any statistically significant differences. Moreover, the current target structure is subject to the negative influence of Chinese L1, which could work against any potential benefits of translanguaging. Although benefits of PTL were not see in the tests, descriptions of PTL practices and attitudes towards PTL suggest that this dynamic view towards language learning has its values. More intervention studies are needed to provide more evidence on the effects of PTL on grammar learning.

6.2 Limitations and future directions

This study is not without limitations.

First, as mentioned before, the intervention was too short to cast any statistically detectable differences between the groups, especially since the tutorial video alone seems to be effective in boosting performance at post-test. Similarly, in Hopp et al. (2021) who reported null results with a six-month intervention, the reason was attributed to translanguaging elements being too broad and unnoticed to many participants. Extended translanguaging sessions with a considerable proportion of translanguaging over a longer time frame are needed to provide more evidence.

Second, since participants practiced the target sentence structure in speaking form, RT, which reflects fluency in processing the structure might not be the most direct measure of participants' improvements in speaking fluency. It would be more direct if their fluency can be evaluated in a speaking fluency measurement. Future research can have more matching treatment and data collection instruments.

Third, the choice of target learning structure needs to be evaluated more carefully to avoid negative transfer from L1 when L1 is included in the translanguaging practice. The current grammatical structure would cause confusion when Chinese nouns are mixed into the sentences, which might impede the learning effect. Future research could avoid structures that can be negatively influenced when L1 or other languages in the linguistic repertoire come into play.

Fourth, this study did not test or collect information on the various background information due to practicality issues. Although this study has attempted to eliminate group differences by allocating participants using randomized controlled trials, collecting information on background variables, for example, language proficiency in both L1 and L2, working memory, English exposure outside of school, phonological awareness, etc., might give us more explanations of their performances and some insights into the correlation between effectiveness of PTL and other moderating variables.

Fifth, although power analysis was conducted before recruiting participant to calculate the least participants needed for a medium effect size (as in Busse et al., 2020), the actual effect size after the data was collected was small to medium. However, this research had obtained the largest sample possible. Future research should still aim for larger sample.

Last but not least, a consistent scope of pedagogical translanguaging for all intervention studies needs to be established. In previous empirical studies on translanguaging, as long as L1 or languages other than the target language was involved, regardless of how and to what extent, it was referred to as translanguaging (e.g. Vaish & Subhan, 2015). In the most recent and influential studies on PTL, Hopp et al. (2021) and Mcmanus and Marsden (2019) actually provided either translation or meta-linguistic information as means to realize translanguaging. Without a consistent definition or a scope of practices in PTL, the results of different studies can hardly be synthesized for valuable conclusions.

In general, this study points out the need for more intervention studies to provide more evidence on the effects of PTL in instructed L2 contexts for learners at an early stages of learning. Longer and more translanguaging-intensive interventions, more participants, suitable target grammar, fully accounting for the influence of pairs or eliminating the influence of pairs, correlation between translanguaging practices during intervention and test performances, correlation between effects of translanguaging and learner characteristics could all be directions for future studies.

6.3 Implications

Despite the limitations, this thesis has reported a rigidly-designed experiment which explores the effects of PTL on grammar development. This study provides the first, to the researcher's knowledge, study that used direct intervention method to see if, in allowing PTL to be put into practice as it intended to be rather than as providing translation or meta-linguistic knowledge, it can aid grammar learning among early FL learners. Although improvements from pre- to post-test were not seen in the current work, the results nevertheless suggest that PTL was at least not harmful in instructed L2 contexts. This study builds the first step by establishing that PTL indeed provided more opportunities for learners to practice the target grammatical structure and helped them become more accurate in their practice and confirming that students have overall positive attitudes towards PTL.

In all, this thesis demonstrated it is possible to investigate experimentally through intervention the benefits of translanguaging in the sense of allowing learners to draw on their whole linguistic repertoire grammar learning. It provides a stepping stone for future research to investigate if pedagogical translanguaging can have broader and lasting implications in a pre-post design. If future research could build on the findings, confirm these results and can show pre-to-post implication that pedagogical translanguaging does aid early FL learning, then it will provide direct evidence for this integrated approach and pedagogical translanguaging could be administered in L2 instructed contexts.

References

Al-Bataineh, A., & Gallagher, K. (2018). Attitudes towards translanguaging: how future teachers perceive the meshing of Arabic and English in children's storybooks. *International Journal of Bilingual Education and Bilingualism*, *24*, 1-15.

Allard, E. C. (2017). Re-examining teacher translanguaging: An ecological perspective. *Bilingual Research Journal*, *40*(2), 116-130.

Arteagoitia, I., & Howard, E. R. (2015). The role of the native language in the literacy development of Latino students in the United States. *Multilingual education*, 61-83.

Bagga-Gupta, S. (2014). Languaging: Ways-of-Being-With-Words across disciplinary boundaries and empirical wites. In H. Paulasto, L. Meriläinen, H. Riionheimo, & M. Kok (Eds.), *Language Contacts at the Crossroads of Disciplines* (pp. 89-127). Newcastle-upon-Tyne: Cambridge Scholars Publishing.

Baker, C. (2011). *Foundations of bilingual education and bilingualism* (5th ed.). Multilingual Maters.

Baker, C. (2017). *Foundations of bilingual education and bilingualism*. Multilingual matters.

Becker, A. L. (1991). Language and languaging. *Language & Communication*, *11*(l/2), 33-35.

Blommaert, J. (2010). *The Sociolinguistics of Globalization*. Cambridge University Press.

Busse, V., Cenoz, J., Dalmann, N. and Rogge, F. (2020). Addressing linguistic diversity in the language classroom in a resource-oriented way: An intervention study with primary school children. *Language Learning*, *70*, 382-419.

Canagarajah, S. (2011). Codemeshing in academic writing: Identifying teachable strategies of translanguaging. *The Modern Language Journal*, *95*, 401-417.

Catherine, M. M., & Claudia, H. (2015). Translanguaging practices at a bilingual university: a case study of a science classroom. *International Journal of Bilingual Education and Bilingualism*, *18*(6), 698-714.

Cenoz, J. (2017). Translanguaging in school contexts: International perspectives. *Journal of Language, Identity and Education*, *16*(4), 193-198.

Cenoz, J., & Gorter, D. (2015). Towards a holistic approach in the study of multilingual education. In Cenoz, J. & Gorter, D. (eds.), *Multilingual education: Between language learning and translanguaging* (pp. 1-15). Cambridge University Press.

Cenoz, J., & Gorter, D. (2021). *Pedagogical translanguaging.* Cambridge University Press.

Cenoz, J., & Gorter, D. (2022). *Pedagogical Translanguaging (Elements in Language Teaching)*. Cambridge University Press.

Chalmers, H. W. (2019). *Leveraging the L1: the role of EAL learners' first language in their acquisition of English vocabulary.* [Doctoral dissertation]. Oxford Brookes University.

Camó, A.C., & Ballester, E.P. (2015). The effects of using L1 translation on young learners' foreign language vocabulary learning. *Elia: Estudios de Lingüística Inglesa Aplicada, 15*, 109-134.

Cook, V. (1991). The poverty-of-the-stimulus argument and multicompetence. *Interlanguage Studies Bulletin (Utrecht)*, *7*(2), 103-117.

Cook, V. (2007). The nature of the L2 user. *EUROSLA Yearbook*, 205-220.

Cook, V. (2015). Discussing the language and thought of motion in second language speakers. *The Modern Language Journal, 99*(S1), 154-164.

Creese, A., & Blackledge, A. (2010). Translanguaging in the bilingual classroom: A pedagogy for teaching and learning. *The Modern Language Journal*, *94*, 103-115.

Creese, A., & Blackledge, A. (2015). Translanguaging and identity in educational settings. *Annual Review of Applied Linguistics*, *35*, 20-35.

Creese, A., Blackledge, A., & Hu, R. (2018). Translanguaging and translation: The construction of social difference across city spaces. *International Journal of Bilingual Education and Bilingualism*, *21*(7), 841-852.

Cummins, J. (1979). Linguistic interdependence and the educational development of

bilingual children. *Review of Educational Research, 49*(2), 222-251

Cummins, J. (1981). *Schooling and language minority students: Theoretical framework*. Professional Cassette Services.

Dai, M., & Liang, Y. (2007). Zhongguo xuesheng de yingyu cunzaiju xide yanjiu [A study on the acquisition of existential sentences by Chinese students]. *Foreign Language Research, 6*, 41-48.

Daniel, S., Jiménez, R. T., Pray, L. & Pacheco, M. B. (2019). Scaffolding to make translanguaging a classroom norm. *TESOL Journal*, *10*, 1-14.

De Jong, N. H., Steinel, M. P., Florijn, A., Schoonen, R., & Hulstijn, J. H. (2013). Linguistic skills and speaking fluency in a second language. *Applied Psycholinguistics*, *34*(5), 893-916.

Derakhshan, A., Khalili, A. N., & Beheshti, F. (2016). Developing EFL learner's speaking ability, accuracy and fluency. *English Language and Literature Studies, 6*(2), 177-186.

Duarte, J. (2016). Translanguaging in mainstream education: A sociocultural approach. *International Journal of Bilingual Education and Bilingualism*, 1-15.

Ferguson, C. J. (2009). Is psychological research really as good as medical research? Effect size comparisons between psychology and medicine. *Review of General Psychology*, *13*(2), 130-136.

Galante, A. (2020). Translanguaging for vocabulary development: A mixed methods study with international students in a Canadian English for Academic Purposes program. In *Envisioning TESOL through a translanguaging lens* (pp. 293-328). Springer, Cham.

García, O. (2009). *Bilingual education in the 21st century: A Global Perspective*. Wiley-Blackwell.

García, O., & Flores, N. (2014). Multilingualism and common core state standards in the United States.pdf. In S. May (Ed.), *The Multilingual Turn: 304 Implications for SLA, TESOL and Bilingual Education* (pp. 147-166). New York; London: Routledge.

García, O., & Li, W. (2014). *Translanguaing: Language, bilingualism and education*.

Palgrave.

García, O., Faghihi, N., Raola, A. R., & Vaid, J. (2021). Factors influencing bilinguals' speed and accuracy of number judgments across languages: A meta-analytic review. *Journal of Memory and Language*, *118*, 104211.

Gardner, R. C., & MacIntyre, P. D. (1993). A student's contributions to second-language learning. Part II: Affective variables. *Language teaching*, *26*(1), 1-11.

Garzón-Duarte, E., & Posada-Ortiz, J. (2020). EFL Learners from Hungary and EFL Pre-service Teachers from Colombia: A Narrative Research on Imagined Identities. *Colombian Applied Linguistics Journal, 22*(1), 87-100.

Gort, M., & Sembiante, S. F. (2015). Navigating hybridized language learning spaces through translanguaging pedagogy: Dual language preschool teachers' languaging practices in support of emergent bilingual children's performance of academic discourse. *International Multilingual Research Journal*, *9*(1), 7-25.

Grace, C. A. (1998). Retention of word meanings inferred from context and sentence-level translations: Implications for the design of beginning-level CALL software. *The Modern Language Journa*l, 82(4), 533-544.

Gulzar, M. A. (2010). Code-switching: Awareness about its utility in bilingual classrooms. *Bulletin of Education and Research*, *32*(2), 23-44.

Hariton, E., & Locascio, J. J. (2018). Randomised controlled trials—the gold standard for effectiveness research. *BJOG: an international journal of obstetrics and gynaecology, 125*(13), 1716.

Hicks, N. S. (2021). Exploring systematic orthographic crosslinguistic similarities to enhance foreign language vocabulary learning. *Language Teaching Research*. https://doi.org/10.1177/13621688211047353

Ho, W. Y. J. (2018). *Translanguaging in online language learning: Case studies of self-directed Chinese learning of multilingual adults.* [Doctoral dissertation]. University College London.

Holdway, J., & Hitchcock, C. H. (2018). Exploring ideological becoming in professional development for teachers of multilingual learners: Perspectives on

translanguaging in the classroom. *Teaching and Teacher Education, 75*, 60-70.

Hopp, H., & Thoma, D. (2021). Effects of Plurilingual Teaching on Grammatical Development in Early Foreign-Language Learning. *The Modern Language Journal*, *105*(2), 464-483.

Hopp, H., & Thoma, D. (2021). Effects of plurilingual teaching on grammatical development in early foreign-language learning. *The Modern Language Journal, 105*(2), 1-20.

Hopp, H., Kieseier, T., Jakisch, J., Sturm, S., & Thoma, D. (2021). Do minority-language and majority-language students benefit from pedagogical translanguaging in early foreign language development? *Multilingua*, *40*(6), 815-837.

Hornberger, N. & Link, H. (2012). Translanguaging and transnational literacies in multilingual classrooms: A bilingual lens. *International Journal of Bilingual Education and Bilingualism*, *15*(3), 261-278.

Hsu, W. (2013). Bridging the vocabulary gap for EFL medical undergraduates: The establishment of a medical word list. *Language Teaching Researc*h*, 17*(4), 454-484.

Infante, P., & Licona, P. R. (2018). Translanguaging as pedagogy: Developing learner scientific discursive practices in a bilingual middle school science classroom. *International Journal of Bilingual Education and Bilingualism*. 1-14.

Jaspers, J. (2018). The transformative limits of translanguaging. *Language & Communication*, *58*, 1-10.

Kim, Y. (2008). The contribution of collaborative and individual tasks to the acquisition of L2 vocabulary. *The Modern Language Journal*, *92*(1), 114-130.

Kosinski, R. J. (2008). A literature review on reaction time. *Clemson University*, *10*(1), 337-344.

Latisha, M., & Young, A. (2017). From silencing to translanguaging: Turning the tide to support emergent bilinguals in transition from home to pre-school. In B. Paulsrud, J. Rosen, B. Straszer, & A. Wedin (Eds.), *New perspectives on translanguaging and education* (pp. 108-128). Multilingual Matters.

Lee, J. H., & Macaro, E. (2013). Investigating age in the use of L1 or English-only instruction: Vocabulary acquisition by Korean EFL learners. *The Modern Language Journal*, *97*(4), 887-901.

Leonet, O., Cenoz, J., & Gorter, D. (2020). Developing morphological awareness across languages: Translanguaging pedagogies in third language acquisition. *Language Awareness*, *29*(1), 41-59.

Leung, C., & Valdés, G. (2019). Translanguaging and the transdisciplinary framework for language teaching and learning in a multilingual world. *The Modern Language Journal*, *103*(2), 348-370.

Lewis, G., Jones, B. & Baker, C. (2012). Translanguaging: Developing its conceptualisation and contextualisation. *Educational Research and Evaluation*, *18*(7), 655-670.

Lewis, G., Jones, B. ＆ Baker, C. (2012). Translanguaging: Origins and development from school to street and beyond. *Educational Research and Evaluation*, *18*(7), 641-654.

Li, W. (2011). Moment analysis and translanguaging space: Discursive construction of identities by multilingual Chinese youth in Britain. *Journal of Pragmatics*, *43*(5), 1222-1235.

Li, W. (2018). Translanguaging as a practical theory of language. *Applied Linguistics*, *39*(1), 9-30.

Li, W., & Shen, Q. (2021). Translanguaging: Origins, developments, and future directions. *Journal of Foreign Languages*, *44*(4), 2-14.

Lin, A. M. (2015). Conceptualising the potential role of L1 in CLIL. *Language, Culture and Curriculum*, *28*(1), 74-89.

Macaro, E. (2001), Analyzing student teachers' code-switching in foreign language classrooms: Theories and decision making. *The Modern Language Journal, 85*(4). 531-548.

MacIntyre, P., & Gregersen, T. (2012). Affect: The Role of Language Anxiety and Other Emotions in Language Learning: The Role of Language Anxiety and Other Emotions in Language Learning. *Psychology for language learning insights from*

research, theory and practice, 103-118.

Makalela, L. (2015). Breaking African language boundaries: Student teachers' reflections on translanguaging practices. *Language Matters*, *46*(2), 275-292.

Makalela, L. (2015). Moving out of linguistic boxes: The effects of translanguaging strategies for multilingual classrooms. *Language and Education*, *29*(3), 200-217.

Masood, N. (2019). *Students' and teachers' attitude towards translanguaging: an inter university study in Dhaka.* [Doctoral dissertation]. Brac University.

McManus, K., & Marsden, E. (2017). L1 explicit instruction can improve L2 online and offline performance. *Studies in Second Language Acquisition*, *39*(3), 459-492.

McManus, K., & Marsden, E. (2019). Signatures of automaticity during practice: Explicit instruction about L1 processing routines can improve L2 grammatical processing. *Applied Psycholinguistics*, *40*(1), 205-234.

McMillan, B. A., & Rivers, D. J. (2011). The practice of policy: Teacher attitudes toward "English only". *System*, *39*(2), 251-263.

Méndez López, M. G., & Peña Aguilar, A. (2013). Emotions as learning enhancers of foreign language learning motivation. *Profile Issues in TeachersProfessional Development*, *15*(1), 109-124.

Menken, K. (2013). Emergent bilingual students in secondary school: Along the academic language and literacy continuum. Language Teaching*, 46*(4), 438-476.

Menken, K., & Sánchez, M. T. (2019). Translanguaging in English-only schools: From pedagogy to stance in the disruption of monolingual policies and practices. *Tesol Quarterl*y, 53(3), 741-767.

Menken, K., Rosario, V. P., & Valerio, L. A. G. (2018). Increasing multilingualism in schoolscapes: New scenery and language education policies. *Linguistic landscape, 4*(2), 101-127.

Palmer, D. K., Martinez, R. A., Mateus, S. G., & Henderson, K. (2014). Reframing the debate on language separation: Toward a vision for translanguaging pedagogies in the dual language classroom. *The Modern Language Journal*, *98*(3), 757-772.

Pekrun, R. (2014). Emotions and learning. *Educational practices series*, *24*(1), 1-31.

Poza, L. (2017). Translanguaging: Definitions, implications, and further needs in burgeoning inquiry. *Berkeley Review of Education*, *6*(2), 101-128.

Prince, P. (1996). Second language vocabulary learning: The role of context versus translations as a function of proficiency. *The modern language journal, 80*(4), 478-493.

Rabiee, F. (2004). Focus-group interview and data analysis. *Proceedings of the Nutrition Society, 63*(4), 655-660.

Raja, F.D., Suparno, S., & Ngadiso, N. (2022). Teachers' attitude towards translanguaging practice and its implication in Indonesian EFL classroom. *Indonesian Journal of Applied Linguistics*, *11*(3).

Sahr, A. (2020). *Translanguaging practices of multilingual learners in the German as a foreign language class.* [Doctoral dissertation]. The University of Texas.

Saxena, M. (2010). Reconceptualising teachers' directive and supportive scaffolding in bilingual classrooms within the neo-Vygotskyan approach. *Journal of Applied Linguistics & Professional Practice, 7*(2).

Scott, V. M., & FUENTE, M. J. D. L. (2008). What's the problem? L2 learners' use of the L1 during consciousness-raising, form-focused tasks. *The Modern language journal*, *92*(1), 100-113.

Segalowitz, N., & Freed, B. F. (2004). Context, contact, and cognition in oral fluency acquisition: Learning Spanish in at home and study abroad contexts. *Studies in second language acquisition*, *26*(2), 173-199.

Sheng, L., Peña, E. D., Bedore, L. M., & Fiestas, C. E. (2012). Semantic deficits in Spanish-English bilingual children with language impairment. *J Speech Lang Hear Res, 55*(1), 1-15.

Shohamy, E. (2006). *Language policy: Hidden agendas and new approaches*. Routledge.

Sibbald, B., & Roland, M. (1998). Understanding controlled trials. Why are randomised controlled trials important? *BMJ: British Medical Journal, 316*(7126), 201.

Sieh, Y. C. (2008). A possible role for the first language in young learners' processing and storage of foreign language vocabulary. *Annual Review of Education, Communication & Language Sciences*, *5*, 136-160

Storch, N. & Wigglesworth, G. (2003). Is there a role for the use of the Ll in an L2 setting? *TESOL Quarterly*, *37*(4), 760-770.

Swain, M. (2006). Languaging, agency and collaboration in advanced second language learning. In H. Byrnes (Ed.), *Advanced language learning: The contributions of Halliday and Vygotsky* (pp. 95-108). Continuum.

Swain, M. (2010). Talking it through: Languaging as a source of learning. *Sociocognitive Perspectives on Language Use and Language Learning*, 112-130.

Tang, H., & Peng, Q. (2020, February). Experimental Research in Phonics Classroom Instruction of Low-Grade Elementary Students from the Perspective of Translanguaging. In *6th International Conference on Education, Language, Art and Inter-cultural Communication (ICELAIC 2019)* (pp. 147-151). Atlantis Press.

Tedick, D. J., & Lyster, R. (2019). *Scaffolding language development in immersion and dual language classrooms*. New York: Routledge.

Thomas, J. (1992). Metalinguistic awareness in second- and third-language learning. *Advances in psychology*, *83*, 531-545.

Vallejo, C. (2018). Review on translanguaging: Language, bilingualism and education. *Journal of Teaching & Learning Language & Literature*, *11*(1), 85-95.

Van de Pol, J., Volman, M., Oort, F., & Beishuizen, J. (2015). The effects of scaffolding in the classroom: support contingency and student independent working time in relation to student achievement, task effort and appreciation of support. *Instructional Science*, *43*(5), 615-641.

Verhoeven, L. T. (1994). Transfer in bilingual development: The linguistic interdependence hypothesis revisited. *Language learning, 44*(3), 381-415.

Viniti Vaish & Aidil Subhan (2015) Translanguaging in a reading class, International Journal of Multilingualism, 12:3, 338-357,

Vygotsky, L. S. (1987). *The collected works of L. S. Vygotsky* (1st ed.). Plenum.

Wang, D. (2013). English in the Chinese foreign language classroom.

Wang, D. (2019). Translanguaging as Pedagogy: Practices and Perceptions. In *Multilingualism and Translanguaging in Chinese Language Classrooms* (pp. 69-96). Palgrave Macmillan, Cham.

Wang, D. (2019). Translanguaging in Chinese foreign language classrooms: students and teachers' attitudes and practices. *International Journal of Bilingual Education and Bilingualism*, *22*(2), 138-149.

Wheeler, R. S., & Swords, R. (2010). *Code-switching lessons: Grammar strategies for linguistically diverse writers: Grades 3-6*. Firsthand Heinemann.

Wigglesworth, G., & Storch, N. (2009). Pair versus individual writing: Effects on fluency, complexity and accuracy. *Language Testing*, *26*(3), 445-466.

Wiley, T. (2010). Language policy in the USA. In K. Potowski (Ed.), *Language diversity in the USA* (pp. 255-271). Cambridge University Press.

Williams, C. (1994). *Arfarniad o Ddulliau Dysgu ac Addysgu yng Nghyd-destun Addysg Uwchradd Ddwyieithog [An evaluation of teaching and learning methods in the context of bilingual secondary education]* [Unpublished doctoral dissertation]. University of Wales.

Williams, C. (2002). Ennill iaith: Astudiaeth o sefyllfa drochi yn 11-16 oed [A language gained: A study of language immersion at 11-16 years of age]. *Bangor, UK: School of Education*.

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry*, *17*, 89-100.

Wu, L. (2020). The learning of "there-be" structure for Chinese EFL learners. *Overseas English, 3*, 13-15.

Wu, L. (2008). Yiwu Jiaoyu feijunheng fazhan xianzhuang ji difang zhengce xuanze -- yi Henansheng Jiaozuoshi weili [Unbalanced development of compulsory education and local policy choices: A case study of Jiaozuo, Henan], *Academic Journal of Zhongzhou, 4*, 111-113.

Wu, L. (2014). *Henan Jiaozuo diqu huizu xiaoxue zhengti jiaoyu huanjing de diaocha yanjiu [Research on the whole education environment of Hui primary school in*

Jiaozuo: According to Three Schools for Example] [Master dissertation]. Bohai University press.

Yang, M., Cooc, N., & Sheng, L. (2017). An investigation of cross-linguistic transfer between Chinese and English: A meta-analysis. *Asian-Pacific Journal of Second and Foreign Language Education, 2*(1), 1-21.

Yang, Y. (2014). The development of speaking fluency: The 4/3/2 technique for the EFL learners in China. *International Journal of Research Studies in Language Learning, 3*(4), 55-70.

Yu, S. & Su, J. (2011). There be cunzaiju xide zhong de dingzhi xiaoying yanjiu[The determinate effect of "there be" in the acquisition of existential Sentences]. *Foreign Language Teaching Research (bimonthly),43*(5), 712-725.

Zhang D. (2002). *Shiyong yingyu yufa (zuixinban) [A practical English Grammar (Latest edition)]*. Beijing: Foreign Language Teaching and Research Press.

Zheng, S. (2018). Cong eryu xide jiaodu fenxi renjiao xiaoxue yingyu cihui yu jiaoxue [An analysis of English vocabulary and teaching in primary schools from the perspective of L2 acquisition]. *English on Campus*, (23), 101-103.

Zhou, X., & Mann, S. (2021). Translanguaging in a Chinese university CLIL classroom: Teacher strategies and student attitudes. *Studies in Second Language Learning and Teaching*, *11*(2), 265-289.

Appendices

Appendix 1 Information sheet and Opt-out consent form

Dear Parent or Guardian,

My name is (name of author, erased here for anonymity, candidate number 1060489) and I am conducting a study about translanguaging at the University of Oxford. Your school has kindly agreed to take part. Please read and keep this letter for your information.

The goal of this project is to study translanguaging (the use of the learners native language in learning a second or foreign language) in the acquisition of grammatical structures for Chinese EFL learners of the beginner level. I will examine the learning of the grammatical structure “there is/ there are” with Year 6 students. During the study, students will first take a pre-test on their knowledge of the grammatical structure “there is/ there are”. I will show them a 12-minute video teaching them the sentence structure. Then, they will be randomly paired up to do a practice activity for 12 minutes. Finally, they will take a post-test and some of them will be invited to a focus group interview with me for less than 40 minutes. This is so we can see whether different languages students use could influence the learning outcome.

The results of this research will help us gain a better theoretical understanding of translanguaging which could further help with pedagogical designs. There are no identified risks to taking part in this research. If your child does not wish to take part, or wishes to stop taking part at any time, they will be able to withdraw.

Your child’s responses will be confidential and will not be shared with their school. A summary of the findings which does not identify individual participant’s results will be made available to teachers and parents/participants at the end of the research, and findings will be used as a degree thesis and possibly for future publications. If you wish to withdraw your child’s data, you may do so by emailing the researcher by the end of May 2022, or two weeks after data collection, whichever is later. Only the researcher and the investigator will have access to the research data, which will be stored on a password-protected file in a pin-protected laptop. Research data will be

kept for a minimum of 3 years after publication of the research findings. The study has been approved by the University of Oxford department of education ethics committee, reference: **[CIA-22HT-022]**.

If you are happy for your child to take part in our research you do not need to take any action.

However, if you **do not wish** for your child to participate, please fill in the form to opt out below.

Feel free to contact me if you have any questions about participating in the study, or to receive a copy of the results when the study is complete. I am grateful for your help with my research.

(name of author, erased here for anonymity, candidate number 1060489)

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Appendix 2 Translation test questions

Set 1:

Translate the following sentences from Chinese to English with the help of the given vocabulary. Use the sentence structure "there be".

用所学 There be 句型根据所给单词将下列句子由中文翻译成英文

1. 这里有一个篮球和两个排球。（篮球 basketball, 两个排球 two volleyballs）
2. 动物园里有老虎。（动物园里 in the zoo, 老虎 tigers）
3. 桌子上有牛奶和三明治 （桌子上 on the table, 牛奶 milk, 三明治 sandwiches）
4. 瓶子里有水吗？（瓶子里 in the bottle, 水 water）
5. 篮子里有哪些水果？（篮子里 in the basket, 水果 fruits）
6. 篮子里有橙子吗？（篮子里 in the basket, 橙子 oranges）
7. 一年有几个月？（一年里 in a year, 月 months）
8. 我的口袋里一点钱也没有了。（我的口袋里 in my pocket, 钱 money）
9. 冰箱里一点面包或者饼干都没有了。（冰箱里 in the fridge, 面包 bread, 牛奶 milk）
10. 足球队里一个男生也没有。（足球队里 in the football team, 男生 boys）
11. 墙上没有任何照片。（墙上 on the wall, 照片 pictures）
12. 罐子里有一些盐 （罐子里 in the jar, 盐 salt）

Set 2:

Translate the following sentences from Chinese to English with the help of the given vocabulary. Use the sentence structure "there be".

用所学 There be 句型根据所给单词将下列句子由中文翻译成英文

1.操场上有一个老师和很多学生。(操场上, on the playground; 老师, teacher; 很多学生, many students)

2.冰箱里有咖啡和三明治。(冰箱里, in the fridge; 咖啡, coffee; 三明治 sandwiches)

3.教室里有一些椅子。(教室里, in the classroom; 一些椅子, some chairs)

4.篮子里有几个香蕉？(篮子里, in the basket; 香蕉, bananas)

5.盒子里有哪些玩具？(盒子里, in the box; 玩具, toys)

6.架子上有书吗？(架子上, on the shelf; 书, books)

7.桌子上有灰尘吗？(桌子上, on the table; 灰尘, dust)

8.在你的口袋里有多少钱？(在你的口袋里, in your pocket, 钱 money)

9.商店里一点肉或者牛奶都没有了。(商店里, in the store; 肉, meat; 牛奶, milk)

10.池塘里一条鱼也没有。(池塘里, in the pound; 鱼, fish)

11.这个碗里没有米饭了。(这个碗里, in this bowl; 米饭, rice)

12.地上没有任何树叶。(地上, on the ground; 树叶, leaves)

Appendix 3 Original texts of the grammaticality judgement test

Set 1:

1. There is two apples in the basket.
2. There are plenty of fish in the lake.
3. There have five bottles on the table.
4. There is some snow on the roof.
5. There isn't any tree in the park.
6. There aren't any monkeys on the mountains.
7. There isn't any flowers on the ground.
8. There haven't any bread in the fridge.
9. There isn't any meat left for us.
10. There isn't any space in this room.
11. There aren't any people in the room.
12. Are there any food in the bowl?
13. Is there any water on the floor?
14. Are there any pictures in the album?
15. Have there any books in your bag?
16. How many tables are there in the room?
17. How much money are there in your purse?
18. How many apples have there on the plate?
19. There is a girl and 5 boys in the classroom.
20. There are milk and tea in our store.
21. There are a tree and many flowers in the park.
22. There are T-shirts and trousers on the bed.
23. There haven't any pencils or pens in the box.

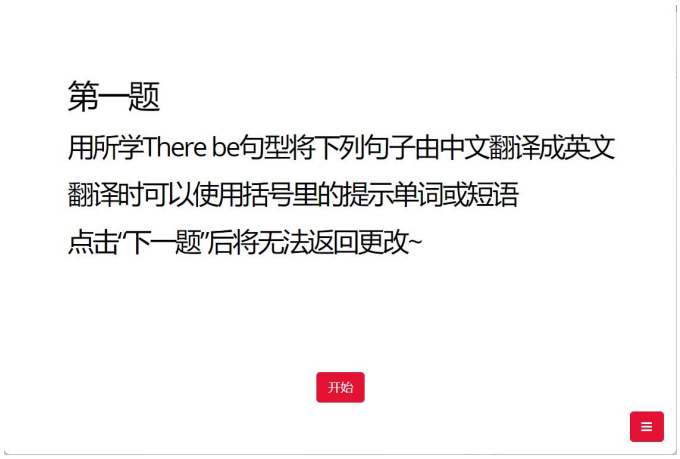
Set 2:

1. There is five oranges in the box.
2. There are plenty of people in the room.

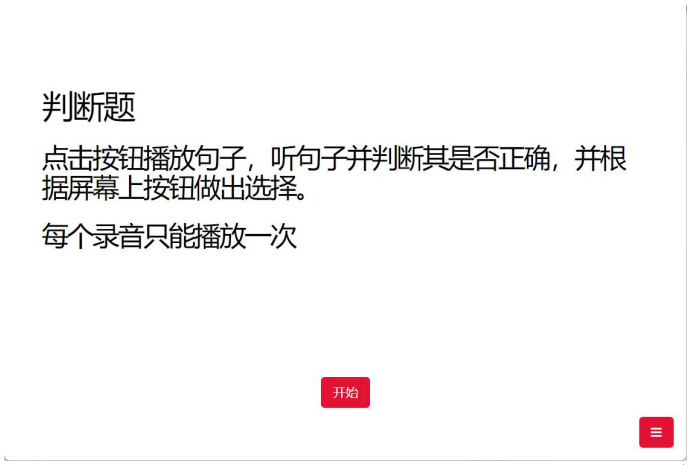
3. There have four hospitals in the village.
4. There is a table in front of the window.
5. There haven’t any eggs in the fridge.
6. There isn’t any juice left for us.
7. There isn’t any child in the park.
8. There aren’t any ghosts in the world.
9. There isn’t any bottles on the shelf.
10. There isn’t any light in the room.
11. There aren’t any girls in the classroom.
12. Are there any milk in the bottle?
13. Is there any money in your bank account?
14. Are there any horses on the farm?
15. Have there any biscuits in your bag?
16. How many books are there on the table?
17. How many days is there in a month?
18. What fruits have there in the fridge?
19. There is an airport and two train stations in our city.
20. There are coffee and tea in the kitchen.
21. There is a strawberry and three oranges.
22. There are a bike and several cars in the garage
23. There aren’t any bread or biscuits here.

Appendix 4: Screenshots of tests realized through Gorilla.sc

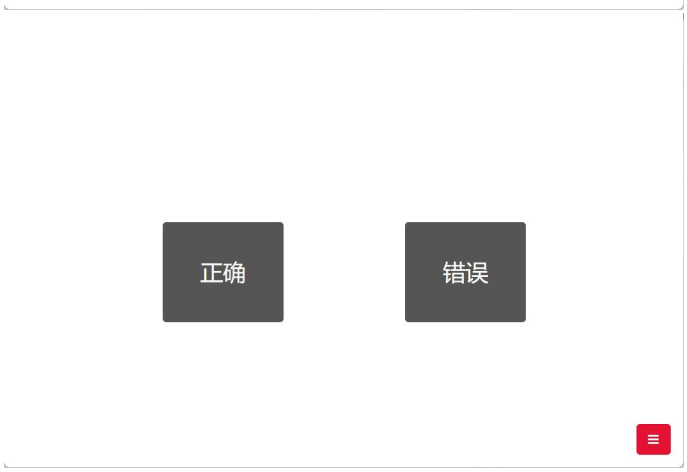







判断题
点击按钮播放句子，听句子并判断其是否正确，并根据屏幕上按钮做出选择。
每个录音只能播放一次
开始


1.
播放句子
1


正确
错误

Appendix 5: Focus group interview guiding questions

1. How do you feel when using Chinese words in English sentence structures/when being instructed to only use English for the activity?
你在练习活动中，对在句子里使用中文/全部使用英文有什么感受吗？

2. What were you focusing on during the activity? /What did you spend most of the time doing? /Where did you pay most attention to during the activity?
你在活动中主要的精力和注意力花在了什么上面？

3. Regardless of the instructions, what was the language you used during the activity?
尽管活动有要求，你在实际找不同的时候的语言使用大概是什么样？

4. How effective do you think it was to practice with both Chinese and English/ only with English?
你觉得活动里的这种练习方式对学 there be 句型有效果吗？

5. Which would you prefer, being allowed to Chinese when practicing English sentences or need to stick to English in your future practice?
你未来会更倾向于哪一种练习方式，全部使用英文，还是在不会的地方用中文单词？

Appendix 6 Tutorial video transcript

Original script:

我们今天一起来学习的结构是 there be 句型。There be 句型是用来表示有某物在某地或者说某地有某物的意思。不过在英语里我们一说到有这个意思，可能首先想到的会是这样一个动词，那就是 have 或者 has。它们和 there be 有什么区别？首先 have 和 has 表示的是某人拥有某物，那也就是说它们的主语是一个人，而 there be 句型后面跟的都是一些物品或者位置，表示的是某个地方有什么样的东西，所以说它们的主语是不一样的，比如说我们想说我有一本书，那就是 I have a book，或者说他有一个姐姐，那就是 he has a sister。

但对于 there be 句型来说，什么时候我们会用到呢？那就是在描述一些场景里某地有某物的时候，比如说我们来看这个图片的例子，如果我们想说桌子上有一本书，那这个时候并不是某人有这本书，而是桌子这个地方有这本书，因此我们就会选择用 there be 句型。这里的 be 是 be 动词，在实际使用中 be 动词永远会变成 is 或者 are，在一般现在时的时态中。所以说这句话应该就是 There is a book on the desk。

至于这个句子的结构，我们可以来分解开看一下。其实是由三个部分组成的，第一个部分就是 there is 它表示哪里有什么东西。第二个部分是 a book，它是我们的名词短语，一本书表示的是这个物品。第三个部分 on the desk 在桌子上表示的是地点。所以说这三个部分连起来就是 There is a book on the desk。表示的就是桌子上有一本书，这个句子就可以告诉我们 there be 句型在表达单数名词在某地的时候，就可以有这样一个句子结构。让我们来接下来学习。那就是 there is 加上 a 或者 an 加上名词的单数，在这个句子里就是 book，然后再加上地点。如果说有一个地点，它有不止一个东西，比如说我们还看这幅图片，桌子上有不止一片树叶，有一些树叶，这个时候是一个树叶的复数，我们可以怎么说？其实句子结构和刚刚也是一样的，还是分成三个部分，刚刚因为是一本书是一个单数，所以 there 后面的 be 动词用的是 is，而这个东西如果是复数的话， there is 会变成 there are 也是 be 动词，是 is 的复数形式。第二部分还是我们的名词短语，在复数的句子中 some 或者是数量词加上复数名词，就可以表达一个复数的名词短语。在这里一些叶子，一些树叶，就是 some leaves。第三部分还是地点，这个

是维持不变的。在这个句子中地点是在桌子上，那就是 on the desk。所以说组合在一起就是 There are some leaves on the desk。复数的 there be 结构，我们就可以从这里总结出来， there are 加上数量加上复数名词，最后再加上地点。

不过我们的名词中除了像一本书两只猫三个人这种可数的名词之外，也有一些是不可数的，比如说牛奶、茶、时间，英语里没有办法说一个时间两个时间，它们就是属于不可数名词的范畴。这种情况下我们是用 there is 还是 there are，我们一起来看一看，比如说如果我们要说杯子里有一些茶，像茶、咖啡、水等这些液体都是不可数的，对于这些不可数名词，be 动词用的应该是 is，这里大家可以记一下，不可数名词的 be 动词用的是 is。再结合我们刚刚讲的三段结构的公式，这个还是不变的，不可数名词的句型就应该是 there is 加上数量词和不可数名词，最后再加地点。所以说我们来看这个句子，杯子里有一些茶第一个部分还是 there is。第二个部分，一些茶就是 some tea，some 就是一些的意思。最后第三部分不变还是加地点 in the cup。合起来它就是 There is some tea in the cup。杯子里有一些茶。

我们再来回顾一下就是 there be 句型的整个句子结构在陈述句中是什么样的。比如说单数名词的时候，我们是 there is 加上 a 或者 an 加上名词单数，加地点。在复数名词的时候就是 there are 加上数量，加上复数名词再加地点。在不可数名词，比如水、时间、钱这些情况下，是 there is 加上数量加上不可数名词，再加上地点。所以说这里能看出它们都是很符合我们的三段结构的公式。那就是 there is 或者 there are 加上名词短语，最后再加地点短语。这就是 there be 句型的陈述句的结构。

关于 there be 句型的陈述句，我们还有最后一个特点要介绍，那就是就近原则。就近原则就是说 there be 句型是一个近视眼，如果说某地有两种或者两种以上的物品在选择使用 there is 还是 there are 的时候，就只需要看离 there be 更近的那一个。比如说要描述这幅图片，我们可以说桌子上有一本书和一些树叶，或者说桌子上有一些树叶和一本书，在中文里这两个句子的意思是完全一样的，但是它们的英文表达却有不同，第一个句子会是 There is a book and some leaves on the desk，而第二个句子是 There are some leaves and a book on the desk。为什么会有这样的区别呢？那就是说 there be 结构它是一个近视眼，它只看得到离它更近的

那个名词短语，它的单复数或者可数不可数。因此在第一个句子里，a book 一本书是单数，所以说 there be 句型的 be 动词选的是 is。即便后面有很多树叶，有一些树叶，我们也不需要来管它。而在第二个句子中，some leaves 离 there be 更近，它是一个复数。所以说这里就应该是 There are some leaves and a book on the desk。

我们再来看一个例子，操场上有很多水和一些树。这里很多水大家可以先想一想，如果我们只说操场上有很多水应该用 there is 还是 there are？因为根据就近原则，后面的一些树，是什么不重要，我们只看离 there be 更近的前面的名词短语。所以说这个句子应该是 There is a lot of water and some trees on the playground。因为 a lot of water 是不可数名词，所以说不可数名词的 there be 的 be 动词一直用单数，也就是说 there is 这句话完整的是 There is a lot of water and some trees on the playground。

以上就是 there be 句型的陈述句。

接下来我们再来看一看它的否定形式，它的否定形式结构其实也非常简单，就是在 there is 或者 there are 这个基础的结构后面加上了 not，然后缩写为 there isn't 或者 there aren't。再加名词短语和地点短语。比如说我们想说桌子上没有水，我们可以先来看桌子上有一些水是什么样的表达。那就是 There is some water on the table。如果想把它变成否定句的话，那就是把 is 变成 isn't， some 变成 any。There isn't any water on the table，其他地方不变，我们照着写下来就可以。所以说它的否定句就是 There isn't any water on the table。在否定句和疑问句中大家要特别注意，所有的 some 都要变成 any，意思就是桌子上没有一点水。而不是桌子上没有一些水，这会是一个很奇怪的表达。

我们再来看一个例子，如果我们想说教室里没有学生，我们可以首先想想教室里有学生怎么说，那就是 There are some students in the classroom。相应的我们把 are 后面加上 not，变成 there aren't, some 变成 any。这个句子就会是 There aren't any students in the classroom。

接着我们再来看 there be 句型的一般疑问句，它就是把 there is 顺序颠倒了一下，变成了 is there。There are 顺序颠倒了一下变成了 are there。后面还照样加上名词短语和地点短语，最后加一个问号。我们来看一个例句，还说桌子上有没有水这个问题。它的陈述句是 There is some water on the table。把 is 和 there 的顺序

颠倒，变成了 Is there any water on the table？这里 is 提前放在 there 前面，然后我们说过的 some 在否定句和疑问句中都变成 any。所以 Is there any water on the table？

我们再看一个例子，树上有一些鸟，There are some birds in the tree。它的一般疑问句也是把 are 提前变成 are there，把 some 变成 any。所以句子就应该是 Are there any birds in the tree？后面的部分名词短语和地点短语还照抄下来。

我们要学习的最后一个句型就是 there be 的特殊疑问句。特殊疑问句是什么？它就是不能简单的用 yes 或者 no 来回答的问题。比如说可能会问某地有多少个某物？或者问某地有哪些某物？这种情况下我们就要用到特殊疑问句。它和一般疑问句的区别其实就是在一般疑问句的基础上加上了一个特殊疑问词，不变的是 is there 和 are there 这个顺序相对陈述句来说还是颠倒过来的。

我们来看两个例句，首先如果我们想对 There are three kids in the room，这个句子里有多少个小孩进行提问的话，这个句子应该是 How many kids are there in the room。我们可以来看看这个句子是怎么出现的。对有多少小孩提问，就是 how many 它是一个对可数名词提问的特殊疑问词。然后和一般疑问句一样，there are 顺序颠倒一下变成 are there。最后再把地点短语照抄下来。那就是 How many kids are there in the room？再比如说，如果我们想说 There is some money in my pocket，说我的口袋里有一些钱。有人如果想问你你的口袋里是什么？那是什么，对 some money 提问。“是什么”，就是特殊疑问词用 what。There is 还是颠倒一下顺序变成 is there？这个句子就应该是 What is there in your pocket？以上就是我们今天学习的全部关于 there be 句型的内容了。非常感谢大家的倾听和专注。

Translation of the transcript (Excerpts)

Today we are going to study the sentence pattern “there be”. This sentence pattern is to express that there is something in a certain place. The first thing that comes to our mind when we talk about existing in English is probably “have or has”, which expresses possession, but what is the difference between have has and there be?

First of all, they are different in meaning. have and has mean that someone has something. They mean that the subject of the sentence is a person, whereas there be sentences are followed by objects and locations, indicating what kind of things are in

a certain place, a kind of description of a scene. For example, if we want to say I have a book, does he have a good friend? The subject here is to indicate that someone has, and that is all with have or has.

When do we use there be sentence structure? That is when you are describing some scenes where something exists. Let's look at the following picture as an example. For example, if there is a book on the table, it is not that someone has the book, but the table, which is somewhere, we use the there be sentence pattern, where be is a verb, which in practice will be in the form of either is or are depending on the noun that follows it. As for the structure of this sentence, we can break it down to see that it is made up of three parts: there is indicates where there is... There is a book on the desk, and there is a book on the desk, which is the place.

This is the sentence structure we can write down when there be sentence type expresses the singular, which is there is + a/an singular noun + place.

....

There is one last feature to be introduced about there be sentences -- the principle of proximity. The principle of proximity means that when choosing whether to use there is or there are we only need to look at the one that is close to there be. For example, to describe this picture.

There is a book and some pencils.

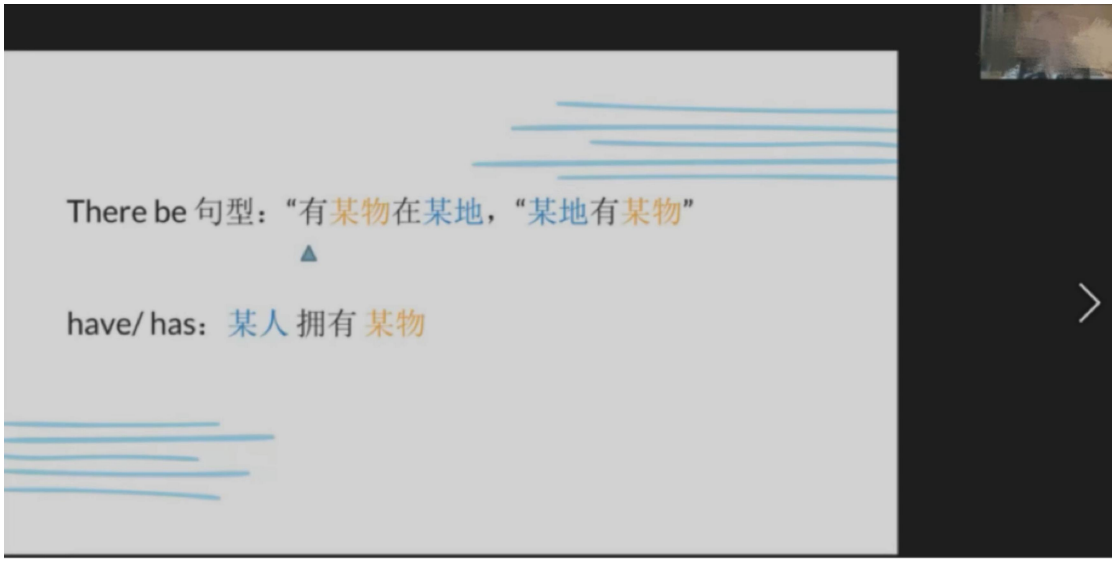
There are some pencils and a book.

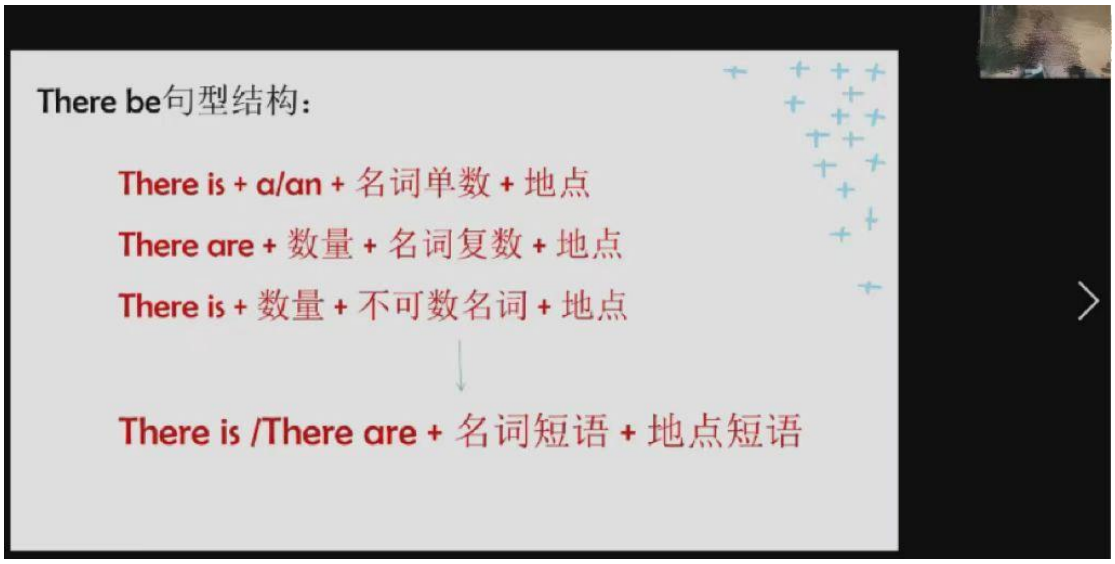
These two sentences have the same meaning, but one uses there is and the other uses there are after switching the order. Let's look at another example.

There is a lot of water and some trees in the playground.

In this sentence, to comply with the principle of proximity, we only need to look at the "a lot of water", which is closer to there be. There is a lot of water. Water is an uncountable noun, so no matter how many trees are behind it, we should use there is.

Appendix 7 Screenshots of tutorial video







Appendix 8: “Spot-the-difference” practice activity handouts

Participant A handout:



肯定句：

There is + a/an + 名词单数 + 地点

There are + 数量 + 名词复数 + 地点

There is + 数量 + 不可数名词 + 地点

否定句：

There aren’t +可数名词 +地点

There isn’t + 不可数名词 +地点

一般疑问句：

——Is there + any +不可数名词+地点？

——Are there + any +可数名词+地点？

——Yes, there is/ are.

——No, there isn’t / aren’t.

特殊疑问句：

特殊疑问词 + 可数名词 + are there +地点？

特殊疑问词 + 不可数名词 + is there +地点？

Participant B handout:



肯定句：

There is + a/an + 名词单数 + 地点

There are + 数量词 + 名词复数 + 地点

There is + 数量 + 不可数名词 + 地点

否定句：

There aren’t +可数名词 +地点

There isn’t + 不可数名词 +地点

一般疑问句：

——Is there + any +不可数名词+地点？

——Are there + any +可数名词+地点？

——Yes, there is/ are.

——No, there isn’t / aren’t.

特殊疑问句：

特殊疑问词 + 可数名词 + are there +地点？

特殊疑问词 + 不可数名词 + is there +地点？

Appendix 9: Instructions for the "spot-the-difference" activity

Instructions:

接下来这个练习，你将和你的搭档两人一组进行"找不同"。你们两人将会分别拿到一张图片，这两张图片大体类似，但会存在 5 个不同之处。你们不会看到对方的图片，因此需要通过问问题、回答、及描述自己图片的方式，来找出图片上的不同之处都在哪里。问答和描述过程中，只可以使用之前学到的 there be 句型中的肯定句、否定句、疑问句、和对疑问句的完整回答。【问答沟通过程中，请全程使用英文~如果遇到了不完全知道的单词，可以想办法换种说法表达出来~达到沟通效果】【沟通过程中，如果不知道句子中除 there be 结构之外的词汇，可以用中文替代，如，可以说"Is there a 滑梯 in your picture?"】不要惧怕出错~~句子说错了也没关系！充分沟通，努力找出不同呀！

Translation of the Instructions:

For this exercise, you will work in pairs with your partner to "find the differences". You will each be given a picture that is generally similar, but with 10 differences. You will not see each other's pictures, so you will need to find out what the differences are by asking questions, answering them and describing your own picture. During the questions and answers and descriptions, you can only use the affirmative, negative and interrogative sentences of the there be sentence pattern that you have learned before, as well as the full answers to the interrogative sentences. If you don;t know a word, you can find a way to say it in a different way to achieve the communication effect. Don't be afraid to make mistakes.) It's okay to say the incorrect sentence! Communicate fully and try to find out the difference!

Appendix 10: Transcripts of the example videos for the TL group and the EO group

TL group video:

Speaker A: There is a 沙滩车 on the beach. Are there any 沙滩车 on the beach in your picture?

Speaker B: No, there aren't. There aren't any 沙滩车 in my picture. So 这里是一个不同！Are there any 红黄条纹的旗子在你图片的右手边？

Speaker A: Yes, there are! There is a 红黄条纹的旗子在我图片的右手边。

Speaker B: Great! 那这里是一样的.

EO group video:

Speaker A: There is a dune buggy on the beach. Are there any dune buggies on the beach in your picture?

Speaker B: No, there aren't. There aren't any dune buggies in my picture. So that's a difference! Are there any flags with red and yellow strips on the right-hand side of your picture?

Speaker A: Yes, there are! There is a flag with red and yellow strips on the right-hand side of my picture.

Speaker B: Great! So this is the same.

Appendix 11: Approval from the Central University Research Ethics Committee of the University of Oxford

Dear (name),

Translanguaging in the acquisition of grammatical structures for Chinese EFL learners
CIA-22HT-022

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethical approval of all research involving human participants.

Our prior discussion on this was very useful – an impressive team as ever, and project, vastly experienced, and a model of genuine care in relation to research ethics.

I am pleased to inform you, then, that, on the basis of the information provided to DREC, the proposed research has been judged as meeting appropriate ethical standards, and accordingly, approval has been granted.

Please continue to follow all current guidance issued by CUREC during the pandemic, notably COVID-19: CUREC guidance on research involving human participants, https://researchsupport.admin.ox.ac.uk/governance/ethics/coronavirus

If relevant please also check the CUREC website for their best practice research guides, these can be very useful in refining the writing up of ethical considerations in your research – see https://researchsupport.admin.ox.ac.uk/governance/ethics/resources/bpg

Good luck with your research study,

Keep well and safe,

Yours sincerely,

All good wishes,

Liam

Chair, DREC

Liam Francis Gearon, PhD, FHEA, FRSA, Docent



Senior Research Fellow, Harris Manchester College, University of Oxford
Associate Professor, Department of Education, University of Oxford
Conjoint Full Professor, Newcastle University, Australia
Docent, University of Helsinki, Finland
Extraordinary Professor, North-West University, South Africa
Visiting Professor, Irish Institute for Catholic Studies, MIC, Limerick, Ireland
Honorary Senior Research Fellow, School of Education, University of Birmingham

Appendix 12 Coding scheme for interview data

Emotions	nervous
	afraid
	confused
	amusing
	strange
	relaxed
	Enjoyable
Effectiveness	Focus on word expression
	Focus on “there be” construction
	Fixed chunks
	Negative transfer of L1
	Path of resistance
Future use/attitude	Not helpful
	Helpful
	common

Appendix 13 One-Way ANOVA of average gains of pairs in TT and GJT

As in the table below, the 25 paired groups in the TL group improved .203 (SD=.164) by average in the TT correct rate, and the 25 paired groups in the EO group improved .180 (SD=.128) by average. For GJT correct rate, the mean gains of the TL group pairs were .052 (SD=.118) and .012 (SD=.115) of the EO group. The average progress of paired participants in the practice activity was not significantly different between TL group and EO group for both TT (F=.315, p=.577) and GJT (F=1.478, p=.23), which is consistent with the findings from the ANOVA on individual participants.

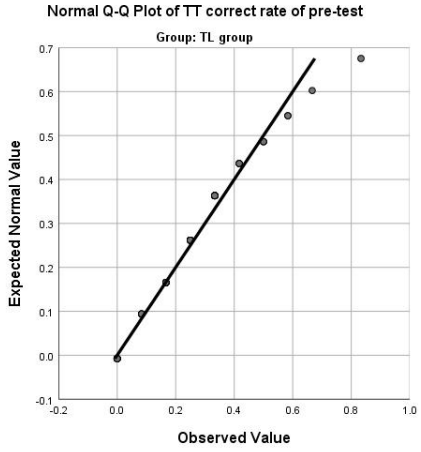
One-Way ANOVA of average gains of pairs in TT and GJT.

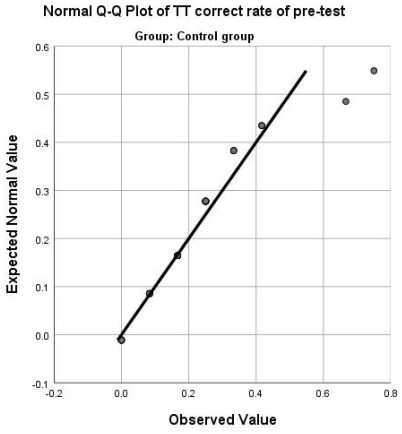
	TT				GJT			
	Mean	Std. Deviation	F	Sig.	Mean	Std. Deviation	F	Sig.
TL group	.203	.164	.315	.577	.052	.118	1.478	.23
EO group	.180	.128			.012	.115		

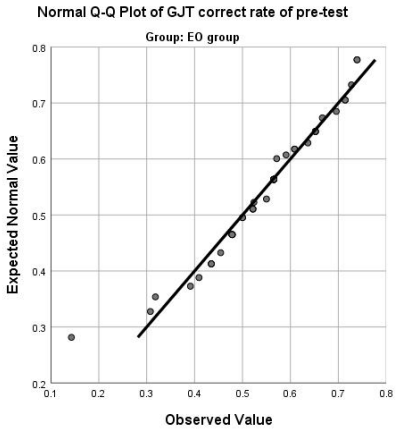
Appendix 14 Test of normality of TT and GJT correct rate

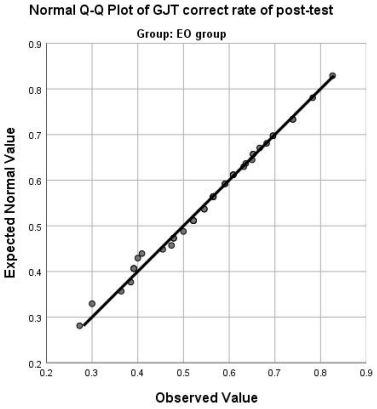
As in the table below, the absolute values of Z-scores on skewness (ZS) and Z-scores on kurtosis (ZK) of the following correct rates were less than 1.96: correct rate of the TL group in TT post-test (ZS=1.10, ZK=-.25), the correct rate of the TL group in GJT pre-test (ZS=.73, ZK=-.58), the correct rate of EO group in TT pre-test (ZS=.32, ZK=-.99), the correct rate of the EO group in TT post-test (ZS=.75, ZK=-.99), the correct rate of the EO group in GJT post-test (ZS=-.36, ZK=-.23), the correct rate of the control group in TT post-test (ZS=.48, ZK=-1.2), the correct rate of the control group in GJT pre-test (ZS=.98, ZK=-1.54), suggesting that these DVs could pass the normality distribution test. For the correct rates whose Z-scores for skewness and kurtosis were not both within the range of ±1.96, histograms and QQ-plots were visually checked. The visual checks suggest that the rest can all be seen as normally distributed for later ANOVA (See following for visual checks of QQ-plots). As for gains of TT and GJT correct rate, they were all normally distributed. Z-scores of skewness and kurtosis of gains of the TL group, the EO group and the Control group on both TT correct rate and GJT correct rate are within ±1.96.

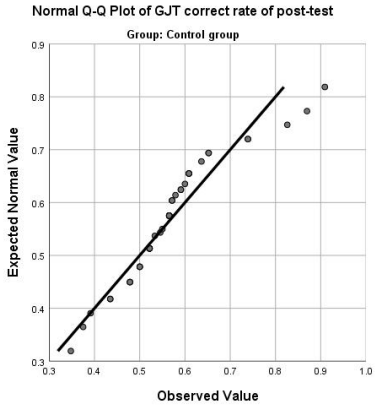
			TT correct rate			GJT correct rate		
		N	Mean (sd.)	Skewness (se.)	Kurtosis (se.)	Mean (sd.)	Skewness (se.)	Kurtosis (se.)
TL group	Pre-test	50	.262 (.184)	.745 (.337)	.880** (.662)	.522 (.146)	.245** (.337)	-.383** (.662)
	Post-test		.465 (.235)	.370** (.337)	-.163** (.662)	.574 (.144)	-.958 (.337)	3.863 (.662)
	Gain		.203 (.225)	.264** (.337)	.245** (.662)	.052 (.190)	-.332** (.337)	.726** (.662)
EO group	Pre-test	50	.272 (.186)	.108** (.337)	-.657** (.662)	.543 (.117)	-.769 (.337)	1.798 (.662)
	Post-test		.452 (.239)	.253** (.337)	-.653** (.662)	.555 (.122)	-.122** (.337)	-.151** (.662)
	Gain		.180 (.208)	.147** (.337)	-.080** (.662)	.012 (.155)	.490** (.337)	1.286** (.662)
Control group	Pre-test	45	.200 (.158)	1.348 (.354)	3.341 (.695)	.553 (.115)	.347** (.354)	-1.073** (.695)
	Post-test		.452 (.213)	.171** (.354)	-.850** (.695)	.569 (.113)	1.027 (.354)	2.070 (.695)
	Gain		.252 (.175)	.047** (.354)	-.829** (.695)	.016 (.136)	.144** (.354)	-.416** (.695)


Normal Q-Q Plot of TT correct rate of pre-test
Group: TL group
Expected Normal Value
Observed Value


Normal Q-Q Plot of TT correct rate of pre-test
Group: Control group
Expected Normal Value
Observed Value


Normal Q-Q Plot of GJT correct rate of pre-test
Group: EO group
Expected Normal Value
Observed Value


Normal Q-Q Plot of GJT correct rate of post-test
Group: EO group
Expected Normal Value
Observed Value


Normal Q-Q Plot of GJT correct rate of post-test
Group: Control group
Expected Normal Value
Observed Value

Appendix 15: Homogeneity test of TT and GJT correct rates

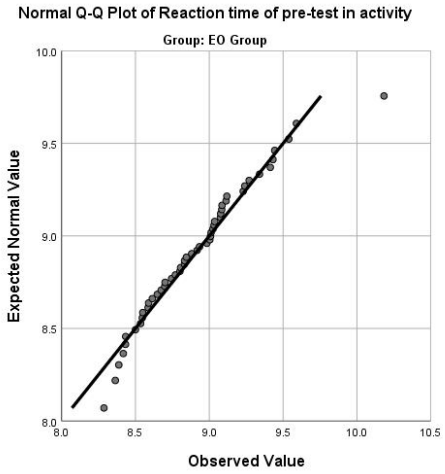
Test of Homogeneity of Variances

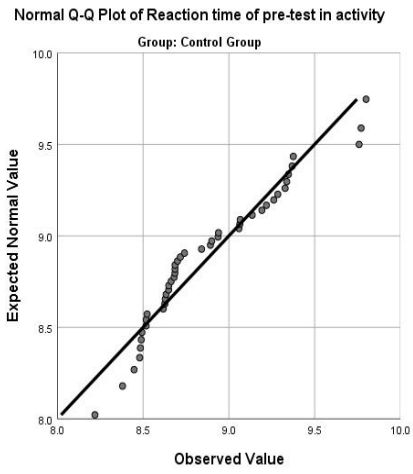
		Levene Statistic	df1	df2	Sig.
TT correct rate of pre-test	**Based on Mean**	1.485	2	141	0.23
	Based on Median	1.437	2	141	0.241
	Based on Median and with adjusted df	1.437	2	138.851	0.241
	Based on trimmed mean	1.484	2	141	0.23
GJT correct rate of pre-test	**Based on Mean**	2.234	2	141	0.111
	Based on Median	2.252	2	141	0.109
	Based on Median and with adjusted df	2.252	2	137.399	0.109
	Based on trimmed mean	2.362	2	141	0.098
TT correct rate of post-test	**Based on Mean**	0.535	2	141	0.587
	Based on Median	0.637	2	141	0.53
	Based on Median and with adjusted df	0.637	2	134.925	0.531
	Based on trimmed mean	0.545	2	141	0.581
GJT correct rate of post-test	**Based on Mean**	1.238	2	141	0.293
	Based on Median	1.068	2	141	0.346
	Based on Median and with adjusted df	1.068	2	138.049	0.347
	Based on trimmed mean	1.256	2	141	0.288
Gains of TT correct rate	**Based on Mean**	0.914	2	141	0.403
	Based on Median	0.654	2	141	0.522
	Based on Median and with adjusted df	0.654	2	130.648	0.522
	Based on trimmed mean	0.923	2	141	0.4
Gains of GJT correct rate	**Based on Mean**	0.642	2	141	0.528
	Based on Median	0.58	2	141	0.561
	Based on Median and with adjusted df	0.58	2	131.106	0.561
	Based on trimmed mean	0.647	2	141	0.525

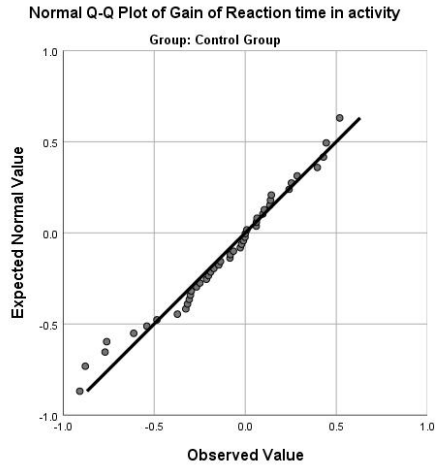
Appendix 16 Test of Normality of GJT reaction time

To achieve normality, the natural logarithms of the RT (in millisecond) were taken. After smoothing the reaction time by taking their logged value, four groups of data had absolutes of skewness and kurtosis Z-scores less than 1.96, thus normally distributed: RT of the TL group in the pre-test (ZS=-1.80, ZK=-1.23), RT of the TL group in post-test (ZS=-.794, ZK=-.883), RT of the EO group in post-test (ZS=1.018, ZK=.335), and RT of the Control group in post-test (ZS=.169, ZK=1.190). For the RT of the EO group in pre-test (ZS=-2.338, ZK=-1.949) and RT of the Control group in pre-test (ZS=-2.023, ZK=.311) whose skewness Z-scores were higher than 1.96, visual checks on QQ-plots were administered and both of them could be seen as normally distributed for later ANOVA analyses. As for the gains of reaction time, it was normally distributed in the TL group (ZS=-.029, ZK=-.440) and Control group (ZS=1.308, ZK=-.128). Although the absolute value of Z-score on gains of EO group was higher than 1.96 (ZK=3.433, ZS=-6.734), gains of EO group can be regarded as normally distributed through QQ-plots (see below for these QQ-plots).

	TL Group			EO Group			Control Group		
	Mean (sd.)	Skewness (se.)	Kurtosis (se.)	Mean (sd.)	Skewness (se.)	Kurtosis (se.)	Mean (sd.)	Skewness (se.)	Kurtosis (se.)
RT of pre-test (mms)	9781.953	2.324	6.506	8021.342	2.731	11.513	7827.616	1.494	1.960
	(-5664.948)	(.340)	(.668)	(3715.619)	(.337)	(.662)	(3509.117)	(.354)	(.695)
RT of post-test (mms)	7503.198	1.001	.841**	6786.895	.250**	.029**	6621.933	.359**	-.839**
	(2720.260)	(.340)	(.668)	(1550.330)	(.337)	(.662)	(1711.253)	(.354)	(.695)
ln (Rt of pre-test)	9.068	.613**	.824**	8.913	.788	1.290**	8.884	.716	-.216**
	(.471)	(.340)	(.668)	(.376)	(.337)	(.662)	(.392)	(.354)	(.695)
ln (RT of post-test)	8.863	.270**	-.590**	8.796	-.343**	-.222**	8.765	-.060**	-.827**
	(.345)	(.340)	(.668)	(.236)	(.337)	(.662)	(.261)	(.354)	(.695)
Ln (Gain of RT)	-.205	.010**	.294**	-.117	-1.157	4.458	-.119	-.463**	.089**
	(.483)	(.340)	(.668)	(.357)	(.337)	(.662)	(.340)	(.354)	(.695)
N		49			50			45	


Normal Q-Q Plot of Reaction time of pre-test in activity
Group: EO Group
Expected Normal Value
Observed Value
10.0
9.5
9.0
8.5
8.0
8.0
8.5
9.0
9.5
10.0
10.5


Normal Q-Q Plot of Reaction time of pre-test in activity
Group: Control Group
Expected Normal Value
Observed Value
10.0
9.5
9.0
8.5
8.0
8.0
8.5
9.0
9.5
10.0


Normal Q-Q Plot of Gain of Reaction time in activity
Group: Control Group
Expected Normal Value
Observed Value
1.0
0.5
0.0
-0.5
-1.0
-1.0
-0.5
0.0
0.5
1.0

Appendix 17 Homogeneity test of RT

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Ln (Gain of reaction time)	**Based on Mean**	2.602	2	141	0.078
	Based on Median	2.541	2	141	0.082
	Based on Median and with adjusted df	2.541	2	128.39	0.083
	Based on trimmed mean	2.61	2	141	0.077
Ln (Reaction time of GJT pre-test)	**Based on Mean**	1.004	2	141	0.369
	Based on Median	0.889	2	141	0.413
	Based on Median and with adjusted df	0.889	2	135.47	0.413
	Based on trimmed mean	1.027	2	141	0.361
Ln (Reaction time of GJT post-test)	**Based on Mean**	6.109	2	141	0.003
	Based on Median	5.859	2	141	0.004
	Based on Median and with adjusted df	5.859	2	131.002	0.004
	Based on trimmed mean	6.103	2	141	0.003

Levene's Test for Equality of Variances of Activity

	Levene Statistic (F)	Sig.
Quantity of correct sentences in activity	1.270	0.265
Percentage of incorrect sentences	0.935	0.338