Investigating the Role of Salient Constructions in Promoting Generalization and Preventing Overgeneralization Among Young EFL Learners: An Artificial Grammar Learning Study

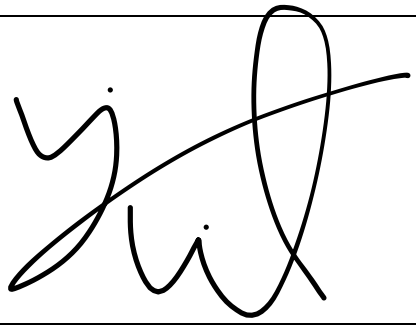
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MSc in Applied Linguistics and Second Language Education, 2024

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Abstract

This study explores the impact of +VLPR salient constructions — constructions containing verbs with lexically profiled roles — on the generalization and prevention of overgeneralization in children learning English as a Foreign Language (EFL). Through a controlled experiment employing an artificial grammar learning (AGL) design, the research compared the performance of children exposed to +VLPR salient constructions with those exposed to constructions containing verbs without lexically profiled roles (-VLPR). The results indicate that children exposed to +VLPR salient constructions demonstrated superior ability in generalizing novel constructions, as evidenced by higher production task scores. However, the study did not find conclusive evidence that +VLPR salient constructions reduce overgeneralization, partly due to a ceiling effect observed in the comprehension tasks. These findings underscore the importance of salience in language instruction, particularly in EFL contexts, and suggest that +VLPR salient constructions can enhance language learning by making grammatical structures more accessible and generalizable for young learners. Future research should address the limitations of sample size and explore strategies to mitigate ceiling effects to further understand the role of +VLPR salient constructions in language acquisition.

1. Introduction

Research in child language acquisition has shown that children learn language by processing the speech they hear around them (O'Grady, 2005). In this language learning process, fixed or semi-fixed constructions such as 'good morning' and 'I love _____' offer useful language chunks that children initially imitate (Bannard & Lieven, 2012; Eskildsen, 2009; Theakston & Lieven, 2017). Gradually, children analyze these constructions and come to understand how words and sentences map onto specific linguistic patterns, enabling them to produce more complex utterances than the original constructions (Tomasello, 2003; Arnon & Christiansen, 2017). This process of extracting linguistic patterns from constructions is called generalization. Ultimately, the more patterns a child learns through generalization, the more developed their grammar becomes. Countless studies into first (L1) and second language (L2) acquisition have observed children advancing their linguistic competence by applying grammatical patterns extracted from constructions to new contexts (Fillmore, 1976; Hakuta, 1974; Hatch, 1972; Tabors, 2008). Thus, research states that constructions can catalyze early foreign language acquisition (Kersten, 2015).

However, generalization usually comes with its archenemy, overgeneralization, where children apply learned linguistic patterns too broadly, resulting in incorrect sentences. The main reason for children overgeneralizing is due to no negative evidence, meaning they rarely receive explicit corrections for their grammatical errors. In other words, children mainly rely on positive evidence—correct usage of constructions—which can lead to misunderstandings about the boundaries of linguistic patterns. Addressing overgeneralization to facilitate correct generalization from constructions is crucial. As Wonnacott (2013, p. 67) states, 'An account of language acquisition has to explain both how we acquire the generalizations and the exceptions to those generalizations.' This thesis aims to contribute to this problem by investigating the role of salient constructions in facilitating generalization among children (ages 6 to 9) learning English as a Foreign Language (EFL). Specifically, the dissertation hypothesizes that constructions containing verbs with lexically profiled roles — verbs that have key participant roles associated with their meaning — can indirectly provide children with negative evidence

(without explicit instruction), enhancing their ability to generalize from constructions while mitigating overgeneralization.

The thesis is purposefully set in EFL-instructed contexts since investigating the role of salient constructions in generalization holds particular relevance in foreign language (FL) classroom settings. This is because there is a significant lack of research into the effectiveness of construction teaching in primary school FL-instructed settings. The systematic review by Schulz, Hamilton, Wonnacott, and Murphy (2022) analyzed studies on implementing constructions in FL classroom settings but identified only two classroom-based studies. They emphasize the need for more classroom-based research in FL-instructed settings to establish clear cause-effect relationships between the teaching of constructions and L2 development outcomes. Thus, this thesis investigates the role of salient constructions in generalization in EFL contexts to contribute empirical evidence to the field of FL learning. Simultaneously, the examination of salient constructions seeks to provide a more comprehensive understanding of factors that influence generalization and overgeneralization from constructions in early foreign language education. Thus, this study aims to contribute empirical evidence to the field and support more effective teaching strategies based on constructions for children in FL classrooms.

2. Literature review

2.1. Constructions

Constructions are conventionalized form-meaning pairings that operate as the basic units of language, encompassing various linguistic elements from morphemes like -ing to abstract constructions like the English transitive construction, *Noun Phrase 1 + Verb + Noun Phrase 2* (Ellis, 2009; Goldberg, 2006). For example, the English transitive construction is a conventionalized form-meaning pairing. It takes the form of *Noun Phrase 1+ Verb+ Noun Phrase 2*, which is paired with the meaning that *Noun Phrase 1* acted upon *Noun Phrase 2*. Additionally, all English speakers use this form to convey this meaning, making it conventionalized. Similarly, common phrases like ‘good morning’ are also

constructions as the common expression is paired with the social meaning of wishing someone well at the start of the day. Essentially, if a linguistic form conveys a conventionalized meaning, the form is considered as a construction (Goldberg, 2006).

Constructivists claim that grammatical knowledge comprises an inventory of various constructions rather than separate sets of syntactic rules (Goldberg, 2006). They discovered that speakers produce language by combining and adjusting constructions rather than following a system of syntax (Widdowson, 1989; Sinclair, 1991). They observed that speakers form sentences by fitting appropriate items into the proper slots in a construction. For example, in the past English intransitive construction, *Noun Phrase* + *Verb* + *ed*, learners construct sentences like 'The boy jumped' by fitting appropriate items (e.g., boy, jump, the) into the proper slots in a construction (Rowland, 2013). Therefore, constructivists argue that a set of syntactic rules emerges from the accumulation of various constructions at different levels of abstraction, enabling fast and fluent language production (Ambridge & Lieven, 2011; Ellis, 2008; Tomasello, 2003).

2.2. Generalization

Constructivists assert that learners acquire such important abstract constructions by analyzing and segmenting constructions (Bybee, 2008). For example, Eskildsen (2009) notes that speakers segment a rote-learned construction (fixed construction) like ‘I don’t know’ to their individual components: *Noun Phrase (I), auxiliary Verb (do)+ negation (not), and Verb (know)*. This segmentation leads to a general schematic construction: *Noun Phrase* + *auxiliary* + *negation* + *Verb*. These constructions enhance learners’ grammatical knowledge by providing patterns for assembling words and sentences that enable efficient communication (Rowland, 2013). As a result, learners start to produce more complex sentences by modifying the individual components of the original construction, replacing them with new words, and adding new phrases. Thus, the constructivist approach to language learning highlights the critical role of constructions in extracting abstract constructions, advancing learners’ grammatical knowledge and language production.

This process of extracting abstract constructions is called generalization. Various research into child first language (L1) acquisition has consistently shown children generalizing from these constructions to produce more abstract utterances (Bannard & Lieven, 2012; Lieven, Salomo, & Tomasello, 2009; Theakston & Lieven, 2017). Identical findings have also been consistently observed in child L2 acquisition (Fillmore, 1976; Hakuta, 1974; Hatch, 1972; Tabors, 2008), making constructions a hallmark of child second language learning (McLaughlin, 1995). However, these studies are primarily concerned with L1 and L2 acquisition in naturalistic settings, and there is a significant lack of research on how children in instructed FL settings generalize effectively from constructions. Schulz et al.'s (2022) systematic review analyzed studies of FL classrooms that implemented language teaching through constructions and identified only two robust classroom-based studies. They emphasize the need for more classroom-based research in FL-instructed settings to establish clear cause-effect relationships between construction teaching and FL development outcomes. The significant lack of research in FL settings raises the question of whether children in FL environments can also successfully generalize from constructions and produce more abstract sentences. To address this question, it is integral to investigate deeper into how constructions promote generalization and apply the mechanisms at play in generalization to EFL contexts. The literature review initiates this thorough examination by exploring usage-based learning theory (UBL), which offers three characteristics of constructions that facilitate generalization.

2.3. Usage-Based Learning Theory (UBL)

Usage-based learning theory (UBL) on language learning, which contributed significantly to both child first language and second language acquisition (Ellis & Cadierno, 2009; Robinson & Ellis, 2008), describes the process of learning from constructions as a statistical sampling and inference problem. Rooted in the constructivist approach, UBL suggests that children acquire both L1 and L2 in naturalistic settings by initially processing constructions like 'I wanna ____,' 'Let's ____,' etc., through social interactions (Tomasello, 2003; Bannard & Lieven, 2012; Lieven et al., 2009; Ellis, 2012). By repeatedly using these semi-fixed sequences,

children progressively generalize and form more intricate linguistic structures. As a result, children enhance their linguistic proficiency in their native and second language. Importantly, beneath this general explanation of UBL lies the idea that language learning from constructions closely resembles the process of estimating from a sample (Ellis, 1999; Ellis, 2009; Ellis, 2012). Ellis (1999), who significantly contributed to applying usage-based language learning into L2 acquisition contexts, notes that language learning depends on experiencing and analyzing constructions to generalize schematic constructions. In this context, the language sample learners experience comprises constructions from which they estimate the underlying schematic constructions. Thus, UBL's view of child language learning can be illustrated as a sample-based inference problem, where children engage socially to experience a range of constructions and estimate more abstract constructions by generalizing from them.

Evaluating UBL's view on language acquisition as a process rooted in statistical sampling and inference reveals a critical problem that children face when estimating from a sample: over-estimating. For instance, when children frequently encounter regular past tense forms from vocabulary like 'walked,' 'played,' and 'jumped,' they might infer the rule of adding '-ed' to create the past tense form. Consequently, they apply this rule broadly, leading to errors such as '*goed*' instead of 'went' and '*eated*' instead of 'ate.' This phenomenon of over-estimating is called overgeneralization, where learners apply extracted rules too broadly (Goldberg, 2006). Overgeneralization errors that stem from constructions have been observed in child language acquisition studies that saw children saying sentences like '*don't giggle me*,' '*I said her no*,' and '*I spilled the rug with juice*' (Bowerman, 1988; Pinker, 1989). These errors primarily occur due to a lack of negative evidence in language learning. Children do not rely on negative evidence — incorrect usages of constructions — to learn about the underlying grammatical patterns of constructions. Instead, children learn from positive evidence — correct language usage—and rarely receive explicit feedback about what is grammatically incorrect (Braine, 1971; Brown & Hanlon, 1970; Newport et al., 1977). Thus, theories on language acquisition must explain how children not only generalize from constructions but also how they avoid overgeneralization. The following section will explain how UBL addresses this.

2.4. Sample characteristics

Analyzing UBL's perspective of language learning as a model of a sample-based inferential problem highlights how specific characteristics of a sample can promote generalization and prevent overgeneralization from constructions. Ellis (2009) argues that successful estimation relies on sample size, sampling history, and sample selection in language learning. These three characteristics of a sample provide a guideline for effectively implementing construction teaching in EFL contexts.

Firstly, sample size can help children in EFL contexts to generalize by providing a wide array of linguistic input, allowing the children to encounter diverse samples (Ellis, 2009). Sample size describes *type frequency*, which refers to the number of different items or elements that fit into a particular linguistic pattern (Bybee, 2008; Ellis, 2002). High type frequency, encountering a construction with several different items, facilitates generalization by exposing learners to various instances that share the same underlying structure. Artificial grammar learning (AGL) experiments have demonstrated the positive effects of high-type frequency in generalization. These experiments typically expose participants to artificial (made-up) rules and structures that mimic natural language. After this exposure, participants are tested on their ability to apply these rules to new, never-encountered constructions. This process highlights how generalization occurs from a variety of inputs. For instance, Wonnacott, Boyd, Thomson, and Goldberg's (2012) research involved an artificial construction—*Verb + Noun 1 + Noun 2*—meaning Noun 2 approaches Noun 1 in a manner denoted by an artificial verb. They tested children's ability to generalize from this novel linguistic structure. The researchers divided children into two groups: the control group was exposed to 16 sentences using a single artificial verb with different noun combinations, while the experimental group was exposed to 16 sentences using four different artificial verbs. The participants were then tested through several tasks, including a production task where children were asked to correctly complete a sentence using the *Verb + Noun 1 + Noun 2* construction, applying it to verbs they had never encountered before. For instance, experimenters would show children a toy bear jumping toward a toy frog and introduce an artificial verb, '*teeping,*' to mean jumping. The children would then

need to say, '*Teeping bear frog.*' The results indicated that the experimental group — children exposed to various artificial verbs — could better generalize the novel construction to new verbs than the control group, which was exposed to only a single verb. This finding highlights the importance of sample size—diverse linguistic input—in promoting effective generalization and language learning. Thus, sample size — providing a variety of constructions — offers a useful framework for helping children in EFL contexts to generalize successfully.

Secondly, sampling history refers to repetition, helping children use their previous experiences to generalize (Ellis, 2009). Sampling history is about *token frequency* — repeated encounters with a specific item — to reinforce children's memory of constructions. In other words, sampling history involves high token frequency, which refers to repeated exposure to constructions, to help children solidify their grasp of the underlying grammatical patterns of constructions and achieve generalization. Crucially, sampling history and sample size work together to promote generalization. Casenhiser and Goldberg's (2005) AGL study highlights the importance of both sample size (type frequency) and sampling history (token frequency) in generalization. They taught English-speaking children, aged five to seven, novel verbs in a novel construction with a subject, verb, and object arranged in a non-English word order. During the exposure stage, the children watched video clips depicting actions corresponding to the sentences they heard. In one condition, only sample size was emphasized by having children hear sentences with a total of five different verbs. Three verbs were repeated twice, and the remaining two verbs were heard only once. On the other condition, children also heard the sentences with a total of five different verbs, but one verb was repeated four times while other verbs were presented only once. In this condition, sample size (five different verbs) and as well as sampling history (one verb repeated four times) was emphasized. These two conditions set the stage for comparing two groups of children that experienced different patterns of verb exposure: one group that was primarily exposed to a variety of verbs (emphasizing sample size), and another group that encountered a mix of verb variety and repetition (emphasizing both sample size and sampling history). After the exposure phase, children were tested with a comprehension task to choose which of the two scenes matched the described action. The children in the condition where one verb was repeated more frequently performed better in learning the construction. Consequently, Casenhiser

and Goldberg state that high token frequency (sampling history) helps learners get a fix on the construction's meaning, facilitating initial learning. At the same time, they note that type frequency (sample size) supports broader generalization, as exposure to multiple verbs provides varied examples of the construction in use, which is crucial for understanding and applying the construction more broadly. Thus, Casenhiser and Goldberg's research highlight how sample size and sampling history cooperates to facilitate generalization among children.

Furthermore, sampling history prevents overgeneralization. As mentioned, overgeneralization happens due to a lack of negative evidence, whereby children rarely learn the incorrect forms of language. Sampling history helps prevent this problem because repeatedly encountering a specific item indirectly provides children with negative evidence. For example, frequently encountering words like 'know' and 'went' helps children apply this knowledge to determine that constructions like 'knowed' and 'goed' are incorrect. This process of preventing overgeneralization is known as statistical pre-emption, and it occurs when frequent exposure to a specific construction prevents the use of more general but potentially incorrect forms (Goldberg, 2006). For instance, Brooks and Tomasello (1999) found that children were less likely to use 'disappear' transitively (e.g., 'He disappeared the ball') because they encountered it intransitively (e.g., 'The ball disappeared') more often. By consistently hearing 'disappear' in an intransitive construction, children indirectly obtain negative evidence and infer that the intransitive usage is correct and avoid the transitive form. Thus, sampling history—repeated encounters with specific constructions—pre-empts the general form, guiding children to use language forms appropriately and preventing overgeneralization.

In summary, a significant sample size—a variety of constructions— and a long sampling history—repeated exposure to constructions—are essential characteristics that can promote generalization in EFL settings. Sample size, or type frequency, exposes learners to various instances within a linguistic pattern, facilitating generalization, while sampling history, or token frequency, involves repeated exposure to specific items, reinforcing their memory and application. Thus, to promote generalization among EFL children, they must be exposed repeatedly to a wide array of constructions. However, the above description that emphasizes variety and repetition of constructions does not answer an essential

question: What kind of constructions promote generalization? Intuitively, some constructions may be challenging for children to process grammatically and difficult to generalize from. Campbell and Tomasello's (2001) research into children's acquisition of dative constructions illustrates this point well. In their study, they analyzed the spontaneous speech of seven children, focusing on how they used three types of dative constructions: the 'double-object' dative (e.g., 'She gave him the book'), the 'to' dative (e.g., 'She gave the book to him'), and the 'for' dative (e.g., 'She gave a book for her friend'). Despite all these constructions sharing a similar meaning, their research found that children acquired the double-object dative earlier than the others. What is the difference between these constructions that caused children to learn some constructions more effectively? To successfully advance construction teaching in EFL settings, answering these questions is crucial. Ellis (2009) provides a final sample characteristic—sampling selection—that attempts to shed light on this query.

Sample selection ensures that children are exposed to specific constructions that help them extract grammatical patterns effectively. Ellis states that this aspect involves selecting authentic language input relevant to learners' needs. For example, a classroom teaching the *NP aux neg Verb* construction might provide children with constructions like 'I don't know' that they can frequently use in their daily lives rather than a construction like 'She mustn't dance.' However, Ellis' argument that effective samples are composed of authentic input pertinent to learners' needs gives an incomplete description of a valid sample that promotes generalization. The terms authenticity and necessity (learners' needs) are too ambiguous to describe practical constructions for generalization. Campbell and Tomasello's (2001) research that found children acquiring the double-object dative construction better than other dative constructions used only authentic language input surrounding children. In addition, they are all similarly relevant to learners' needs as they carry the same meaning of giving an object. Therefore, Ellis' (2009) usage of the terms authenticity and necessity (learners' needs) does not provide an accurate picture of a valid sample of constructions. Instead, this thesis proposes that an adequate sample is characterized more comprehensively by salient input rather than needs-based authentic input.

2.5. Salience

Salience is linked to the ease with which an item can be noticed, and therefore, the more salient the language input, the more easily learners acquire it (Crossley & Salsbury, 2016). A construction's frequency and meaningfulness contribute to its salience (Crossley & Salsbury, 2016; Goldberg, 1995; Goldberg, 2003). Campbell and Tomasello's (2001) research on children's acquisition of dative constructions states that children acquired the double-object dative earlier than other dative constructions because the double-object dative was used more frequently by adults in child-directed speech. The greater frequency of the double-object dative made it more noticeable for children, facilitating its earlier acquisition compared to the less frequent 'to' dative and 'for' dative constructions. In addition, research shows how children generalize more effectively from salient constructions with more comprehensible meanings. Despite the high frequency of function words like 'of,' 'and,' and articles such as 'the' and 'a, these constructions are often among the most challenging for learners to acquire (Crossley & Salsbury, 2016; Slabakova, 2012). This difficulty arises because these items, though frequently encountered, lack a transparent meaning and are less noticeable in the input than clear content words. In this context, meaningfulness enhances the salience of linguistic forms, making them more memorable and easier to acquire. For instance, Marantz's (1982) study tested young children's ability to interpret sentences with novel verbs. Marantz illustrates that children learned sentences with canonical mappings (e.g., 'John is mocking the table' to describe John pounding the table with his elbow) more easily compared to sentences with non-canonical mappings (e.g., 'The table is mocking John' for the same action). This finding suggests that children could generalize the construction that made more sense to them, highlighting that meaningfulness of constructions is crucial in their ability to learn new linguistic forms.

In this sense, frequency, and meaningfulness contribute to the salience of an item, which facilitates children acquisition of the item. Rosch, Varela, and Thompson (1991) illustrates how frequency and meaningfulness help children acquire linguistic items by giving an example of 'hammer.' They explain that learners acquire the word 'hammer' faster than 'tools' not just because they hear them more often but because 'hammer' is both frequently used and meaningful. 'Hammer' is a clear and

useful linguistic item that learners can easily picture and use, unlike the broader category 'tools' (which is too general to visualize a specific item easily) or the more specific 'ball peen hammer' (which is less frequently used). This optimal level of frequency of usage and meaningfulness of the ‘hammer’ makes the item more salient and, therefore, easier to learn.

The concept of salience provides a more compelling framework for describing effective sample selection compared to Ellis’ (2009) advocacy of authenticity and necessity (learners’ needs). The concept of authenticity and necessity (learners’ needs) entails frequently usable constructions like ‘I don’t know’ (as opposed to ‘She mustn’t play’) that learners can use to convey their communicative needs. Accordingly, his notion does not distinguish between ‘hammer’ and ‘tools’ as both words are authentic language that children can frequently use to convey similar communicative needs like fixing or destroying things. His idea may even advocate teaching children ‘tools’ instead of ‘hammer’ because ‘tools’ is a broader term that can convey a wider array of learners’ communicative needs. Moreover, previously mentioned research such as Campbell and Tomasello (2001) and Marantz (1982) illustrates children effectively generalizing from salient constructions. Thus, this thesis proposes that a valid sample selection should comprise salient constructions.

To summarize, by taking together all three characteristics of sample—sample size, sampling history, and sample selection—this thesis proposes that *successful generalization depends on repeated exposure to various salient constructions.* Meeting this condition is essential for effective construction teaching in EFL contexts. Accordingly, teaching constructions in EFL settings must ensure constructions’ variety, repetition, and salience. Guaranteeing variety and repetition of constructions is quite simple, as it involves selecting the optimal number of constructions. The AGL experiments mentioned above, like Wonnacott et al.’s (2012) and Casenhiser and Goldberg’s (2005) research, demonstrate that presenting four types (variety) of constructions four times (repetition) promotes generalization among children. However, such research does not investigate the effects of sample selection—salient constructions—in generalization. The question remains: How does salient constructions influence generalization? As mentioned, frequency and meaningfulness can elevate a construction’s salience. In this regard,

adequate sample size and sampling history can contribute to a construction's salience by frequently exposing children to these constructions. However, elevating a construction's salience by focusing on the aspect of meaningfulness is a difficult matter as it involves a subjective selection of high-quality samples that children can easily notice and understand. This thesis attempts to address this issue by exploring the role of verbs within constructions. The dissertation hypothesizes that verbs with lexically profiled roles, which have key participant roles associated with their meaning, can make constructions more salient. Furthermore, this research hypothesizes that salient constructions containing such verbs can also indirectly offer negative evidence (without explicit instruction) to EFL children. This, in turn, can help improve their ability to generalize from constructions while reducing the risk of overgeneralization. In short, this dissertation hypothesizes that salient constructions containing verbs with lexically profiled roles can facilitate generalization and prevent overgeneralization among young EFL learners.

2.6. The role of verbs in generalization

Certain verbs can make constructions more salient by enhancing the clarity of constructions' meaning. Ninio's (1999) research provides robust evidence supporting this claim. Her study focused on the early use of verb-argument structures in Hebrew children acquiring their first language. She aimed to understand how children generalize syntactic patterns and what role specific verbs play in this process. Her study involved longitudinal data from 15 children and cross-sectional data from 84 children at 18 months old. In both types of studies, she observed children using highly transitive verbs like 'put' and 'give' in SVO (subject-verb-object) and VO (verb-object) patterns before they applied this pattern to other verbs. Ninio explains that verbs with high transitivity, like 'put,' clearly express the relationship between the subject (agent) and the object (patient), aiding children's understanding of these patterns. For example, 'put' involves an agent (subject) placing an object (patient) in a specific location, as in 'She put the book on the table.' In contrast, verbs with low transitivity, like 'see' in constructions like 'She sees the bird,' describe a perception rather than a direct action affecting the object, making the relationship between the subject and object less clear. Ninio notes that children's usage of highly transitive verbs made the constructions they formed

highly meaningful and salient. Consequently, the high clarity of these constructions enhanced children's ability to notice the meaning of abstract constructions like SVO, which helped them extract the construction more effectively. Through this finding, Ninio claims that children's use of highly transitive verbs makes the constructions they form more salient, helping them notice the meaning of the underlying patterns and aiding in generalization. Thus, Ninio's research supports the claim that certain verbs generate more salient constructions crucial for effective generalization.

Ninio's research is closely related to the idea that generalization in language learning relies on noticing semantic patterns and roles of words within constructions. According to Tomasello's (2003) verb-island hypothesis, children initially learn verbs in specific contexts. For example, a child might understand the verb 'kisses' solely in the context of the phrase 'Henry kisses mommy.' As children encounter more instances of the verb in various contexts, they begin to recognize the roles of words in a construction, like identifying 'Henry' as the agent and 'mommy' as the theme. Wonnacott (2013) states that generalization relies on the child's capacity to notice and understand that these semantic roles are analogous across different sentences. For instance, in another sentence like 'Poppy drinks milk,' the roles of 'Poppy' and 'milk' as agents and themes parallel those in 'Henry kisses mommy.' This recognition of similar semantic roles in different contexts allows children to apply the concept of 'kissing' or 'drinking' to new subjects and objects. Thus, Wonnacott highlights the importance of recognizing these semantic patterns and roles within a multiword construction, facilitating the generalization process beyond specific language usage. In this context, Ninio's research shows that highly transitive verbs aid children in noticing the semantic roles of words in constructions by clearly expressing the relationship between the agent and the patient. Frequently using verbs like 'put' and 'give,' children can more easily discern the roles—agent and patient—associated with these verbs and the underlying syntactic patterns. This clarity helps children to generalize these patterns to new verbs and contexts, reinforcing their understanding of abstract constructions like the SVO structure. Thus, Ninio's demonstration that certain verbs generate more salient constructions align with Wonnacott's emphasis on recognizing semantic roles, which is crucial for effective generalization in language learning.

In summary, frequency and meaningfulness can strengthen a construction's salience. In this context, certain verbs can enhance the salience of a construction by clarifying the relationship between the subject and object. Ninio's (1999) research supports this claim, showing that Hebrew-speaking children use highly transitive verbs like 'put' and 'give' early in SVO and VO patterns. These verbs clearly express the agent-patient relationship, making the constructions more meaningful and, therefore, more salient, which aids in generalization. Her findings align with Wonnacott's (2013) emphasis on recognizing semantic roles within constructions in generalization. Children initially learn verbs in specific contexts and gradually recognize analogous roles across different sentences. Highly transitive verbs help children discern these roles and syntactic patterns, reinforcing their understanding of abstract constructions like the SVO structure. Thus, certain verbs generate more salient constructions, which are crucial for effective language learning and generalization.

2.7. Verbs with lexically profiled roles

Adopting Ninio's research, this thesis proposes that verbs with lexically profiled roles can similarly enhance the salience of semantic roles within a construction, promoting generalization. Lexically profiled roles are participant roles associated with a verb's meaning that function as focal points within a scene, achieving a special degree of prominence (Goldberg, 2006). These roles highlight which elements in a sentence are essential to the verb's meaning, such as the agent, patient, or instrument. Notably, some verbs have lexically profiled roles while others do not. For example, the verb 'bite' has lexically profiled roles. In the sentence 'The dog bites the boy,' the roles of the dog (agent) and the boy (patient) are clearly delineated and prominent. The verb 'bite' inherently involves a direct action where the agent (the dog) performs the biting on the patient (the boy). This clarity in roles helps children easily recognize and understand the relationships between different elements in the sentence, facilitating the extraction and generalization of syntactic patterns. In contrast, the verb 'see' does not have lexically profiled roles to the same extent. In the sentence 'She sees the bird,' the relationship between the subject (She) and the object (the bird) involves perception

rather than direct action. The roles of the seer (agent) and the seen (patient) are less clear and less prominent because ‘see’ describes a state rather than an action that affects the object directly. This makes it harder for children to notice and generalize the semantic roles with verbs like ‘see.’ Thus, by making semantic roles more prominent, verbs with lexically profiled roles like ‘bite’ can help children map out the syntactic structure more easily and apply learned patterns to new verbs and contexts. Simply put, lexically profiled roles enhance the salience of semantic roles within a construction, supporting the generalization of linguistic patterns.

Moreover, constructions containing verbs with lexically profiled roles can help children avoid overgeneralization by indirectly providing negative evidence (without explicit instruction). Constructions with verbs that have lexically profiled roles must follow the Correspondence Principle. The Correspondence Principle states that a verb’s semantically salient participant roles must be encoded by grammatical relations that provide sufficient discourse prominence (Goldberg, 1995). This means that roles expressed in prominent positions, such as the subject (Subj) or object (Obj), are considered prominent and must correspond to the core arguments of the verb. For example, with the verb ‘bite,’ the biter (agent) must be in the subject position, and the entity being bitten (patient) must be in the object position, as in ‘The dog bites the boy.’ This alignment follows the Correspondence Principle because the prominent roles (biter and bitten) are in the correct grammatical positions (subject and object). However, if the positions were switched to ‘The boy bites the dog,’ it would violate the Correspondence Principle and appear incorrect to children. Crucially, when the Correspondence Principle is violated, as in the incorrect alignment of participant roles, it can indirectly provide children with negative evidence without any explicit instruction. If a child hears a sentence structured as ‘The boy bites the dog,’ it would sound awkward to them since, while feasible, it is unnatural for a boy to bite a dog. This misalignment helps children recognize incorrect patterns and reinforces the correct syntactic and semantic structures. On the contrary, constructions containing verbs without lexically profiled roles do not have a Correspondence Principle to adhere to. For instance, with the verb ‘see,’ the agent (seer) and the patient (seen) can switch positions without violating grammatical or semantic rules, as in ‘She sees the bird’ and ‘The bird sees her.’ Both constructions make sense, and no indirect negative evidence is provided to children, making it harder for them to identify incorrect patterns independently.

Therefore, by providing clear and prominent role assignments, constructions containing verbs with lexically profiled roles help children learn to avoid overgeneralization through indirect negative evidence.

2.8. Summary

The constructivist approach to language learning claims that children develop their language abilities by generalizing from constructions. UBL theory describes this generalization process as a statistical inference problem whereby children must estimate the general schematic constructions from a sample of constructions. Through this description, UBL theory highlights how sample size, sampling history, and sample selection are critical in facilitating generalization among children. This thesis adopts these three sample characteristics with some modification to sample selection, proposing that it is vital for constructions to be salient to promote generalization. In this regard, this thesis hypothesizes that verbs with lexically profiled roles can enhance the salience of constructions by clarifying the relationships between semantic roles. Furthermore, the constructions containing such verbs can help avoid overgeneralization. As mentioned, an account of child language acquisition needs to explain how children not only generalize but avoid overgeneralizing. Constructions with verbs that have lexically profiled roles help achieve both ends by making the relationships between semantic roles more salient and adhering to the Correspondence Principle. When this principle is violated, it provides indirect negative evidence, guiding children toward correct syntactic structures and helping them avoid overgeneralization. Such a process is impossible with constructions containing verbs that do not have lexically profiled roles because such constructions do not have a Correspondence Principle to follow. The only question remains, ‘Do salient constructions with verbs that have lexically profiled roles promote generalization among children?’ This thesis attempts to answer this question in EFL contexts in Korea since research into the effects of constructions in FL settings is scarce. The thesis now turns to the methodology chapter, which reflects on the three sample characteristics — sample size, sampling history, and sample selection — to design research that effectively implements the teaching of salient constructions in EFL-instructed contexts and answer the above question.

3. Methodology

3.1. Research design

To investigate how constructions that contained verbs with lexically profiled roles affected children's ability to generalize a novel construction, this study employed an artificial grammar learning (AGL) research design. The independent variable was tested at two levels: i) +VLPR salient constructions, constructions containing verbs with lexically profiled roles and ii) -VLPR constructions, constructions without such verbs. The study involved children aged 6 to 9 years. These participants were first stratified by age to ensure an even distribution, and then they were randomly assigned to one of the two groups. The +VLPR group encountered +VLPR salient constructions, whereas the -VLPR group encountered -VLPR constructions. After forming these two main groups, each group was then subdivided into four smaller classes. Each class consisted of three children, except for one class with only two children. This subdivision aimed to replicate the environment of foreign language (FL) instructional settings by having three children in one class. The average age within each smaller class remained comparable across both groups, maintaining the balance achieved in the initial grouping. Figure 1 illustrates the organization of the participants for this research design.



Figure 1. Organization of participants

This age-stratified random assignment ensured similar average ages across all +VLPR and -VLPR groups' classes, facilitating an accurate evaluation of how verb types in constructions impacted children's ability to generalize new constructions in FL-instructed contexts.

The dependent variable was the children's ability to generalize the *Verb (+) big/small + Noun phrase 1 (+) big/small + Noun phrase 2* construction, measured by an oral production task. This construction was modeled after the study of Wonnacott et al. (2012), with slight variations. In their research, Noun Phrase 2 (the agent) performed an action denoted by the verb on Noun Phrase 1 (the patient), which deviated from the grammatical structures of Korean and English. While the present

study followed this pattern, occasionally, the adjectives ‘big’ or ‘small’ were added to the noun phrases, whereas in Wonnacott et al., only single nouns were used in their construction. This modification aimed to ensure that the novel construction was abstract enough to prevent children from generalizing the construction too easily. Thus, this study set the dependent variable as the ability of the children to generalize a complex novel construction — *Verb (+) big/small + Noun phrase 1 (+) big/small + Noun phrase 2.*

With these independent and dependent variables, the study investigated if +VLPR salient constructions facilitated the generalization of novel constructions and prevented overgeneralization among EFL children. Hence, the research questions were:

1. Do +VLPR salient constructions facilitate generalization among EFL children?
2. Do +VLPR salient constructions prevent overgeneralization among EFL children?

3.2. Participants

The participants included 23 Korean children aged 6 to 9 years learning English as a foreign language (EFL). All the children were taught by native English-speaking teachers in kindergartens that primarily employed English as the medium of instruction (EMI). Most academic subjects were taught in English with some aid in Korean. On average, these children had been learning English for approximately four years, with some beginning to learn English since they were three years old. Their English proficiency levels were not measured through testing. However, based on my experience teaching them on average for about a year, their English proficiency varied significantly. Some children were fluent in English and able to handle conversations in English, while some children were starting to produce their own sentences in English with grammatical errors. Overall, all the children were proficient and capable enough to understand all the materials and instruments — artificial verbs, nouns, and pictures — used in the research. Moreover, the participants were fluent in their first language, Korean, and therefore had no

difficulty understanding the definitions of artificial verbs, which were explained in Korean.

3.3. Sampling frame

The study used a convenient sampling method by selecting young EFL learners I had previously taught as an English teacher in Korea. This approach allowed for efficient data collection from a readily accessible population, ensuring that the study could be conducted within the practical constraints of time and resources.

3.4. Materials and instruments

Children were exposed to the novel construction with the following six artificial verbs and eight nouns, composed of four predatory animals and four prey animals.

Artificial verbs: *tozzing, ralling, jibbing, datting*, and *pemming* (the meanings of all five artificial verbs are provided in Appendix A).
Nouns: rabbit, deer, monkey, zebra, cheetah, lion, tiger, and wolf.

These artificial verbs were sourced from Wonnacott et al.'s (2012) artificial grammar learning (AGL) study. Constructions like '*Tozzing* cheetah zebra' were created by combining these made-up verbs and nouns. Importantly, all the artificial verbs had two meanings each: a meaning with lexically profiled roles and a meaning without lexically profiled roles. For example, *tozzing* meant 'evade' — a meaning that has lexically profiled roles — and it also meant 'see'— a meaning that does have such roles. Specifically, 'evade' is related to prey animals like rabbits, deer, monkeys, and zebra, while 'see' was not particularly associated with prey or predatory animals. When the verb *tozzing* signified 'evade,' the salient construction '*Tozzing* cheetah zebra' followed the Correspondence Principle with the zebra being the agent and the cheetah being the patient of the verb. On the other hand, when *tozzing* was taught with the meaning of 'see,' the construction '*Tozzing* cheetah zebra' had no Correspondence Principle to adhere to. The children in the +VLPR and -VLPR groups encountered the same set of constructions, such as 'Tozzing

cheetah zebra' (Appendix B provides all the sentences each group encountered). However, the children in the +VLPR group were introduced to salient constructions with verbs whose meanings had lexically profiled roles (+VLPR salient constructions), while the children in the -VLPR group were tasked to learn the constructions with verbs that did not have such roles (-VLPR constructions). This uniform set of constructions with the same noun ordering was designed to isolate the effect of the constructions' meaning, ensuring that any observed differences in how children generalized the construction were due to the type of construction they encountered, not variations in noun placement. Moreover, all the artificial verbs were transitive verbs, which ensured that participants in both the +VLPR and -VLPR groups were learning the same type of verb structure. This consistency in verb type helped to enhance the precision of the study by controlling for potential differences in how children might process or generalize other verb types.

Cartoon drawings of these animals were printed from freepik.com to effectively illustrate the meaning of the six artificial verbs. For example, when the children encountered the sentence '*Datting* small zebra big tiger,' I showed printed illustrations of a tiger and a zebra to demonstrate the two meanings of the construction: a big tiger biting a small zebra and a big tiger touching a small zebra. Thus, using cartoon illustrations of the eight animals helped children in both groups understand the meaning of all six artificial verbs and learn the grammatical structure of the novel construction. A few examples of printed illustrations of animals used in the study are provided in Appendix E.

The research transitioned to a forced-choice comprehension task after the children learned the novel construction with such verbs and nouns. The forced-choice task is widely used in testing children's language understanding as it effectively assesses their ability to interpret new constructions. The task had five questions, each displaying three pictures of animals that were generated from ChatGPT. The participants had to choose the correct picture corresponding to the sequences' meaning. The incorrect image portrayed a scene with the roles of the animals reversed. For example, for the +VLPR group, if the sentence were '*tozzing* cheetah zebra,' the correct image would show a cheetah chasing a zebra, while the incorrect image would show a zebra chasing a cheetah. Additionally, the task showed one distractor image, demonstrating a random action like jumping

performed by one of the two animals. Thus, the participants had to identify the proper picture from these three images — correct, incorrect, and distractor image. Notably, the +VLPR and -VLPR groups encountered a different set of three images because they were exposed to constructions with different meanings. For instance, for the +VLPR group, one of the questions showed a correct image of a tiger biting a zebra, an incorrect image of a zebra biting a tiger, and a distractor image. On the other hand, the -VLPR group encountered one question with a correct picture of a tiger touching a zebra, an incorrect picture of a zebra touching a tiger, and a distractor image. By having children in both groups choose images that correctly represent the grammatical structure of the novel construction, the task aimed to explore their ability to generalize the learned construction accurately and apply their understanding to identify the correct scenes. Examples of pictures used in the forced-choice comprehension task are illustrated in Appendix F.

After the comprehension task, the children began the oral production task that tested their ability to generalize the novel construction and integrate new lexical items into it, similar to the methodology used in Wonnacott et al.'s study. This test used six new artificial verbs and five new animals.

New artificial verbs: *dazzing, latting, migging, nassing, suzzing, and ketting* (the meanings of the verbs are provided in Appendix C).
New nouns: big hippo, big bear, small squirrel, big elephant, and fox.

The six new artificial verbs were divided evenly, with three verbs having lexically profiled roles and three verbs without, to ensure balance in the oral production task. Specifically, three verbs—Dazzing, Migging, and Suzzing—were assigned meanings with lexically profiled roles, while the other three—Latting, Nassing, and Ketting—were assigned meanings without such roles. This division was necessary because the children in the two groups encountered constructions that involved different meanings. Using these new verbs and nouns that children had not encountered when learning about the novel construction was important for measuring children's ability to apply these new elements within the learned novel construction. The test required children in both +VLPR and -VLPR groups to orally produce six target sentences, such as '*Dazzing* small squirrel fox,' incorporating these new verbs and nouns (all five target sentences are provided in Appendix D).

Additionally, the test used cartoon illustrations of the five new animals taken from freepik.com, designed to visually support the children's understanding and recall of the novel verbs and nouns during the test.

3.5. Procedure

The study was conducted online through Microsoft Teams, an online platform for remote interaction and data collection. The procedure of this study was divided into three stages: the exposure stage, the forced-choice comprehension task, and the oral production task. The children encountered the novel construction with constructions during the exposure stage. The forced-choice comprehension task assessed children's understanding of the novel construction. Crucially, this task also indirectly provided negative evidence to the +VLPR group by showing semantically anomalous pictures, like a cheetah evading a zebra. Finally, the oral production task measured the participants' ability to generalize.

3.5.1. Exposure stage

The exposure stage followed the methodology of Casenhiser and Goldberg's (2005) study. Their research repeated the same verb four times across different constructions to ensure sufficient sampling history. In addition, they introduced four other verbs just once to provide sufficient sample size. As a result, children encountered a total of eight constructions in their research. This design proved effective in investigating how children generalized novel constructions, providing a robust framework for understanding children's generalizing process.

This present research procedure paralleled Casenhiser and Goldberg's (2005) robust study. Both the +VLPR and -VLPR groups were exposed to a total of eight constructions. Here, the verb *tozzing* was repeated four times across four different constructions, each featuring a different set of animals. For example, children encountered the constructions' *tozzing* cheetah zebra,' '*tozzing* tiger small monkey,' '*tozzing* wolf small deer,' and '*tozzing* big lion rabbit' to ensure adequate sampling history. The rest of the verbs — *ralling, jibbing, datting*, and *pemming* —

were all introduced once, mirroring Casenhiser and Goldberg's approach to maintain sufficient sample size.

As mentioned, this research mimicked a classroom setting by initiating the exposure stage by grouping the children in threes (only one group comprised two children). I was with three children at a time through Microsoft Teams, reading aloud the artificial verbs and the constructions that contained them. When I explained the made-up verb, I explained the meaning in Korean — the children's mother tongue — to ensure that children understood the definition and to mimic FL-instructed settings where instructions are given in children's L1. After introducing the artificial verb, I demonstrated the constructions' meaning using printed illustrations of animals. For instance, if the construction was 'Jibbing small rabbit wolf,' I showed a printed drawing of a wolf clawing a small rabbit for the +VLPR group and a wolf outrunning a small rabbit for the -VLPR group. Then, each child in each group was encouraged to say the construction aloud to me. In cases where the child said the sentence inaccurately, I said the sentence once more, offering the child one more chance to repeat it correctly.

3.5.2. Forced-choice comprehension task

When the exposure stage was over, each child was put into breakout rooms in Microsoft Teams — virtual rooms for individual tasks— and they did the forced-choice comprehension task individually. Conducting the test individually was integral to ensuring that each child's responses were independent and not influenced by their peers, providing a more accurate measure of their understanding. The task utilized the same set of constructions from the exposure stage to test the children's knowledge of the constructions. I read aloud constructions that children heard from the exposure stage and reminded them of the verbs' meanings. For instance, for children in the +VLPR group, I read aloud '*Tozzing* cheetah zebra' and repeated the meaning of *tozzing*. Then, the children selected which of the three pictures corresponded correctly to the construction. I followed the same procedure for children in the -VLPR group and recorded how many questions the participants got right.

Crucially, this task will likely provide children in the +VLPR group with clear indirect negative evidence. The +VLPR salient constructions followed the Correspondence Principle, such as a zebra evading a cheetah in '*Tozzing* cheetah zebra' and a wolf clawing a small rabbit in '*Jibbing* small rabbit wolf.' The correct pictures displayed the meaning of the artificial verbs by showing prey and predatory animals in their respective roles. Here, the incorrect images, which showed these roles reversed, would seem highly absurd for children to comprehend. For instance, a picture displaying a rabbit clawing a wolf would seem nonsensical to the participants. As children in the +VLPR group scanned through such absurd images to choose the correct one, they would recognize the weird photo demonstrating the reversed roles as incorrect. Consequently, recognizing negative evidence would help +VLPR children avoid overgeneralization, leading to higher scores in the production task. Thus, the comprehension task would indirectly provide children with negative evidence by displaying absurd images, thereby preventing them from overgeneralizing and ultimately contributing to better performance in the production task.

On the contrary, indirect negative evidence was not as explicit for children in the -VLPR group because the constructions they encountered contained verbs without lexically profiled roles. For instance, in the case of '*Tozzing* cheetah zebra,' which signified a zebra seeing a cheetah, the incorrect picture of the comprehension task showed a cheetah seeing a zebra. Since both images were plausible and did not rely on inherent roles like predator and prey, children in the -VLPR group were not provided with clear negative evidence to distinguish correct from incorrect actions. This lack of absurdity in the incorrect pictures meant they did not receive the same cues as children in the +VLPR group. Accordingly, the -VLPR group may have found it more challenging to generalize from constructions as it was more difficult to differentiate between the correct and incorrect depiction of the constructions.

3.5.3. Oral production task

After the forced-choice comprehension task, the oral production task was also conducted individually in breakout rooms. The task tested the children's ability to apply new artificial verbs and nouns within the learned novel construction. Before the test began, I was with one child at a time and introduced each new verb and its

meaning. Then, I asked the child to say the artificial verb and its meaning back to me to ensure they understood the novel word. If a child struggled with the word or its meaning, I repeated the made-up word until they grasped its meaning. After ensuring each child understood the new verb, the production test commenced with new nouns like hippo and bear that had not been used in the exposure phase. Again, I used printed illustrations of these animals to demonstrate the meaning of the artificial verb, and children had to verbally produce my enactment using the *Verb (+) big/small + Noun phrase 1 (+) big/small + Noun phrase 2* construction. For example, if I demonstrated an illustration of a hippo *latting*— meaning 'following' — a big elephant, the child had to construct the sentence '*Latting* big elephant hippo.' When the children could not produce the construction, I provided them with the first word of the construction, '*Latting*,' and they had to complete the rest of the construction. This method paralleled Wonnacott et al.'s (2012) research, which also gave children the first word during their oral production task that investigated children's ability to generalize. Providing the verb during the oral production task did not undermine the investigation into children's ability to generalize, as the participants still had to determine the correct order of the nouns, which shed light on their understanding of the grammatical structure of the novel construction. Furthermore, if children failed to produce the adjectives' big' or 'small' in their response, I read aloud 'big' or 'small' once again to give them one more opportunity to produce the construction accurately. I repeated this process of testing for all six constructions. For each child in each group, I recorded how many times they correctly produced the novel construction. Failure to identify the agent and patient animals was counted as an incorrect response. In addition, failure to provide any answer was also counted as incorrect.

3.6. Ethical considerations

CUREC had approved this research, detailed in Appendix G. Since the research dealt with young children who could not give free and informed consent, their parents were given an information sheet and a consent form, and the children were given an assent form (all three forms are provided in appendices H, I, and J). Parents were given time to read and fully understand the information sheet before signing the consent forms and agreeing to their children's participation in the study.

Additionally, I carefully explained the research to the children, clearly outlining the study's procedures, and ensured they understood before obtaining their assent. Only the participants' names and ages were gathered during this consent procedure. Although the participants' ages were reported in the production test since age differences might cause children to score differently, the names of the participants were replaced with numbers ranging from 0 to 23. This method of anonymization prevented participants from being identified in the research. The scores of the comprehension test and the production task were assigned to these numbers, and this data was securely stored as files in the University's Nexus365 OneDrive for Business online storage service with password protection and multi-factor authentication. This data was only accessible to me and the principal investigator. The data will be stored securely for three years to allow for the possibility of academic publication. After three years, the data will be deleted. Also, the research materials did not pose any risks to young children; they simply tested children's ability to generalize a novel construction without touching upon any sensitive topics. However, since the participants were young children, they might have had trouble focusing on the research or gotten tired during the research. The research was designed to avoid such circumstances by using funny words and animals that children would likely find interesting. Nonetheless, if such problems arose, the student researcher followed the Ethical Guidelines for Education Research (BERA) and implemented appropriate measures, such as giving them a break and/or halting the research immediately.

3.7. Analytical strategy

To evaluate the impact of +VLPR salient constructions on generalization among children in FL-instructed contexts, the study will compare the scores of the +VLPR and -VLPR groups on the comprehension and production tests using SPSS software. Before the test, the normality of data distribution will be assessed to decide on the appropriate test.

A p-value below .05 indicated a statistically significant difference in generalizing the novel construction between the +VLPR and -VLPR groups. If the +VLPR group scored better than the -VLPR group, this suggested that the +VLPR salient

constructions facilitated the generalization of the novel construction. Conversely, if the -VLPR group scored better than the +VLPR group, this suggested that the verbs with lexically profiled roles did not significantly affect children's ability to generalize.

Furthermore, this research predicted that children in the +VLPR group would notice negative evidence by doing the comprehension test, resulting in higher oral production scores as children avoided overgeneralization. In contrast, the -VLPR group's comprehension test will not provide negative evidence as clearly as the +VLPR group's test did, which would result in production scores lower than those of children in the +VLPR group. In other words, the thesis assumed that the correlation between the +VLPR group's comprehension scores and production scores would be stronger than that of the -VLPR group because the +VLPR group was expected to benefit more from the negative evidence presented in the comprehension test. A correlation analysis between the two test scores of both groups will be conducted to test this assumption.

4. Results

This section presents the study's findings, analyzing the data collected from the comprehension and production tasks to evaluate children's understanding and generalization of the novel construction. Crucially, the +VLPR group's forced-choice comprehension scores displayed a noticeable ceiling effect, compromising the validity of comparing both groups' comprehension test scores and the correlational analysis. However, the research conducted statistical analyses on both groups' data for exploratory purposes, aiming to uncover potential insights that could inform future studies and provide a deeper understanding of the observed phenomena. The results of the comparison of the groups' comprehension test scores and the correlational analysis should be interpreted with caution.

4.1. Comprehension test

The research involved a forced-choice comprehension test with five questions. The participants were divided into two groups, and their performance was evaluated

using percentage scores. The +VLPR group comprised 11 participants, and the -VLPR group comprised 12 participants. The percentage scores of both groups are depicted below.

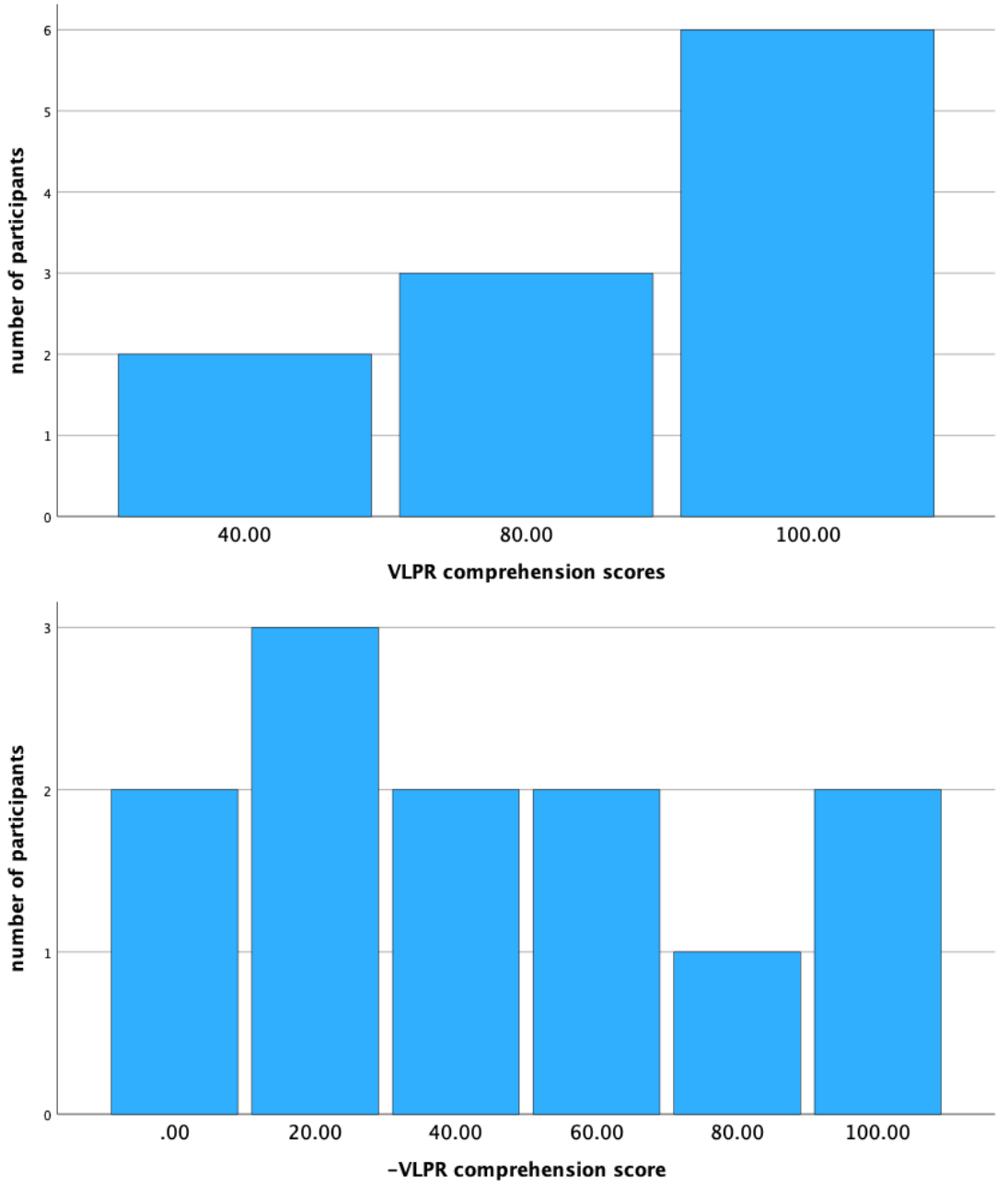


Table 1. +VLPR and -VLPR group's comprehension test scores

Table 1 illustrates the distribution of comprehension scores for both groups with each bar indicating how many participants scored within those ranges. There is a high concentration of participants that scored a 100 in the +VLPR group, indicating a ceiling effect (six children with 100 mark). On the other hand, the participants' scores are more spread across different intervals. The +VLPR group had a higher

mean score on the comprehension test (M = 83.64, SD = 23.35) than the -VLPR group's mean (M = 38.33, SD = 31.29). Table 2 illustrates the distribution of comprehension scores for both groups using a box plot.

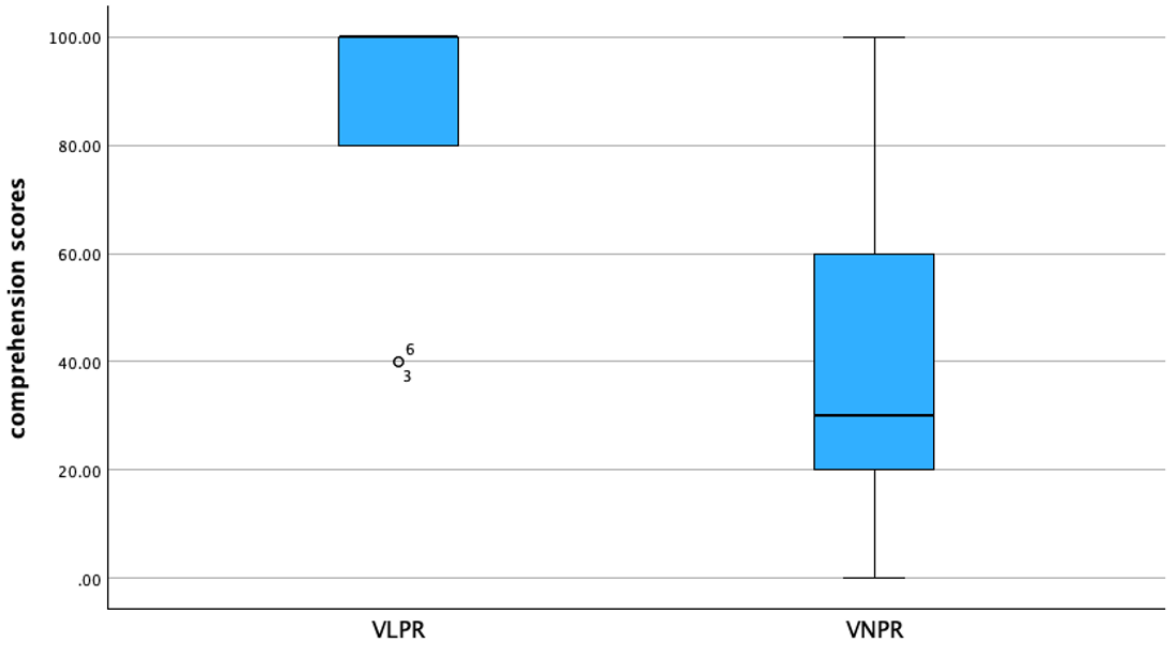


Table 2. Box plot of +VLPR and -VLPR comprehension test scores

The box plot displays two outliers, both with scores of 40, from participants in the +VLPR group. The outliers were retained for several reasons. First, the outliers identified were not extreme, meaning they were within a reasonable range of the interquartile range (1.5 times the IQR) and not excessively distant from other data points. Thus, they were not exceptionally far from the lower quartile and still represented valid data points that contributed to the overall variability within the group. Second, removing outliers can sometimes lead to the loss of valuable information. In this case, the scores of 40.0 were legitimate observations that reflected the performance variability within the +VLPR group. Eliminating them could have introduced bias into the analysis. Thus, keeping these outliers ensured that the analysis remained robust and reflected the actual data distribution. However, the presence of these high scores contributed to the observed ceiling effect, where a significant number of participants achieved maximum scores, limiting the ability to distinguish performance differences among higher-scoring individuals.

4.1.1. Shapiro-Wilk and Kolmogorov-Smirnov Test

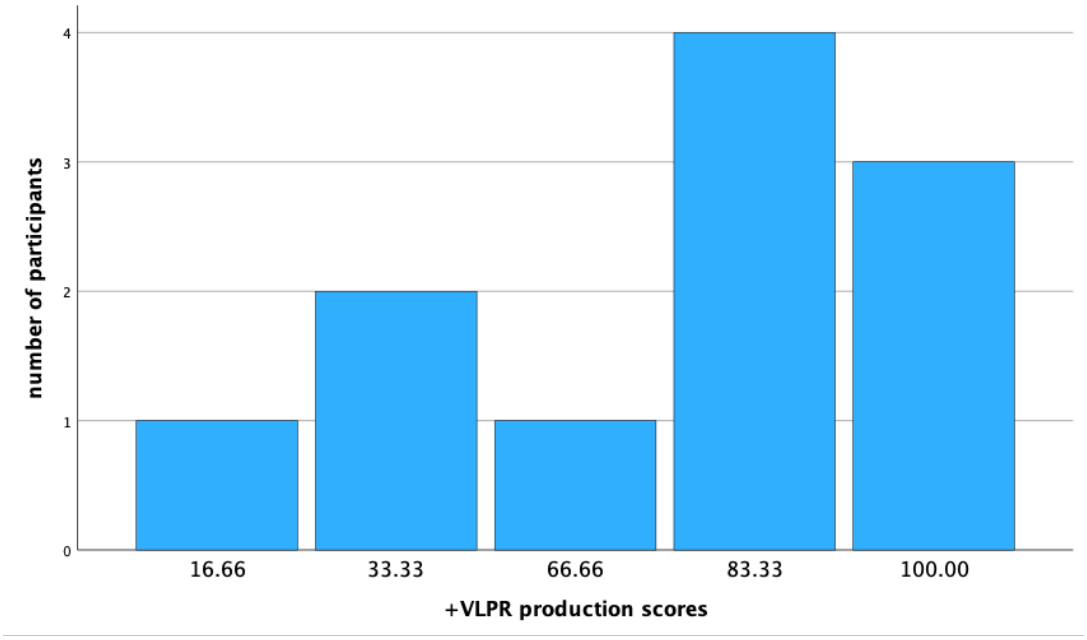
The Shapiro-Wilk test for normality was conducted on both groups to determine the appropriate statistical test for comparing the groups. For the +VLPR group, the Shapiro-Wilk statistic was 0.832 with a p-value of 0.025, indicating that the data for the +VLPR group was not normally distributed. In contrast, the -VLPR group had a Shapiro-Wilk statistic of 0.881 with a p-value of 0.0907, suggesting that the data for the -VLPR group was approximately normally distributed. Given that the data for the +VLPR group was not normally distributed, the assumption of normality required for the independent samples t-test was violated. Therefore, a non-parametric alternative was considered. Furthermore, to see if the two datasets had identical distributions, the Kolmogorov-Smirnov test was conducted to compare the distribution of percentage scores between the +VLPR and -VLPR groups. The test yielded a Kolmogorov-Smirnov Z value of 1.561, with an associated asymptotic significance (two-tailed p-value) of 0.015. This p-value was lower than the standard significance level of 0.05, indicating that we rejected the null hypothesis that the two groups had identical distributions. This result indicates a statistically significant difference between the distributions of the two groups, which means that the assumptions required for the Mann-Whitney U test were violated.

4.1.2. Permutation Test

The permutation test, a non-parametric method, does not assume similar distributions between the groups, making it appropriate for the +VLPR group's comprehension scores data. This test involved repeatedly shuffling the combined dataset and recalculating the difference in means to build a distribution of the test statistic under the null hypothesis. The observed difference in means was found to be 45.30, and the permutation test yielded a p-value of 0.0019, indicating a statistically significant difference between the groups. These findings suggested that the +VLPR group performed significantly better than the -VLPR group in comprehension scores. However, due to the ceiling effect of the +VLPR group's data, this finding must be interpreted with caution. The discussion section will address the implications of the ceiling effect on the results given by the permutation test.

4.2. Production test

The study evaluated the production test scores of the +VLPR group and the -VLPR group. The +VLPR group consisted of 11 participants, and the -VLPR group consisted of 12 participants. The percentage scores for the +VLPR and -VLPR groups are depicted below.



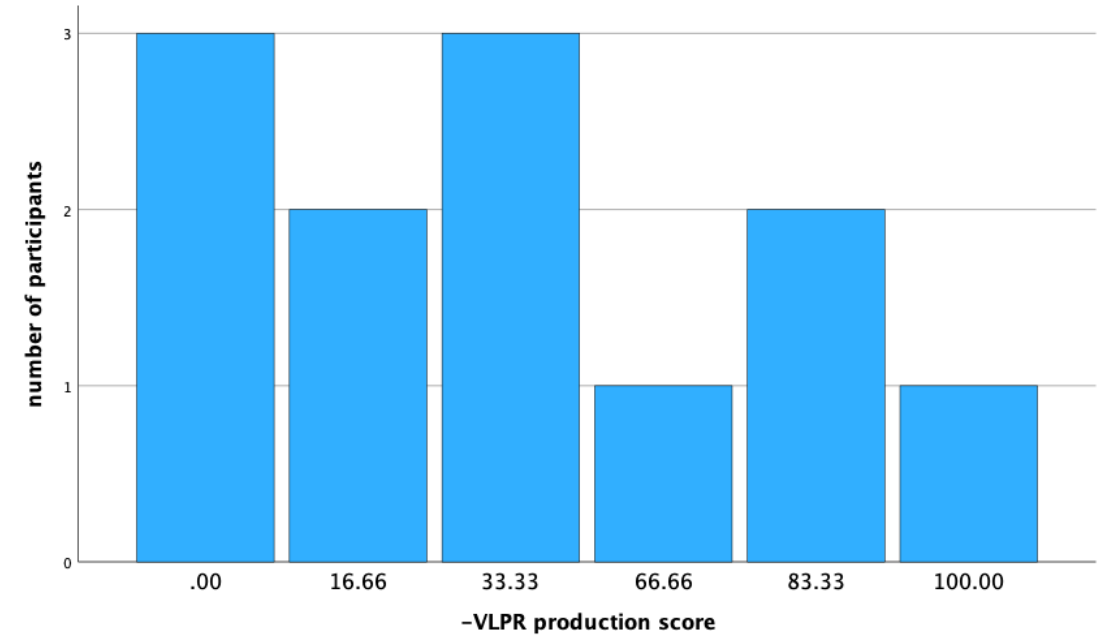


Table 3. +VLPR and -VLPR group's production task scores

Table 3 illustrates the distribution of production scores for two groups with each bar indicating how many participants scored within those ranges. In the +VLPR group, most participants scored around 83.33, with fewer at lower scores. In the -VLPR group, scores are more spread out, with many participants scoring 0, and a noticeable number at 33.33. The +VLPR group achieved a higher mean score in the production task (M = 71.21, SD = 29.90) compared to the -VLPR group's mean score (M = 38.89, SD = 35.77). Table 4 illustrates the distribution of the production task scores for both groups using a box plot.

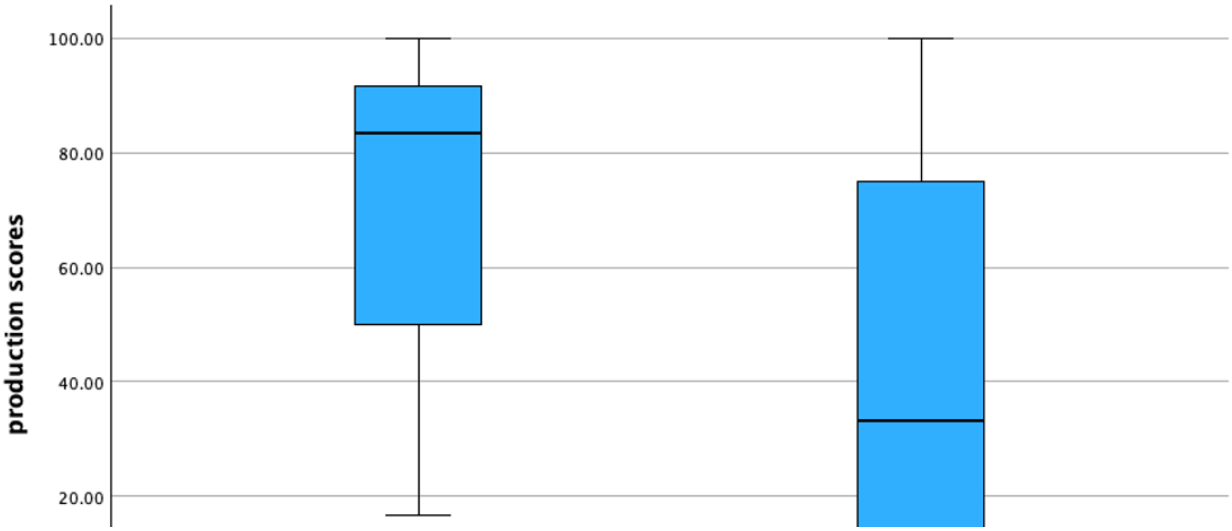


Table 4. Box plot of +VLPR and -VLPR production task scores

The box plot illustrates the distribution of production scores for the +VLPR and -VLPR groups. The +VLPR group shows a higher median score and a more concentrated range of scores, primarily between 60 and 100. In contrast, the -VLPR group has a lower median score and a broader range of scores, indicating greater variability in performance.

4.2.1. Shapiro-Wilk and Kolmogorov-Smirnov Test

The Shapiro-Wilk test for normality was conducted on both groups to determine the appropriate statistical test for comparing the groups. For the +VLPR group, the Shapiro-Wilk statistic was 0.832 with a p-value of 0.0246, indicating that the data for the +VLPR group was not normally distributed. In contrast, the -VLPR group had a Shapiro-Wilk statistic of 0.883 with a p-value of 0.0961, suggesting that the

data for the -VLPR group was approximately normally distributed. Given that the data for the +VLPR group was not normally distributed, the assumption of normality required for the independent samples t-test was violated. Therefore, a non-parametric alternative was considered. Moreover, the Kolmogorov-Smirnov test was conducted to compare the distribution of percentage scores between the +VLPR and -VLPR groups. The test yielded a Kolmogorov-Smirnov Z value of 0.944, with an associated asymptotic significance (two-tailed p-value) of 0.335. The p-value of 0.335 was higher than the standard significance level of 0.05, indicating that we failed to reject the null hypothesis. The result suggested that the distributions of percentage scores for the +VLPR and -VLPR groups were similar in shape. Thus, the non-normal distribution of the +VLPR group's production scores and the identical distribution of the two groups' data met the assumptions of the Mann-Whitney U test.

4.2.2. Mann-Whitney U Test

The results of the Mann-Whitney U test showed a U statistic of 32.000 and a p-value of 0.033. Since the p-value was less than 0.05, we rejected the null hypothesis, indicating a statistically significant difference between the production scores of the +VLPR and -VLPR groups. Furthermore, the effect size for the Mann-Whitney U test was calculated based on the Z-score from the test results and the total number of observations across both groups. The Z-score obtained from the Mann-Whitney U test was -2.224, and the total sample size was 23 participants. Using these values, the effect size was calculated and found to be approximately -0.464. This result indicated a moderate effect size, suggesting that the difference in production scores between the two groups was practically significant in addition to being statistically significant.

4.3. Spearman's rank correlation: +VLPR vs. -VLPR

The research predicted that children only in the +VLPR group would notice negative evidence by doing the comprehension test, resulting in higher oral production scores as children avoided overgeneralization. Thus, the thesis assumed that the correlational strength between the +VLPR group's comprehension and production

scores would be stronger than that of the -VLPR group. To test this assumption, a correlation analysis between the two test scores of both groups was conducted.

4.3.1. Correlational analysis

The study used Spearman's rank correlation coefficient — a non-parametric test that assesses the strength and direction of the monotonic relationship between two variables — for both groups. This is because, although the normal distribution of the -VLPR group's data would typically invite Pearson's rank test, Spearman's rank test was used instead to ensure consistency in the analysis since the +VLPR group's data had a non-normal distribution. To accurately compare the correlation between comprehension and production scores across both groups, it was necessary to use the same non-parametric test; hence, Spearman's rank test was applied to both groups.

The Spearman's rank correlation coefficient was calculated to be 0.502 with a p-value of 0.115 for the +VLPR group. This result indicated a moderate positive relationship between comprehension and production scores within the +VLPR group. However, the p-value suggested that this relationship was not statistically significant at the conventional alpha level of 0.05. Therefore, while there appeared to be a trend towards a positive correlation, it was not strong enough to draw definitive conclusions given the sample size. On the other hand, Spearman's rank correlation coefficient for the -VLPR group was calculated to be 0.597 with a p-value of 0.04, indicating a moderate positive relationship between comprehension and production scores that was statistically significant.

4.3.2. Fisher's z-transformation comparison

To statistically compare the two Spearman's rank correlation coefficients, the research conducted Fisher's z-transformation. This method converted the correlation coefficients to z-scores, which can then be compared using a standard normal distribution. The transformation involved converting each Spearman correlation coefficient to a z-score using the Fisher transformation formula. For the +VLPR group, the Spearman correlation coefficient of 0.502 was transformed to a

z-score of approximately 0.552. For the -VLPR group, the Spearman correlation coefficient of 0.597 was converted to a z-score of roughly 0.682. Using the standard error, the difference between the two z-scores was calculated, resulting in a z-score difference of approximately -0.268. The two-tailed p-value for this z-score was 0.788, indicating that the difference between the two correlation coefficients was not statistically significant. However, there was a ceiling effect in the comprehension scores data of the +VLPR group, which compromised the correlational analysis result of the +VLPR group. This suggested that the observed differences in the strength of the relationships between the two tests of the +VLPR and -VLPR groups might not be meaningful and should be interpreted with caution.

In summary, the observed ceiling effect in the +VLPR group's comprehension scores undermined the permutation test results and the correlational analysis. On the other hand, the statistical analysis of the production test scores indicated significant differences between the +VLPR and -VLPR groups, with the +VLPR group achieving higher mean scores. A Mann-Whitney U test confirmed the statistical significance of these differences, with a moderate effect size suggesting practical relevance.

5. Discussion

This research attempts to answer two questions: whether +VLPR salient constructions can facilitate generalization and prevent overgeneralization among EFL children. Despite the ceiling effect in the +VLPR's comprehension scores, the statistical analysis of the production test scores indicates that +VLPR salient constructions raise EFL children's ability to generalize. On the other hand, the findings fail to answer the latter question, suggesting no evidence that +VLPR salient constructions help EFL children avoid overgeneralization. The following sections will analyze the implications of these findings, exploring the mechanisms through which +VLPR salient constructions promotes generalization and why the ceiling effect in the +VLPR group's comprehension scores does not undermine the significant difference between the groups' production test scores. In addition, this section will discuss potential reasons for the lack of evidence regarding the role of +VLPR salient constructions in preventing overgeneralization.

5.1. +VLPR salient constructions and generalization

Among the 11 participants of the +VLPR group, six children scored a perfect 100.00 in the forced-choice comprehension task. This concentration of high scores indicates an apparent ceiling effect within the +VLPR group's data. Crucially, the ceiling effect compromises the results of the permutation test between +VLPR and -VLPR group's comprehension scores, which found a statistically significant difference between the groups (observed difference in means was found to be 45.30 with a p-value of 0.0019). The ceiling effect undermines the results of a permutation test by introducing an artificial limit on the highest possible scores. This means that many scores cluster at the maximum value that can be recorded, which reduces the overall variability in the data. When there is less variability, detecting actual differences between groups becomes harder. In addition, this clustering at the top distorts the distribution of the test statistic. A permutation test creates a distribution of possible outcomes by randomly shuffling the data. If many scores are artificially capped, this reshuffling does not produce a true reflection of variability, leading to a skewed distribution. This skewed distribution can generate inaccurate p-values, which are used to determine statistical significance. As a result, the permutation test might incorrectly indicate a statistically significant difference between the groups (false positive) or fail to detect a real difference (false negative). Thus, the permutation test that revealed a statistically significant difference between the +VLPR and -VLPR groups' comprehension marks is unreliable because the test result is influenced by the ceiling effect rather than reflecting actual differences.

On the contrary, there was no ceiling effect on the production task scores of the +VLPR and -VLPR group's data. Thus, the Mann-Whitney U test results that revealed statistically significant differences between the two groups' production task scores are not compromised. The statistically significant difference likely resulted from +VLPR salient constructions having more noticeable semantic roles than -VLPR constructions. The +VLPR salient constructions adhere to the Correspondence Principle, whereby the verb's semantically salient participant roles, such as predator and prey, are encoded by grammatical relations that provide sufficient discourse prominence. This adherence ensures that predator and prey

roles are correctly aligned in prominent positions, such as the subject and object. For example, in a +VLPR construction like '*Jibbing* rabbit wolf,' where *Jibbing* means 'clawing,' the predator (wolf) is understood to be the subject and the prey (rabbit) the object. This correct alignment helps reinforce the proper syntactic structures for children, ensuring that the roles expressed in the sentence correspond accurately to the verb's core arguments, facilitating better comprehension of the construction. In contrast, -VLPR constructions have no Correspondence Principle to follow. Consequently, these constructions lack a systematic alignment of semantically salient roles, making it more challenging for children to identify and learn the correct syntactic and semantic structures. For example, in a -VLPR construction like '*Jibbing* rabbit wolf,' where '*Jibbing*' means 'outrunning,' the roles of predator and prey do not align clearly with the subject and object positions. Both 'The wolf outruns the rabbit' and 'The rabbit outruns the wolf' are grammatically and semantically valid, creating ambiguity in role assignments. This lack of clear structure means that -VLPR constructions do not provide the same level of syntactic clarity and reinforcement, potentially making it harder for children to learn the appropriate grammatical roles.

Moreover, the assertion that +VLPR salient constructions led to higher production scores because children could more easily discern the semantics of these constructions confirms Ninio's (1999) and Wonnacott's (2013) works. Just as Ninio found that highly transitive verbs like 'put' and 'give' help children notice and understand syntactic patterns, this study shows that verbs with lexically profiled roles enhance children's ability to notice the semantic patterns embedded in the constructions. Consequently, this research found that children could generalize these patterns more effectively than -VLPR children. This finding confirms Wonnacott's claim that recognizing semantic roles and patterns facilitates generalization. By providing clear semantic roles, +VLPR salient constructions enabled children to generalize syntactic structures effectively, confirming the importance of recognizing semantic patterns in language acquisition. Thus, while Ninio and Wonnacott's work was not set in EFL contexts, their works support this research's finding, highlighting the critical role of recognizing semantic roles in facilitating language generalization in EFL contexts.

Crucially, the +VLPR salient constructions that adhered to the Correspondence Principle also provide a valid explanation for the ceiling effect observed in the +VLPR group's comprehension scores. The ceiling effect implies that the comprehension test was not challenging, and this lack of difficulty likely resulted from +VLPR salient constructions that clearly demonstrated the relationship between prey and predator. For instance, '*Ralling* deer lion,' meaning the lion tackled the deer, follows the Correspondence Principle and clearly illustrates the predator-prey dynamic with the lion being a predator, tackling the deer, a prey animal. This apparent relationship between semantic roles resulted in pictures displaying predator animals engaging in typical predatory actions towards prey animals and prey animals reacting in typical ways to predators. This alignment made it straightforward for children to identify the correct images in the comprehension test, as the expected actions of predators and prey were consistently depicted. Furthermore, any violations of the Correspondence Principle resulted in incorrect pictures displaying absurd scenarios, which significantly helped children identify the correct ones. The incorrect pictures displaying absurd images — whereby the prominent roles of prey and predator were switched — likely promoted the ceiling effect in the comprehension test. Three out of six participants of the +VLPR group who scored 100.00 on the comprehension test explicitly commented on the absurdity of specific photos during the task. For example, Participant 1 laughed and stated, 'But, a cheetah doesn't run away from a zebra!' and repeatedly said, 'It doesn't make sense' when referring to pictures of prey and predatory animals engaging in unusual behaviors. Similarly, Participant 8 noticed a picture of a rabbit clawing a tiger and remarked, 'That's so weird!' Participant 11 also commented on the images of prey animals attacking predatory animals, describing them as 'weird' and 'doesn't make sense.' Thus, the presence of absurd pictures in the +VLPR group's comprehension test likely contributed to the ceiling effect observed.

On the other hand, the comprehension scores of the -VLPR group were approximately normally distributed, as indicated by the Shapiro-Wilk test (Shapiro-Wilk statistic of 0.881 with a p-value of 0.0907). The data does not display any ceiling effect, and it is likely because the -VLPR constructions have no Correspondence Principle to adhere to, resulting in incorrect images that depicted plausible scenes. For example, an incorrect picture might show a rabbit outrunning

a wolf, which is a plausible scenario and does not stand out as absurd. Without clear and easily identifiable errors based on the Correspondence Principle, children in the -VLPR group found it more challenging to distinguish correct from incorrect constructions. This lack of obvious visual cues made the comprehension task less straightforward and more challenging than the comprehension test conducted in the +VLPR group.

In this context, while the ceiling effect compromises the validity of comparing the groups' comprehension test scores, it does not affect the comparison of the groups' production test scores. This is because the +VLPR salient constructions that facilitated generalization in the production task were likely the reason for the ceiling effect. Verbs with lexically profiled roles produced salient constructions with easily noticeable semantic roles and patterns by following the Correspondence Principle. The role of verbs in elevating the noticeability of semantic patterns within a construction aligns with Ninio's findings that highly transitive verbs raise the salience of semantic roles in constructions. Consequently, +VLPR children could generalize the novel construction — *Verb (+) big/small + Noun phrase 1 (+) big/small + Noun phrase 2* — more effectively than the -VLPR group, confirming Wonnacott's emphasis on recognizing semantic patterns in advancing generalization. Similarly, the +VLPR comprehension test was too easy for children because the +VLPR salient constructions provided clear semantic roles, making the correct pictures obvious. In addition, when the Correspondence Principle was violated, it resulted in absurd images that distinctly highlighted incorrect roles, such as a rabbit clawing a tiger. Accordingly, the +VLPR salient constructions inherently involved correct pictures emphasizing transparent semantic relationships and incorrect pictures highlighting a clear violation of this relationship, which likely promoted the ceiling effect. Thus, the ceiling effect observed in the +VLPR groups' comprehension test does not undermine the statistically significant difference between the groups' production test scores.

To summarize, this research found that +VLPR salient constructions significantly facilitate generalization in EFL children's language learning. By adhering to the Correspondence Principle, +VLPR salient constructions provided clear and salient semantic roles, such as the predator-prey dynamic, which made it easier for children to understand and apply syntactic patterns. This clarity led to higher

production scores and a noticeable ceiling effect in comprehension tests, where children easily identified correct images from incorrect ones due to the apparent semantic relationships. Conversely, -VLPR constructions lacked this systematic alignment, resulting in less clear role assignments and more challenging comprehension tasks. These findings align with Ninio's and Wonnacott's works, demonstrating that highly transitive verbs enhance the salience of semantic roles, thus aiding in the generalization of language structures. Hence, this study underscores the importance of +VLPR salient constructions in facilitating language generalization, providing robust evidence that clear semantic role assignments significantly enhance EFL children's ability to generalize. The following section will explore whether +VLPR salient constructions also assist EFL children in overcoming overgeneralization.

5.2. +VLPR salient constructions and overgeneralization

Although this study uncovered meaningful insights into constructions and generalization, it fails to find evidence suggesting that salient +VLPR salient constructions prevent overgeneralization among EFL children. The correlation between comprehension and production scores in the +VLPR group was expected to be stronger than in the VNRR group because the comprehension test's negative evidence would indirectly aid children in overcoming overgeneralization. This study fails to provide any evidence that the correlation between comprehension and production scores is stronger in the +VLPR group compared to the -VLPR group. Crucially, this lack of evidence originates from the prevalent ceiling effect within the +VLPR group's comprehension scores data, rendering the correlation test between comprehension scores and production marks ineffective. As mentioned, the ceiling effect implies that the comprehension test was not challenging enough to differentiate among high-performing individuals, thereby reducing the variability in the data and masking potential differences in comprehension abilities.

Consequently, the results of the correlational analysis, as indicated by Spearman's rank test within the +VLPR group, are unreliable. The Spearman's rank correlation coefficient was calculated to be 0.502 with a p-value of 0.115 for the +VLPR group. This result, which reveals no significant correlation between comprehension and

production scores of the +VLPR, is substantially undermined by the ceiling effect. When many scores cluster at the maximum value, the range of possible scores is compressed, and the actual relationship between comprehension and production abilities cannot be accurately assessed. Essentially, the ceiling effect compresses the data range and reduces the sensitivity of the correlation test, leading to an underestimation of the actual correlation strength. Therefore, the apparent trend towards a positive correlation in the +VLPR group may be more pronounced than the test suggests, but the ceiling effect limits the ability to confirm this with statistical confidence. With the ceiling effect masking the actual level of correlation between the +VLPR group's comprehension and production scores, the statistical comparison between the +VLPR group's and the -VLPR group's correlation also becomes ineffective. In other words, the result of Fisher's z-transformation, suggesting no significant difference between the two Spearman's rank correlation coefficients, cannot be considered reliable. Thus, the ceiling effect obscures any differences in correlation between comprehension and production scores of the +VLPR group, failing to provide evidence that the +VLPR children noticed negative evidence and averted overgeneralization more effectively than the -VLPR group.

It is important to mention here again that the absurd photos helped +VLPR children identify correct pictures during their comprehension test. The absurdity of the incorrect photos likely served as negative evidence to help the children find the correct photos. However, due to the lack of evidence in the correlation test between the groups, the research cannot claim that the absurd photos that acted as negative evidence also helped them correctly produce the novel construction in the production task. Consequently, the +VLPR group's higher performance in the production task than the -VLPR group cannot be confidently attributed to their recognition of negative evidence. This research can only explain their higher performance in terms of +VLPR salient constructions having more salient semantic roles and patterns than the -VLPR constructions, not in terms of +VLPR salient constructions providing negative evidence necessary for avoiding overgeneralization.

5.3. Summary

This research comparing +VLPR salient constructions and -VLPR constructions shows that salient +VLPR salient constructions enhance generalization among EFL children. The results of the Mann-Whitney U test demonstrated that children exposed to +VLPR salient constructions showed improved production abilities, indicating their effectiveness in facilitating the generalization of linguistic patterns. The +VLPR salient constructions inherently involved clear, correct, and absurd images, which helped the participants easily identify the correct photos and led to higher production scores. However, the ceiling effect in the +VLPR group's comprehension test scores undermined the results of the correlational test. Consequently, the ceiling effect prevented this research from reliably stating that the absurd images provided negative evidence, which helped children produce the correct forms of the novel construction in the production task. The negative evidence that helped children identify correct forms was likely limited to the comprehension test. Taking all this together, while the research cannot assert that +VLPR salient constructions improved scores due to providing negative evidence, it is clear that the well-defined semantic roles and patterns within these constructions were crucial. This clarity most likely led to the observed improvement in EFL children's production abilities, highlighting the effectiveness of +VLPR salient constructions in facilitating language generalization.

6. Implications

6.1. Salient constructions

This study adds insight to previous UBL research, suggesting that the salience of constructions matters along with sample size (variety) and sampling history (repetition) in child foreign language education. UBL research into child language acquisition has demonstrated the vital role of sample size and sampling history. Wonnacott et al. (2012) showed that children exposed to a larger sample size—a variety of constructions with multiple verbs—could better generalize to new verbs than those exposed to a single type of construction with one verb. Additionally, Casenhiser and Goldberg (2005) found that sampling history, or repeated exposure

to a specific construction, reinforces memory and aids initial learning. Their studies showed that children exposed to repeated constructions better learned novel constructions. However, previous UBL research has not shown the effects of salience of constructions in generalization. In this research, both the +VLPR and -VLPR groups had identical sample sizes and sampling histories, and they encountered the *exact* same number of various constructions with *equal* repetition. Additionally, the constructions both groups encountered were *exactly* the same, differing only in the meanings dictated by the +VLPR and -VLPR conditions. This subtle difference in semantic salience, where +VLPR salient constructions made the roles of agent and patient more noticeable, led to statistically significant differences in the oral production task of novel constructions. This finding suggests that selecting constructions—specifically those with more transparent and more noticeable semantic roles—is critical in enhancing children's ability to generalize linguistic patterns. Therefore, while sample size and sampling history are essential, constructions with semantic clarity provided by verbs with lexically profiled roles further aid generalization.

Furthermore, this research was set in EFL-instructed settings due to the lack of research on teaching constructions in FL-instructed classrooms. The research design mimicked a classroom setting with three children per class, and it revealed that EFL children could effectively generalize novel constructions by encountering various salient constructions with some repetition. Therefore, this research recommends that teachers in EFL contexts first and foremost implement various constructions with noticeable semantic roles that children can easily recognize in their classrooms when teaching constructions. After selecting a wide array of salient constructions, the teachers should teach them repetitively to promote generalization.

6.2. Explicit instruction

Moreover, this research suggests that teachers include explicit instruction when teaching constructions. This research minimized explicit instruction by simply introducing novel constructions and their meanings rather than teaching the grammatical structure of the novel construction. This measure was implemented to

construct a fair testing environment whereby no child received explicit instruction to ensure that all children had an equal opportunity to learn the novel constructions from the exposure alone. However, this resulted in some children scoring zero in their comprehension and production tasks, meaning that some children could not learn anything. In this context, explicit instruction could have helped children to learn the construction and perform better on tests. Research consistently shows that explicit instruction is more beneficial than implicit instruction, particularly for helping learners acquire complex grammatical structures that do not emerge readily from mere exposure (DeKeyser, 2003; Ellis, 2008; Norris & Ortega, 2000; Spada & Tomita, 2010). Thus, explicitly teaching the grammatical structure of constructions can raise the salience of hard-to-notice features and promote learning. Furthermore, empirical research has shown evidence of the efficacy of explicit instruction among children. For instance, the study by Ferman and Karni (2014) compared the effects of explicit and implicit instruction on children's ability to learn an artificial morphological rule in their L1. The results indicated that children who received explicit instruction learned the rule more effectively and demonstrated better generalization to new items. The explicit instruction clearly explained the rule, which helped the children understand and apply it accurately, even to novel situations. Their finding suggests that explicit instruction facilitates the development of explicit knowledge, making it easier for children to internalize and use complex language structures. Therefore, incorporating explicit instruction in teaching salient constructions can significantly enhance children's learning outcomes, ensuring they grasp and retain grammatical features that are hard to notice independently.

7. Limitations

7.1. Priori power analysis

Before conducting the study, a priori power analysis was performed to determine the required sample size to detect a medium effect size ($d = 0.5$) with a power of 80% ($1-\beta = 0.80$) and a significance level (α) of 0.05. The power analysis indicated that approximately 64 participants per group would be needed to detect a medium effect size with adequate power. Given the current sample sizes of 11 participants

in the +VLPR group and 12 participants in the -VLPR group, the study is underpowered to detect a medium effect size reliably. This limitation should be considered when interpreting the results, as the small sample size may reduce the study's ability to detect actual differences between the groups. Future research with larger sample sizes is recommended to achieve adequate power and more reliable results.

7.2. Participants

The children's English proficiency was not measured using standardized tests, which may have influenced the results of the research's findings. However, the research mitigated this potential effect by employing random sampling stratified by age. This approach ensured that any possible differences in English proficiency were evenly distributed across the groups, reducing the likelihood that proficiency levels would systematically bias the results. Additionally, since the test involved learning a novel construction that even advanced English speakers have never encountered, the children's existing English proficiency may not have been a significant factor. This novel aspect of the construction aimed to level the playing field, making the task challenging and new for all participants regardless of their prior English proficiency. Thus, while not measuring proficiency with standardized tests could be seen as a limitation, the research design incorporated strategies to minimize its potential impact on the findings.

7.3. Convenient sampling method

While the convenient sampling method allowed for efficient data collection from a readily accessible population of children previously taught English by the researcher, this approach may limit the generalizability of the findings. The sample may not be representative of the broader population of English as a Foreign Language (EFL) learners, as these children might have specific characteristics or prior exposure to English that differ from those in other educational settings. South Korea is known for its rigorous EMI system in early childhood foreign language education (Choi, 2013). Such an educational system may differ from other FL-

instructed settings, like bilingual programs. Therefore, the results of this study may not apply to EFL learners in contexts where the intensity and method of language instruction differ. Future research should include a more diverse sample of EFL learners from various educational backgrounds to enhance the generalizability of the findings. Additionally, incorporating a randomized sampling method could help ensure that the sample more accurately reflects the broader population of EFL learners, thereby providing a more comprehensive understanding of the effects of +VLPR salient constructions on language acquisition.

7.4. Procedure

Another limitation of this study was using printed illustrations of animals to demonstrate the meanings of the artificial verbs during the exposure stage. There were inherent limitations to enacting the scenes using printed illustrations, as it took much work to accurately depict the meanings of the verbs. For example, for the verb 'datting,' which meant ‘bite’ for the +VLPR group, I could not show the animal actually biting. Instead, I depicted the scene by burying the tiger’s face into the zebra, indicating that this action corresponded to biting. Fortunately, this limitation applied to both groups, ensuring the condition was balanced and thus did not significantly affect the comparative results. Nonetheless, the use of printed pictures of the animals still constrained the clarity of the verb demonstrations. Future research should incorporate videos that accurately depict the scenes to address this issue, providing a more precise and dynamic representation of the verbs’ meanings. This improvement would enhance the validity of the exposure stage and potentially lead to more accurate assessments of children’s understanding and generalization of novel constructions.

7.5. Ceiling effect

This research aimed to discover +VLPR salient constructions’ effects on generalization and overgeneralization. It was challenging to create a research design with this dual focus. Attempting to investigate salient constructions and their impact on generalization resulted in implementing +VLPR salient constructions

that inherently involved absurd imagery, making the comprehension test very easy for participants. The apparent and easily noticeable absurdity of incorrect pictures, such as prey animals attacking predators, led to a ceiling effect, with many participants scoring at the maximum level. Consequently, the research failed to find evidence regarding salient constructions and overgeneralization. Future research should focus on either generalization or overgeneralization and implement research designs that effectively investigate one aspect. In this regard, this research recommends that future studies incorporate elements of qualitative research methodology to interview participants about whether they have noticed negative evidence. Qualitative interviews can provide deeper insights into children's thought processes, allowing researchers to understand how they perceive and respond to negative evidence. Researchers can gather rich, detailed data on whether and how negative evidence impacts their learning and overgeneralization patterns by asking open-ended questions and encouraging children to explain their reasoning. This qualitative approach can uncover nuances that quantitative measures might miss, such as the children's awareness of absurd imagery and its role in overgeneralization.

8. Conclusion

This research investigated if EFL children generalize more effectively from specific constructions. This study conducted a controlled experiment using stratified random sampling based on age to address this aim. The study found that EFL children generalize more effectively from +VLPR salient constructions — constructions containing verbs with lexically profiled roles — compared to -VLPR constructions. This finding suggests that the salience of constructions, particularly those that clearly delineate semantic roles like agent and patient, is crucial in facilitating language generalization among EFL learners. Despite the ceiling effect observed in the comprehension test of the +VLPR group, the results of the production task demonstrated that children exposed to +VLPR salient constructions were better able to apply learned syntactic patterns to new contexts than the -VLPR group.

This study contributes to the field of child foreign language acquisition by showing the critical role of salience in generalization. While previous studies have focused on investigating the effects of quantity of input — sample size (variety of constructions) and sampling history (repetition of constructions) — this study shifts the focus towards the quality of the input. This study suggests that while exposure to a diverse and repeated set of constructions is vital, the salience of constructions — the inherent clarity and meaningfulness of constructions — is also crucial in supporting children's ability to abstract and apply grammatical patterns in new contexts. Thus, this study adds a new layer of understanding to how the quantity and quality of language input contribute to successful foreign language learning in children.

Furthermore, the study's implications extend to language teaching practices, especially in EFL contexts, where selecting instructional materials can significantly impact learners' language development. By incorporating constructions with verbs that have lexically profiled roles, educators can enhance the effectiveness of language instruction, promoting a deeper and more flexible understanding of language among young learners. Additionally, the study recommends that teachers incorporate explicit instruction in their classrooms to support students' comprehension of complex grammatical structures. Although the +VLPR group encountered salient constructions, some children still could not grasp the grammatical structure of the novel construction. It is evident that such children need explicit instruction to aid them in understanding the underlying patterns and rules of the language more effectively.

The study had two areas for improvement: the ceiling effect and the small sample size. While the ceiling effect did not undermine the study's findings regarding the effectiveness of +VLPR salient constructions in facilitating generalization, it did limit the ability to thoroughly investigate the role of these constructions in preventing overgeneralization. Moreover, the small sample size likely restricted the generalizability of the findings, as the results may not reflect the broader population of EFL learners.

Despite these limitations, this study can serve as a valuable model for future research in the field of child foreign language acquisition. This study provides a

framework that can be built upon and refined by demonstrating the importance of constructions' salience, particularly through the use of verbs with lexically profiled roles. Future studies can adopt a similar experimental design while addressing these limitations. For instance, increasing the sample size and employing more diverse sampling methods would enhance the generalizability of the results. Additionally, designing comprehension tasks that mitigate the ceiling effect would allow for a more nuanced investigation into both generalization and overgeneralization. By refining these aspects, future research can further validate and expand upon the findings of this study, contributing to a deeper understanding of how salient constructions influence language learning in EFL contexts.

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Appendices

Appendix A: Verb meanings in +VLPR and -VLPR groups

	+VLPR	-VLPR
Tozzing	Evading	Seeing
Pemming	Dodging	Grabbing
Ralling	Tackling	Smelling
Jibbing	Clawing	Outrunning
Dating	Biting	Touching

Appendix B: Constructions encountered by +VLPR and -VLPR group

Tozzing cheetah zebra
Tozzing tiger small monkey
Tozzing wolf small deer
Tozzing big lion rabbit
Ralling deer lion
Jibbing small rabbit wolf
Datting small zebra big tiger
Pemming big cheetah small monkey

Appendix C: Verb meanings in production task

Datting: hunting
Latting: following
Migging: grabbing
Nassing: awaken
Suzzing: stepping on
Ketting: head butting

Appendix D: Production task's target sentences

Dazzing small squirrel fox

Latting big elephant hippo

Migging squirrel big bear

Nassing big hippo big bear

Suzzing small squirrel big elephant

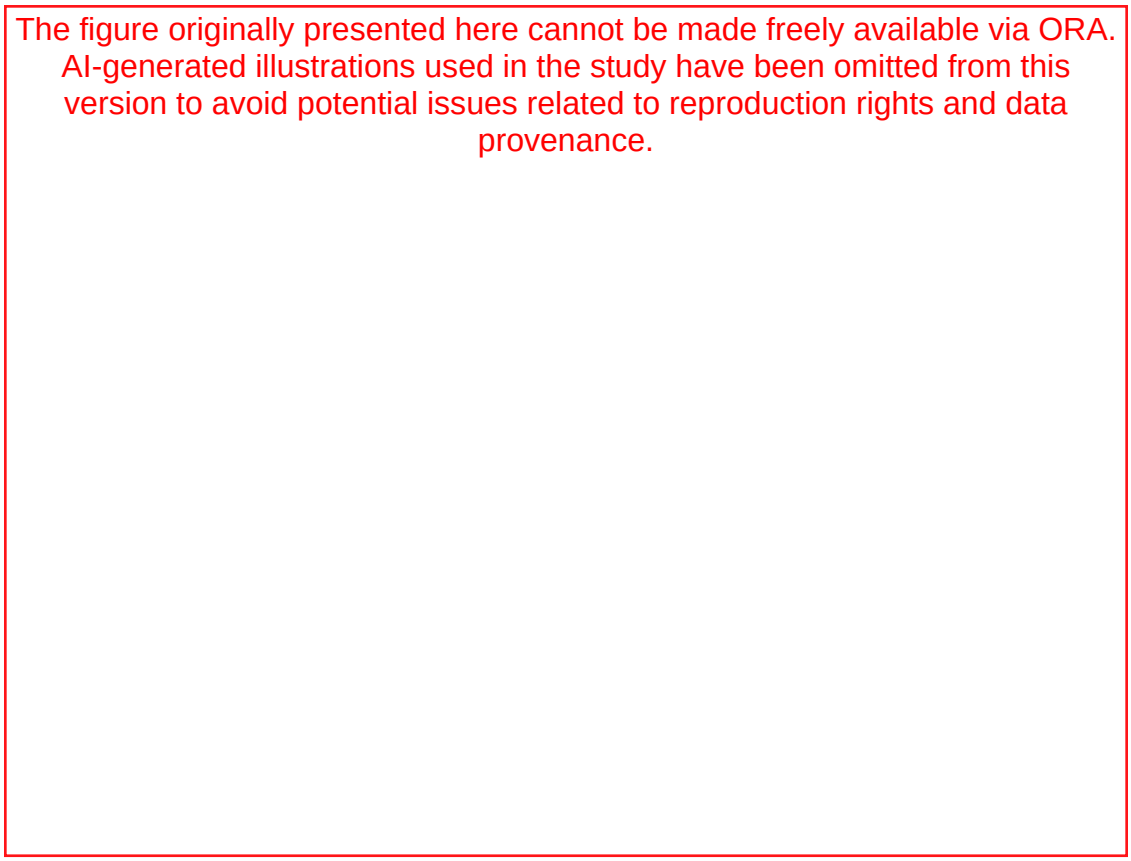
Ketting fox bear

Appendix E: Examples of animal printed illustrations

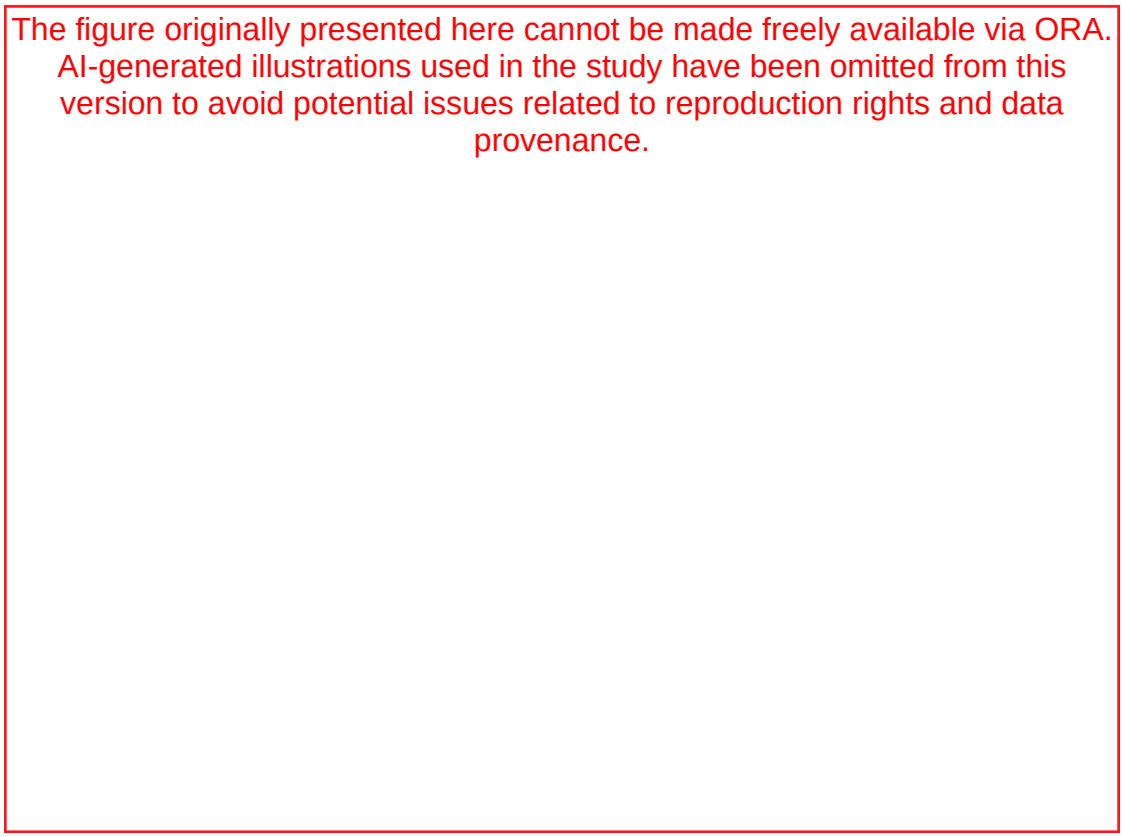


Appendix F: Comprehension test questions examples

i) +VLPR group comprehension questions examples



ii) -VLPR group comprehension questions example



Appendix G: CUREC approval letter

SOCIAL SCIENCES & HUMANITIES
INTERDIVISIONAL RESEARCH ETHICS COMMITTEE

Research Governance, Ethics & Assurance Team, Research Services, University of Oxford,
Boundary Brook House, Churchill Drive, Headington, Oxford OX3 7GB, UK
Tel: +44(0)1865 289881 Email: ethics@socsci.ox.ac.uk



Yoonjae Kil
Department of Education
University of Oxford

15 May 2024

Dear Yoonjae

Research ethics approval

Research title: Comparing the effects of meaning-salient input and high variable input on the generalization of a novel multiword unit in 7 to 9-year-old EFL children.

Research ethics reference: R93241/RE001

The above application has been considered by the Social Sciences and Humanities Interdivisional Research Ethics Committee (SSH IDREC) in accordance with the University's procedures for ethical approval of all research involving human participants.

I am pleased to confirm that, on the basis of the information provided to the IDREC, ethics approval has now been granted for this study for the period 14th May 2024 to 13th November 2025.

Please note the following:

Personal data: It is the responsibility of the Principal Investigator to ensure that all personal data collected during the project is managed in accordance with the University's guidance and legal requirements.

Fieldwork: The University's Safety in Fieldwork Policy must be followed.

Amendments: Please notify the committee if you intend to make any amendments to the information in your ethics application as submitted at date of this approval, as all changes must receive ethical approval prior to implementation. The **amendment form** is available on the SSH IDREC webpage.

Adverse events: The SSH IDRECs must be notified within seven days of any unexpected adverse consequences to the research participants, researchers or other people involved in this research project.

Audit: The SSH IDREC audits a sample of projects each year to enable the Committee to monitor the ethical aspects of research in progress.

We welcome feedback on your experience of the ethical review process and suggestions for improvement. Please email any comments to ethics@socsci.ox.ac.uk.

Yours sincerely

DocuSigned by:
Yolande Monger
55238B5B6383436...

Mrs Yolande Monger, *for*

Jennifer Blaikie, Research Ethics Manager (SSH IDREC)

cc: Professor Victoria Murphy

Appendix H. Information sheet for parents

Department of Education
Principal Investigator: Professor Victoria Murphy
victoria.murphy@education.ox.ac.uk
Student Researcher: Yoonjae Kil
MSc in Applied Linguistics and Second Language Acquisition
yoonjae.kil@education.ox.ac.uk
Department of Education telephone number:
+44 1865 274024

[One meaningful word or various words: which is better for learning grammar?]

INFORMATION SHEET FOR PARENTS / GUARDIANS

Central University Research Ethics Committee Approval Reference: [Insert]

Researchers at the University of Oxford would like to invite your child to be part of this research. The research will study how children learning English as a Foreign language learns English grammar. We very much hope you would like your child to take part, but before you decide, it is important that you understand why the research is being done and what it will involve.

Why is this research being conducted?

This study is about seeing if understanding the meaning of words helps young children learn English grammar better. We will have two groups of kids: a control group and an experimental group. The control group will learn grammar by studying lots of words, which many experts think is a good way. Importantly, these words will be hard for children to understand. On the other hand, the experimental group will learn grammar by focusing on the meaning of one easy word. We want to find out which group learns grammar better. This will show us how important it is for children to understand what words mean when learning English grammar. More information about the research can be obtained by contacting the student researcher (yoonjae.kil@education.ox.ac.uk)

Why has my child been invited to be involved in this research?

We are inviting your child to take part because they are children aged between 7 to 9-years-old that are learning English in a country that does not officially speak English. We are inviting approximately 24 children to take part.

Does my child have to be involved?

No. You can ask questions about the research before deciding whether to allow your child to participate. If you do agree to participation, you may withdraw your child and their test results at any time, without giving a reason and without any effect on their education, by advising the researcher (Yoonjae Kil) of this decision. You can choose to withdraw your child's information from the research anytime before July 15th by contacting Yoonjae Kil via email (yoonjae.kil@education.ox.ac.uk). If you want to withdraw your child's information after this date please contact Yoonjae Kil via email. He will withdraw your child's information.

What will happen if my child takes part?

How to participate

If you want your child to participate in the research, you and your child must do two things:

1. You (the parent) must sign the consent form you received via email and send it back to the student researcher, Yoonjae Kil.
2. Your child must sign the assent form and return it to Yoonjae. Importantly, because children might have a hard time reading the assent form, Yoonjae will read it out loud for your child and explain it. The child can decide whether to participate in the research or not.

After you and your child have submitted the consent and assent forms, Yoonjae will schedule a time that works for your child for the research.

How the research will be done

The research will be done online by Yoonjae. Your child will meet Yoonjae online, one-on-one, via Microsoft Teams. Your child will have to participate in just one online meeting that will take place for one hour.

Yoonjae will teach your child made-up English grammar and made-up words for 30 minutes. The research is teaching your child made-up English because it will show how children learn vocabulary and grammar they have never seen before. In other words, using made-up English is important because it makes the research seem like your child is learning new grammar and words.

The made-up English grammar your child will learn from the research will be Verb+Noun 1+(Adjective)+Noun 2+ (Adjective). The made-up words your child will learn will be words like, bilaking, ralling, chadding, etc.

Here are the meanings of these words:
Bilaking: running towards
Ralling: spinning towards
Chadding: hopping on head.

Thus, your child will learn sentences like 'Bilaking turtle big tiger' meaning that a tiger is running towards a big turtle. Yoonjae will see if your child can understand this new grammar and use new words like bilaking that they have never seen before.

After 30 minutes of teaching, your child will be tested on his/her understanding of made-up grammar and vocabulary. This test will take place for 30 minutes as well. Yoonjae will show an action using toy animals, and your child must make a sentence explaining Yoonjae's action by correctly using made-up grammar and words. For example, if Yoonjae shows a toy tiger running towards a small rabbit, the correct sentence here would be 'Bilaking rabbit small tiger.' Yoonjae will test approximately ten sentences and record how many questions your child gets right.

Your child's privacy

Your child will not be recorded during the research. The only things that will be recorded are your child's age and how many questions your child gets right. In order to protect your child's privacy, this test record will not show your child's name. Your child's name will be replaced by numbers instead. Furthermore, your child's test scores will be securely stored in Oxford University's online data storage system, Nexus 365. **Importantly, the test score of your child will not be shared with you due to ethical guidelines for research.** In addition, your child's age will be recorded in the test result. This is because the research involves 7 to 9-year-old children, and age differences may cause children to score differently during the

test. Therefore, it is necessary to record your child's age to see if differences in age cause children to have different test results.

You and your child's responsibilities

As mentioned, the online research will only be done once with your child, meaning there will be no follow-up research. If you need to adjust the time for the research, you can ask Yoonjae anytime. More importantly, because the research is being done once, your child must pay attention to Yoonjae's instructions during the research.

What are the possible disadvantages and risks in taking part?

1. Because your child will be learning made-up grammar and words, this research will not likely improve your child's English.
2. With any research, your child's privacy is very important. As mentioned, your child's test scores will not show your child's name. The names will be replaced by numbers. When Yoonjae reports the research's findings in his research, these numbers will be used instead of your child's name.
3. When submitting your consent form and your child's assent form, your email and name and your child's name will appear in the form. This information will not be used in the research at all. Also, only Yoonjae and the prinicpal investigator, Professor Victoria Murphy, will have access to it. Furthermore, the consent forms and assent forms will be kept securely in Oxford University's data storage system for three years according to research guidelines.
4. If your child feels uncomfortable doing the research, he/she can tell Yoonjae. Yoonjae will stop the research immediately and any information about your will be deleted.

Are there any benefits in taking part?

While the research will not likely improve your child's English learning, it is hoped that the research will show which methods are good for children's English grammar learning. Thus, although your child may not benefit from the research, your child's participation in the research may help researchers and teachers that are interested in English teaching.

What information will be collected and why is the collection of this information relevant for achieving the research objectives?

Only your child's age and test scores will be used in the research. As mentioned, recording your child's age is important because the research involves 7 to 9-year-old children, and age differences may cause children to score differently during the test. Furthermore, recording your child's test results is important to see how children learn English grammar.

As mentioned, your child's age and test results will be stored securely in Oxford University's online data storage system, Nexus 365 for three years. After three years every information related with your child will be deleted.

Will the research be published? Could my child be identified from any publications or other research outputs?

The finding of from the research will be written into a thesis. Although your child's age will be published in the thesis, it will be impossible for your child to be identifiable from the research as your child's name will be replaced with numbers.

Data Protection

The University of Oxford is the data controller with respect to your personal data, and as such will determine how your child's personal data is used in the research.

The University will process your child's personal data for the purpose of the research outlined above. Research is a task that we perform in the public interest.

Further information about your rights with respect to your personal data is available from https://compliance.web.ox.ac.uk/individual-rights.

Who has reviewed this research?

This research has received ethics approval from a subcommittee of the University of Oxford Central University Research Ethics Committee. (Ethics reference: xxxxx).

Who is organising and funding the research?

There are no funding for the research.

Who do I contact if I have a concern about the research, or I wish to complain?

If you have any concerns of this research, please contact Yoonjae Kil via phone (+44 7796 397582) or email (yoonjae.kil@education.ox.ac.uk) or Professor Victoria Murphy by phone (+44 1865 274024) or email (victoria.murphy@education.ox.ac.uk). We will do our best to answer your query. We will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the Chair of the Research Ethics Committee at the University of Oxford who will seek to resolve the matter as soon as possible:

Chair, **Medical Sciences Interdivisional Research Ethics Committee**; Email: ethics@medsci.ox.ac.uk; Address: Research Services, University of Oxford, Boundary Brook House, Churchill Drive, Headington, Oxford OX3 7GB

OR

Chair, **Social Sciences & Humanities Interdivisional Research Ethics Committee**; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Boundary Brook House, Churchill Drive, Headington, Oxford OX3 7GB

OR

[only for applications reviewed by a Departmental Research Ethics Committee (DREC)] Chair, **[insert relevant Departmental Research Ethics Committee name]**; Email: [insert relevant departmental research ethics committee email address and postal address]

OR

[For applications reviewed by the **Oxford Tropical Research Ethics Committee** (OxTREC), please insert the contact details for the local ethics committee that has reviewed your study]

What should I do next?

Please fill in the enclosed form and return it to the student researcher, Yoonjae Kil via email (yoonjae.kil@education.ox.ac.uk). If you would/would not like your child to take part in this research. Please remember that you may withdraw your child at any time, without affecting their education and without giving a reason, by notifying the researcher.

Further Information and Contact Details

If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

Yoonjae Kil
Department of Education
OX2 6PY
University tel: +44 1865 274024
University email: yoonjae.kil@education.ox.ac.uk

Appendix I. Consent form for parents

DEPARTMENT OF EDUCATION

Principal Investigator: Professor Victoria Murphy
victoria.murphy@education.ox.ac.uk

PARENT/GUARDIAN CONSENT FORM

CUREC Approval Reference:

[The effects of meaning-salient input on the generalization of a novel multiword unit]

- This study conducted by the University of Oxford looks at meaning of words can affect children's learning of English grammar.
- If your child takes part, the student researcher (Yoonjae Kil) will meet with your child online and do some activities
- To find out more about the study, please read the attached information sheet. You can e-mail us at yoonjae.kil@education.ox.ac.uk or call the student researcher, Yoonjae Kil on +44 7796 397582 if you have any questions.
- If you are happy for your child to take part, please fill in the form below and return it to your child's class teacher as soon as possible.

Name of child: _____ _____
Forename Surname

I have read and understood the details of the above study, and have had the opportunity to ask questions and discuss the study with others. I have received satisfactory answers to my questions. I understand that the project has received ethics clearance through the University of Oxford's ethical approval process for research involving human participants, and I understand who will have access to the data, how it will be stored and what will happen to the data at the end of the study. I understand that participation is voluntary and that my child and I are free to withdraw at any time, without giving any reason and without my child's education being affected in any way. I understand how to raise a concern or make a complaint.

If applicable:

I agree for my child to participate in the test of the research	Yes ☐	No ☐
I understand how my child's test results will be used in research outputs	Yes ☐	No ☐

I give permission for my child to take part in the above study.

Name of parent/guardian: _____

Signature: _____ **Date:** dd / mm / yyyy

Name of researcher: _____

Signature: _____ **Date:** dd / mm / yyyy

Participant Consent Form, version 3.1, February 2023

If you would like to receive an annual newsletter summarising our research, please fill in your address:

Appendix J. Assent form for children

DEPARTMENT OF EDUCATION

Principal Investigator: Professor Victoria Murphy
Department of Education number: +44 1865 274024
E-Mail: victoria.murphy@education.ox.ac.uk
https://www.education.ox.ac.uk/

ASSENT FORM FOR CHILDREN UNDER 16

The effects of meaning-salient input on the generalization of a novel multiword unit

Child/Young Person (or if unable, parent/researcher/teacher on their behalf) to circle all they agree with:

- Has somebody else explained this project to you? Yes/No
- Do you understand what this project is about? Yes/No
- Have you asked all the questions you want? Yes/No
- Have you had your questions answered in a way you understand? Yes/No
- Do you understand it's OK to stop taking part at any time? Yes/No
- Are you happy to take part? Yes/No
- Are you happy for your voice to be recorded? Yes/No
- Are you happy to be on video? Yes/No
- Are you happy to have photographs taken? Yes/No

If <u>any</u> answers are "no" or you don't want to take part, that's OK! No one will be cross with you.

If you <u>do</u> want to take part, please write your name below

Your name _____

Date _____

The researcher who explained this project to you needs to sign too:

Print Name _____

Sign _____

Date _____

A witness (parent or legal guardian) should also sign:

Print Name _____

Sign _____

Date _____

Thank you!