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From LAB to Classroom: structural priming and ESOL learners' comprehension and production of passives

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Submitted in accordance with the requirements for the degree of
Professional Doctorate in Applied Linguistics

York St John University

School of Education, Language and Psychology

March 2026

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Acknowledgements

First of all, I would like to express an immense thank you to my primary supervisor, Dr Leesa Clarke, who has provided all the support and guidance I needed until the final moments. I am also deeply grateful to Dr Yeji Han for stepping in to supervise my research when I was midway through my thesis journey. Your willingness to guide me at such a critical stage was both a lifeline and a source of inspiration. Your expertise, insightful feedback, and unwavering support have been invaluable in shaping my work and helping me navigate the challenges of completing this project. I deeply appreciate your understanding, encouragement, and dedication, which have played a pivotal role in bringing this thesis to fruition.

I would also like to thank Dr Ann-Marie Hunter, who guided me along with Dr Leesa Clarke in the first two years of my doctoral journey and patiently helped me with valuable advice.

I would especially like to thank the staff of the Psychology Lab at York St John University, in particular Charlotte Elwell, whose invaluable assistance in the experimental design and data collection was crucial for this thesis. I am also very grateful to Dr Claudia Bracht, who consistently provided support whenever I needed it throughout my research.

Thank you to Dr Lorna Hamilton and Dr Mattia Zingaretti for their comments and suggestions on the progression stages of this project.

Finally, I give a very special thank you to my ESOL learners for volunteering their time and willingness to make this study possible. I deeply value the trust you placed in me and the openness with which you engaged in the research project. I am also grateful to my college for granting me permission to conduct the study on site and for supporting the research process throughout. Thanks to your contribution, this work has been possible. I hope that the findings of this study honour your input and contribute meaningfully to the understanding of structural priming and second language learning.

Abstract

This thesis examines the role of structural priming (SP) as a mechanism of processing facilitation and potential implicit learning in second language (L2) acquisition and its pedagogical applications in English for Speakers of Other Languages (ESOL) contexts. SP, the tendency to reuse encountered syntactic structures, has been widely studied in language production; however, its role in L2 comprehension and classroom-based learning, particularly with respect to lexical mediation and learners' proficiency, remains underexplored. This thesis addresses this gap through two objectives: (i) to investigate whether SP occurs during L2 comprehension and how it interacts with lexical overlap and proficiency, and (ii) to evaluate whether priming tasks support learners' comprehension and production of passives in classrooms. Two studies examined the effects of exposure to passives on syntactic processing and learning in experimental and classroom contexts. Study 1 used a self-paced reading task with 45 ESOL learners across three proficiency levels. Significant priming effects occurred with main-verb repetition between prime and target sentences ($p < .001$), indicating lexically mediated SP consistent with a lexical boost effect. Nevertheless, priming across proficiency levels suggests differential sensitivity to lexical and structural overlap, instead of fully abstract SP, supporting accounts in which SP reflects short-term activation and/or gradual representational adaptation driven by prior input. Study 2 implemented priming tasks in a pretest–treatment–posttest design with 24 ESOL learners. The experimental group outperformed the control group in passive production ($p < .001$) and comprehension accuracy ($p = .002$). Gains in metalinguistic knowledge were limited, suggesting performance improvements without clear evidence of robust explicit learning effects. Overall, the findings advance L2 processing models by evidencing lexically mediated SP in comprehension and extending SP research into pedagogical contexts. The thesis bridges psycholinguistic theory and language teaching, positioning SP as a useful resource for supporting syntactic development in ESOL instruction.

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Abbreviations

AI	Artificial intelligence
AWCF	Automated written corrective feedback
AWE	Automated writing evaluation
BOLD	Blood-oxygen-level-dependent
CALL	Computer-assisted language learning
CEFR	Common European Framework of Reference
CG	Construction Grammar
DfE	Department for Education
DO	Double object
EEG	Electroencephalography
EFL	English Foreign Language
ERP	Event-Related Potential
ESOL	English for Speakers of Other Languages
fMRI	Functional magnetic resonance imaging
FSE	Functional Skills English
FTF	Face-to-face
GEE	Generalised Estimating Equations
GJT	Grammaticality judgment task
GLHs	Guided learning hours
LLM	Large language model
LSD	Least Significant Difference
NATECLA	National Association for Teaching English and Community Language to Adults
PO	Prepositional object
PPP	Presentation–Practice–Production
RT	Reaction time
SCMC	Synchronous computer-mediated communication
SLA	Second language acquisition
SPR	Self-paced reading
TBLT	Task-Based Language Teaching
UBL	Usage-based linguistics
VW	Visual world

Chapter 1 Introduction

1.1 Introduction

Adult English for Speakers of Other Languages (ESOL) learners in England typically receive extensive explicit grammar instruction in classroom settings, with guided learning hours (GLHs) varying by course and provider. On average, ESOL provision provides at least 270 GLHs per level (Roden and Osmaston, 2021). However, despite this considerable amount of instruction, many learners continue to face significant challenges in achieving syntactic accuracy and fluency, particularly in preparation for standardised assessments. This persistent difficulty suggests that traditional pedagogical approaches, while significant, may be insufficient on their own to support the development of complex grammatical structures in second language (L2) learners, particularly in diverse, multilingual classrooms.

Research in second language acquisition has shown that syntactic knowledge, often referred to as grammar (Gass, Behney and Plonsky, 2013), is one of the most challenging aspects of language learning because syntax requires learners to coordinate multiple interconnected representational and processing capacities rather than memorise isolated forms (Bernolet, Collina and Hartsuiker, 2018; Gass, Behney and Plonsky, 2013). To produce and comprehend well-formed sentences, L2 learners must internalise word meanings, form and differentiate syntactic categories (e.g., nouns and verbs), understand grammatical functions (e.g., subject or object), and acquire the patterns that rule sentence structure (e.g., determiners precede nouns). These elements help learners understand how syntax reflects the relationships between different sentence components (Chang, Dell and Bock, 2006; Bernolet, Collina and Hartsuiker, 2018) and point syntactic knowledge functions as a relational scaffold: it binds words into hierarchical structures that determine thematic role assignment, semantic relations, attachment decisions, and ultimately discourse-level interpretation, processes that have been demonstrated to predict comprehension outcomes above and beyond vocabulary size (Zhou, 2022) and to contribute to the quality of L2 production beyond lexical sophistication (Kyle and Crossley, 2017).

The processes that have been demonstrated to predict comprehension and production outcomes above and beyond vocabulary size in empirical samples of L2 learners (Zhou, 2022).

Given the central role of syntax in overall grammatical competence, research on second language grammar instruction has emphasised the importance of pedagogical approaches that support the development of syntactic knowledge (Ur, 2011). Grammatical competence encompasses not only an understanding of language rules but also the ability to apply these rules in meaningful communication (Nassaji, 2017). Although studies have highlighted the benefits of implicit instruction, which exposes learners to language input without overt explanation (e.g., Williams, 2005; Leung and Williams, 2011), the effects of such approaches are often influenced by factors such as learners' proficiency, working memory, and the complexity of the targeted structures. Conversely, explicit instruction, which involves direct explanation and focused attention on grammatical forms, can enhance learners' awareness and facilitate the acquisition of specific structures, particularly in contexts where input alone may not provide sufficient cues (e.g., Swan, 2005; Norris and Ortega, 2000; Scheffler and Cinciala, 2011; Bell and Collins, 2025).

Importantly, the dichotomy between implicit and explicit approaches is not absolute. Evidence suggests that effective grammar instruction may involve a combination of both, where explicit guidance draws learners' attention to form, while meaningful exposure and practice allow internalisation through implicit mechanisms (e.g., Nassaji and Fotos, 2011; Nassaji, 2017; Leow, 2018). Such a blended approach recognises that syntactic knowledge develops along a continuum, with explicit awareness supporting initial acquisition and implicit processes contributing to automatisation and fluent use in communicative contexts.

Grammar instruction can also be examined in terms of its emphasis on input versus output, reflecting different theoretical perspectives on how syntactic knowledge is acquired. Input-based instruction prioritises engagement with comprehensible language input, enabling learners to notice grammatical forms while focusing on meaning (Nassaji, 2017). This approach aligns with Schmidt's (1994) noticing hypothesis, which provides one influential theoretical account of how learners acquire L2 grammatical structures. According to Schmidt (1994), learners have

limited cognitive capacity and cannot simultaneously attend to all aspects of language input; consequently, attention influences which features enter conscious awareness, making noticing an important condition for learning. In the context of grammar instruction, this perspective features the value of pedagogical approaches that draw learners' attention to target structures, whether through explicit explanation or input enhancement. However, the extent to which conscious noticing is necessary for acquisition remains debated. Some researchers have argued that learning may also occur through less conscious or implicit mechanisms and that attention and awareness should not be treated as equivalent constructs (Robinson, 1995, 2003; Truscott and Sharwood Smith, 2004).

Output-based instruction, by contrast, encourages learners to produce language by drawing attention to syntactic structures through guided practice and eliciting their own output (Swain and Lapkin, 2000; Swain, 2005). Through output, learners encounter gaps in their interlanguage and may engage in hypothesis testing and self-correction, processes that are central to internalising abstract grammatical patterns (Bygate, 2001; Ellis, 2005). Research suggests that the acquisition of complex syntax, such as passives or relative clauses, benefits from repeated exposure and structured practice across both input and output modalities, supporting the gradual abstraction of rules from varied exemplars rather than mere rote memorisation (Tomasello, 2003; McDonough and Trofimovich, 2009).

Usage-based accounts further emphasise that syntactic knowledge emerges from repeated experience with language in meaningful contexts, pointing up the importance of distributional patterns and frequency effects in shaping learners' mental representations of grammar (Tomasello, 2003; Chang, Dell and Bock, 2006) (see Chapter 2). Consequently, instructional approaches that integrate rich, comprehensible input, opportunities for meaningful production, and systematic repetition can effectively complement explicit grammar instruction, creating conditions for both noticing and proceduralisation of target structures (Ellis, 2002; DeKeyser, 2007).

A complementary theoretical perspective informing this thesis is usage-based linguistics (UBL), and more specifically Construction Grammar (CG), which provides a detailed account of how repeated language experience gives rise to grammatical

representations (Tomasello, 2003; Ellis and Cadierno, 2009; Bybee, 2010). Instead of treating syntax as a system of abstract rules, usage-based approaches propose that linguistic knowledge consists of constructions, conventionalised pairings of form and meaning that range from highly specific expressions to more abstract grammatical patterns (Goldberg, 1995, 2006; Hoffmann and Trousdale, 2013). Within Construction Grammar (Goldberg, 1995, 2006), the passive is therefore treated not as a transformation of an active sentence but as a distinct argument-structure construction with its own semantic and pragmatic properties. From this perspective, acquiring the English passive involves developing an increasingly stable representation of the construction as an independent form–meaning unit (Ellis and Wulff, 2014).

A central prediction of this framework is that constructions emerge gradually along a continuum of schematicity, progressing from lexically specific instances to more abstract and productive representations (Langacker, 2008; Ellis, 2002; Gries and Wulff, 2005). This prediction is directly relevant to the present thesis because it provides a theoretical basis for examining lexical overlap and proficiency as factors that may influence the extent to which learners rely on item-specific or more abstract representations during structural priming. The implications of this framework for interpreting the findings are developed further in Chapter 5.

One promising approach that aligns with these instructional goals is the use of structural priming tasks. Structural priming, also known as syntactic priming, syntactic persistence, or structural alignment, refers to the tendency for speakers to reproduce or process more easily a syntactic structure they have recently encountered (Pickering and Ferreira, 2008). Developed initially as a research method in psycholinguistics, the structural priming paradigm has been increasingly applied in second language research to design tasks that foster the acquisition of L2 syntactic knowledge (e.g., McDonough and Mackey, 2008; McDonough and Chaikitmongkol, 2010; McDonough, Crawford and Mackey, 2015; Kim and McDonough, 2016). This phenomenon can be observed across a range of syntactic constructions, languages, and in both comprehension and production contexts (Mahowald *et al.,* 2016) (see Chapter 2). Structural priming is also observed when the target sentences are comprehended instead of produced. In this case, the prime sentence is modified to either match the structure of the target sentence or differ

from it (Branigan and Gibb, 2018). Priming is demonstrated by processing facilitation of the target sentence, such as faster reading times, anticipatory eye movements toward an expected referent in a visual scene, changes in the BOLD (blood-oxygen-level-dependent) response, or shifts in language-related event-related potential (ERP) components, when preceded by a prime with the same structure compared to a prime with a different structure (Tooley, 2022).

Currently, the scope of structural priming research has expanded further, and the paradigm has been employed to examine, for example, the relationship between reading and syntactic processing in school-aged children (e.g., Kramer, 2017; Bidgood *et al.,* 2020), to investigate sentence processing and grammatical learning in special populations such as individuals with dyslexia, developmental language disorder, or amnesia (e.g., Kurten, 2017; Heyselaar *et al.,* 2017; Lee *et al.,* 2019), to explore age-related effects on syntactic planning and processing in older adults (e.g., Hardy, Messenger and Maylor, 2017; Hardy, Wheeldon and Segaert, 2020; van Boxtel and Lawyer, 2023), and in L2 research (e.g., Bernolet and Hartsuiker, 2010; Shin and Christianson, 2012; Jackson and Ruf, 2017). (See Mahowald *et al*., 2016 and Pickering and Ferreira, 2008, for a more comprehensive discussion).

In L2 studies, research evidence has demonstrated that such priming effects encourage L2 speakers to use the target structures more frequently or comprehend them faster and more accurately during and after a structural priming task (e.g., Shin and Christianson, 2012; Conroy, 2013; Kim and McDonough, 2016; Teixeira, 2016; Jackson and Ruf, 2017; Coumel, 2021; Wei, Kim and Shin, 2022). Second language studies have used structural priming tasks to investigate the acquisition of a variety of syntax constructions in L2 learners, such as transitives (Bock and Griffin, 2000); subordinate clauses (Hartsuiker and Westenberg, 2000), datives (Bock, 1986; Jacob *et al.,* 2017; Son, 2020), and passives (Flett, 2006; Conroy, 2013; Segaert *et al.*, 2011, 2012, 2013; Kramer, 2017; Gaviazzi *et al*., 2018; Bidgood *et al*., 2020). The findings suggest that structural priming not only facilitates immediate linguistic performance but may also contribute to longer-term syntactic development (Shin and Christianson, 2012) and increased confidence in using and comprehending less familiar or complex forms in L2 (McDonough, Neumann and Trofimovich, 2015). (see Chapter 2 for a detailed discussion of structural priming in production and comprehension modalities).

To date, research on structural priming in second language acquisition has focused predominantly on language production, examining a range of syntactic structures across diverse learner populations (see Chapter 2). In contrast, as noted by Tooley (2022), structural priming in comprehension has received comparatively less attention, and findings in this domain differ notably from those observed in production. While production studies often report robust abstract priming, in which syntactic facilitation arises solely from structural similarity, independent of lexical overlap (e.g., Pickering and Branigan, 1998; Ledoux, Traxler and Swaab, 2007; Arai, Van Gompel and Scheepers, 2007), such effects are less consistently observed in comprehension. A small number of studies have reported abstract priming effects (e.g., Hsieh, 2017; Hopp, 2017; Wei *et al.,* 2019), in contrast, most comprehension based studies tend to find weaker or absent abstract effects pointing to lexically mediated priming, commonly referred to as the lexical boost effect, in which priming is significantly stronger when the prime and target share key lexical elements, particularly the main verb (e.g., Branigan, Pickering and McLean*,* 2005; Traxler, Tooley and Pickering, 2014; Tooley and Bock, 2014; Santos and Mota, 2018; Felicio, 2018; Tooley, Pickering and Traxler, 2019). These findings suggest that structural processing during comprehension may be more lexically constrained than in production, though not entirely dependent on lexical repetition (see Chapter 2 for a detailed review).

Moreover, they emphasise the importance of surface-level similarity in facilitating syntactic processing (Pickering and Branigan, 1998; Tooley and Traxler, 2010; Scheepers, Raffray and Myachykov*,* 2017), an effect that appears especially pronounced among L2 learners, who may rely more heavily on lexical cues to process unfamiliar syntactic structures (McDonough and Kim, 2009; Shin and Christianson, 2012). This discrepancy between comprehension and production findings raises important theoretical and empirical questions. Does abstract structural priming reliably occur during comprehension? Is structural processing during comprehension fundamentally more lexically mediated than in production? And are the underlying mechanisms of structural priming shared across comprehension and production modalities?

Investigating structural priming in comprehension is theoretically significant because it offers insight into the mechanisms by which learners encode and retrieve syntactic

representations from input, thereby contributing to the development of implicit grammatical knowledge that underpins both comprehension and production (Pickering and Garrod, 2013; Tooley and Bock, 2014). If structural priming mechanisms operate differently across modalities, this challenges assumptions about shared representations and has implications for theories of implicit learning. Furthermore, if the lexical boost effect is indeed significant for priming to emerge in comprehension, it may carry pedagogical implications. Specifically, the strategic use of lexical repetition may help learners consolidate both syntactic forms and lexical knowledge simultaneously, an approach particularly relevant for L2 instruction and curriculum design. Moreover, the limited evidence for abstract priming in comprehension reinforces the need for experimental paradigms that can isolate structural processing from lexical repetition. The present study addresses this gap by employing a self-paced reading task to examine whether L2 learners exhibit structural priming in comprehension independently of lexical overlap. By manipulating lexical repetition, this design provides a means to evaluate the extent to which L2 syntactic processing during comprehension relies on abstract representations or lexical associations.

Another relevant factor investigated in L2 research as a possible facilitator of priming effects in comprehension is learners' L2 proficiency. Some studies have found that lower proficiency learners exhibit weaker or absent priming effects unless lexical repetition is present (e.g., Chen *et al*., 2013; Kim and McDonough, 2016), suggesting that abstract structural priming may emerge only at higher levels of L2 development. However, the role of proficiency in L2 structural priming remains insufficiently understood, particularly in comprehension research, where relatively few studies have directly examined how learners at different proficiency levels respond to structural priming. Notably, most existing studies have focused on relatively homogeneous L2 populations, such as undergraduate learners with similar L1 backgrounds (e.g., Weber and Indefrey, 2009; Felicio, 2018; Zhang, Huang and Liu, 2022; Hwang, 2022; Coumel, Ushioda and Messenger, 2020), leaving open the question of whether these patterns hold for more diverse learner groups, such as adult ESOL learners with varying literacy skills and language backgrounds.

Although the role of L2 proficiency is significant, another underexplored dimension in the structural priming literature is its pedagogical application, particularly in ESOL

contexts. Despite growing theoretical interest in priming as a tool for grammar instruction, few studies have examined how to integrate it into classroom practice to support syntactic development and reading comprehension. Moreover, the existing research is limited and rarely considers learners with diverse literacy levels or multilingual backgrounds (Liu, 2023). This thesis addresses these gaps by combining experimental methods with real-world teaching interventions. By examining how structural priming tasks affect the processing and use of target syntactic forms by ESOL learners, this study offers new insights into how research on language processing can inform practical instructional strategies. For that reason, this thesis investigates whether tasks informed by the structural priming paradigm can be effectively applied in an ESOL context, both in controlled experimental settings and in the classroom.

The syntactic structure chosen for investigation is passive voice constructions. This choice is supported by several reasons: the passive voice poses significant challenges for English as a second language (ESL)/English as a foreign language (EFL) learners, particularly in mastering its meanings, uses, and functions (Conroy, 2013; Celce-Murcia and Larsen-Freeman, 2015). Studies using offline comprehension tasks have reported that both adults and children are less accurate at comprehending passive sentences than active ones (e.g., Ferreira, 2003; Messenger *et al.,* 2012; Paolazzi *et al.,* 2019). Additionally, research has shown that the long-term effects of a prime are greater when the prime structure is less common (Kaan and Chun, 2018; Jackson and Ruf, 2017), a finding consistent with the inverse frequency effect described by Chang, Dell and Bock (2006). This effect is the natural outcome of a mechanism that learns most when its current expectations are violated (the inverse frequency effect is explored in detail in Chapter 2, section 2.2). Finally, research on the passive voice has been the target of various structural priming studies in L2 contexts, allowing for comparisons of results. Thus, the rationale for selecting the passive voice as the target structure aligns with both the theoretical framework and the broader goals of this research, which will be further elaborated in the following chapters.

Overall, this study addresses several significant questions: Can prime enhance the real-time sentence comprehension of ESOL learners at different proficiency levels? Does lexical repetition (the main verb of a sentence) influence the strength of priming

effects? Can tasks designed around the structural priming paradigm lead to measurable improvements in learners' grammatical competence in a classroom setting? And importantly, can these findings be translated into scalable teaching interventions that improve ESOL outcomes, particularly for learners facing educational disadvantages? By grounding these questions in both theoretical literature and the realities of adult ESOL provision in England, this thesis aims to contribute to a growing movement within applied linguistics to integrate findings from experimental research into practical language teaching. It responds to the need for more inclusive evidence-based pedagogical approaches that can support learners from diverse educational, cultural and linguistic backgrounds, not only in achieving linguistic accuracy but also in gaining the qualifications and confidence needed to thrive in their host societies.

1.2 Motivation for the study

The motivation for this study stems from my experience as an English as a Foreign Language (EFL) student and my English for Speakers of Other Languages (ESOL) teaching background to adult migrants and refugees living in England. The opportunity to teach after being a second language learner has provided me with significant insight into the challenges ESOL learners face in gaining solid English language knowledge to achieve nationally recognised qualifications in English language in England.

According to the latest UK census (ONS, 2022), one in six usual residents of England and Wales, equivalent to approximately 10 million people, were born in countries where English is not the primary language. Nearly a million people reported limited English proficiency or did not speak English at all; more than one-third of whom are UK citizens. These statistics reflect England and Wales's linguistic diversity and reveal the importance of inclusive policies and programmes that address language barriers and support pedagogical practices to help these individuals in their language-learning journey, enabling them to better integrate into society and build successful lives in the UK.

ESOL provision in England is a professional sector guided and funded by the government, supported by research, professional organisations (e.g., further education colleges, training providers and adult education settings), voluntary organisations, and professional bodies (Paget and Stevenson, 2014) whose main aim is to help learners to acquire or improve their English language skills to access education and employment. Enrolment for ESOL classes is largely at the lower levels. Data from the UK Department for Education (DfE) (2023/2024) with ESOL enrolments and achievement from 2017/2018 to 2021/2022 show a sharp decrease from entry levels 1- 3 enrolments to level 2 (an average of 82.8% at entry 1-3, 15.6% at level 1, and 5.4% at level 2). What drives these learners to join an ESOL course may differ across individuals: some study English to enhance their social and economic contributions to their host society, others aim to earn an accredited qualification to progress into Further or Higher Education or employment, and many seek to fulfil immigration requirements.

In general, my contact with migrant ESOL learners has found that they recognise the importance of achieving a satisfactory level of English language competence in order to settle in Britain and become valuable, well-integrated British citizens. Regarding their familiarity with language learning, from my experience as an ESOL tutor, the vast majority of ESOL learners I have had contact with are multilingual or have been exposed to diversifications of their native languages, especially those born in countries where multiple languages are officially spoken and culturally taught as part of their upbringing. Besides the natural language diversity in their home country, these learners often have prior experience living in a foreign country and have mostly learned the target language in a more naturalistic setting. There is, however, a small number of students who have learned a second language in formal educational environments suited for academic or employability purposes, making them more easily adaptable to the requirements of formal study programmes. Therefore, I could conclude that, for most ESOL learners, learning English would not be an obstacle, as they have already experienced acquiring a second language.

Nevertheless, when it comes to preparing these learners for a nationally accredited assessment in which they must meet the requirements of the National Standard for Adult Literacy and demonstrate the skills of spoken communication, reading, and writing, both tutors and learners face multiple challenges. For tutors, the

heterogeneity of group members' ages, literacy levels, and educational backgrounds is a concern. It is not uncommon for an ESOL adult classroom to be composed of learners aged 19 to 60 (or older) with different abilities, needs, and expectations. In addition, some learners have strong study skills, are accustomed to a classroom environment, and can transfer their existing literacy skills to their learning. Others, however, have only had a few years of schooling and may have little or no print literacy in their own language. This particular group of learners is usually the most vulnerable and susceptible to discrimination, as their learning progress is slower, leading to lower test performance, particularly on language tests (Carlsen and Rocca, 2021). Such disparity requires tutors' flexibility and additional time to develop supplementary materials tailored to individual needs, as standardised teaching sources may not address the diversity in the classroom.

The ESOL learners' challenges are not diminished. In addition to different cultural norms, classroom dynamics, and expectations, most are forced to adapt to an unfamiliar educational system and assessment culture rapidly. As learning groups are heterogeneous, some learners might be disadvantaged because of their poor prior literacy skills, since formal learning and tests are more challenging for them than their peers with more education. Furthermore, as Carlsen and Rocca (2021) state, the possibility of failing a formal examination might have severe consequences for them, such as educational progression, access to the job market, family reunification, and protection against deportation. Therefore, gaining good language skills, including reading and writing, to meet specific benchmarks or pass exams is essential for these learners to avoid unwanted concerns.

Government policies have consistently revised and updated the ESOL provision in England (Simpson, 2019), and alternative progression routes have been explored in the sector. For instance, in 2010, the government introduced the Functional Skills English (FSE) qualifications, a programme designed for learners whose first language (L1) is English and who are familiar with the cultural context of the UK (Roden and Osmaston, 2021). This programme is integrated into the Employability Skills programme, which aims to help unemployed individuals return to work (Simpson, 2019). As financial support for ESOL provision was reduced and much funding is now restricted to employment-related courses with a progression to Functional Skills, once ESOL learners have reached the Entry 3 level (CEFR B1),

they are likely to be moved to FSE to keep the institutions' budget healthy (Paget and Stevenson, 2014). However, these programmes lack a framework for accrediting migrants' and refugees' English language skills (Simpson, 2019). As a result, the target groups consist of two distinct categories: native English speaker learners and migrants and refugees who speak English as a second language. According to a report carried out in 2021 by the National Association for Teaching English and Community Language to Adults (NATECLA), 60% of FSE provisions have ESOL needs, and over a quarter of adult providers consider that FSE is not the best option for most ESOL learners. This is because although both native English speakers and ESOL learners have the same end goal regarding language skills: to use English with fluency and accuracy and to obtain a recognised certification, they are engaged in an entirely different language learning enterprise.

Research on language learning demonstrates that native speakers' learning paths differ significantly from those of non-native speakers (Zingaretti and Spelorzi, 2021). Adult native speakers, except in impaired populations or in cases of severe deprivation, have acquired their L1 to a very high standard. They have a well-established command of language, and processing and understanding occur automatically (Lightbown and Spada, 2013). Proficiency in speaking and listening is fully achieved before learning to read and write as part of formal education (Grabe, 2009). Some gaps might occur, but the underlying cause is often a lack of exposure to situations where more formal language is required (Simpson, 2019), resulting in an inability to handle the full range and register of the language, such as using formal language during a job interview or writing more formal texts. ESOL learners (and L2 learners in general), on the other hand, follow a markedly different learning trajectory. Initially, these learners have to develop the ability to understand and use, for example, the grammar of the English language, as well as other structural aspects such as vocabulary, idioms, pronunciation, and standard conventions. This foundational knowledge is essential for developing other critical skills, including reading and writing (Ortega, 2009), which adult L2 learners must acquire simultaneously. Hence, FSE qualifications can be overwhelming for ESOL learners, as many of the structural aspects of the language expected of learners will be taken for granted. Consequently, ESOL learners often require more extensive input in this area than native speakers to develop their language knowledge rapidly and

consistently. If this is not achieved, they may feel demotivated and disengaged, as they may perceive they are not making progress and are falling behind their peers.

With these issues in mind, I found that there was limited existing research which explored pedagogical interventions in an ESOL context that could potentially result in an effective way to assist these learners in developing their foundational knowledge of the English language to accelerate their grammar learning and minimise the contrasting language competence between ESOL learners themselves and English native speakers. It is my view that gaining strong grammar knowledge, more specifically the syntax of a target language, is one of the pillars of effective language use. While other language components (e.g., vocabulary, pronunciation, semantics and pragmatics) are essential, syntax ties everything together, enabling the comprehension and production of grammatically correct sentences, facilitating better comprehension of written texts and producing well-formed sentences that convey clear and coherent ideas in spoken and written language.

This doctoral research is, therefore, a result of my professional commitment to supporting ESOL learners' educational and social integration and an academic desire to bridge experimental psycholinguistic research with pedagogical practice. In response to the need for more effective and inclusive grammar instruction in ESOL classrooms, particularly in light of the challenges posed by the Functional Skills English framework, this study investigates whether structural priming can serve as a mechanism for enhancing the comprehension and production of English passive constructions. Drawing on two complementary experiments, one laboratory-based and one classroom-based, the thesis explores how priming tasks might help learners process and produce complex syntactic structures more efficiently. By doing so, it aims to develop pedagogically viable approaches that can be translated into classroom activities, with the potential to improve both learners' outcomes and learners' confidence in their language use. Ultimately, this research seeks to contribute to the development of evidence-based teaching strategies that promote equitable access to language qualifications and meaningful participation in society for adult migrant learners.

1.3 Research objectives and research questions

This thesis is an interface between the psycholinguistic paradigm of priming and applied linguistics, with a focus on L2 structural priming and its potential contribution to L2 learning. It draws on two complementary theoretical frameworks: psycholinguistic accounts of structural priming and usage-based linguistics, including Construction Grammar (Goldberg, 1995, 2006; Tomasello, 2003; Bybee, 2010; Hoffmann and Trousdale, 2013). These frameworks are treated as equivalent perspectives that provide complementary explanations of the same empirical phenomena. It explores the role of structural priming in the comprehension and production of the English passive voice among ESOL learners. Specifically, the research investigates whether prior exposure to English passive structures facilitates sentence comprehension by leading to faster reading reaction times and higher comprehension accuracy. Additionally, the study examines the extent to which structural priming tasks support the development of ESOL learners' comprehension and production of English passive constructions while fostering their grammatical knowledge within a classroom context enriched by mobile technology.

To pursue these aims, the study has two interconnected objectives. The theoretical objective is to investigate whether structural priming effects emerge during the comprehension of English passive constructions, and whether these effects are influenced by lexical overlap or learners' L2 proficiency. Based on methods from experimental psycholinguistics, this part of the study seeks to shed light on the cognitive mechanisms involved in L2 sentence processing. The pedagogical objective is to determine whether structural priming tasks, when adapted for classroom use, promote the acquisition and use of passive constructions in real-world ESOL learning environments. This includes examining how these tasks influence both comprehension and production, and how the findings might inform grammar instruction for linguistically and educationally diverse adult learners.

To achieve these goals, the thesis addresses the following five research questions:

> **RQ1:** Does structural priming occur during sentence comprehension of the passive voice among ESOL learners?

RQ2: If structural priming occurs, does lexical repetition influence its magnitude?

RQ3: Is the effect of structural priming moderated by the learners' L2 proficiency levels?

RQ4: To what extent do structural priming tasks implemented in a classroom setting influence ESOL learners' production and grammatical development of English passive constructions?

RQ5: To what extent do structural priming tasks facilitate ESOL learners' comprehension of English passive constructions in a classroom setting?

These questions were examined through two distinct but complementary studies, each employing a different methodology. The first study explored structural priming effects in the sentence-level reading comprehension of English passive constructions among ESOL learners at three proficiency levels: Entry Level 3, Level 1, and Level 2, corresponding to B1, B2, and C1 on the Common European Framework of Reference (CEFR). The self-paced reading method was employed to record and measure participants' response latencies (see Chapter 2). The dependent variable was reading reaction times to the target structures relative to the primes, providing a measure of the effect of structural priming on sentence comprehension across the three proficiency levels.

The second study was conducted in a classroom setting with ESOL learners at Level 1 (CEFR B2) and used a pretest-priming treatment-posttest design with experimental and control groups. The study compared the effectiveness of tasks from the structural priming paradigm to elicit comprehension and production of passive structures among ESOL learners. Comprehension was measured by the accurate selection of a picture that correctly corresponded to the meaning of passive sentences during the pretest, immediate and delayed posttests. Production was operationalised as the total number of prompt-generated sentences of the target structure during the treatment phase. Although the primary focus of this study was to examine whether structural priming tasks lead to an improvement in comprehension and production of passive forms in ESOL learners, a grammaticality judgment task was included to enable comparisons with other studies in structural priming (Shin

and Christianson, 2012; Kim and McDonough, 2008, 2016; Wei, Kim and Shin, 2022) that reported the results of grammaticality judgment tasks.

Together, these studies aim to provide empirical contributions to the cognitive and pedagogical potential of structural priming and to inform the development of inclusive, evidence-based grammar instruction for ESOL learners in England.

1.4 The structure of the thesis

This thesis is organised into five chapters. Chapter 2 presents a review of the literature on L2 structural priming, which forms the foundation of this study. This chapter situates the study within its theoretical and empirical context by exploring key concepts, frameworks, and findings from the fields of psycholinguistics and applied linguistics. It also introduces the theoretical framework of usage-based linguistics and Construction Grammar, which, alongside the psycholinguistic literature, provides a complementary explanation for the findings presented in the later chapters. The review begins by examining L2 structural priming in the psycholinguistic domain, where research has provided important insights into how it facilitates language processing, learning, and production in second language learners.

Next, the chapter shifts to the role of priming in applied linguistics, focusing on how structural priming is linked to broader aspects of language learning, such as the internalisation of syntactic constructions and cross-linguistic influences. This section emphasises how understanding priming mechanisms can inform theories of second language acquisition and address challenges unique to L2 learners.

The following section describes the most frequent priming tasks and the methodological procedures used to investigate structural priming in applied linguistics, along with a discussion of the pros and cons of each method. Next, structural priming in L2 comprehension research is discussed, with empirical evidence showing that exposure to specific syntactic constructions can facilitate the processing and understanding of similar structures in a second language, thereby shedding light on the cognitive mechanisms underlying L2 comprehension and their pedagogical implications.

The final section of the chapter examines structural priming in L2 teaching and learning, exploring its implications for instructional strategies. This includes a discussion of how priming-based approaches can enhance learners' syntactic development and fluency, as well as the practical integration of priming techniques into language teaching practices.

Chapters 3 and 4 provide a detailed account of the methodological procedures undertaken in the two studies that form the core of this research. Each chapter outlines the research design, data collection methods, participants, contextual factors, and the tasks implemented in the studies. Additionally, both chapters include a comprehensive summary of the findings and a discussion of the results, emphasising their relevance to the research objectives and broader theoretical framework.

Chapter 5 synthesises the key findings of the research and articulates the main conclusions. This chapter also explores the theoretical and pedagogical implications of the findings, offering perspectives into their significance within the field. In particular, it examines the findings through both a psycholinguistic and a usage-based linguistic perspective. In addition, it considers how structural priming tasks may be applied in pedagogical contexts to support second language learning. The chapter also reflects on how these pedagogical principles may extend to emerging instructional contexts, such as AI- mediated learning. Further, it examines the limitations of the research, acknowledging constraints that may have influenced the outcomes, and offers recommendations for future research. Finally, Chapter 6 concludes the thesis by summarising the principal findings and contributions of the research, highlighting the implications for understanding structural priming in L2 learning and its potential application in classroom practice, and identifying directions for future research.

Chapter 2 Literature Review

2.1 The role of structural priming in second language learning: contributions from psycholinguistics and applied linguistics

Based on the overview of structural priming presented in the introduction, this chapter reviews the structural priming paradigm within the second language context from both psycholinguistics and applied linguistics perspectives, which formed the theoretical foundation of this thesis and guided the research design and analysis of the studies presented in Chapters 3 and 4. By examining the cognitive and pedagogical significance of structural priming, this review outlines theoretical models, major empirical studies, and the role of structural priming in shaping L2 learning and use, including the methodological approaches used to study structural priming in both comprehension and production, as well as its integration into L2 classrooms. These discussions provide a comprehensive framework for understanding the implications of structural priming in second language learning and its applications.

Research on structural priming has its roots in investigating how speakers' internal linguistic representations influence sentence production in their first language (L1) (Branigan *et al*., 1995; Pickering and Branigan, 1998; Chang, Dell and Bock, 2006) and in understanding the mechanisms underlying L1 language production (Pickering and Branigan, 1998; Cleland and Pickering, 2003). One of the earliest and most influential experiments in this area was conducted by Bock (1986), who examined speakers' tendency to reproduce syntactic structures they had just encountered. In her study, participants were first exposed to prime sentences featuring either a double object (DO) or a prepositional object (PO) construction, as well as active or passive forms. They were then asked to describe pictures using either the prime structure or an alternative form. The results showed a strong inclination for participants to produce sentences matching the syntactic structure of the prime, suggesting that the reuse of syntactic forms occurs independently of the specific content of the sentence. Bock interpreted this effect as evidence for the automatic nature of syntactic processes in language production, laying the groundwork for decades of subsequent research on structural priming. Based on these foundational

experimental findings, subsequent research sought to contextualise structural priming in more naturalistic language use.

Prior to experimental investigation, structural priming was observed in naturalistic settings. Levelt and Kelter (1982) demonstrated the effects of repetition in a controlled but naturalistic question-answering situation (Pickering and Ferreira, 2008). In one experiment, they called a business and asked either a prepositional-phrase question (‘’At what time does the shop close?’’) or a non-prepositional question (‘’What time does your shop close?’’). When the time question included a preposition, speakers replied with a prepositional form (‘’at 7 am’’). In contrast, a non-prepositional question elicited responses without a preposition (‘’7 am’’). Notably, the priming effect only occurred under a specific circumstance, when the participant was allowed to respond immediately after hearing the question (Immediate Response Condition), but not when an extra comment was added after the question (Delayed Response Condition) (Pickering and Ferreira, 2008; Chia *et al*., 2019). This experiment is frequently cited in priming studies (e.g., Pickering and Ferreira, 2008; Conroy, 2013; Jacob *et al*., 2017; Chia *et al*., 2019; Bencini, 2025) due to the fact that it was among the first documented studies to demonstrate the likelihood of a speaker producing a syntactic form after experiencing the given form in a previous situation.

However, several researchers have argued that interpreting these findings is not straightforward (e.g., Cleland and Pickering, 2003; Dell and Ferreira, 2016; Chia and Kaschak, 2023). Cleland and Pickering (2003) and Dell and Ferreira (2016) suggested that the repetition effect observed in Levelt and Kelter’s experiment could be explained through lexical priming, whereby exposure to a particular word influences the processing of the subsequent same word or related words. This perspective is supported by an experiment carried out by Chia and Kaschak (2023), who replicated the basic design of Levelt and Kelter’s study but introduced three different prepositions in the questions - at, around, and about (“At/around/about what time do you close?”). They found that participants were more likely to produce a prepositional answer when responding to a prepositional question than to a non-prepositional one. Moreover, the overall rate of preposition use was similar across the three prepositional question types. Based on these findings, the authors proposed that the effect could be driven by pragmatic and/or semantic factors.

Specifically, questions like these typically call for a precise response, as most businesses have a specific closing time. Therefore, answers using a bare noun phrase (A: “What time do you close?” B: “Six.”) or the preposition at (“At six.”) imply precision, whereas prepositions like around or about suggest approximation, which does not accurately reflect how most businesses operate. These differing interpretations illustrate the complexity of structural priming and indicate that its underlying mechanisms have not yet reached consensus among researchers, suggesting that structural priming may be influenced by multiple interacting factors, including lexical, pragmatic, and semantic processes.

While Levelt and Kelter’s observational study provided important initial evidence of syntactic repetition effects in naturalistic interactions, Bock’s research examined structural priming under more controlled experimental conditions to better isolate its underlying mechanisms. This progression laid the foundation for the development of further experimental production paradigms in which priming is systematically elicited and measured through participants’ syntactic choices in response to carefully manipulated input structures (Branigan and Gibb, 2018). Typically, structural priming is investigated by alternating target expressions in which speakers choose between two structures to convey the same meaning (Branigan and Gibb, 2018). For example, participants may be exposed to a specific syntactic form, such as a passive sentence (“The criminals are being chased by the police”) or its syntactic alternative, an active sentence (“The police are chasing the criminals”). Structural priming is observed and measured if participants tend to produce target sentences in the passive form when primed with a passive sentence rather than an active one (Coumel, 2021).

Grounded in these experimental paradigms developed in L1 research, the field of second language acquisition (SLA) has employed the psycholinguistic priming paradigm as a tool to investigate the linguistic and cognitive mechanisms underlying L2 acquisition. In L2 studies, structural priming has been widely used to explore how the syntactic systems of the L1 and L2 are organised and represented in bilinguals’ minds (e.g., Slim, Lauwers and Hartsuiker, 2021; Hopp and Grüter, 2023), how syntactic representations develop in late L2 acquisition (e.g., Hartsuiker, Pickering and Veltkamp, 2004), and how these findings provide theoretical insights into mechanisms that facilitate L2 learning (e.g., Pickering and Branigan, 1998; Chang,

Dell and Bock, 2006; Reitter, Keller and Moore, 2011). This body of research contributes to SLA by demonstrating that structural priming effects tap into the mental architecture of language. Specifically, it allows researchers to investigate whether comprehension and production share common mental representations, how syntactic structures are learned implicitly, and how syntax interacts with other linguistic domains, such as semantics and the lexicon.

Beyond psycholinguistics, structural priming has also gained prominence in applied linguistics, where it is used to explore practical aspects of language learning, teaching, and use (Trofimovich and McDonough, 2011). In SLA, for instance, structural priming is employed to investigate how learners internalise and produce syntactic structures in the target language, focusing on the role of input and practice in language development (e.g., Bock and Griffin, 2000; McDonough and Chaikitmongkol, 2010; Conroy, 2013; McDonough, 2015) or how language proficiency interferes with the magnitude of the priming effect (e.g., Bernolet, Hartsuiker and Pickering, 2007; Kim and McDonough, 2008). Additionally, structural priming has been used to examine cross-linguistic influence in bilinguals, providing evidence of the transfer of syntactic structures between a speaker's first and second languages (e.g., Hartsuiker, Pickering and Veltkamp, 2004; Santos and Mota, 2022) or how working memory capacity influences structural priming in L2 learners (e.g., Shin and Christianson, 2012). These topics will be discussed in this review (see section 2.3).

Overall, the application of structural priming across both psycholinguistics and applied linguistics emphasises its versatility as a theoretical framework for understanding language cognition and as a practical tool for informing language teaching and learning. This thesis draws on this dual role to investigate how structural priming can enhance our understanding of L2 learning mechanisms and inform pedagogical practices in L2 classrooms. Specifically, it examines how repeated exposure to syntactic structures supports L2 learners' comprehension and production, particularly through reading-based tasks. In doing so, the study bridges psycholinguistic models of language processing with practical classroom applications. It contributes to ongoing discussions on the role of implicit learning, the effectiveness of priming-based instruction, and the development of input-driven activities for language teaching. The following section introduces the psycholinguistic

perspective on structural priming, followed by its interpretation and application in applied linguistics.

2.2 Structural priming in psycholinguistics: mechanisms and implications

Within psycholinguistics, structural priming has been widely employed to investigate whether L2 speakers develop abstract syntactic representations comparable to those of native speakers and whether these representations are shared across languages (Jackson, 2018). Cross-linguistic priming studies, for instance, test whether exposure to a structure in one language facilitates the use of the same structure in another, thus providing evidence for shared or language-specific syntactic representations (Hartsuiker and Bernolet, 2017). In addition, psycholinguistic research has focused on the mechanisms underlying priming effects, particularly the extent to which they reflect short-term residual activation or longer-term implicit learning (Pickering and Ferreira, 2008). This distinction is especially relevant in L2 contexts, where persistent priming effects are often interpreted as evidence of learning.

Given these debates about the nature of priming mechanisms, psycholinguistics has proposed different theoretical models to explain how structural priming operates in L1 and L2 speakers and to account for language learning through priming. However, the mechanisms underlying these effects remain unclear, as the likelihood, strength, and duration of structural priming effects appear to vary across contexts, such as language production versus comprehension, and between L1 and L2 speakers (Coumel, 2021). Early psycholinguistic models proposed that structural priming was lexically driven and emerged from short-term memory or temporary retrieval of syntactic representations, which were tied to the lexicon and determined word order (Segaert *et al.,* 2011).

Among these theoretical accounts, one influential model is the Residual Activation model (Pickering and Branigan, 1998; Pickering and Ferreira, 2008), which posits that explicit memory of a prime sentence's surface structure can lead to structural repetition. Consequently, structural priming results from residual activation left behind after the prime sentence has been processed (Pickering and Branigan, 1998). For example, if a target sentence is transitive and can be formulated in either

the active or passive voice, the residual activation from a preceding passive prime is likely to increase the probability that the target will also be produced in the passive form (Segaert, Wheeldon and Hagoort, 2016). This hypothesis accounts for evidence from structural priming strengthened by lexical repetition, a phenomenon known as the lexical boost effect, in which the extension of a short-term prime increases with the number of lexical repetitions between the prime and the target sentences (Pickering and Branigan, 1998).

In a meta-analysis by Mahowald *et al.* (2016), the lexical boost has been identified as the most studied priming moderator and the most effective priming phenomenon. However, its influence quickly dissipates when filler sentences intervene between the prime and the target (Hartsuiker and Pickering, 2008). This may indicate that the lexical boost is not a direct effect of the structural priming mechanism itself, but rather reflects an additional process based on the speaker's explicit memory of the preceding prime structures (Chang, Dell and Bock, 2006; Bernolet and Hartsuiker, 2010).

Moreover, the extent of the priming effects as a result of the lexical boost varies in function of modality (comprehension versus production) (Segaert *et al*., 2013). Research on language comprehension has observed a strong correlation between priming effects and content repetition, usually when a main verb of a sentence is repeated (e.g., Traxler and Tooley, 2007; Tooley, Traxler and Swaab, 2009; Tooley, Pickering and Traxler, 2019; Zhang, Huang and Liu, 2022; van Boxtel and Lawyer, 2023). In contrast, production priming research has demonstrated that priming effects can occur in the absence of lexical repetition; however, these effects are significantly boosted when a lexical word is repeated (e.g., Hartsuiker and Pickering, 2008; Segaert *et al.,* 2011; Zhang, Bernolet and Hartsuiker, 2020). This indicates that linguistic processing involves interactions between structural representations and lexical activation, with semantic and syntactic components mutually influencing one another.

What is difficult to explain under the lexicalist accounts is the long-lasting priming effects, as they predict that such effects should be short-lived, given that activation is usually assumed to be transient (Wei *et al*., 2024). Research has demonstrated that structural priming persists up to 10 fillers intervening between the prime and target

(Bock and Griffin, 2000; Bock *et al*., 2007), which is incompatible with the residual activation framework (Pickering and Branigan, 1998), whose one of the key assumptions is the temporary retrieval of syntactic representations.

To account for the long-lasting effects of structural priming, error-based implicit learning models were proposed as an alternative theory to the residual activation hypothesis (Chang, Dell and Bock, 2006, 2012; Dell and Chang, 2014). According to these models, during language production, speakers use prior knowledge and experience to predict upcoming structures within the production system and then compare these predictions to the actual language input (Chang, Dell and Bock, 2006). When a prediction error occurs during the processing of a prime sentence, the connections associated with the prime structure are reinforced, making that structure more expected on subsequent encounters (Khoe *et al.,* 2023). This process increases the likelihood of producing the same structure in the future (Chang, Dell and Bock, 2006; Dell and Chang, 2014; Chen, Wang and Hartsuiker, 2023) and may reduce the chances of further prediction errors (Coumel, 2021). As these representational adjustments may persist over time, structural priming has been interpreted as reflecting implicit syntactic learning and may contribute to language acquisition, though the relationship between priming and acquisition remains a matter of ongoing investigation.

Expectation-based accounts offer a related but theoretically distinct explanation of how prediction mechanisms generate structural priming effects. Levy (2008) proposed that language comprehension is fundamentally predictive: comprehenders continuously generate expectations about upcoming linguistic input based on prior experience, and processing difficulty is determined by the surprisal of that input, defined as the negative log probability of a word or structure given its preceding context. Less expected input generates greater processing costs. This framework differs from Chang, Dell and Bock (2006) error-based model in its focus: where Chang, Bock and Goldberg (2003) are concerned with how prediction errors drive syntactic learning during production, Levy's account is primarily a theory of comprehension difficulty, formalising how expectations shape the ease of incremental processing. Extending this processing-based framework to structural priming, Jaeger and Snider (2013) argue that priming arises from expectation adaptation: language users continuously adjust their syntactic expectations in response to prediction error, operationalised as

syntactic surprisal. Structures associated with greater surprisal produce stronger priming effects because they trigger larger representational adjustments. Unlike Levy, who focuses on moment-to-moment comprehension, Jaeger and Snider are specifically concerned with how these adjustments accumulate to produce priming. These adaptations are shaped both by long-term linguistic knowledge, such as verb-specific distributional preferences, and by rapid adaptation to recent input, providing further support for the view that structural priming reflects implicit syntactic learning driven by prediction error.

In addition, error-based models predict that structural priming effects are greater when less frequent or less preferred structures are used, a phenomenon referred to as the inverse frequency effect (Chang, Dell and Bock, 2006). For example, in English, passive constructions (e.g., "The book was read by the student.") are generally less preferred than active constructions ("The student read the book."), and double-object datives (e.g., "She gave him the book.") tend to be less frequent than prepositional datives ("She gave the book to him.") (Conroy, 2013). This phenomenon has been observed across various syntactic structures in L1 and L2 speakers and across languages. In L1, Bock and Warren (1985) demonstrated this effect in English passives, Bernolet and Hartsuiker (2010) in Dutch double-object datives, and Segaert, Wheeldon and Hagoort (2016) in German datives. L2 speakers demonstrated the inverse frequency effect in studies of the Esperanto transitive construction (McDonough and Fulga, 2015) and passives (Wei, Kim and Shin, 2022) Overall, the error-based models' predictions of long-lasting structural priming effects, along with the inverse frequency effects, provide strong evidence that structural priming may play a role in facilitating implicit language learning by promoting greater learning of structures that speakers are least familiar with (Ferreira and Bock, 2006).

A challenge for these models is to explain the rapid decay of priming effects in structural choices and response latencies (Branigan *et al.,* 2007) and to account for the lexical boost effect, which is short-lived and usually disappears after just one or two intervening trials, indicating the presence of residual activation or short-term memory processes that are not attributed to error-driven accounts (Jaeger and Snider, 2013). In addition, the lexical boost is verb-specific (van Lieburg and Bernolet, 2025), indicating a strong link between syntactic structures and lexical items, which contradicts the assumption that syntactic representations are entirely

abstract and separable from the lexicon. This challenges the notion that structural priming results solely from implicit learning driven by prediction errors, given its rapid decay and sensitivity to verb repetition, which suggests the influence of short-term, lexically specific mechanisms. Consequently, researchers (e.g., Pickering and Ferreira, 2008; Reitter, Keller and Moore, 2011) have argued that error-based learning models, on their own, cannot account for the full range of priming effects in experimental contexts.

To address these issues, other psycholinguistic models have explored how structural priming contributes to language acquisition, integrating activation-based mechanisms with learning frameworks (Pickering and Branigan, 1998; Pickering and Ferreira, 2008; Reitter, Keller and Moore, 2011) or by viewing priming as a result of a combination of factors operating simultaneously including the implicit learning mechanism that causes consistent and persistent structural priming, and explicit memory of the prime sentence surface structure responsible for a short-lived effect (Bernolet, Collina and Hartsuiker, 2016).

Reitter, Keller and Moore (2011) proposed a syntactic priming model in which language production occurs incrementally, with syntactic structures generated and processed step by step. According to this model, speakers face choices between syntactic alternatives when producing a sentence that differs in surface form but shares similar meanings (e.g., active vs passive or double object vs prepositional object). These choices are influenced by the activation levels of syntactic nodes (e.g., Noun Phrases and Verb Phrases), which have a base-level activation that increases with repeated exposure to specific syntactic structures. Contact with such structures triggers spreading activation from the working memory buffer to corresponding nodes in long-term memory (Coumel, 2021), making retrieval more likely and faster and generating priming effects. According to Reitter, Keller and Moore (2011), priming effects are not simply the temporary activation of structures but also a form of implicit learning in which syntactic representations are gradually strengthened through repeated use.

This model captures the lexical boost effect by linking syntactic structures to specific lexical representations, in which repeated lexical items amplify the activation of associated syntactic forms (Reitter, Keller and Moore, 2011). Furthermore, the model

accounts for the inverse frequency effect: while high-frequency syntactic structures have higher base-level activation, low-frequency structures show stronger priming effects, as they benefit more from repeated exposure (Chen, Wang and Hartsuiker, 2023). This reflects the learning-oriented nature of structural priming, where less frequently used constructions are more sensitive to recent input, supporting both short-term activation and long-term adaptation.

However, this model does not fully account for specific structural priming effects, such as the repetition of thematic and semantic roles across sentences, which cannot be attributed solely to the retrieval of lexical-syntactic representations (Chang, Bock and Goldberg, 2003). Thematic roles, which define who did what in a sentence despite variations in surface word order, play an important role in sentence comprehension and production (Ziegler and Snedeker, 2018). Research has shown that priming can occur not just through syntactic structure but also on purely a thematic basis (e.g., Chang, Bock and Goldberg, 2003; Köhne, Pickering and Branigan*,* 2014; Pappert and Pechmann, 2014; Yi and Koenig, 2016; Ziegler *et al.*, 2019; Wittenberg, Khan and Snedeker*,* 2017). Chang, Bock and Goldberg (2003) found that participants were more likely to produce theme-first locative sentences (e.g., ‘’The maid rubbed polish onto the table’’) following other theme-first locative sentences (e.g., ‘’The farmer heaped straw onto the wagon’’) relative to theme-second locative primes (e.g., ‘’The farmer heaped the wagon with straw’’). However, both exhibit the same surface syntax (Noun Phrase-Verb-Noun Phrase-Prepositional Phrase). This implies that structural priming may involve a deeper level of cognitive processing, extending beyond simple syntactic pattern retrieval, potentially engaging abstract representations of event or argument structure.

While activation-based and error-driven learning models account for aspects of structural priming, such as the lexical boost, they do not fully explain effects involving thematic or semantic role repetition. To address this, Bernolet, Collina and Hartsuiker (2016) proposed a multifactorial account that integrates implicit learning, residual activation, and explicit memory to explain how different priming effects can arise and interact over time. In this account, long-term priming stems from implicit, unconscious processes, whereas short-term priming and the lexical boost are supported by explicit memory of the prime sentence (Bernolet, Collina and Hartsuiker, 2016). This account is supported by experimental studies in L1 (e.g.,

Zhang, Bernolet and Hartsuiker, 2020) and L2 (e.g., Shin and Christianson, 2012), which employ lag manipulations in which the target sentence appears after several intervening sentences or trials. Zhang, Bernolet and Hartsuiker (2020) demonstrated that both lexical overlap and cognitive load affect structural priming and sentence retrieval among L1 Dutch speakers, suggesting that speakers temporarily store prime sentences in explicit memory to maintain conversational coherence, with lexical repetition functioning as a retrieval cue that intensifies reactivation of prime structures. Shin and Christianson (2012) found priming in both long-lag and no-lag conditions, suggesting that L2 structural priming draws on both explicit memory and implicit learning of abstract syntax. These studies showed that priming effects were strongest when the prime and target were adjacent but decreased as intervening items increased, while remaining detectable across longer lags.

Overall, these findings suggest that a single mechanism is not sufficient to explain the complexity of the processes underlying structural priming, but rather the interaction of several cognitive processes that operate over different time periods. The persistence of priming across longer lags supports the idea that speakers gradually adapt abstract syntactic representations through implicit learning. On the other hand, the stronger effects found when primes and targets are adjacent highlight the role of explicit memory and temporary activation. Furthermore, the effects of lexical overlap and cognitive load suggest that structural priming is influenced not only by syntactic representations but also by other processing factors such as attention and retrieval. These findings indicate that structural priming does not only support a purely structural or lexical explanation. They reflect a dynamic interaction between memory, processing, and learning mechanisms in sentence production and comprehension. These perspectives provide a foundation for examining how priming can be used to investigate the nature of sentence representations in L2 speakers.

2.3 Structural priming to investigate sentence representations in L2 speakers

Research on L2 structural priming has given important views into how syntactic representations develop in late L2 acquisition and how the grammars of two

languages may become integrated (Bencini, 2025). These findings have led to different proposals about how L2 speakers mentally represent the syntax of a later-learned language. One view, the separate syntax account, argues that L2 speakers keep the syntactic systems of their languages apart Hartsuiker and Pickering, 2008), contrasting with the shared syntax account, which proposes that L2 speakers rely on a single, integrated representation for structures that overlap across their languages (Hartsuiker, Pickering and Veltkamp, 2004). Due to the centrality of this debate to understanding how L2 speakers' grammars interact, it is essential to consider the empirical evidence relevant to the extent to which syntactic representations are shared across languages.

2.3.1 Evidence for shared syntactic representations between L1 and L2

The main evidence for shared syntactic representations between a speaker's first language and second language comes from studies that compare crosslinguistic priming with priming within the same language. If these syntactic structures are shared in the mind, priming effects should transfer across different languages with similar strength (Bencini, 2025). Hartsuiker and Bernolet (2017) propose that this is because L2 speakers who are proficient enough in both languages store identical structures using a single combinatorial node. This node acts as a mental unit that decides how words are combined, and it is not tied to one specific language. According to their theory, producing or understanding a sentence activates both this combinatorial node and the link between the node and the specific word used. Because this mental activation lasts for a short time, choosing the same structure becomes easier when the speaker produces the next sentence. This activation process is guided by two competing ideas: specificity, which keeps different structures separate, and economy, which merges similar ones. This balance explains the regular results found in crosslinguistic priming experiments.

An early example of this effect was found by Hartsuiker, Pickering and Veltkamp (2004), who showed that Spanish-English speakers were more likely to use passive sentences in English after hearing passive sentences in Spanish, compared to when they heard active sentences. Because both languages use similar active and passive structures, the results reveal that some syntactic representations are shared across

bilinguals' languages. Van Gompel and Arai (2018) included these findings in their shared-syntax model, which states that bilinguals do not keep separate mental files for identical grammatical structures in their two languages. Instead, they store a single shared node, meaning that processing a structure in one language directly activates the same structure for the other language.

Later studies have expanded this research from simple word order to deeper levels of meaning. For instance, Slim, Lauwers and Hartsuiker (2021) tested whether logical and semantic meanings are shared across languages. Using multiple sentence-to-picture matching experiments, they found strong priming effects when participants interpreted ambiguous sentences. Priming occurred within the same language, from L1 to L2, and within the L2, showing similar effect sizes regardless of the speaker's language proficiency. Such findings support the results of Hartsuiker, Pickering and Veltkamp (2004) regarding shared mental structures. However, the evidence also suggests that the shared system may work at a deeper level of meaning rather than just matching surface word shapes. This outcome aligns with what Van Gompel and Arai (2018) call the meaning-equivalence boost. The term describes how crosslinguistic priming becomes much stronger when the verbs in the first and second sentences have the same translation meaning. Consequently, conceptual meanings appear to be shared as well, and activating them helps the speaker reuse the connected syntactic structures. Finally, the connection supports the idea of an integrated mental system by showing that crosslinguistic priming goes beyond simple surface similarity.

Some researchers, on the other hand, suggest that shared representations are constrained by real-time language processing issues, such as limitations in attention, working memory, and the speed at which a speaker can retrieve a grammatical structure from memory (Cunnings, 2017). These ideas are known as processing-based accounts. They state that differences between L1 and L2 performance do not occur due to a lack of grammar knowledge; they happen because of general cognitive limits during real-time communication. Within this framework, Cunnings (2017) suggests that L2 speakers use the same mental parsing tools as native speakers but are less efficient at retrieving information from memory. According to Cunnings (2017), even if syntactic structures are shared, L2 listeners may struggle to access them quickly or accurately when there is interference, and this often happens

when multiple nouns compete as the correct subject, when sentence parts are separated by long distances, or when the sentence structure is highly complex. Hartsuiker and Bernolet (2017) offer a similar explanation. They state that lower-proficiency learners, who have not yet developed abstract or language-independent nodes, must use explicit memory strategies to communicate. They recall and slightly change a sentence they just heard, instead of automatically activating a shared grammatical structure. This distinction indicates that processing difficulties do not always mean a learner lacks grammatical knowledge; instead, it shows that their mental representations are not yet abstract enough to allow fast, automatic retrieval.

While processing models focus on cognitive limits, other studies look at the learning mechanisms that drive crosslinguistic priming. For example, Hopp and Grüter (2023) studied whether crosslinguistic priming shows how L2 speakers learn and adapt, or if it shows a competition between the L1 and L2 systems during listening. Their results revealed regular priming for structures that share the same meaning across languages, such as object *wh*-questions, which helped participants process rare sentence structures. However, priming did not cause more mistakes or wrong interpretations when the L1 and L2 allowed different but grammatically correct meanings for the same sentence. This provides some evidence for shared-syntax models because it shows information can move between languages. At the same time, it argues against extreme integration views, because shared structures do not automatically cause conflict between a bilingual's two languages during real-time communication.

This perspective aligns with the ideas of Jackson and Hopp (2020), who argue that structural priming is not the result of direct activation of stored grammar templates. It is an L2 form of implicit learning driven by prediction errors. Their findings demonstrate that priming helps learners adjust their expectations without strengthening incorrect L1-based meaning, supporting the idea that shared structures work alongside adaptive learning as opposed to causing language confusion. Van Gompel and Arai (2018) extend this learning model by arguing that the structural help seen in priming studies is a long-term adaptation of the language system, not a quick, temporary jump in activation. According to this view, hearing a structure multiple times does not just prime it for a moment. Instead, it slowly changes the strength of the connections between grammatical nodes, an effect that

can last for days and can slowly lead to permanent language changes within L2 speakers' communities. This long-term adaptation view extends Jackson and Hopp's ideas (2020) by connecting error-based learning to a broader model of language change. These studies show that priming acts as a learning tool to help students adjust their language expectations, instead of serving as simple proof of a completely shared grammar store.

Following this learning perspective, further evidence regarding the development of shared syntactic representations comes from longitudinal studies using artificial languages. Muylle, Bernolet and Hartsuiker (2021) showed that cross-linguistic structural priming can emerge very early during L2 learning, with evidence of shared syntactic representations appearing from the first or second learning session, depending on the construction. Their findings support the developmental account proposed by Hartsuiker and Bernolet (2017), according to which syntactic representations become progressively more abstract and increasingly shared across languages through experience. Under this perspective, shared representations develop gradually as learners accumulate linguistic experience with the L2 and are not fully established from the outset.

This gradual view converges with the usage-based account proposed by Gries and Wulff (2005), who argue that L2 learners develop mental constructions as stable form-meaning pairings through repeated exposure to language input. In their study, learners' verb choices were compared with usage patterns observed in native-speaker corpora using collostructional analysis. This method identifies how strongly particular verbs are associated with specific grammatical constructions based on their frequency of co-occurrence in authentic language use. The results showed that learners' verb-construction preferences more closely matched native English usage structures than German translation equivalents, suggesting that L2 learners do not rely on direct L1 transfer. On the contrary, they develop constructions shaped by exposure to the target language, indicating that abstract language development in an L2 emerges from learners' experience with the L2 rather than from transferring an existing L1 system. This shift in interpretation is consistent with usage-based accounts of structural priming, which view priming effects as arising from accumulated experience with constructional constructions, not from an abstract shared system (e.g., Chang, Dell and Bock, 2006; Jaeger and Snider, 2013). From

this perspective, early shared structures reflect the gradual accumulation of probabilistic, experience-based knowledge about how L2 constructions are used. Support for this view also comes from Coumel *et al.*'s (2024) study that revealed that the role of explicit memory in priming changes as proficiency increases, indicating that the cognitive mechanisms supporting language connection change over time and may modulate the stability of priming effects.

2.3.2 The role of proficiency in L2 structural priming

A learner's proficiency in their second language is an important factor that determines the number of syntactic structures that are shared between languages (Hartsuiker and Bernolet, 2017). Research shows that proficiency changes both the strength and the style of structural priming, showing how an L2 speaker's mental grammar grows over time Coumel *et al*. 2024). Generally, higher proficiency is linked to more abstract priming that does not depend on specific words, while lower-proficiency learners rely more on matching vocabulary and surface cues. This developmental framework is also compatible with processing-based models of sentence comprehension. For example, Cunnings (2017) argues that successful sentence processing depends on cue-based memory retrieval and susceptibility to interference. These mechanisms are not developmental in themselves, but they may help explain why learners at different proficiency levels differ in how efficiently they access existing syntactic representations during online processing.

Coumel *et al.* (2024) tested this empirically in a web-based structural priming study with English-speaking learners of French, who examined how working memory load and proficiency interact during L2 passive sentence production. By introducing a dual-task manipulation designed to limit explicit recall of the prime sentence, the authors showed that explicit memory contributes to structural priming across proficiency levels, particularly when lexical overlap is present. The results also pointed to a change in processing strategy: less proficient learners were more likely to rely on explicit copy-and-edit strategies and item-based representations, while more advanced learners drew on syntactic knowledge that was more stable and automatic. Increasing proficiency, in other words, reduces dependence on word-bound structures and supports more efficient processing overall.

Hartsuiker and Bernolet (2017) propose a four-stage developmental model in which L2 learners progress from reliance on L1 transfer and imitation to the emergence of lexically specific, item-based L2 representations, followed by increasingly abstract constructions within the L2, and ultimately a merged, language-independent representational system shared across languages. The model offers a coherent account of how structural priming effects may vary across proficiency levels, since different studies may capture learners at different points along this developmental trajectory. However, this staged progression assumes a relatively uniform pathway of abstraction across the grammar, implying that all constructions are subject to similar developmental dynamics.

Evidence from usage-based research refines this assumption. Gries and Wulff (2005) demonstrate that L2 learners' knowledge of verb-construction pairings is closely shaped by frequency distributions in the input, as reflected in native-speaker corpus data. Their findings indicate that learners do not acquire constructions through a single, global transfer from item-specific to abstract representations. Instead, abstraction appears to be construction-dependent, emerging more rapidly for highly frequent or strongly entrenched patterns and more slowly for less frequent or less salient ones.

From this point of view, the developmental stages proposed by Hartsuiker and Bernolet (2017) may not represent a uniform progression through the grammar. They represent a general macro-structure that is realised not uniformly across different constructions. Proficiency effects in structural priming are therefore likely to reflect not only a learner's position within a stage, but also the usage history of specific constructions. Treating structures like the passive as potentially developing at their own pace, shaped by exposure and frequency, follows naturally from this finer-grained picture.

Early evidence for proficiency effects comes from Bernolet, Hartsuiker and Pickering (2007), who found that Dutch learners of English showed better generalisation of priming across different verbs as their proficiency improved. While lower-proficiency learners only showed priming when the prime and target sentences used the same words, advanced learners showed priming even without word repetition; a sign of more abstract syntactic representation emerging. Within Van Gompel and Arai's

(2018) model, this change is in line with the transition from the item-specific stage to the abstract stage: once grammar structures are no longer tied to specific words, priming can spread across the entire verb system. Hartsuiker and Bernolet (2017) offer a similar explanation: lower-proficiency learners show a larger lexical boost, a major increase in priming when a verb is repeated, because they use explicit episodic memory of the prime sentence to make up for their lack of an abstract grammar node. In this account, the stronger lexical boost arises because lower-proficiency learners rely on retrieving the prime as a stored episode, including its lexical content, rather than activating a more abstract syntactic schema that generalises across verbs. As nodes become abstract, this lexical boost decreases because the syntactic structure no longer needs word support to be activated. Kim and McDonough (2008) reported comparable findings with Thai learners of English, noting that higher proficiency led to stronger priming for English dative structures and more native-like grammatical choices, consistent with the broader claim that proficiency helps build more stable, integrated syntactic systems and reduces reliance on lexical clues.

While those studies look at priming within the L2, proficiency also plays a key role in crosslinguistic priming, where structures transfer from the L1 to the L2. Research shows that advanced learners are more likely to show priming effects that spread across languages. For example, Bernolet, Hartsuiker and Pickering (2013) showed that advanced Dutch–English bilinguals experienced crosslinguistic priming for word order constructions even when the structures looked slightly different across the two languages. In contrast, lower-proficiency learners only showed priming when the structures were almost identical. Building shared structures, on this evidence, is a slow process that depends on a learner's ability to look past surface details.

This view is supported by Jackson and Hopp (2020), who argue that higher proficiency strengthens the implicit learning mechanisms behind priming, allowing learners to update their syntactic expectations and generalise across languages even with little surface overlap. This perspective converges with the usage-based view of Gries and Wulff (2005), who show that even learners with limited L2 input can develop abstract, frequency-sensitive construction knowledge that does not just copy L1 patterns. Their finding that L2 verb choices align with native-speaker corpus frequencies points to representation quality, built through exposure, as the driving

factor and helps explain why learners at the same proficiency level can generalise to different degrees.

However, proficiency does not always increase priming effects. Some studies indicate that lower-proficiency learners experience stronger priming for rare or less preferred structures, a view consistent with error-based learning models. For instance, McDonough and Fulga (2015) found that lower-proficiency learners of Esperanto showed strong priming for the rare object–verb–subject word order, demonstrating that priming can support the learning of unfamiliar structures even before abstract representations are fully developed. Proficiency, it seems, interacts with structural frequency and complexity to shape how learners respond to grammatical input. Lower-proficiency learners may rely more heavily on lexical information and explicit memory strategies during sentence processing than learners with more developed syntactic representations.

Another view comes from Jackson and Ruf (2017), whose findings challenge the idea that higher proficiency simply means stronger or longer-lasting priming. In their study of intermediate L2 learners, only some participants showed long-term priming effects, and general proficiency scores did not explain this difference. Instead, learners who showed strong priming without word repetition were more likely to keep those priming effects over time. These results illustrate that the ability to generalise structures may be more important than proficiency alone. Therefore, there is a lot of variation within the same proficiency level, indicating that intermediate learners use a mix of word-specific and abstract structures. The resulting variation may also reflect individual differences in memory retrieval during sentence processing (Cunnings, 2017), since learners at the same proficiency level can differ in how efficiently they access shared syntactic representations.

Within Van Gompel and Arai's (2018) model, intermediate learners sit right on the boundary between the item-specific and abstract stages. This position predicts exactly this kind of group variation: some learners have developed abstract representations for certain structures while others have not, creating the irregular priming profiles noted by Jackson and Ruf (2017). Gries and Wulff (2005) suggest that the level of abstraction achieved by L2 learners is sensitive to usage frequency and construction-specific experience. In particular, their sentence-completion task

with advanced German learners of English showed that learners' verb choices in dative constructions aligned with frequency constructions observed in native-speaker corpora, and did not directly reflect German translation equivalents. Importantly, this conclusion is based on production data from the completion task, supported by a separate sentence-sorting task that probed constructional organisation more generally. Overall, these findings indicate that abstraction in L2 syntax is not uniform across constructions but emerges in relation to how frequently and strongly particular verb-construction pairings are entrenched in the input.

Importantly, these proficiency effects occur during both speaking and listening. Hopp (2016), for example, found that advanced L2 German speakers showed stronger and more stable priming of word-order meanings during real-time sentence processing than lower-proficiency speakers, who were more affected by word repetition and processing load. Proficiency, then, makes syntactic representations more stable across different language modes, allowing learners to rely less on word cues and more on structural information during both comprehension and production.

In general, proficiency research shows that structural priming reflects both a learner's current grammatical knowledge and the way that knowledge develops. As proficiency goes up, learners rely more on abstract structures and show better crosslinguistic generalisation, supporting the notion that shared representations appear slowly through experience. At lower proficiency levels, priming often reflects surface-level matching driven by word overlap or structural frequency. Hartsuiker and Bernolet's (2017) four-stage model agrees that this growth moves from item-specific, word-dependent nodes toward abstract, language-independent structures. This movement is driven by accumulated language exposure and the automatic adaptation of the syntactic system. Gries and Wulff's (2005) evidence that this abstraction is sensitive to frequency and specific constructions, instead of being a global feature of proficiency, adds an important point: syntactic integration is not the same for all learners or constructions. It develops step-by-step and unevenly, shaped by the specific language input each learner encounters.

Although proficiency helps explain why some learners show more abstract or crosslinguistic priming, it does not solve all the inconsistencies found across different studies. Several lines of evidence suggest that L2 speakers may keep language-

specific syntactic representations, especially when priming depends heavily on word overlap or shows directional differences (e.g., Bernolet, Hartsuiker and Pickering, 2007; 2013; Salamoura and Williams, 2007). These observations show that proficiency alone cannot account for every pattern of structural priming, leaving room for theories that assume more separate, language-specific grammar structures.

Considering these mixed findings, including proficiency as a key variable in this study is based on the idea that learners at different stages of development vary in their ability to access and generalise abstract syntactic structures. This variation influences both the occurrence and strength of priming effects. While L2 speaking studies have clearly documented abstract structural priming, findings from listening-based studies are less consistent and often suggest a greater dependency on word overlap. Few studies have explored structural priming in comprehension among L2 learners across different proficiency levels, leaving it unclear whether increasing proficiency promotes reliance on abstract syntactic representations or whether lexical overlap continues to play a central role during online sentence processing (Kim and Godfroid, 2019; Weber and Indefrey, 2009; Jackson and Ruf, 2017).

This gap is why the present study focuses on proficiency as the main learner variable. Other individual differences, such as working memory and attentional resources, may also influence priming. However, proficiency was selected because it reflects the central theoretical aim of the thesis, which is to investigate the nature of syntactic representation across different stages of development. Developmental accounts of structural priming argue that proficiency tracks movement from item-specific, lexically bound representations towards increasingly abstract syntactic nodes (Hartsuiker and Bernolet, 2017), while usage-based accounts similarly describe learning as the gradual emergence of constructional schemas through accumulated experience and abstraction across exemplars (Gries and Wulff, 2005).

By contrast, working memory and attentional resources are generally assumed to affect the efficiency with which existing representations are accessed during online processing (Cunnings, 2017). Consequently, if structural priming and lexical boost effects vary systematically with proficiency, such differences may provide evidence about the organisation of learners' syntactic representations. Within developmental accounts, stronger lexical boost effects may indicate greater reliance on lexical-

structural associations during processing, whereas structural priming that persists in the absence of lexical overlap provides evidence for increasingly abstract syntactic representations (Hartsuiker and Bernolet, 2017). Similarly, usage-based accounts relate increasing abstraction to accumulated experience with constructions and repeated exposure across exemplars (Gries and Wulff, 2005). Examining proficiency therefore allows the study to investigate whether differences in priming reflect changes in the underlying organisation of syntactic knowledge instead of differences in processing efficiency alone.

2.3.3 Evidence for language-specific syntactic representations

Although many studies support the idea of shared grammar systems, some findings suggest that L2 speakers may also maintain language-specific syntactic structures (Bernolet, Hartsuiker and Pickering, 2013). This has been observed in irregular crosslinguistic priming, where effects are stronger in one direction than the other (Hopp and Jackson, 2023), in the strong influence of lexical and word-order overlap on cross-language priming (Schoonbaert, Hartsuiker and Pickering, 2007; Hopp and Jackson, 2023), and in evidence that shared syntactic representations emerge only gradually as L2 proficiency increases (Bernolet, Hartsuiker and Pickering, 2013), indicating that syntactic representations do not always generalise across languages and may remain partly language-specific, particularly when structural similarity or lexical support is limited.

Van Gompel and Arai (2018) offer a framework that explains these findings without rejecting the shared-syntax model. They separate structures into two groups: those that are identical across languages, which share a single combinatorial node and produce strong, balanced crosslinguistic priming, and structures that are similar but not identical, which are stored as separate but connected nodes. When the connection between these nodes is weak, priming between languages will be smaller or directionally unbalanced because the mental activation must travel across a link between nodes. The distinction between full sharing and simple connection means that the absence of strong crosslinguistic priming does not imply that the learner lacks an integrated language system; rather, it may simply reflect the degree of structural overlap between the two languages for that specific construction. Similarly,

Hartsuiker and Bernolet (2017) explain the survival of language-specific structures through the concept of node instantiation. When an L2 structure is not similar enough to an existing L1 node to trigger a merger, the mind creates a new, separate L2-specific node. The node remains unique to that language until further experience allows the two nodes to merge. These two accounts reframe language-specific structures not as evidence against integration, but as a predictable result of how structural similarity and experience determine whether two mental nodes merge or stay connected.

Evidence for language-specific structures is visible in unequal cross-linguistic priming, where priming effects are typically stronger from the native L1 to the L2 than in the opposite direction. Schoonbaert, Hartsuiker and Pickering (2007) showed that Dutch-English speakers produced more L2 passives after hearing L1 passive primes than vice versa, suggesting that L1 structures have a stronger influence on L2 production. Similar different results have been reported in other language pairs. Flett *et al.* (2013), for example, found stronger priming from Spanish to English than from English to Spanish, indicating that syntactic structures may not be fully integrated across languages, particularly in late bilinguals whose L1 structures are deeply set. Under Van Gompel and Arai's (2018) account, this difference is the expected outcome when L1 and L2 structures are connected and not fully shared: the L1 node, which is stronger due to years of use, sends more activation to the linked L2 node than the reverse, creating the directional advantage reported in these studies.

Further evidence comes from the role of word overlap in crosslinguistic priming. Hartsuiker *et al.* (2008) demonstrated that priming between Spanish and English was much stronger when the verb was the same in both languages, suggesting that crosslinguistic priming may rely on lexical links instead of fully abstract grammatical structures. Follow-up work supported this interpretation, showing that repeating a verb increases priming even when structural similarity is low. Recent research with bilingual children also found that crosslinguistic priming depends on activating specific word and structural features. Hartsuiker and Bernolet (2017) integrate this lexical-boost effect into their developmental model: the dependency on word overlap is highest when grammatical nodes are still item-specific, because the structural representation has not yet been separated from the verb that created it. As nodes become abstract, this lexical boost decreases, and priming can occur across

different verbs within the same construction. The persistence of a strong lexical boost across languages shows that the relevant nodes, while perhaps connected, have not yet merged into a fully shared, language-independent representation. This view connects the lexical-boost findings with shared-syntax accounts without needing to conclude that grammar is entirely language-specific; instead, the level of word dependency reflects the current developmental state of the representation. Word connections, therefore, play a central role in crosslinguistic priming, which is difficult to explain using theories that assume fully shared syntax.

Additional support for language-specific structures comes from construction-dependent or reduced transfer effects in L2 speaking. McDonough (2006) found that the strength and durability of priming changed across different syntactic constructions in L2 English and that some structures may not be represented at an abstract, language-independent level. Conroy (2013) similarly reported weaker or missing priming effects for certain constructions, concluding that L2 syntactic structures can remain partially separate from those of the L1. More recent work reinforces this structure-specific view. Li (2025) showed that crosslinguistic priming for ditransitives in L1 English–L2 Chinese learners changed by structure and modality. These findings reinforce the idea that not all syntactic structures transfer equally across languages and that aspects of L2 grammar remain at least partly language-specific.

Gries and Wulff's (2005) usage-based model provides a matching perspective on this construction-specificity: because mental representations are built up from exposure to individual constructions as opposed to a single unified grammar system, the level of abstraction achieved will differ across construction types depending on the learner's history with input. A construction that has been encountered frequently and across many different verbs will tend towards a more abstract and shared representation. Meanwhile, one that has been encountered rarely or only with specific verbs will remain more item-specific and therefore more vulnerable to the language-specific effects documented by McDonough (2006) and Conroy (2013). This input sensitivity is not a weakness of the shared-syntax account but a direct prediction of the usage-based framework: shared representations are not an all-or-nothing feature of the bilingual system, but a gradual outcome of specific learning histories (Gries and Wulff, 2005; Hartsuiker and Bernolet, 2017).

In general, research on structural priming in L2 speakers shows that priming provides meaningful perspectives into how grammatical knowledge is organised across languages. While many findings support the development of partially shared syntactic structures, the variation observed across structures, tasks, and learner profiles suggests that integration is a gradual process limited by vocabulary, structural similarity, and processing factors. The theoretical models offered by Van Gompel and Arai (2018), Hartsuiker and Bernolet (2017), and Gries and Wulff (2005) agree in describing this variation not as an error, but as a predictable result of a developing language system. In this system, shared representations emerge slowly, are specific to certain constructions, and depend on the intersection of structural similarity, accumulated input, and the cognitive tools available at each proficiency level. This growing body of evidence has also encouraged applied linguists to consider how priming might be used beyond theoretical research, particularly in exploring how priming-based mechanisms can support grammatical development in second language teaching and learning.

2.4 Structural priming in applied linguistics: theoretical Foundations and empirical evidence in L2 teaching and learning

Within applied linguistics, structural priming is increasingly recognised as both a research tool for investigating L2 processing and a potential pedagogical strategy for supporting syntactic development. This interest aligns with SLA approaches that emphasise the importance of input, experience, and frequency in shaping learners' linguistic knowledge.

Usage-based theories provide a strong theoretical basis for understanding how priming may contribute to L2 learning. These approaches view language learning as emerging from exposure to meaningful language use (Ellis and Wulff, 2014). Grammatical knowledge develops through general cognitive processes, such as memory, categorisation, and perception, that operate across domains instead of being specific to language (Diessel, 2019). From this perspective, grammar is not a fixed set of rules but a dynamic network of form–meaning pairings shaped by learners' experience with the input (Bybee, 2008; Ellis, 2006). Frequency plays a central role: repeated exposure strengthens the activation and entrenchment of

linguistic units, including constructions (Diessel, 2019). Structural priming fits naturally within this framework because it provides repeated, meaningful encounters with target structures.

A central concept in usage-based theory is the construction. Constructions are form–meaning pairings that range from specific patterns (e.g., *table* + *-s* → *tables*) to more abstract schemas (e.g., *[Noun]* + *-s* marking plurality) (Ellis and Wulff, 2014). They operate across all levels of linguistic structure, from morphemes and lexical items to idioms and syntactic frames (Goldberg, 2006; Hoffmann and Trousdale, 2013). Some constructions also serve discourse functions, such as passive constructions that background the agent of an action (Diessel, 2019). Because structural priming strengthens the activation of these form–meaning pairings, it provides a mechanism through which constructions can become more established in the learner's developing grammar.

Empirical research supports the idea that structural priming contributes to the development of constructional knowledge. Gries and Wulff (2005) showed that L2 learners display priming effects similar to those of native speakers, indicating sensitivity to abstract argument-structure constructions. They concluded that these effects were not influenced by their L1; instead, they were verb-specific preferences that reflected learners' L2 usage, suggesting the development of language-specific, usage-based representations. Additional evidence from a sorting task showed that learners grouped sentences according to constructional meaning rather than lexical similarity, reinforcing the idea that constructions function as integrated form-meaning pairings in the learner's mental grammar.

These findings indicate that priming works directly on usage-based mental structures. By making it easier to activate specific connections between form and meaning, priming acts as the bridge that turns short-term processing experiences into long-term learning (constructional entrenchment). This connection has motivated researchers to explore structural priming as a practical teaching tool in second language classrooms.

2.4.1 Experimental evidence for priming-based learning

Structural priming has been widely studied as a mechanism that supports language learning, first in L1 speakers and later in L2 contexts. Based on the implicit learning account (Chang, Dell and Bock, 2006, 2012), research in second language acquisition has increasingly used priming both as a theoretical framework and as a pedagogical tool to support the development of syntactic knowledge (McDonough and Chaikitmongkol, 2010; McDonough, Neumann and Trofimovich, 2015; Kim and McDonough, 2016; Coumel, 2021). At the same time, researchers have started to investigate other factors that may influence priming effects in L2 learning, such as inverse frequency effects (Wei, Kim and Shin, 2022; Kaan and Chun, 2018; Alzahrani, 2022) and the extent to which priming can lead to long-term changes in learners' syntactic representations (Kavathan *et al.,* 2022; Jackson and Ruf, 2017).

Across laboratory-based studies, structural priming has been shown to facilitate L2 learners' production of target syntactic constructions, providing evidence that repeated exposure to grammatical structures can support syntactic learning under controlled conditions. This effect has been demonstrated across a range of constructions, including datives, wh-questions, and relative clauses (McDonough, 2006; McDonough and Kim, 2009; Conroy, 2013; Wei, Kim and Shin, 2022). However, the magnitude and durability of priming effects vary according to the linguistic properties of the construction being learned. Studies have suggested that structural complexity, frequency, and learners' existing knowledge all influence how effectively priming promotes learning. For example, McDonough (2006) argued that priming is most effective when learners have already developed some abstract knowledge of the target construction. Similarly, Conroy (2013) reported stronger priming effects for stranded prepositions than for *get*-passives, suggesting that some constructions are more readily primed than others. Overall, these findings indicate that structural priming is more effective when learners possess some prior knowledge of the target construction and when the construction is relatively accessible for processing and production.

Research on inverse frequency effects provides further support for this idea. These studies reveal that priming can help learners use structures that they normally avoid. For example, Wei, Kim and Shin (2022) found that L1 Chinese learners were more

likely to produce object relative clauses than passive relatives after being primed. Likewise, Kaan and Chun (2018) and Alzahrani (2022) showed that Korean and Arabic learners were more likely to produce double object datives than prepositional datives. These effects, however, are not unconditional; they appear to be moderated by structural complexity and by the learner's readiness to acquire the primed structure.

In addition to structural factors, learner-internal variables also influence priming outcomes. Several studies suggest that learners' proficiency level and existing knowledge play an important role in determining how much they benefit from structural priming (McDonough, 2006; McDonough and Trofimovich, 2009; Shin and Christianson, 2012; Wei, Kim and Shin, 2022). Other studies point to the importance of attention, motivation, and individual differences. For instance, Coumel *et al*. (2021) found that priming supports both immediate and long-term learning, but the mechanisms differ for L1 and L2 speakers. While attention was more important for L1 speakers, motivation had a stronger influence on L2 learners, indicating that priming can also be shaped by cognitive and affective factors. This view is consistent with usage-based approaches, which emphasise the interaction between linguistic input and learner characteristics.

Compared with production, evidence for structural priming in L2 comprehension is more limited and less consistent. Across the available published studies, priming effects in comprehension tend to be smaller than those observed in production and appear to depend more strongly on the type of construction being tested and the demands of the assessment task (Shin and Christianson, 2012; Wei, Kim and Shin, 2022). Although both studies report weaker comprehension than production effects, they offer complementary explanations for these results. Shin and Christianson (2012) attribute the weaker effects largely to the assessment method, whereas Wei, Kim and Shin (2022) emphasise that comprehension gains vary across grammatical constructions, suggesting that both methodological and linguistic factors contribute to the variability observed in comprehension research. One explanation for this inconsistency is that comprehension processes are less directly observable than production and therefore require indirect behavioural measures, such as picture-matching tasks or grammaticality judgement tests, which differ in the aspects of linguistic processing they capture (Tooley, 2022). Consequently, differences across

comprehension studies may reflect variation in task sensitivity as well as differences in the strength of structural priming.

The contrast between production and comprehension also emphasises an important distinction between procedural and explicit knowledge. While production tasks generally reveal robust priming effects, comprehension measures, particularly grammaticality judgement tasks, often show weaker or less stable gains (Shin and Christianson, 2012; Wei, Kim and Shin, 2022). These findings appear to converge on the view that structural priming primarily supports implicit procedural learning, whereas tasks requiring explicit metalinguistic judgements are less sensitive to these learning effects.

Shin and Christianson (2012) argue that this difference arises because priming strengthens procedural knowledge, whereas grammaticality judgement tasks rely more heavily on explicit metalinguistic knowledge. Similarly, Wei, Kim and Shin (2022) found that priming consistently improved learners' production across different constructions, but improvements in comprehension were restricted to particular structures, suggesting that the transfer of implicit learning to comprehension depends not only on learners' procedural knowledge but also on the linguistic characteristics of the target construction. These studies indicate that differences between production and comprehension are unlikely to reflect a simple absence of priming during comprehension. Instead, they suggest that the magnitude of comprehension priming is shaped by the interaction between assessment methodology, construction type, and the distinction between implicit and explicit linguistic knowledge.

Research has also indicated that priming effects can accumulate over time and lead to longer-term changes in learners’ syntactic representations. For example, Jackson and Ruf (2017) found that repeated exposure to certain structures led to long-term changes in learners’ word order patterns. Extending the evidence beyond the immediate priming effects reported by Shin and Christianson (2012) and Wei, Kim and Shin (2022). However, unlike studies focusing mainly on immediate processing, Jackson and Ruf (2017) demonstrated that the persistence of priming was moderated by semantic factors and learner proficiency, suggesting that long-term

syntactic adaptation is influenced by multiple interacting variables rather than structural repetition alone.

The available comprehension literature presents a less uniform picture than the production literature. Although structural priming can facilitate comprehension and contribute to longer-term learning, the magnitude and persistence of these effects vary according to the assessment task, the grammatical construction under investigation, semantic factors, and learner characteristics. This variability illustrates the need for further research that examines online comprehension using sensitive processing measures and considers learner-related variables such as proficiency.

Overall, these laboratory-controlled studies establish structural priming as a robust mechanism of implicit L2 learning, while also demonstrating that its effects are more consistent in production than in comprehension. The greater variability observed in comprehension suggests that methodological differences and learner characteristics play a more prominent role than has generally been acknowledged. Despite the strong evidence from laboratory research, considerably less is known about whether these learning effects extend to classroom environments, where interactional demands and instructional conditions differ substantially from controlled experimental settings.

2.4.2 Classroom implementations of priming-based instruction

A smaller number of studies have moved structural priming out of the controlled laboratory and into real interactional or instructional settings, to test whether priming effects also emerge under authentic pedagogical conditions. McDonough and Chaikitmongkol (2010) and Kim, Skalicky and Jung (2020) both demonstrate that interactional priming activities increase learners' production of interrogative structures, indicating that structural alignment during classroom interaction plays an important role in syntactic development. In a similar way, McDonough, Crawford and Mackey (2015) show that priming helps learners produce relative clauses and adverbial clauses through collaborative classroom activities, indicating that priming can strengthen the link between form and meaning by encouraging learners to produce target-like language. McDonough, Crawford and Mackey (2015) also

reported that priming was more effective for relative and adverbial clauses than for passives, showing that the strength of classroom-based priming still depends on the structure being taught.

Contextual factors, especially interactional modality, also play an important role in classroom-based priming. Kim, Skalicky and Jung (2020) showed that synchronous computer-mediated communication (SCMC) led to stronger priming effects than face-to-face interaction in the production of direct questions. This suggests that the context in which interaction takes place can influence structural alignment. SCMC provides a hybrid environment where learners can interact in real time while also having access to written input that remains visible. This allows learners to process, reread, and modify language more easily, which may increase noticing and uptake. In this way, SCMC may reduce processing pressure while still maintaining the benefits of interaction, making it a useful pedagogical context for studying priming under classroom-relevant conditions.

Kim and McDonough (2016) conducted a classroom-based study that examined both comprehension and production of passives together, using a pretest, posttest, and delayed posttest design similar to the one adopted for the classroom-based study in this thesis**.** They found that repetition of primes improved production of passives, while comprehension improved regardless of repetition and remained stable over time. This dissociation between comprehension and production is an important finding for classroom-based pedagogy, because it suggests that priming activities may need to be designed differently depending on whether the instructional goal is to develop learners' receptive or productive knowledge of a structure.

In sum, classroom-based research shows that structural priming can be delivered successfully within real ESOL instruction and interaction, but this literature remains considerably smaller than the laboratory-based literature reviewed above, and few classroom studies have examined comprehension and production together. This is an important gap, because language development depends on the integration of receptive and productive knowledge. In particular, there is limited research on whether classroom-based priming activities can support both modalities at the same time, especially for ESOL learners with diverse linguistic and literacy backgrounds. Addressing this gap is important for understanding how priming works as a learning

mechanism in real classroom contexts, and it is the gap that the classroom-based study reported in this thesis is designed to address.

Although most classroom-based studies have examined priming during face-to-face interaction, increasing attention has been given to technology-mediated learning environments. As digital communication becomes more integrated into language teaching, researchers have begun to investigate whether the mechanisms of structural priming operate similarly in computer-mediated interaction. Within this broader field of computer-assisted language learning (CALL), synchronous computer-mediated communication (SCMC) has emerged as a particularly important context because it combines authentic interaction with technological affordances that may influence learners' attention, processing, and syntactic alignment (Michel and Stiefenhöfer, 2019).

2.5 Structural priming in synchronous computer-mediated communication (SCMC)

Given that the priming tasks in the present study were conducted online, it is important to consider evidence from studies investigating structural priming in synchronous computer-mediated communication (SCMC). SCMC refers to real-time interaction through digital platforms, typically in text-based chat environments, and has been increasingly used in L2 research as a context for examining language processing and learning.

One of the main reasons SCMC has been adopted in priming research is that it combines key features of face-to-face interaction with additional processing affordances. Similar to spoken interaction, SCMC allows for real-time exchange between interlocutors. However, it also provides visual persistence of input, meaning that learners can see, reread, and reuse previously produced language, which increases cognitive manageability in otherwise interactionally demanding exchanges (Herring, 1999). This dual characteristic may reduce processing pressure and increase attention to linguistic form (Herring, 1999), which is considered important for priming and learning (Coumel *et al.,* 2021). Importantly, this combination of real-time interaction and persistent input may also facilitate the joint use of implicit and more

controlled memory processes during language production, as learners can rely on both immediate activation and reprocessing of previously available linguistic material. As a result, SCMC creates a hybrid interactional environment in which structural alignment may be supported through both memory-based and attentional mechanisms.

Empirical studies comparing SCMC and face-to-face (FTF) interaction generally suggest that modality plays a significant role in shaping priming effects. For example, Kim *et al.* (2019) examined linguistic alignment in Korean learners of English, focusing on stranded prepositions in relative clauses. Their findings showed that SCMC led to stronger alignment effects than FTF interaction, and that learners were more likely to produce target-like structures after exposure to primes. Later, Kim, Skalicky and Jung (2020), using comparable experimental conditions but different target structures (direct and indirect questions), found that SCMC resulted in higher rates of primed production for direct questions. Across both studies, learners' prior knowledge, working memory, and proficiency were also found to influence priming, suggesting that modality interacts with learner-internal factors rather than operating independently.

A common explanation for the advantage of SCMC is that the availability of written primes during interaction allows learners to draw on both implicit and explicit memory processes when producing language. In contrast to spoken interaction, where input is transient, the persistent nature of written input allows for reprocessing of prior input, facilitating rehearsal and reformulation of language during interaction (Herring, 1999), thereby strengthening structural alignment. This suggests that SCMC may provide particularly favourable conditions for observing priming effects, especially in L2 contexts where processing demands are higher.

However, findings are not entirely consistent across studies. Michel and Stiefenhöfer (2019), for example, investigated priming of the Spanish subjunctive in SCMC and found only small effects across conditions. This contrasts with the stronger effects reported by Kim and colleagues and suggests that the effectiveness of SCMC for priming may depend on additional factors, such as the complexity of the target structure, the number of primes provided, task design, and learner-related variables.

These differences indicate that while SCMC can support priming, it does not guarantee strong effects in all contexts.

Further evidence comes from studies examining whether SCMC can support learning outcomes beyond immediate priming. Coumel (2021) investigated chat-based priming with multiple target structures (e.g., genitives, passives, and datives) and found that learners improved in production but not in explicit grammatical knowledge, as measured by grammaticality judgment tests. Similar results were reported by Shin and Christianson (2012), who observed only limited gains in grammaticality judgment performance following priming tasks. Their findings are consistent with the broader view that SCMC-based priming, like priming more generally, primarily supports the development of implicit, procedural knowledge, with more limited effects on learners' explicit metalinguistic knowledge. This also reinforces the possibility that comprehension-based measures may underestimate priming effects, particularly when these effects are subtle or not consciously accessible.

Overall, research suggests that SCMC provides a valuable context for investigating structural priming in L2 learning. Its combination of interactivity and visual support appears to facilitate structural alignment and may enhance opportunities for noticing and application. Nevertheless, the variability in findings across studies indicates that priming effects in SCMC are influenced by multiple interacting factors, including task design, target structure, learner characteristics, and the type of knowledge being measured. While some studies demonstrate clear advantages of SCMC over face-to-face interaction, others show more limited effects, highlighting the need for further research in this area.

To fully interpret the evidence reviewed so far, it is important to examine the methodological tools used to investigate structural priming. Different tasks and measures can reveal different aspects of priming, and their design directly shapes how priming effects are detected, interpreted, and compared across studies. The following section reviews the main psycholinguistic methods used to study priming in L2 research, including their strengths, limitations, and relevance for classroom-based and ecologically valid contexts.

2.6 Methodological approaches in studying structural priming

A central feature of priming research is the use of experimental tasks designed to elicit measurable behavioural or processing outcomes. These include decision-based paradigms and latency-based measures, which provide indirect evidence of underlying linguistic representations and processing mechanisms (Grey and Tagarelli, 2018). Decision tasks, such as grammaticality judgment tasks (GJTs) and structural priming decision tasks, require participants to make rapid linguistic judgments, from which researchers infer implicit knowledge and processing efficiency (Trofimovich and McDonough, 2011). Because of their theoretical grounding and practical applicability, these tasks are widely used in applied linguistics, including in this thesis.

In addition to accuracy-based measures, priming research frequently relies on processing time as an index of cognitive load. Reaction time (RT), defined as the interval between stimulus presentation and response, is one of the most widely used measures in psycholinguistic research (Grey and Tagarelli, 2018). Longer reaction times are typically interpreted as reflecting increased processing difficulty or greater cognitive demand (Keiser, 2013). RT measures are commonly applied in both comprehension and production research, capturing processes such as sentence reading, lexical recognition, or speech initiation.

A range of experimental techniques operationalise these processing measures. Lexical decision tasks require participants to judge whether letter strings correspond to real words (Keiser, 2013). Eye-tracking methods record real-time eye movements, including fixations and saccades, to infer processing effort during reading or visual interpretation (Pellicer-Sánchez and Conklin, 2019). In the same way, self-paced reading tasks measure the time taken to process individual sentence segments and are widely used to examine sentence comprehension in real time (Jegerski, 2014). These methods are particularly relevant for comprehension-based priming studies, including the self-paced reading experiment used in this thesis.

Overall, priming methodologies vary depending on whether the focus is on comprehension or production, and on whether the aim is to capture overt responses (e.g., structure choice) or online processing (e.g., reaction time or eye movements).

The following section outlines how these methodological principles are operationalised in experimental priming paradigms.

2.6.1 Methodological paradigms in structural priming research

Structural priming experiments typically employ a prime-target structure in which participants are exposed to a prime sentence and subsequently respond to a target stimulus (Grey and Tagarelli, 2018). Primes are designed to elicit a specific syntactic structure, whereas targets allow multiple structural alternatives, enabling researchers to measure whether prior exposure influences syntactic choice (Branigan and Gibb, 2018).

A defining feature of priming paradigms is the manipulation of structural information within the prime to induce changes in target responses. In some experimental designs, primes may be briefly presented or masked (e.g., 40–60 milliseconds) to minimise conscious awareness and isolate implicit processing mechanisms (Grey and Tagarelli, 2018). In other designs, more naturalistic exposure is used to capture learning in communicative contexts. These methodological differences reflect the broader distinction between highly controlled laboratory paradigms and more ecologically valid experimental tasks.

Structural priming paradigms are also sensitive to modality. Production-based tasks typically measure structural choice, whereas comprehension-based tasks often rely on reaction time or accuracy measures. The following subsections describe the most commonly used paradigms in production and comprehension research.

2.6.2 Structural priming tasks in language production studies

To measure structural priming in language production, researchers can analyse overt responses using temporal measures (e.g., self-paced reading tasks), non-behavioural responses (e.g., Event-Related Potential (ERP), and structure choice (e.g., picture description task) (Branigan and Gibb, 2018), with the latter being the most frequently employed method due to its flexibility and adaptability across different populations, including children, L2 learners with limited proficiency or

individuals with clinical conditions (Giavazzi *et al*., 2018). These tasks impose minimal cognitive and linguistic demands, requiring only that participants describe what they see, making them suitable for diverse research contexts. Temporal measure paradigms are generally more restrictive in terms of participants' language production. These paradigms often require participants to use specific language structures, with tasks typically involving event descriptions or language repetition. Since they capture online processing, the use of computerised stimuli allows for precise recordings, which are crucial for demonstrating structural priming effects and are more commonly used in comprehension studies (Branigan and Gibb, 2018).

Non-behavioural response paradigms, such as those using fMRI, have been developed to study structural priming. In these tasks, the stimulus might involve a verb that participants must use to describe a subsequent stimulus. BOLD (blood-oxygen-level-dependent) responses are analysed by comparing participants' production data after exposure to stimuli with a specific structure with those after exposure to stimuli with an alternative structure (Branigan and Gibb, 2018).

This subsection describes the most common tasks used to examine how priming affects structure choice during language production. The tasks include sentence recall, dialogic techniques, written and spoken sentence completion tasks, and the picture description paradigm (Branigan and Gibb, 2018).

Sentence recall is a technique in which participants are instructed to verbally reproduce sentences they have previously heard (McDonough and Chaikitmongkol, 2010). In this method, participants first read a sentence presented on a computer screen that shows only one word at a time at a fast rate (using rapid serial visual presentation) (e.g., Savill, Pickering and Branigan, 2017; Zhang, Bernolet and Hartsuiker, 2020). In the sequence, they perform a distractor task and repeat the original sentence aloud (Branigan and Gibb, 2018). Due to the challenge of retaining the exact surface form after the distractor task, participants may alter the structure of the sentence (McDonough, 2006). However, if they preserve the syntactic structure of the prime in their recall responses despite variations in wording, this indicates a priming effect. Consistently reproducing the same syntactic structure as the prime indicates that priming has influenced their sentence production (Branigan and Gibb, 2018).

Sentence recall tasks have been shown to be effective in demonstrating implicit syntactic learning (McDonough and Chaikitmongkol, 2010), tracking L2 syntactic development (Savill, Pickering and Branigan, 2017), and capturing the long-term effects of priming (Bock and Griffin, 2000). However, they come with some limitations. For example, priming effects can be masked or boosted by the repetition of lexical words between the prime and target sentences, as the lexical input can interfere with participants' performance (Mahowald *et al*., 2016). Further, sentence recall tasks might be challenging for less proficient L2 learners, as they often struggle to recall sentences, leaving many responses incomplete or blank (Jackson and Hopp, 2020). As a result, a significant portion of participant data may be excluded from analysis, reducing the statistical power and representativeness of the findings, especially for lower-proficiency groups.

Dialogic techniques involve interactive, communicative tasks where participants interact with an interlocutor (e.g., Branigan *et al*., 2007; Hardy, Messenger and Maylor, 2017; Schoot, Hagoort and Segaert, 2019; Chia *et al*., 2019), and sometimes a simulated interlocutor generated by a computer programme (e.g., Cleland and Pickering, 2003). These techniques are generally used to investigate priming in more naturalistic language use and have been employed in both L1 and L2 contexts (Branigan and Gibb, 2018). In L2 studies, the use of dialogic techniques has shown that interaction-driven priming can increase learners' ability to use complex syntactic structures more accurately (Branigan, Pickering and Cleland, 2000; Bock *et al*., 2007; McDonough and Chaikitmongkol, 2010). Further, as learners unconsciously adjust their syntactic choices to align with their interlocutor's discourse pattern, priming in dialogue has been linked to implicit learning (McDonough and Mackey, 2008).

One key advantage of dialogic techniques is that they promote naturalistic and meaningful language use, offering a more authentic context for second language acquisition (Pickering and Garrot, 2004). Unlike more controlled, descontextualised tasks, dialogic priming aims to reflect real-world communication by embedding syntactic processing within goal-oriented interaction (Kaschak and Borreggine, 2008). This makes it particularly suitable for exploring how priming operates in dynamic, reciprocal settings such as classroom conversations or peer interactions. Further, because these tasks are interactive, learners may feel more engaged and

motivated, potentially contributing to the processing and retention of the target syntactic forms. However, they also present methodological challenges, as they are more difficult to control for response variability than individual tasks, making it hard to isolate structural priming from other discourse-related influences (Segaert *et al*. 2012). Therefore, designing dialogic tasks that balance naturalism with experimental control can be challenging for researchers seeking reliable conclusions about priming and implicit learning in interactive contexts.

The sentence completion task is an experimental method in which participants are presented with an incomplete sentence, either written or spoken, and are asked to complete it in a way that maintains syntactic or semantic coherence. This task has been widely used to investigate how structural priming influences syntactic choices during both production and comprehension (Branigan and Gibb, 2018). In written sentence completion tasks, participants are typically given a sentence fragment and must write a grammatically coherent continuation (e.g., Pickering and Branigan, 1998; Jacob *et al*., 2017; Song and Do, 2018; Hwang and Shin, 2019). In spoken versions, fragments are presented on a computer screen, and participants read them aloud and produce a spoken continuation, which is audio-recorded for analysis (McDonough, 2006). Researchers can manipulate the structure of prime sentence fragments to induce the production of specific syntactic forms in the target completions. This makes the sentence completion task a valuable tool for examining syntactic persistence and the transfer of structures from one sentence to the next, as participants often replicate structures encountered in the primes (Branigan, Pickering and Cleland, 2000).

In addition to its usefulness for studying priming effects, the sentence completion task is highly adaptable (McDonough and Chaikitmongkol, 2010). It has been employed to investigate a range of syntactic structures, including active/passive voice (e.g., Hwang and Shin, 2019), dative alternations (e.g., Jacob *et al*., 2017), subordinate clauses (e.g., Wei, Kim and Shin, 2022), and subject-object constructions (e.g., Song and Do, 2018). A further advantage of this technique is its ability to capture real-time language production, offering insights into the planning and formulation of syntactic structures during spontaneous speech or writing (Bock and Griffin, 2000). The data generated by this task provide strong evidence of how

priming operates in real time, making it a valuable method for exploring the dynamic nature of syntactic processing.

While sentence completion tasks provide significant controlled information into production priming, picture description paradigms offer a complementary approach by situating priming within more naturalistic and interactive language production contexts.

Finally, picture description paradigms vary in complexity, ranging from straightforward tasks where participants listen to or read a prime sentence and subsequently describe target pictures or videos, to more complex setups that integrate picture description with additional tasks, such as picture-matching (Branigan and Gibb, 2018). In these more complex paradigms, participants first read or hear a prime stimulus and decide whether the description matches the prime image. Afterwards, they are presented with a target picture and asked to produce their own description (Branigan and Gibb, 2018). The pictures can be structured to encourage specific syntactic forms, such as active or passive constructions (e.g., Kim and McDonough, 2016; Hwang and Shin, 2019), PO/DO dative structures (e.g., Son, 2020) or to examine immediate and cumulative priming effects in L2 speakers (e.g., Alzahrani, 2022). Researchers then determine whether structural priming from earlier sentences or pictures influences the structures participants use in their descriptions.

Picture description tasks are instrumental in priming research because they simulate more naturalistic language production than other tasks, allowing for more ecologically valid evidence on how syntactic structures are produced in spontaneous speech (Branigan, Pickering and Cleland, 2000). Furthermore, they are as versatile as sentence-completion or sentence-recall tasks. They can be used across different languages to analyse how cross-linguistic differences may influence priming effects (e.g., Santos and Mota, 2018). However, this paradigm is not without challenges. One main disadvantage of picture description tasks is that participants can describe the pictures in many different ways, illustrating variability in responses such as a shift in focus (e.g., agent-focus or patient-focus), different word order or constructions (e.g., canonical order or alternative structure), or the omission or inclusion of information. This leads to significant individual variability in their responses, which

may make it challenging to analyse and quantify priming effects. Another disadvantage is that, depending on the complexity of the picture, participants' performance on the task may be compromised, thereby influencing syntactic structure choice (Kaschak, Loney and Borreggine*,* 2006). For example, a more complex picture may lead to more complex sentence structures, which could confound the analysis of priming effects (Segaert *et al*., 2012).

Overall, in sentence production tasks such as those described above, participants tend to use the same abstract syntactic construction as the one to which they were previously exposed (Bock *et al.,* 2007; Pickering and Branigan, 1998). For example, participants are more likely to use the passive voice (e.g., 'The church was struck by a flash of lightning') when the previous description used a passive structure. Supporting this, Mahowald *et al*. (2016) conducted a comprehensive meta-analysis of syntactic priming studies, confirming that the effect is robust across different languages and syntactic constructions. Their findings highlight the strong influence of prior exposure on sentence production, with lexical overlap playing a key role in strengthening the priming effect; responses were 63% more likely to follow the primed structure without lexical repetition and 77% more likely with lexical repetition. In addition, these tasks have allowed researchers to observe structural priming when only aspects of sentence structure, but not content words are shared between prime and target sentences, a phenomenon known as abstract priming (Segaert *et al*., 2013, Tooley, Pickering and Traxler, 2019) providing evidence for the idea that in sentence production the syntactic structure can be accessed and processed independent of meaning and sound (Tooley and Traxler, 2010).

While the evidence for structural priming in language production is well established, that for comprehension is less clear (Giavazzi *et al*., 2018). In contrast to production, several studies suggest that comprehending a sentence with a particular syntactic structure can facilitate the processing of a subsequent sentence with the same structure, but mainly when both sentences share the same main verb (Chen *et al*., 2013). Branigan, Pickering and McLean (2005) found no evidence for priming effects in active/passive and DO/PO structures when the verb was not repeated. Tooley, Pickering and Traxler (2019) observed priming in reduced relative structures only when the verb was repeated across prime and target sentences. These studies indicate that processing measures during comprehension were influenced only when

the prime and target sentences shared both structural and lexical overlap (Tooley, 2022).

Nonetheless, several comprehension studies have reported significant structural priming effects even in the absence of lexical overlap between the prime and target sentence (e.g., Kim *et al*., 2014; Segaert *et al*., 2013; Pickering, McLean and Branigan, 2013; Giavazzi *et al*., 2018; Lee *et al*., 2019; Ziegler and Snedeker, 2019; Tooley, 2020). Findings from these studies suggest that structural priming in comprehension is non-transient and abstract, similar to production, yet remains sensitive to lexical factors. However, it can still be influenced by lexical factors (Tooley, 2022).

One possible explanation for these diverging findings is that, in sentence production, speakers must actively select a syntactic structure, whereas, in comprehension, word order and lexical content alone are sufficient to derive meaning without fully processing the syntactic structure (Giavazzi *et al*., 2018). Additionally, it has been observed that specific syntactic structures are best suited to one language modality rather than another. For example, comprehension studies frequently involve more complex structures, such as relative clauses, which are challenging to incorporate into production studies because eliciting their spontaneous use is not straightforward (Tooley, 2022).

These conclusions lead studies in comprehension to focus on methodological tools that could contribute to difficulties in observing structural priming effects during comprehension. The following subsection describes the techniques commonly used to explore priming effects in the comprehension modality.

2.6.3 Structural priming tasks in language comprehension studies

Unlike structural priming in production, which mainly examines constrained outcomes and focuses on participants' choice of a structure (Branigan and Gibb, 2018), structural priming in comprehension is measured using real-time processing methods (e.g., self-paced reading, eye tracking). These methods assess responses to ambiguous or complex sentences, structure choices, and non-behavioural indicators (Tooley, Pickering and Traxler, 2019). The following subsections will

discuss the overt responses in temporal measures and structure choice. While non-behavioural responses, such as event-related potentials (ERP) using electroencephalography (EEG) and brain imaging with functional magnetic resonance imaging (fMRI), have been frequently employed to obtain online measures of language comprehension (Branigan and Gibb, 2018), this thesis will not focus on these methods as they fall beyond the scope of this dissertation.

2.6.3.1 Overt responses: temporal measures

Regarding temporal measures, eye-tracking and self-paced reading paradigms have been extensively used to investigate structural priming in language comprehension (Branigan and Gibb, 2018). Eye-tracking is an experimental technique that monitors and records participants' eye movements while they complete a task on a computer screen (Tooley, Traxler and Swaab, 2009). It provides precise measurements of eye movement, including fixations (brief pauses when the eyes focus on a specific point), regressions (backward movements to re-read text), and saccades (rapid shifts between fixations), enabling researchers to analyse how syntactic structures are processed over time (Keating, 2014). In an experimental trial, prime and target sentences are sequentially presented in full on a computer screen. These sentences may share the same syntactic structure or differ, with a specific region of interest identified for analysis (Branigan and Gibb, 2018). Commonly used eye-tracking measures include first-pass processing, which captures the total duration of fixations within a region before the reader moves on, and total reading time, which accounts for all fixations within that region. Structural priming is detected when target sentences in prime-target pairs with matching structures are read more quickly than those with differing structures (Branigan and Gibb, 2018). Faster target structure reading times in relation to the primes serve as evidence that the syntactic representation used during the prime sentence has been reused or reactivated when processing the target (Segaert *et al*., 2013). This reflects a reduction in cognitive effort; if a given structure has just been processed, the syntactic parser is primed to comprehend a similar structure again. In doing so, shorter fixation durations and fewer regressions suggest that the parser encounters less syntactic difficulty or ambiguity, reinforcing the idea that previous exposure facilitates subsequent

comprehension (Pickering and Ferreira, 2008). This effect of faster reading of structurally repeated sentences is informative because it shows that structural priming reflects implicit processing rather than deliberate conscious strategies.

In addition to using eye-tracking to observe structural priming occurrence, researchers have also employed it to investigate, for example, the mechanisms underlying the lexical boost effect (Tooley, Pickering and Traxler, 2019; Tooley, 2020), to compare L2 speakers' misinterpretation persistence in ambiguous sentence reading to L1 speakers (Fujita and Cunnings, 2021), or to determine how changes to sentence structure affect the processing of lexical repetition (Lowder *et al*., 2023). These applications further demonstrate that eye-tracking not only provides evidence of priming effects through faster processing but also reveals how syntactic representations interact with lexical and cognitive factors during real-time language comprehension.

One advantage of eye-tracking is its high temporal resolution, which provides real-time data on syntactic processing and captures moment-by-moment cognitive mechanisms involved in priming (Keating, 2014). Another advantage is that, unlike other behavioural methods (e.g., self-paced reading), eye-tracking does not require explicit responses, making it ideal for studying unconscious priming effects (Staub, 2015). While beneficial, eye-tracking methods have some methodological limitations. For example, eye movement monitoring and recording require specialised equipment, making it costly and logistically demanding (Keating, 2014). Also, eye-tracking systems come with sophisticated software for storing collected data, generating large datasets that require advanced statistical methods for interpretation (Keating, 2014). Finally, Eye-tracking is a non-covert method as participants know their eye movements are monitored. This can make them alter their reading behaviour even if they do not fully understand the study’s goals (Keating, 2014).

While eye-tracking offers real-time insights into syntactic processing by recording readers’ eye movements, another widely used method for investigating the temporal dynamics of language comprehension is the self-paced reading (SPR) paradigm. SPR is a computer-assisted behavioural technique that measures reaction times (reading times, RTs) for individual words or phrases within a sentence (Yoshida, 2023).

The theoretical basis of SPR is the immediacy assumption, which holds that participants' reaction times to a given stimulus are a direct index of their real-time cognitive processing of that linguistic unit, reflecting their sensitivity to particular linguistic phenomena relative to others (Marsden, Thompson and Plonsk*,* 2018). Consequently, localised elevations in RT indicate processing difficulty or syntactic integration costs, whereas decreased RTs suggest that processing has been facilitated, often by a preceding stimulus, as seen in priming paradigms.

In a typical non-cumulative moving-window SPR task, a sentence initially appears on the screen masked by dashes (e.g., *"--- ------ ---- --- -----"*). The participant presses a button to reveal the first segment or word. When they press the button again, the first segment is re-masked, and the next segment is revealed. The computer records the exact time interval between button presses, providing a localised, millisecond-by-millisecond index of reading speed for each specific linguistic unit (Keating, 2014).

A key feature of SPR is that it controls how linguistic input is presented on the screen, and several presentation formats are used in experimental research. In the most common non-cumulative moving-window design, the sentence is initially hidden and displayed as a string of dashes (e.g., "--- ------ ---- --- -----"). Participants reveal the sentence incrementally by pressing a button, with each press replacing the previous segment with the next word or phrase, which is then masked again. This creates a strictly sequential, word-by-word reading experience in which only one segment is visible at a time, allowing precise measurement of processing time for each unit.

A closely related variant, and the one adopted in the present thesis, is word-by-word self-paced reading. In this version, each button press reveals a single word at a time in a fixed position on the screen, rather than displaying or re-displaying longer sentence segments. This design ensures that participants process the sentence in a strictly incremental manner, with each word replacing the previous one in the same spatial location. It offers strong experimental control over input timing while minimising visual complexity, making it particularly suitable for isolating word-level processing effects in L2 comprehension (Sprouse, 2007; Jegerski, 2014).

Other SPR formats vary in how much linguistic information remains visible during reading. In cumulative moving-window designs, previously revealed words remain on

the screen as new words appear, so the sentence gradually builds up from left to right (Jegerski, 2014). This reduces memory load compared to non-cumulative designs and more closely resembles natural reading, while still allowing word-by-word timing measures. A further variant is phrase-by-phrase presentation, where multi-word chunks (e.g., noun phrases or verb phrases) are revealed at each button press rather than individual words, enabling researchers to target larger syntactic units (Just, Carpenter and Woolley, 1982). Across all variants, the computer records the time between button presses, providing a fine-grained, millisecond-level index of processing difficulty for each displayed segment.

Within the literature on structural priming in language comprehension, the SPR paradigm has been extensively deployed to isolate real-time parsing mechanisms. Researchers have utilized SPR to examine the processing difficulties that arise when L2 readers navigate structurally ambiguous sentences (e.g., Fukuta *et al.,* 2018; Hsieh, 2017), to compare the magnitude of structural priming in comprehension across different age demographics (e.g., van Baxter and Lawyer, 2023), and to track the durability of long-term priming effects when decoding complex or non-canonical structures like reduced relative clauses and passive voice constructions (e.g., Santos and Mota, 2018; Weber and Indefrey, 2009; Wei *et al.,* 2019).

The SPR method offers several distinct advantages for investigating comprehension priming. Fundamentally, it provides highly granular temporal data capable of detecting incremental changes in reading profiles across critical and post-critical regions (Jegerski, 2014). Methodological comparisons demonstrate that SPR is remarkably sensitive to online reading differences, often yielding data comparable to eye-tracking protocols (Kim *et al.,* 2014; Marsden, Thompson and Plonsk, 2018). However, unlike eye-tracking, SPR requires minimal hardware, incurs low financial costs, and is straightforward to program and administer, making it uniquely suited for large-scale, web-based, or fieldwork studies (Jegerski, 2014).

Despite these strengths, SPR possesses inherent limitations, particularly when applied to second language research. Unlike native speakers whose parsing mechanisms are largely automatic, L2 readers exhibit substantial individual variability driven by varying proficiency levels, age of acquisition, and L1 literacy backgrounds (Jegerski, 2014). Furthermore, because L2 reading speeds are

naturally slower and can be heavily influenced by explicit metalinguistic knowledge, the raw RTs may occasionally obscure implicit cognitive mechanisms. Finally, unlike eye-tracking, SPR prevents natural regressions (looking back at previous words), which alters the natural reading process. Therefore, the validity of SPR data in L2 contexts relies heavily on rigorous experimental design, appropriate segment length, and the strategic implementation of comprehension wrap-up questions to ensure attentive reading (Marsden, Thompson and Plonsk, 2018).

Another paradigm for investigating structural priming is the visual world (VW) method. This method combines experimental designs typically employed in spoken language comprehension studies with eye-tracking to analyse how language processing influences eye movements to different objects over time (Dussias, Kroff and Gerfen, 2013). It captures how participants process language in real time by tracking their eye movements during a visual task. The VW method has been used to investigate, for example, whether verb repetition facilitates priming in ditransitive sentences (e.g., ‘’The man is reading a book to the boy’’ or ‘’The man is reading the boy a book’’) (e.g., Arai, Van Gompel and Scheepers, 2007), whether the priming effects are due to anticipation of structural properties such as thematic role, grammatical role or the constituent order (e.g., Carminati *et al*. 2008), or whether multilinguals rely on shared or separate representations of syntax when predicting sentence structures (e.g., Chen *et al*., 2022). It has also been used to examine if prediction errors influence syntactic processing during language comprehension (e.g., Chen *et al*., 2022) and to investigate the lexical boost effect (e.g., Chen and Hartsuiker, 2022).

A common VW task in priming research involves participants listening to spoken language (e.g., sentences or words) while viewing a set of visual objects (animate or inanimate), which may be presented in realia (e.g., stuffed animals, plastic toys) or as images on a computer screen (Dussias, Kroff and Gerfen, 2013). The goal is to determine whether participants’ anticipatory eye movements toward these objects align with the structure they just processed in the prime (Branigan and Gibb, 2018). Structural priming is identified when there is a higher likelihood of fixating an object constituent with the same structure as the prime (Branigan and Gibb, 2018).

The main advantage of this method is that it allows researchers to measure structural priming effects as they unfold, rather than relying on post hoc responses (Arai, Van Gompel and Scheepers, 2007). Also, the eye movements can provide fine-grained temporal resolution, revealing when priming effects emerge (Thothathiri and Snedeker, 2008). Another advantage is that the VW paradigm can be straightforwardly adapted for use with children (Thothathiri and Snedeker, 2008) and illiterate participants (Dussias, Kroff and Gerfen, 2013). This allows researchers to extend their research projects to different target populations.

Despite the advantages, certain limitations must be considered. For example, eye movements may not directly reflect syntactic processing, as they can also be influenced by factors such as lexical, semantic, or attentional processes (Hale, 2001). Another issue to consider is that participants may use visual prediction strategies rather than relying solely on syntactic processing, which can confound priming-effect measurements (Kamide, 2012). Finally, visual salience and scene complexity may influence priming effects, making experimental control challenging (Huettig, Rommers and Meyer, 2011).

2.6.3.2 Overt responses: structure choice

The structure choice paradigm examines how previous experience affects participants' interpretation of a stimulus (Branigan and Gibb, 2018). Picture-matching and acceptability-judgment tasks are the most common methods used in L2 structural priming investigations and are employed in this thesis (see Chapter 4).

The picture-matching paradigm involves presenting participants with visual scenes or images that represent different syntactic structures (e.g., active vs passive sentences) (Branigan and Gibb, 2018). Participants are asked to match a spoken or written sentence to one of several images, each illustrating a different syntactic structure. Structural priming can be detected in participants' picture selections, as they often choose images that match the structures to which they were previously primed. Additional measures, such as response latencies, can also be used to examine priming effects (Branigan and Gibb, 2018). Studies have used picture-matching tasks to detect L2 learners' comprehension of syntactic forms (e.g., English

passives) (e.g., Kim and McDonough, 2016, Hwang, 2022), to test structural interpretation of globally ambiguous, high/low attachment sentences (e.g., ‘’The waitress is prodding the clown with the umbrella.’’) (e.g., Pickering, McLean and Branigan, 2013; Branigan, Pickering and McLean, 2005), to investigate cross-linguistic structural priming (e.g., Hartsuiker, Pickering and Veltkamp, 2004), to examine non mediated lexical priming (e.g., Giavazzi *et al*., 2018; Tooley, Pickering and Traxler, 2019), to determine the persistence of structural priming (e.g., Ziegler *et al*., 2019) and to investigate the inverse preference priming (e.g., Chen, Wang and Hartsuiker, 2023).

One of the strengths of this method is the precise control over experimental variables, allowing researchers to isolate the effects of specific syntactic structures on comprehension. Additionally, by requiring participants to choose between images representing different syntactic interpretations, researchers can directly assess how prior exposure influences sentence processing (Branigan and Gibb, 2018).

However, this method has certain drawbacks: as in production-based priming studies, participants' choices may be influenced by factors other than syntactic structure, such as semantic content or image salience. Furthermore, the task may not fully capture the complexity of natural language comprehension, as it involves explicit decision-making that may differ from everyday language processing (Branigan and Gibb, 2018).

Lastly, acceptability judgment tasks, which are a commonly used method in linguistic research to evaluate how speakers perceive the grammaticality or naturalness of sentence structures. In structural priming studies, these tasks help determine whether repeated exposure to specific syntactic forms influences participants' acceptability ratings in subsequent evaluations (Luka and Barsalou, 2005; Sprouse, 2007). The design of these tasks varies depending on the research objective. Still, many studies employ a two-alternative forced-choice format, requiring participants to classify sentences as acceptable or unacceptable, or grammatical or ungrammatical (e.g., Shin and Christianson, 2012; Wei, Kim and Shin, 2022). Acceptability judgments, also known as grammaticality judgments, are shaped by multiple cognitive factors, including sentence grammaticality, processing demands, semantic interpretation, and real-world plausibility (Sprouse and Aronoff, 2013). Understanding

these influences is crucial for interpreting results in priming studies and broader linguistic research (Myers, 2017).

Depending on the study design and the hypothesis being tested, acceptability judgment tasks appear to be a suitable tool for measuring structural priming, as studies suggest that repeated exposure to a syntactic structure can result in higher acceptability ratings for that structure (Sprouse, 2007). However, caution is needed regarding factors such as how structures are presented to participants. For example, the ratio of grammatical to ungrammatical sentences can potentially bias participants before they rate the sentences. Sprouse and Aronoff (2013) highlights these considerations, emphasising the need for careful task design to ensure valid results.

Overall, research in applied linguistics draws on well-established methods and techniques from psycholinguistics to test specific hypotheses in the field of structural priming. These methodologies, including eye-tracking, self-paced reading, and acceptability judgment tasks, significantly contribute to how language users process and retain syntactic structures over time. By incorporating both real-time and offline measures, studies can capture both immediate processing effects and longer-term priming influences, offering a more comprehensive understanding of second-language acquisition and syntactic adaptation. Future research can further refine these methods and explore new experimental paradigms to deepen our knowledge of structural priming across different linguistic contexts and learner populations.

In line with this goal, the present study conducted an experiment that investigated structural priming of passive constructions among ESOL learners. The self-paced reading paradigm was adopted to examine whether comprehension of passive structures is influenced by prior exposure. Structural priming in comprehension, although less widely studied than in production (Giavazzi *et al*., 2018), contributes significantly to our understanding of how syntactic representations are processed and potentially learned through exposure (Tooley, 2022). For L2 learners, comprehension-based priming offers a perspective on implicit learning, as it allows researchers to observe sensitivity to structural patterns without requiring active generation of those structures (Tooley, 2022). This is particularly relevant for syntactic forms that are known to be difficult for learners to produce, such as passive constructions (Conroy, 2013; Celce-Murcia and Larsen-Freeman, 2015).

To investigate comprehension-based priming, this study employed the self-paced reading paradigm, a widely used method for investigating structural priming in the comprehension modality (e.g., Weber and Indefrey, 2009; Hsieh, 2017; Fukuta *et al*., 2018; Wei et al., 2019; van Boxtel and Lawyer, 2023). The choice of this method is further motivated by its capacity to minimise production-related interferences. Unlike tasks that require overt output, self-paced reading allows learners to process language passively, providing a more transparent window into comprehension-based syntactic processing (Marsden, Thompson and Plonsk, 2018). Moreover, because the tasks can be closely controlled for lexical and structural repetition, they are well-suited to isolating abstract structural priming effects from lexical boost effects (Hartsuiker and Bernolet, 2017; Ledoux, Traxler and Swaab, 2007).

Another strength of self-paced reading is that it can reveal subtle facilitation effects that may not be evident in offline comprehension measures such as grammaticality judgments or picture-matching tasks (Marsden, Thompson and Plonsk, 2018). For example, faster reading times in structurally primed conditions can indicate facilitated syntactic parsing, suggesting that learners are becoming more efficient in processing the target structure. In the context of this study, such findings would provide evidence that repeated exposure to passive constructions results in enhanced processing fluency, which can be an indicator of implicit syntactic learning.

Moreover, SPR is consistent with usage-based approaches and input-based models in second language acquisition, which emphasise the importance of input frequency and structural repetition in the development of grammatical knowledge (Ellis, 2006; Rebuschat and Williams, 2012). By monitoring how repeated exposure influences comprehension during processing, this study adds to the SLA literature that conceptualises L2 learning as a process driven by experiential interaction with input.

In summary, self-paced reading provides a theoretically grounded and methodologically sensitive approach for investigating comprehension-based structural priming. It allows researchers to detect subtle, implicit signs of syntactic learning, contributing to our understanding of how L2 learners process and internalise complex structures such as passives. At the same time, its reliance on segmented, decontextualised input may limit ecological validity, and individual differences can influence performance in reading proficiency or working memory.

Recognising these constraints is essential for interpreting findings and situating them within the broader evidence base on structural priming in L2 contexts.

Overall, the reviewed literature demonstrates that structural priming is a multifaceted phenomenon that plays a significant role in both first- and second-language acquisition. By examining a range of methodological approaches, this review has highlighted how task design, measurement choices, and learner-related variables such as proficiency and lexical repetition influence the detection and interpretation of priming effects. Yet, significant gaps remain, especially in extending comprehension-based findings to classroom contexts, in exploring learner populations beyond the most frequently studied groups, and in assessing the long-term durability of priming effects in naturalistic settings. Addressing these gaps requires research that combines the methodological precision of laboratory tasks with designs that approximate authentic language use. Grounded on this foundation, the following chapter presents the first empirical study of this thesis, which investigates structural priming effects in L2 English sentence comprehension among ESOL learners across different proficiency levels. In doing so, it seeks to clarify how priming operates in real-time processing and to evaluate its potential contribution to pedagogical practice.

Chapter 3 Investigating Structural Priming Among ESOL Learners

In this chapter, I present the behavioural experiment designed to explore whether ESOL learners experience structural priming during sentence reading comprehension. Section 3.1 outlines the study's main objective, followed by the research questions in Section 3.2. Section 3.3 details the overall research methodology and the rationale for selecting the experimental design. Section 3.4 describes the pilot study, which was conducted to test the research protocols, data collection instruments, and procedural framework. The methodological framework of the main study is presented in Section 3.5, with separate subsections covering participants, design, materials, and procedure. Section 3.6 describes the data analysis approach. Sections 3.7, 3.8 and 3.9 present the comprehensive descriptive and inferential results of the study. Finally, Section 3.10 discusses the key findings in relation to the reviewed literature.

3.1 Objectives

This study investigated whether structural priming occurs during sentence comprehension of the English passive voice among ESOL learners at three different proficiency levels. Structural priming, the tendency to repeat previously encountered syntactic structures, has been widely studied in L2 production. However, research in sentence comprehension indicates that priming effects in real-time processing are not automatic. They typically arise only under certain conditions, such as when the prime and target share the same main lexical verb (e.g., Tooley and Bock, 2014; Traxler, Tooley and Pickering, 2014; Tooley, Pickering and Traxler, 2019). These findings raise important questions about how syntactic representations are accessed during L2 comprehension, and whether such effects extend to learners at different proficiency levels.

By focusing on comprehension-based priming in ESOL learners, this study contributes to a broader understanding of how syntactic processing develops through exposure in second language acquisition. It also engages with ongoing debates about whether priming in comprehension reflects short-term activation or

more durable learning mechanisms such as syntactic consolidation. Moreover, investigating the role of lexical overlap provides insights not only into the conditions under which priming is strongest but also into how repeated exposure to form-meaning mappings might be employed in L2 classrooms to support learners' processing and retention of complex structures.

3.2 Research questions

The research questions examine whether structural priming occurs during sentence comprehension in L2 learners. They also investigate how factors such as lexical repetition and learner proficiency influence this effect.

> RQ 1: Will a structural priming effect occur during sentence comprehension of the passive voice in ESOL learners?
>
> RQ 2: If priming occurs, to what extent will lexical repetition influence structural priming?
>
> RQ 3: Is the effect moderated by learners' L2 proficiency level?

To address these questions, a self-paced reading task was employed in which participants read prime and target sentences in the passive voice. Reaction times (RTs) within the critical passive region and comprehension accuracy were measured to assess structural priming effects. Faster RTs and higher accuracy in target sentences following structurally similar primes were taken as indicators of successful priming.

3.3 Method

The methodology employed a quantitative experimental design to isolate the effects of structural priming on sentence reading comprehension. The target structure was the passive voice (*be* + *past participle*, followed by a by-phrase indicating the agent), the experimental stimuli controlled for reversible and non-reversible passive constructions. Reversible passives are sentences in which either noun phrase could plausibly serve as the agent or patient (e.g., “The dog was chased by the cat”),

requiring readers to rely primarily on syntactic cues to interpret meaning. Non-reversible passives, in contrast, have a fixed agent–patient relationship based on world knowledge (e.g., “The cake was eaten by the child”), allowing comprehension to be mainly guided by semantic information rather than syntax (Celce-Murcia and Larsen-Freeman, 2015).

The experiment utilised the self-paced reading (SPR) paradigm to measure online processing. The selection of the SPR method is justified by a large body of empirical research investigating structural priming in sentence comprehension across various target structures, including the passive voice (e.g., Wei *et al*., 2019), reduced relative clauses (e.g., Traxler and Tooley, 2007), and broader syntactic adaptation effects during online comprehension (e.g., Ledoux, Traxler and Swaab, 2007; Traxler, 2008). SPR is sensitive to facilitation arising from prior syntactic exposure and allows researchers to capture incremental sentence processing in real time (e.g., Branigan, Pickering and McLean, 2005). While several researchers have investigated syntactic priming using alternative real-time measures such as eye-tracking (e.g., Arai, Van Gompel and Scheepers, 2007; Tooley and Bock, 2014) or fMRI (Weber and Indefrey, 2009), SPR provides an effective, non-invasive method for recording reading times across distinct sentence segments, enabling researchers to isolate regions of interest and detect real-time processing facilitation. Furthermore, SPR offers practical advantages for testing language learners within institutional or classroom-like settings where eye-tracking hardware may be impractical.

3.4 Pilot study

A pilot study was conducted before the main experiment to evaluate the empirical design, refine the linguistic stimuli, and verify that the technological protocols functioned effectively across different testing environments. The pilot was carried out in two distinct settings: the psychology laboratory at York St John University and the assessment room at the further education college where the target ESOL learners were formally enrolled. This dual-site testing was essential to determine whether the computerised task could be implemented reliably in a naturalistic educational environment as well as a highly controlled laboratory.

A total of six participants volunteered for the pilot study: two undergraduate students and four ESOL learners from the ESOL Skills for Life Department at a college in England. Participants were recruited through institutional emails and were informed about the research aims and objectives. Access to the ESOL participants was granted with permission from the programme coordinator of the ESOL and Basic Skills Department at the college (see Appendix 1). All participants provided written consent before participating in the pilot study (see Appendix 2).

Participants in the pilot study completed the experimental task under the same conditions planned for the main study. The researcher closely observed all six participants throughout each session and conducted a brief verbal debrief immediately afterwards. Based on these observations and participant feedback, four specific refinements were made before the main data collection phase: (1) two typographical errors in filler sentences were corrected; (2) the display font size was increased from 18-point to 20-point Arial to improve readability on both monitor types used in the study; (3) three experimental sentences containing low-frequency vocabulary items were revised to ensure alignment with the Oxford 3000 word list; and (4) the written instructions screen was reformatted to display on two pages rather than one, reducing on-screen text density. The self-paced reading task was implemented using E-Prime 3.0 software, which enabled precise control over stimulus presentation and response-time recording. The programme functioned as expected during the pilot study, and no participants reported significant difficulties in completing the task. After all revisions, the experimental instruments and procedures were finalised and deemed suitable for the main data collection phase. No participants from the pilot study were included in the sample for the main experiment.

3.5 The main study

3.5.1 Participants

In a voluntary condition, forty-eight ESOL learners were recruited from a further education college and university centre in England. At the time of testing, all participants were formally enrolled in the ESOL Skills for Life Department and were

attending Functional Skills English courses at three levels: Entry Level 3, Level 1, and Level 2 (16 participants per level). This study was approved by the Ethics Committee of York St John University under approval code RECLL00038 on 26/03/2022 (see Appendix 3). Participants were informed about the research aims and objectives (see Appendix 4) and were required to sign a consent form before taking part (see Appendix 5). They also completed a reading assessment using the Skills Forward e-platform, a UK-based online system used by education providers to assess functional language competencies, including Functional Skills, GCSEs, and employability skills.

To ensure an accurate placement verification, all participants had previously completed a standardised reading assessment via the Skills Forward e-platform, a validated UK digital diagnostic framework used by educational providers to evaluate functional language competencies aligned to the CEFR.

Volunteers were informed that participation was entirely voluntary, that they had the right to withdraw at any stage without penalty, and that non-participation would not affect their relationship with the researcher or institution. To protect participant anonymity, all data were fully anonymised immediately upon collection. Participant names were replaced with numeric codes and were never linked to the digital dataset. The physical consent forms were scanned, transferred securely to a password-protected folder on the university's institutional OneDrive storage, and the original paper copies were securely shredded.

None of the participants in this study was involved in or had any exposure to the subsequent classroom intervention study reported in the following chapter.

3.5.2 Demographic and language questionnaire

After signing the consent form, participants individually completed a 17-question questionnaire to provide a participant profile. The questionnaire gathered information about their education and language backgrounds, as well as their attitudes towards learning and using English.

According to questionnaire data, participants' ages ranged from 19 to 58 years (Entry Level 3), 29 to 49 years (Level 1), and 26 to 52 years (Level 2). The number of

languages spoken ranged from 2 to 4 across groups. Years residing in an English-speaking country ranged from 9 months to 19 years (Entry Level 3), 10 months to 12 years (Level 1), and 1.5 to 20 years (Level 2). Years of formal education in English ranged from 6 months to 6 years (Entry Level 3), 4 to 8 years (Level 1), and 4 to 11 years (Level 2). This notable variance reflects the diverse immigration histories commonly found in ESOL programmes. Tables 1 and 2 report sample characterisation and L1 background data.

Table 1: Sample Characterisation Data by Proficiency Group

Entry 3 (n = 16)	*Level 1 (n = 16)*	*Level 2 (n = 16)*			
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*
Age (years)	37.38	11.70	35.56	6.55	35.75	8.88
Languages spoken (n)	2.88	0.71	2.63	0.80	2.63	0.80
Years in the UK	6.26	5.77	5.74	3.60	7.09	4.69
Years of formal education (years)	3.69	1.82	5.56	1.67	6.93	2.11

Table 2: L1 Background of All Participants

L1 Background	*Number of Participants*
Arabic	7
Bulgarian	3
Farsi	7
French	2
Kurdish	6
Mandarin	5
Polish	2
Portuguese	2
Romanian	5
Russian	1
Spanish	2
Turkish	5
Urdu	1

3.5.3 Design

The experiment employed a 3 × 4 mixed factorial design. The between-subjects independent variable was proficiency level, with three groups (Entry Level 3, Level 1, Level 2). The within-subjects independent variable was experimental condition, with four levels based on sentence role (prime or target) and the presence or absence of lexical repetition:

(a) Prime Repetition (PrimeRep): prime sentence with a repeated verb;

(b) Prime Non-Repetition (PrimeNoRep): prime sentence with a non-repeated verb;

(c) Target Repetition (TargetRep): target sentence immediately following a verb-repeated prime;

(d) Target Non-Repetition (TargetNoRep): target sentence immediately following a non-repeated prime.

The experiment was structured with a baseline lag of zero (Lag 0), meaning that each target sentence appeared immediately after its corresponding prime sentence. The primary dependent variables were online RT measured in milliseconds (ms) for the entire passive region (Words 3–5 combined) and for the critical verb region (Word 4 alone), and offline comprehension accuracy calculated as the proportion of correct responses to binary yes/no verification questions.

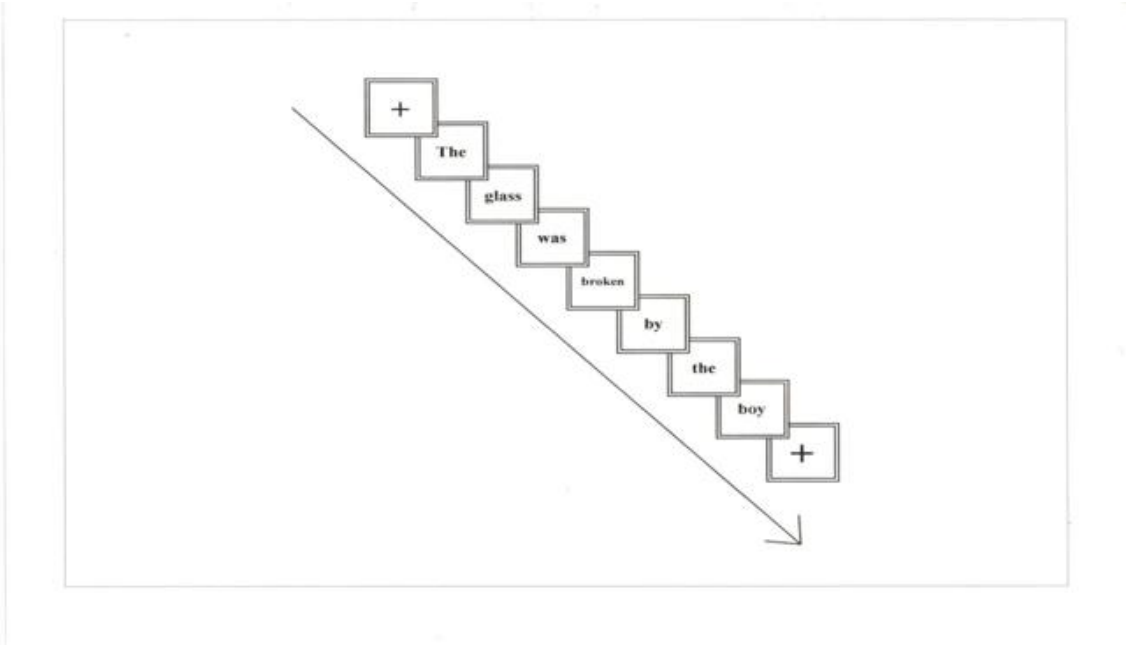
3.5.4 Materials and stimulus controls

The experimental materials comprised a total pool of 300 sentences organised into prime–target pairs and filler items. The complete set of experimental and filler sentence stimuli is provided in Appendix 6. To ensure that processing difficulty was not confounded by vocabulary unfamiliarity, all words were selected based on frequency data and relevance to the target demographic, using the Oxford 3000 and Oxford 5000 lexical databases (Oxford University Press, 2013). Every word was cross-referenced with the Cambridge English Vocabulary Profile (Cambridge University Press, 2020) to ensure alignment with CEFR standards spanning levels

A1 to C1. Lexical selection prioritised content words indexed within the Entry Level 3 and Level 1 parameters of the Skills Forward curricular database.

Every experimental sentence was exactly seven words long, and the critical passive region consistently occupied positions 3, 4, and 5. Specifically, Word 3 was always the auxiliary verb was, Word 4 was the past participle form of the main lexical verb, and Word 5 was the agentive preposition by. This standardised structure ensured that any differences in processing times could be attributed to experimental manipulations rather than variations in sentence length or syntactic configuration. An example of the word-by-word sentence presentation sequence is illustrated below in Figure 1.

Figure 1: Schematic Representation of the Word-by-Word Self-Paced Reading Presentation Sequence



Note. This figure demonstrates the non-cumulative, word-by-word self-paced reading layout. The trial initiates with a fixation cross (+), followed by the sequential, button-triggered disclosure of individual words. Positions 3 (*was*), 4 (*broken*), and 5 (*by*) constitute the predefined critical passive region.

3.5.5 Methodological controls for passive reversibility

To prevent strategic reading behaviours, sentence structures were balanced across conditions. Reversible passives (e.g., “The athlete was helped by the coach”)

accounted for 50% (n = 100) of the experimental sentences, while non-reversible passives (e.g., “The letter was written by the secretary”) made up the remaining 50% (n = 100). The distribution of these two semantic categories was split equally across the repetition and non-repetition conditions (25 reversible and 25 non-reversible prime–target pairs per condition), ensuring that semantic plausibility did not introduce systematic processing bias. Table 3 presents the full stimulus distribution across conditions.

Table 3: Distribution of Stimulus Items Across Experimental Conditions

Condition	*Reversible Pairs (n)*	*Non-Reversible Pairs (n)*	*Regular Verbs (n)*	*Irregular Verbs (n)*
Repetition	25	25	25	25
Non-Repetition	25	25	25	25
Total	50	50	50	50

3.5.6 Methodological controls for verb morphology

The past participles used as the main verbs (Word 4) were balanced for morphological regularity. Regular past participles ending in the inflectional suffix -ed (e.g., questioned, contacted, chased) were used in exactly 50% (n = 100) of experimental sentences. Irregular past participle forms (e.g., broken, found, seen) were deployed in the remaining 50% (n = 100). This morphological distribution was counterbalanced across both the repetition and non-repetition conditions (see Table 3), ensuring that observed reading-time differences could be attributed to structural priming rather than differences in how regular versus irregular verb inflections are processed. In the repetition condition, the repeated verb was always of the same morphological type across prime and target (i.e., regular-to-regular or irregular-to-irregular), maintaining consistency within pairs.

The overall stimulus set consisted of 200 experimental passive sentences (100 sentences/50 pairs per condition) combined with 100 active-voice filler sentences containing balanced transitive and intransitive structures. These filler sentences

served as distractors to mask the syntactic focus of the study. Table 4 illustrates representative sentence structures across conditions.

Table 4: Illustrative Stimulus Examples Across Experimental and Distractor Conditions

Condition	*Example Sentence*
Repetition — Prime	The glass was broken by the boy.
Repetition — Target	The door was broken by the man.
Repetition — Prime	The suspect was questioned by the officer.
Repetition — Target	The man was questioned by the inspector.
Non-Repetition — Prime	The woman was found by the police.
Non-Repetition — Target	The candidate was hired by the company.
Non-Repetition — Prime	The man was arrested by the police.
Non-Repetition — Target	The client was contacted by the shop.
Filler	The shop closed early yesterday.
Filler	The boy played video games.

3.5.7 Procedure

The data collection sessions took place individually or in pairs within a quiet testing room, with participants seated in front of personal computers. Before beginning the computerised task, participants were given both a printed information sheet and a verbal explanation of the study. The researcher remained present throughout each session to answer procedural questions and to ensure that the E-Prime software was functioning correctly. The entire session lasted between 45 and 60 minutes and followed the five-step sequence presented in Table 5.

Table 5: Overview of the Data Collection Session

Step	*Activity*	*Description*	*Duration*	*Materials*
1	Consent and Profile	Participants read information sheets, asked questions, signed consent forms, and completed the 17-item demographic and language questionnaire.	~15 min	Information sheet, consent form, demographic questionnaire
2	Practice session	Participants completed six practice trials (one prime–target pair per condition and two fillers) with on-screen feedback to familiarise themselves with the spacebar-driven word-by-word display.	~5 min	E-Prime practice block
3	Experimental SPR task	Participants read 300 sentences word-by-word at their own pace. They were permitted to take brief rests only during fixation-cross intervals between sentences.	30–40 min	E-Prime experimental block
4	Comprehension questions	Eighteen binary (Yes/No) comprehension questions were presented at random intervals immediately after passive target sentences. Participants pressed Y or N.	Embedded in Step 3	E-Prime response screen
5	Debriefing	Participants were thanked, debriefed on study goals, and given the opportunity to ask questions.	~5 min	Debriefing sheet

Note. SPR = self-paced reading. All sessions were conducted using E-Prime 3.0 software on ACER and DELL 15-inch widescreen monitors. Sentences appeared in 20-point Arial font, centred on a white background. Y = Yes key; N = No key.

The self-paced reading task used a non-cumulative, word-by-word display format. Each time a participant pressed the spacebar, the current word disappeared and was replaced by the next word in the sequence. Because previous words were immediately masked, participants could not look back at earlier parts of the sentence. This design choice prevents re-reading, ensuring that the recorded reaction times accurately capture real-time, incremental sentence processing (Marsden, Thompson and Plonsk, 2018).

The 300 sentences were pseudo-randomised for each participant by the E-Prime software, subject to the constraint that no two experimental prime–target pairs were separated by fewer than two filler sentences, and that no more than three consecutive passive sentences appeared in sequence. Each target sentence always appeared immediately after its corresponding prime sentence (Lag 0). The 18 comprehension questions were distributed pseudo-randomly across the experimental block, always following a passive target sentence and never appearing on consecutive trials. The questions targeted reversible passive sentences where participants had to rely on syntactic processing rather than world knowledge to answer correctly. An example is presented below:

> Sentence read: “The woman was found by the police”
>
> Comprehension question: “Did the woman find the police?” (Correct answer: N)

3.6 Data analysis

The self-paced reading task generated two types of quantitative data from E-Prime: (a) comprehension accuracy scores from the verification questions and (b) reaction times (RTs) measured in milliseconds recorded during sentence processing. Reaction times were analysed for the full passive region comprising Words 3–5 and for the critical verb region (Word 4) separately.

To address Research Question 1, reaction-time data were analysed using Generalised Estimating Equations (GEE). GEE is appropriate for repeated measures designs because it accounts for the correlation among observations contributed by the same participant across multiple trials. In contrast to traditional repeated-

measures ANOVA, GEE does not require the assumption of sphericity and is robust to departures from normality that are common in RT data. The GEE model specified reading time as the dependent variable and included proficiency level (Entry Level 3, Level 1, Level 2), experimental condition (PrimeNoRep, PrimeRep, TargetNoRep, TargetRep), and their interaction as fixed effects. Participant was specified as the subject variable. A normal distribution with an identity link function was employed, together with an independent working correlation structure. Robust parameter estimates were used throughout. The model is represented as:

Reading Time = β_0 + β_1(Proficiency) + β_2(Condition) + β_3(Proficiency × Condition)

To address Research Question 2, multiple linear regression analyses were conducted using reaction-time difference scores (ΔRT = Target RT minus Prime RT) as the dependent variable. Two models were estimated: Model 1 used the combined passive region (Words 3–5); Model 2 focused on the critical verb region (Word 4). In both models, proficiency level and lexical condition were entered as dummy-coded predictors. Entry Level 3 served as the reference category for proficiency, and the Repetition condition served as the reference category for the lexical condition. Because ΔRT was calculated as a single mean difference score per participant, the effective sample size for both regression models was N = 48, preventing artificial inflation of degrees of freedom.

Before regression analyses, standard diagnostic procedures were undertaken. Residual distributions were examined via histograms and normal probability plots. Multicollinearity was assessed using tolerance values and variance inflation factors (VIF). Homoscedasticity was evaluated through residual-versus-predicted-value plots, and potential outliers were identified using standardised residuals. Outlying observations were retained where they represented genuine participant variability and did not substantially alter the pattern of results. The significance level for all analyses was set at α = .05. All analyses were performed using IBM SPSS Statistics Version 28.

3.7 Results

3.7.1 Descriptive statistics

Descriptive statistics were calculated to summarise comprehension accuracy and reading times across proficiency levels and lexical conditions. All descriptive tables include means (M), standard deviations (SD), and observed minimum and maximum values for transparency and to support the assessment of distributional assumptions before inferential analysis.

3.7.1.1 Comprehension accuracy

Table 6 presents the descriptive statistics for comprehension accuracy. Across all proficiency groups, accuracy scores were generally high, indicating that participants attended to and understood the task. Higher-proficiency learners tended to achieve higher accuracy scores, and performance was generally higher in the repetition condition than in the non-repetition condition.

Table 6: Descriptive Statistics for Comprehension Question Accuracy by Proficiency Group and Lexical Condition

Proficiency Level	*Lexical Condition*	*n*	*M*	*SD*	*Min*	*Max*
Entry Level 3	Repetition	16	0.72	0.15	0.40	1.00
	Non-Repetition	16	0.67	0.20	0.40	1.00
Level 1	Repetition	16	0.81	0.12	0.60	1.00
	Non-Repetition	16	0.70	0.15	0.40	0.90
Level 2	Repetition	16	0.84	0.15	0.50	1.00
	Non-Repetition	16	0.81	0.15	0.60	1.00

3.7.1.2 Reaction times - combined passive region (Words 3–5)

Table 7 presents descriptive statistics for raw reading times across the combined passive region. Entry Level 3 learners exhibited longer reading times than Level 1 and Level 2 learners, indicating slower processing overall. Reaction times were generally lower for target sentences than for prime sentences in the repetition condition, suggesting potential facilitation effects. These results are examined through inferential analysis in Section 3.8.

Table 7: Descriptive Statistics for Reading Reaction Times in the Combined Passive Region (Words 3–5), in Milliseconds

Proficiency	*Condition*	*Timing*	*n*	*M*	*SD*	*Min*	*Max*
Entry Level 3	Repetition	Prime	16	1991.08	698.45	1042.11	3217.54
		Target	16	1862.63	578.16	978.32	2987.43
	Non-Repetition	Prime	16	1816.06	567.36	921.50	3011.22
		Target	16	1796.72	556.19	905.44	2934.77
Level 1	Repetition	Prime	16	1462.63	363.59	812.33	2344.67
		Target	16	1380.03	335.00	754.89	2189.54
	Non-Repetition	Prime	16	1344.20	343.36	701.22	2143.88
		Target	16	1381.32	360.44	714.55	2201.33
Level 2	Repetition	Prime	16	1477.86	379.95	803.11	2312.44
		Target	16	1406.30	335.00	744.32	2167.88
	Non-Repetition	Prime	16	1322.38	403.11	654.80	2188.77
		Target	16	1381.32	360.44	711.44	2198.55

Note. RT values are presented in milliseconds. Prime = reading time for the prime sentence; Target = reading time for the target sentence immediately following the prime at Lag 0.

3.7.1.3 Reaction times - critical verb region (Word 4)

Table 8 presents descriptive statistics for reaction times at the critical verb region (Word 4, the past participle). This region is of primary theoretical interest because it is the locus of lexical repetition in the repetition condition. Entry Level 3 learners again showed longer RTs than higher-proficiency groups. A numerical reduction from

prime to target in the repetition condition was visible across all three groups, most evident in Entry Level 3. Inferential analyses testing the predictive value of lexical condition and proficiency for these differences are reported in Section 3.9.2.2.

Table 8: Descriptive Statistics for Reading Reaction Times at the Critical Verb Region (Word 4, Past Participle), in Milliseconds

Proficiency	*Condition*	*Timing*	*n*	*M*	*SD*	*Min*	*Max*
Entry Level 3	Repetition	Prime	16	723.44	289.33	341.22	1512.88
		Target	16	611.77	241.18	298.44	1389.55
	Non-Repetition	Prime	16	688.91	271.55	322.11	1478.33
		Target	16	680.34	268.44	311.55	1455.77
Level 1	Repetition	Prime	16	521.33	178.44	244.11	1044.88
		Target	16	467.22	155.33	222.44	988.11
	Non-Repetition	Prime	16	499.88	166.22	234.55	1011.33
		Target	16	512.44	171.55	239.33	1033.22
Level 2	Repetition	Prime	16	534.11	182.33	251.22	1067.55
		Target	16	478.55	159.44	228.11	999.88
	Non-Repetition	Prime	16	507.66	169.55	238.44	1022.77
		Target	16	519.33	174.22	244.88	1041.44

Note. RT values are in milliseconds. Word 4 is the past participle of the main lexical verb, the locus of lexical repetition in the Repetition condition.

3.8 Generalised estimating equations analysis (GEE)

A GEE model was fitted to examine the effects of proficiency level and experimental condition on reading times in the combined passive region (Words 3–5). The model included proficiency level, condition, and their interaction as fixed effects, with Participant as the subject variable.

The analysis revealed a significant main effect of proficiency, Wald $\chi^2(2) = 9.54$, $p = .008$, indicating that reading times differed across learner groups. Pairwise comparisons showed that Entry Level 3 learners read significantly more slowly than both Level 1 ($p = .004$) and Level 2 ($p = .005$) learners. No significant difference was observed between Level 1 and Level 2 learners ($p = .970$).

A significant main effect of condition was also observed, Wald $\chi^2(3) = 34.34$, $p < .001$, indicating that reading times varied across the four experimental conditions. Pairwise comparisons (Table 9) showed that the PrimeRep condition produced significantly longer reading times than PrimeNoRep, TargetNoRep, and TargetRep (all $p < .001$). No significant differences were found among PrimeNoRep, TargetNoRep, and TargetRep conditions. Importantly, the TargetRep versus TargetNoRep comparison did not reach significance ($p = .300$), indicating that the GEE model, collapsed across proficiency groups, did not confirm a statistically reliable structural priming effect in the target conditions. The interaction between proficiency level and condition was not statistically significant, Wald $\chi^2(6) = 11.87$, $p = .065$. Table 9 presents the overall tests of model effects.

Table 9: GEE Results: Tests of Model Effects for Passive Reading Times (Words 3–5)

Effect	*Wald χ²*	*df*	*p*
Proficiency	9.54	2	.008
Condition	34.34	3	< .001
Proficiency × Condition	11.87	6	.065

Note. Estimated marginal means for the significant main effects are presented in Table 10. The GEE parameter estimates for all proficiency-by-condition interaction cells are presented in Table 11.

Table 10: Estimated Marginal Means for Main Effects (Words 3–5)

Factor / Level	*M*	*SE*	*95% CI*
Proficiency Level			
Level 1	1395.08	82.90	[1232.60, 1557.56]
Level 2	1390.40	92.36	[1209.38, 1571.42]
Entry Level 3	1866.63	140.41	[1591.43, 2141.82]
Experimental Condition			
PrimeNoRep	1494.22	62.62	[1371.48, 1616.95]
PrimeRep	1644.55	70.52	[1506.33, 1782.76]
TargetNoRep	1514.38	67.11	[1382.85, 1645.92]
TargetRep	1549.65	60.15	[1431.76, 1667.55]

Note. M = estimated marginal mean in milliseconds; SE = standard error; CI = confidence interval.

Table 11: GEE Parameter Estimates for the Proficiency × Condition Interaction

Parameter	*B*	*SE*	*95% CI Lower*	*95% CI Upper*	*Wald χ²*	*p*
(Intercept)	1862.63	139.95	1588.33	2136.93	177.13	< .001
[Proficiency=Level 1] × [Condition=PrimeNoRep]	-46.56	71.52	-186.74	93.62	0.42	.515
[Proficiency=Level 1] × [Condition=PrimeRep]	128.46	42.32	45.52	211.40	9.22	.002
[Proficiency=Level 1] × [Condition=TargetNoRep]	-65.91	59.89	-183.30	51.48	1.21	.271
[Proficiency=Level 1] × [Condition=TargetRep]	0[a]					
[Proficiency=Level 2] × [Condition=PrimeNoRep]	-518.43	162.77	-837.45	-199.40	10.14	.001
[Proficiency=Level 2] × [Condition=PrimeRep]	-397.93	165.33	-721.97	-73.90	5.79	.016
[Proficiency=Level 2] × [Condition=TargetNoRep]	-497.51	164.92	-820.75	-174.27	9.10	.003
[Proficiency=Level 2] × [Condition=TargetRep]	0[a]					
[Entry Level 3] × [Condition=PrimeNoRep]	-540.25	170.61	-874.64	-205.86	10.03	.002
[Entry Level 3] × [Condition=PrimeRep]	-384.77	167.47	-713.00	-56.54	5.28	.022
[Entry Level 3] × [Condition=TargetNoRep]	-481.31	184.42	-842.76	-119.86	6.81	.009
[Entry Level 3] × [Condition=TargetRep]	-482.60	161.21	-798.57	-166.63	8.96	.003

Note. B = unstandardised GEE coefficient. Reference categories: Proficiency = Entry Level 3 (set to zero, denoted [a]); Condition = TargetRep (set to zero, denoted [a]). All parameters set to zero are redundant reference categories.

Although the overall interaction effect did not reach statistical significance, exploratory simple-effects analyses were conducted to examine the consistency of observed patterns. Significant proficiency differences were observed within each experimental condition (PrimeNoRep: Wald $\chi^2(2) = 10.15$, $p = .006$; PrimeRep: Wald $\chi^2(2) = 8.31$, $p = .016$; TargetNoRep: Wald $\chi^2(2) = 7.74$, $p = .021$; TargetRep: Wald $\chi^2(2) = 9.71$, $p = .008$), and significant condition effects were observed within each proficiency group (Level 1: Wald $\chi^2(3) = 28.70$, $p < .001$; Level 2: Wald $\chi^2(3) = 37.25$, $p < .001$; Entry Level 3: Wald $\chi^2(3) = 15.26$, $p = .002$). Because the overall interaction was non-significant, these follow-up analyses are treated as exploratory.

3.9 Multiple linear regression analyses

Descriptive statistics for the reaction-time difference scores (ΔRT = Target RT minus Prime RT) used as dependent variables in the regression analyses are presented in Tables 12 and 13 for the combined passive region and the critical verb region, respectively, before the inferential models.

Table 12: Descriptive Statistics for Reaction-Time Difference Scores (ΔRT) in the Combined Passive Region (Words 3–5), in Milliseconds

Proficiency Level	*Lexical Condition*	*n*	*M*	*SD*	*Min*	*Max*
Entry Level 3	Repetition	16	-128.46	174.82	-597.22	193.70
	Non-Repetition	16	-19.35	103.90	-177.42	190.50
Level 1	Repetition	16	-58.39	51.33	-142.52	23.56
	Non-Repetition	16	20.91	43.37	-25.38	157.30
Level 2	Repetition	16	-97.83	92.55	-242.70	74.50
	Non-Repetition	16	58.94	188.83	-181.82	705.62

Note. ΔRT = Target RT minus Prime RT. Negative values indicate faster reading at target relative to prime (facilitation). Values are in milliseconds.

Table 13: Descriptive Statistics for Reaction-Time Difference Scores (ΔRT) at the Critical Verb Region (Word 4), in Milliseconds

Proficiency Level	*Lexical Condition*	*n*	*M*	*SD*	*Min*	*Max*
Entry Level 3	Repetition	16	-75.98	99.22	-291.80	116.20
	Non-Repetition	16	-6.71	78.57	-122.56	199.26
Level 1	Repetition	16	-32.88	37.71	-116.78	29.62
	Non-Repetition	16	25.99	42.59	-29.32	117.64
Level 2	Repetition	16	-50.91	73.42	-208.20	119.30
	Non-Repetition	16	52.21	182.10	-133.64	699.90

Note. ΔRT = Target RT minus Prime RT at Word 4 only. Negative values indicate facilitation at the critical verb. Values are in milliseconds.

3.9.1 Comprehension accuracy regression

A multiple linear regression was conducted to determine whether proficiency level and lexical condition predicted offline comprehension accuracy. The overall model approached but did not reach statistical significance, $F(2, 45) = 2.78$, $p = .067$, $R^2 = .056$, adjusted $R^2 = .036$. Neither proficiency level nor lexical condition significantly predicted comprehension accuracy, indicating that these factors did not strongly differentiate accuracy performance in the current sample.

3.9.2 Reaction-time difference score regression

3.9.2.1 Combined passive region (Words 3–5)

The first regression model used ΔRT for the combined passive region as the dependent variable. The overall model was statistically significant, $F(2, 45) = 12.25$, $p < .001$, $R^2 = .217$, adjusted $R^2 = .200$, Durbin–Watson = 1.90. Lexical condition was the only significant predictor: relative to the repetition condition, the non-repetition condition was associated with a significant increase of 115.06 ms in reaction-time difference scores ($B = 115.06$, $p < .001$), indicating that processing facilitation was substantially reduced when lexical overlap was absent. Neither Level 1 nor Level 2 proficiency significantly predicted reaction-time differences relative to Entry Level 3.

3.9.2.2 Model 2: Critical verb region (Word 4)

The second regression model focused on the critical verb region. The overall model was statistically significant, $F(2, 45) = 8.68$, $p < .001$, $R^2 = .168$, adjusted $R^2 = .150$, Durbin–Watson = 2.36. Inspection of standardised residuals identified two observations with absolute values exceeding 2.0 (Cases 22 and 28). These were retained as they represented genuine participant responses and their removal did not materially alter the results. Consistent with Model 1, lexical condition was the only significant predictor ($B = 77.09$, $p < .001$). Full regression coefficients for both models are presented in Table 14.

Table 14: Multiple Linear Regression Models Predicting Reaction-Time Difference Scores (ΔRT)

Predictor	*B*	*SE*	*β*	*95% CI Lower*	*95% CI Upper*	*p*
Model 1: Combined Region (Words 3–5)						
(Intercept)	-91.14	41.23	—	-174.16	-8.11	< .001
Non-Repetition	115.06	22.33	.55	70.09	160.03	< .001
Level 1	9.33	35.44	.03	-62.02	80.68	.793
Level 2	12.45	35.44	.04	-58.90	83.80	.727
Model 2: Critical Verb Region (Word 4)						
(Intercept)	-58.22	34.11	—	-126.92	10.48	.089
Non-Repetition	77.09	19.55	.47	37.73	116.45	< .001
Level 1	7.22	29.33	.03	-51.84	66.28	.806
Level 2	8.11	29.33	.03	-50.95	67.17	.782

Note. N = 48 for both models. Reference categories: Proficiency = Entry Level 3; Lexical Condition = Repetition. Model 1: $F(2, 45) = 12.25$, $p < .001$, $R^2 = .217$, adjusted $R^2 = .200$. Model 2: $F(2, 45) = 8.68$, $p < .001$, $R^2 = .168$, adjusted $R^2 = .150$. β = standardised coefficient; SE = standard error; CI = confidence interval. Dashes (—) denote intercept terms for which β is not reported.

Overall, the regression analyses demonstrated that lexical repetition was the main factor influencing structural priming across both the combined passive region and the critical verb region. In contrast, proficiency level did not significantly predict priming magnitude, suggesting that the lexical boost effect operated similarly across the proficiency groups examined in this study.

3.10 Discussion

3.10.1 Lexical boost and structural priming

The current study investigated structural priming in comprehension among ESOL learners, focusing on the roles of lexical repetition and proficiency as main factors

potentially influencing online sentence processing. The inferential results revealed a significant main effect of proficiency, Wald $\chi^2(2) = 9.54$, $p = .008$, and a significant main effect of condition, Wald $\chi^2(3) = 34.34$, $p < .001$, demonstrating that both factors independently influence real-time sentence decoding. The interaction between condition and proficiency group was not statistically significant ($p = .065$), indicating that the influence of experimental condition on reading times did not differ reliably across proficiency groups. Critically, the TargetRep versus TargetNoRep pairwise comparison did not reach significance ($p = .300$) in the collapsed GEE model, suggesting that the GEE analysis did not provide statistically significant evidence for a structural priming effect in the target conditions when considered independently of lexical repetition. This finding is therefore interpreted cautiously in the discussion below.

Descriptive statistics indicated a numerical reduction in reading times from prime to target in the repetition condition across all three proficiency levels (see Tables 7 and 8). Similar patterns emerged at the critical verb region (Word 4). Although these descriptive reductions are consistent with processing facilitation following exposure to repeated lexical items, they do not in themselves constitute evidence of structural priming and therefore should not be interpreted independently of the inferential analyses. The GEE analysis examined differences across all four experimental conditions and did not identify a statistically significant difference between TargetRep and TargetNoRep. Consequently, the present findings do not allow a firm conclusion that structural priming occurred independently of lexical repetition.

The regression analyses, however, provide complementary evidence regarding the role of lexical repetition. Lexical condition significantly predicted ΔRT in both Model 1 ($B = 115.06$, $p < .001$) and Model 2 ($B = 77.09$, $p < .001$), demonstrating that participants showed greater prime-to-target facilitation when the lexical verb was repeated than when it changed. These findings therefore provide evidence for a lexical boost effect within the present experimental paradigm, while remaining compatible with, but not independently demonstrating, the operation of structural priming during sentence comprehension.

These findings align with previous research (e.g., Tooley and Bock, 2014; Traxler, Tooley and Pickering, 2014), which has demonstrated that processing facilitation

during sentence comprehension is often strongest when prime and target sentences share the same lexical verb. This pattern has frequently been interpreted as evidence for the lexical boost phenomenon, whereby lexical repetition enhances access to previously activated syntactic representations (Segaert, Wheeldon and Hagoort, 2016). The present findings are consistent with this interpretation, although the current design cannot determine whether the observed facilitation reflects structural priming itself, lexical repetition, or an interaction between the two. Whether the lexical boost stems primarily from residual activation or explicit memory processes remains debated (Lieburg and Bernolet, 2025). According to the residual activation account (Pickering and Branigan, 1998), the lexical boost arises through temporary activation of connections between lexical nodes and combinatorial syntactic representations. Competing theories instead propose that repeated lexical items function as retrieval cues supporting memory-based processing (e.g., Chang, Dell and Bock, 2006; Zhang, Bernolet and Hartsuiker, 2020). Zhang, Bernolet and Hartsuiker (2020), for example, demonstrated that structural priming weakened when participants completed a mathematical distractor task between prime and target, suggesting that short-term memory processes contribute to the observed facilitation. Furthermore, previous research has shown that the lexical boost is typically strongest when prime and target are presented in close succession (Pickering and Garrod, 2019). Because the present study employed a Lag 0 design, in which target sentences immediately followed their corresponding primes, the observed facilitation is compatible with these accounts of short-lived lexical activation.

3.10.2 The role of proficiency

Proficiency emerged as an important factor influencing overall sentence processing, as evidenced by the statistically significant main effect observed in the GEE analysis. Participants in the higher-proficiency groups exhibited shorter reading times than those at Entry Level 3, indicating more efficient online processing of the experimental sentences overall. However, because the present study measured only reaction times and not specific parsing strategies, these differences should be interpreted as reflecting overall processing efficiency instead of syntactic processing alone. Reading speed may also be influenced by broader factors such as lexical

knowledge, reading fluency, processing automaticity, and working memory resources, all of which are likely to develop alongside language proficiency.

The absence of a significant proficiency x condition interaction suggests that the effect of lexical repetition on reading times was broadly comparable across the three proficiency groups. In other words, there was no statistical evidence that proficiency systematically altered the magnitude of the lexical facilitation observed in the repetition condition. This finding indicates that, within the limits of the present sample, lexical repetition appeared to benefit learners across proficiency levels, even though the groups differed in their overall processing speed.

A closer examination of the estimated marginal means nevertheless revealed numerically faster processing among higher-proficiency learners. Although these descriptive differences cannot be interpreted as evidence of differential syntactic processing, they are consistent with previous L2 research suggesting that increased proficiency is often associated with greater automaticity during sentence comprehension (Hartsuiker and Pickering, 2008; Kim and McDonough, 2008; Bernolet, Hartsuiker and Pickering, 2013). The present findings therefore complement previous accounts linking proficiency with increasingly efficient language processing.

The descriptive data also indicated that, in the non-repetition condition, Level 1 and Level 2 participants showed a slight increase in reading time from prime to target, whereas Entry Level 3 participants showed a slight reduction. Because these results did not reach statistical significance, they should be interpreted with considerable caution and should not be regarded as evidence of a proficiency-related interaction. Nevertheless, it may represent a potentially informative trend worthy of future investigation. One possible explanation is offered by usage-based accounts of second language development (Ellis, 2013), which propose that learners gradually progress from reliance on lexically specific representations towards increasingly abstract syntactic representations. Within this framework, lower-proficiency learners may rely more heavily on familiar lexical items, whereas higher-proficiency learners may be more sensitive to changes in lexical input. However, the present data cannot determine whether this interpretation is correct, and alternative explanations remain equally plausible.

These findings are broadly consistent with theoretical accounts proposing that second language learners gradually develop more abstract syntactic representations with increasing experience (Bernolet, Hartsuiker and Pickering, 2013; Wei *et al.,* 2019). At the same time, the present study does not provide direct evidence regarding the nature of those representations, nor does it allow conclusions about the cognitive mechanisms underlying proficiency differences. The conflicting findings reported in previous studies (e.g., Schoonbaert, Hartsuiker and Pickering*,* 2007 versus Bernolet, Hartsuiker and Pickering, 2013) may reflect differences in task design, target constructions, participant populations, or language combinations. The present study contributes to this literature by extending the investigation to online comprehension in ESOL learners, an area that remains comparatively underexplored. Future research using larger samples and treating proficiency as a continuous as opposed to categorical variable would provide a stronger basis for examining how proficiency influences the interaction between lexical repetition and sentence processing.

3.10.3 Comprehension accuracy and task engagement

Comprehension accuracy data contextualise the RT findings by revealing proficiency-related differences in task engagement. Among Entry Level 3 learners, accuracy was relatively low (Repetition: M = 0.72, SD = 0.15; Non-Repetition: M = 0.67, SD = 0.20), contrasting with higher rates reported in prior L2 research (e.g., Weber and Indefrey, 2009; Wei *et al*., 2019). This raises the possibility that observed RT reductions in the repetition condition among lower-proficiency learners may partly reflect facilitated lexical recognition rather than structural priming per se. However, this interpretation remains tentative, as the accuracy difference between conditions is relatively small and does not directly index syntactic processing. Future research should address this limitation by incorporating trial-by-trial comprehension checks or employing eye-tracking, which may better capture syntactic engagement during sentence processing.

By contrast, Level 1 (Repetition: M = 0.81, SD = 0.12; Non-Repetition: M = 0.70, SD = 0.15) and Level 2 (Repetition: M = 0.84, SD = 0.15; Non-Repetition: M = 0.81, SD = 0.15) learners achieved notably higher accuracy. If attention had declined in these

groups, a corresponding drop in comprehension accuracy would be expected; that this was not observed provides partial support for the assumption that higher-proficiency learners were engaged and processing sentences for meaning. Their RT results can therefore more confidently be attributed to structural priming enhanced by a lexical boost insofar as accuracy reflects sustained task engagement, although it cannot fully rule out alternative accounts such as strategic processing or familiarity effects. Together, the RT and accuracy data suggest that priming in comprehension reflects not only processing speed but also the extent to which learners can map structural cues onto meaning, with effectiveness dependent on proficiency level, although this relationship should be interpreted as correlational instead of strictly causal given the design of the study.

3.10.4 Implicit learning vs Explicit memory

The overall findings suggest that ESOL learners exhibit structural priming effects that may be at least partially driven by sensitivity to individual lexical items, consistent with the lexical boost. The presence of priming across proficiency levels, though strongest and most consistent among higher-proficiency participants, is compatible with shared syntactic representations facilitating subsequent processing. From an implicit learning perspective, structural priming reflects a learning mechanism by which repeated exposure to syntactic forms gradually reshapes underlying grammatical representations (Pickering and Ferreira, 2008), as captured by the error-based learning model of Chang, Dell and Bock (2006). However, the enhanced effects observed when lexical items were repeated suggest not necessarily distinct explicit memory processes, but that lexical repetition may increase accessibility of recently activated representations within the processing system (Pickering and Branigan, 1998). Importantly, the present data do not directly distinguish between implicit learning and explicit memory contributions and therefore cannot be taken as evidence for a dual-mechanism interpretation. For lower-proficiency learners, who may lack stable abstract syntactic representations, reliance on familiar lexical items may serve as a compensatory processing strategy that increases reliance on item-based rather than fully abstract representations during processing.

Overall, the findings support the view that both implicit learning and explicit memory processes may interact in contributing to structural priming in L2 learners. The lexical boost does not rule out syntactic learning but suggests that priming may initially rely on lexically specific representations, which may gradually generalise into more abstract structural knowledge with increased exposure and proficiency, instead of strictly developing linearly or uniformly.

3.10.5 Theoretical and pedagogical implications

The current study indicates that implicit learning and explicit memory do not operate as mutually exclusive mechanisms; instead, they may function concurrently, a finding consistent with hybrid accounts such as the multifactorial model (Bernolet, Collina and Hartsuiker, 2016), which proposes a short-lived, lexically mediated mechanism and a longer-term, abstract priming mechanism (Alzahrani, 2022). This dual-mechanism perspective has found support in several empirical studies (e.g., Ferreira and Bock, 2006; Hartsuiker and Pickering, 2008; Shin and Christianson, 2012; Bernolet, Collina and Hartsuiker, 2016). However, the present study provides only indirect support for such a dual-mechanism interpretation, as it cannot separate short-term lexical activation from longer-term structural adaptation.

Pedagogically, the findings suggest that structured repetition of target verbs and constructions within form-focused input, for example, presenting passive sentences with repeated verb forms before asking learners to process or produce similar structures, may have the potential to support syntactic development by building on the lexical -syntactic pairings targeted in priming tasks. This interpretation should be treated as suggestive, given that the study did not directly test instructional effectiveness or long-term learning outcomes. Future studies should vary lexical overlap and examine the long-term persistence of priming effects across proficiency levels to determine whether observed effects arise from transient lexical activation or more stable syntactic adaptation.

In conclusion, structural priming in ESOL contexts appears to involve an interaction between memory-based facilitation and underlying grammatical development, shaped by both task demands and learner proficiency. However, the present findings

are best interpreted as demonstrating patterns of processing facilitation that are consistent with, not direct evidence for, such an interaction. The observed effects suggest that lexical repetition and syntactic structure together influence processing efficiency, but the extent to which this reflects stable learning versus short-term activation cannot be determined from the current data. Considering these results, the next chapter presents a second study conducted in a classroom setting with ESOL learners, which adapts two priming tasks commonly used in laboratory research to investigate whether structural priming can influence learners' comprehension and production of passive constructions.

Chapter 4 Eliciting ESOL Learners' Reading Comprehension and Production of Passive Form Through Priming Activities: a classroom investigation

This chapter presents a classroom-based study that investigates both theoretical and pedagogical dimensions of structural priming in second language learning. Specifically, it examines how structural priming, an established phenomenon in psycholinguistic research, can be applied as an instructional strategy in ESOL classrooms. While much of the existing research has focused on priming effects in controlled experimental settings (see Chapter 2), a growing number of studies have reported learning gains from using structural priming tasks with L2 learners (e.g., McDonough and Kim, 2009; McDonough and Chaikitmongkol, 2010; McDonough and De Vleeschauwer, 2012; Conroy and Antón-Méndez, 2015; Kim *et al*., 2019). These findings point to the potential of structural priming as a pedagogically meaningful tool for supporting syntactic development in classroom settings.

Grounded in prior studies on L2 structural priming (e.g., Kim and McDonough, 2008, 2016; Wei, Kim and Shin, 2022), this study adopted a classroom-based perspective to explore whether a priming intervention could help ESOL learners at Level 1 (CEFR B2) improve their comprehension and production of English passive structures. The learner group was diverse in terms of linguistic backgrounds and literacy levels, reflecting the heterogeneity typical of ESOL classrooms. Level 1 was selected for this study because it marks a transitional stage in which learners can produce clear descriptions and express opinions on familiar topics using some complex forms, while still developing complete mastery of more advanced syntactic structures (Council of Europe). Accordingly, structural priming was introduced as one possible way to complement other instructional strategies in reinforcing syntactic development at this level.

To operationalise the intervention, the study was delivered as an online classroom lesson in which learners carried out activities on screen under teacher guidance. This format ensured a controlled, consistent way to present prime–target sequences while still resembling a typical classroom task. It also allowed learners to receive

repeated exposure to target structures, with fewer potential confounds than might arise in more spontaneous classroom interaction.

Previous research has shown that online classroom activities can support structural priming, though outcomes vary depending on the context and structures examined. For instance, Kim, Skalicky, and Jung (2020) reported that real-time online interaction promoted priming in Korean learners, sometimes exceeding effects found in face-to-face contexts, particularly for direct questions. In contrast, Michel and Stiefenhöfer (2019) observed only minor priming effects for the Spanish subjunctive mood in online text-chat tasks, whereas Coumel (2021) found that chat-based interaction supported priming and learning of multiple syntactic structures among Spanish L1 learners of English. In sum, these findings suggest that screen-based lessons provide a practical and controlled environment for delivering priming tasks, making them a suitable choice for the present study.

The remainder of this chapter is organised as follows. Section 4.1 sets out the research questions guiding the investigation. Section 4.2 describes the methodology of the study, including the research design, pilot study, participants, ethical procedures, participant profile and language background, and the materials and instruments used for data collection. The specific tasks employed in the study are described in Sections 4.2.7–4.2.9, while Sections 4.2.10 and 4.2.11 detail the treatment materials used with the experimental and control groups, respectively. Section 4.3 outlines the study procedure across the pretest, treatment and immediate posttest, and delayed posttest sessions. Section 4.4 describes the scoring procedures and data analysis approach. Section 4.5 presents the results, including the scoring rationale and analyses of the picture-description, priming treatment, picture-matching, and grammaticality judgement tasks. Finally, Section 4.6 discusses the findings in relation to the research questions and the relevant literature.

4.1 Research questions

To determine whether priming tasks from the structural priming paradigm, implemented as a pedagogical instrument, improved ESOL learners' reading comprehension and the production of English passive constructions, this study

measured performance in pretest-priming-posttest conditions across the experimental and control groups. Performance in the pretest was used as a baseline. Performance in the priming session and the immediate posttest was used to detect immediate task-related increase in passive production relative to the baseline tests, and a delayed posttest was used to measure cumulative long-term syntactic learning. Using these measures, the study addresses the following major research questions:

> **RQ1**: To what extent do structural priming tasks implemented in a classroom setting influence ESOL learners' production and grammatical development of English passive constructions?
>
> **RQ2**: To what extent do structural priming tasks facilitate ESOL learners' comprehension of English passive constructions in a classroom setting?

4.2 Method

4.2.1 Research design

The current study employed a pretest–treatment–posttest experimental design with experimental and control groups. Performance in picture-description, picture-matching, and grammaticality judgment tasks at pretest served as a baseline measure for both groups. Performance in the treatment session and subsequent posttests was used to assess immediate target structure use and delayed syntactic learning associated with exposure to structural priming activities.

The study adopted a 2 × 3 mixed factorial design. Group (experimental vs control) was treated as a 2-level between-subjects factor, whereas time (pretest, immediate posttest, and delayed posttest) was treated as a 3-level within-subjects factor. The dependent variables were learners' production, comprehension, and grammatical knowledge of English passive constructions.

Production was measured through picture-description tasks and written summaries completed during the treatment phase. Comprehension was measured using a picture-matching task, and grammatical knowledge was assessed through a grammaticality judgment task (GJT). The target structure was the English passive

voice construction (*be* + past participle, optionally followed by a *by*-phrase) involving reversible passive sentences.

The experimental group received a structural priming treatment consisting of a reading activity containing multiple passive constructions followed by comprehension and production tasks. The control group completed an equivalent activity that differed only in that passive constructions were largely removed from the input text. Both groups completed immediate and delayed posttests using the same measures administered at pretest. Table 1 presents a standardised overview of the experimental design and the exact time allocated to each research activity.

Table 15: Overview of the Experimental Design and Task Durations

Day	Session	Activity	Duration
1	Pretest	Demographic Questionnaire	15 min
		Grammaticality Judgment Task (GJT)	15 min
		Picture-Description Task	15 min
		Picture-Matching Task	15 min
2	Treatment	Reading, Comprehension, and Summary Tasks (4 cycles × 15 min)	60 min
	Immediate Posttest	Grammaticality Judgment Task (GJT)	15 min
		Picture-Description Task	15 min
		Picture-Matching Task	15 min
3	Delayed Posttest	Grammaticality Judgment Task (GJT)	15 min
		Picture-Description Task	15 min
		Picture-Matching Task	15 min

Note: Timing reflects active task engagement per activity. The pretest block (Day 1) includes an additional 15-minute demographic questionnaire window, giving a total session length of 60 minutes. The treatment session (Day 2) lasted 60 minutes, followed immediately by the 45-minute posttest block. The delayed posttest (Day 3) was administered five days after treatment.

4.2.2 Pilot study

A pilot study was conducted before the main experiment. The main purposes were to assess how participants reacted to the general format of the proposed tasks, to verify whether the learners could complete the tasks within the proposed timeframe, and to confirm if implementing the activities via mobile and computer devices was logistically feasible.

Twelve ESOL learners attending a Functional Skills English course participated voluntarily in the pilot study. The participants were representative of the target population and reflected a range of first language and literacy backgrounds. All were enrolled in Level 1 Functional Skills English at the time of data collection. The pilot study took place in a classroom at the participating college and university centre, on a day separate from the participants' regular sessions. Before beginning the tasks,

participants were informed about the study's aims and procedures and signed consent forms (See Appendix 7). Permission to access the participants was obtained from the programme coordinator of the ESOL and Basic Skills Department.

Participants completed a grammaticality judgment task, a picture-matching task, and a picture-description task. The full priming treatment intervention was not administered because the primary objective was to evaluate the practicality and clarity of the research procedures rather than to conduct a full-scale evaluation.

Participants reported no difficulties accessing the online digital platforms used to deliver the tasks. They found the tasks appropriate for their proficiency levels and the platforms user-friendly. However, feedback indicated that the original 10-second time limit used in the picture-matching task was insufficient for accurate sentence processing. Consequently, the time allocation for each item in the picture-matching task was increased to 20 seconds in the main study. No further modifications were required for the materials or procedures.

4.2.3 Participants

A sample of 24 adult ESOL learners was recruited voluntarily from a college and university centre in England, and these 24 participants were randomly allocated to either the experimental or control group. At the time of data collection, all participants were enrolled in Functional Skills English at Level 1 and were attending classes within the ESOL Skills for Life Department. Participants' ages ranged from 18 to over 45 years. All participants completed a demographic questionnaire to provide detailed information about their linguistic and educational backgrounds. None of the participants who took part in this study had participated in the comprehension-based structural priming experiment. Therefore, the two studies involved completely independent samples.

4.2.4 Ethical procedures

The Ethics Committee of York St John University granted ethical approval for this study (Approval Number: ETH2324-0277; 19 April 2024) (see Appendix 8). In

addition, permission to access the participants was obtained from the program coordinator of the ESOL and Basic Skills Department (see Appendix 9). Before the study began, all learners received written information sheets (see Appendix 10) and signed informed consent forms (see Appendix 11).

Participants were clearly informed that their participation was completely voluntary and that they could withdraw at any stage without any penalty. To protect the participants, strict confidentiality and anonymity were maintained throughout the study. No identifying personal information was included in the final dataset. The signed consent forms were stored securely on a password-protected university server, and they will be destroyed in accordance with institutional guidelines.

4.2.5 Participant profile and language background

Following the completion of the informed consent protocol, participants individually completed a comprehensive demographic and language background questionnaire to build a participant profile. This instrument systematically gathered data regarding the learners' educational backgrounds, native and auxiliary languages, and residency periods in the United Kingdom.

According to the questionnaire data, the number of active languages spoken by the participants ranged from 2 to 4. Length of residency within the United Kingdom ranged from a minimum of 1 year to a maximum of over 8 years. Similarly, formal instructional exposure to the English language in a classroom setting varied from 1 year to over 8 years. This notable variation reflects the heterogeneous educational backgrounds and diverse histories that characterise modern adult ESOL programmes. Table 16 and Table 17 detail the comprehensive sample characterisation matrix and L1 background distributions, respectively.

Table 16: Sample characterisation matrix

Descriptive Category	*Experimental Group (n = 12)*	*Control Group (n = 12)*	*Total Cohort (n= 24)*
Age Range Profile (Years)			
18–24	7	5	12
25–34	3	4	7
35–44	1	2	3
> 45	1	1	2
Years Residing in the UK			
1–4 years	10	11	21
5–8 years	1	0	1
> 8 years	1	1	2
Formal English Education			
1–4 years	8	11	19
5–8 years	3	0	3
> 8 years	1	1	2

Note. All metrics represent individual self-reported frequency counts derived from the intake language background profile assessment.

Table 17: L1 First Language Background of Sample Cohort

Native Language (L1) Background	*Experimental Group (n = 12)*	*Control Group (n = 12)*	*Total Frequency (n = 24)*
Dari	4	3	7
Farsi	2	1	3
Kurdish	1	2	3
Ukrainian	2	1	3
Pashto	1	1	2
Polish	0	2	2
Arabic	1	0	1
Hungarian	0	1	1
Romanian	0	1	1
Spanish	1	0	1
Total	12	12	24

Note. The frequency data illustrate the primary native language backgrounds reported by the participants during the initial baseline session.

4.2.6 Materials and instruments

To maintain a learning environment that closely reflected participants' typical classroom experiences, all materials were developed using digital platforms already familiar to the learners, including Padlet, Kahoot, Microsoft Forms, and Microsoft Teams. Stimulus pictures were obtained from freely available online sources through Google Image Search. Some stimulus sentences and target verbs were adapted from previous structural priming research (Kim and McDonough, 2008, 2016; Wei, Kim and Shin, 2022), while additional materials were developed specifically for the present study. The reading materials used during the treatment phase were adapted from a Level 1 ESOL course textbook.

Three instruments were used to assess learners' comprehension, production, and grammatical knowledge of English passive constructions: a grammaticality judgment task, a picture-matching task, and a picture-description task. The treatment phase additionally included reading-comprehension and summary-writing activities designed to elicit production of the target structure.

4.2.7 Grammaticality judgment task

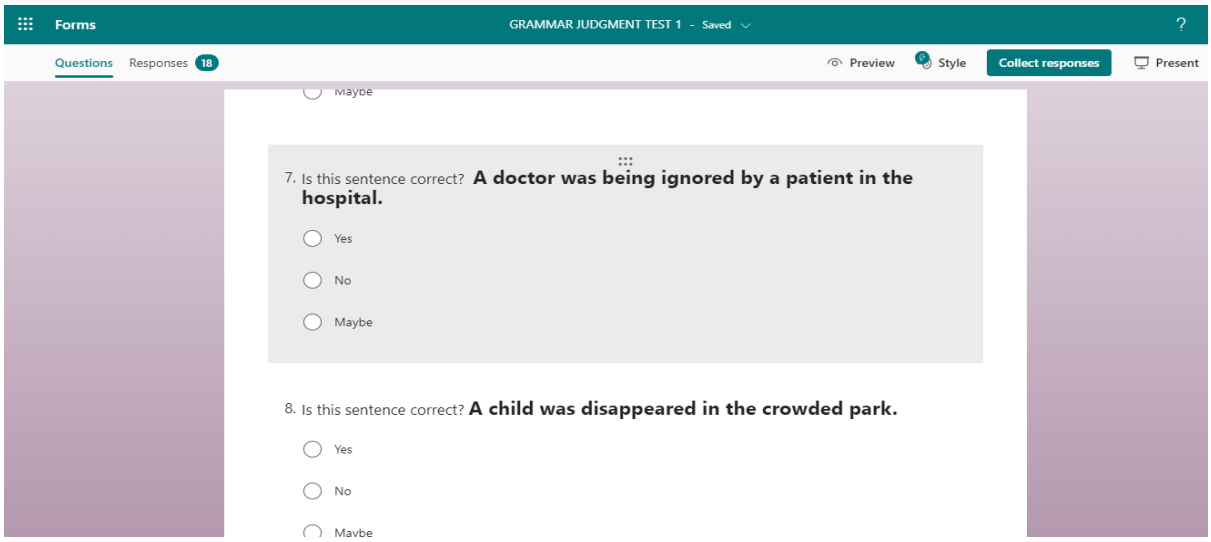
The grammaticality judgment task (GJT) was designed to measure learners' receptive grammatical knowledge of English passive constructions before and after the intervention. Three parallel versions were developed for administration at pretest, immediate posttest, and delayed posttest.

Each version consisted of 22 items: 12 critical items, 8 filler items, and 2 practice items. The critical items comprised six grammatical passive sentences and six ungrammatical passive sentences. To minimise participants' awareness of the target structure, passive items were interspersed with filler sentences. The complete set of stimuli is provided in Appendix 12.

The task was administered through Microsoft Forms and completed individually using classroom laptops or mobile devices. Participants judged each sentence by selecting one of three response options: *Yes* (grammatical), *No* (ungrammatical), or

Maybe (when they were uncertain of the answer). Figure 2 illustrates a sample of the GJT trial.

Figure 2: Grammaticality Judgment Test. Example of grammatical and ungrammatical stimuli



4.2.8 Picture-matching task

The picture-matching task was designed to assess learners' comprehension of English passive constructions. Following Kim and McDonough (2016), each test consisted of 30 items: 20 critical passive items, 8 filler items, and 2 practice items. The complete set of stimuli is provided in Appendix 13.

For each critical item, participants viewed a picture accompanied by a passive sentence and indicated whether the sentence accurately described the image. Half of the critical items required a *True* response and half required a *False* response. Filler items followed the same format but contained active sentences with relative clauses.

To control the plausibility of the depicted events, all agents and patients were animate nouns. Based on findings from the pilot study, participants were given exactly 20 seconds to process each picture and sentence combination. The task was administered through Kahoot and completed individually using mobile devices. Figure 3 represents a sample comprehension item.

Figure 3: Stimuli in the picture matching test used in the pre- and posttests



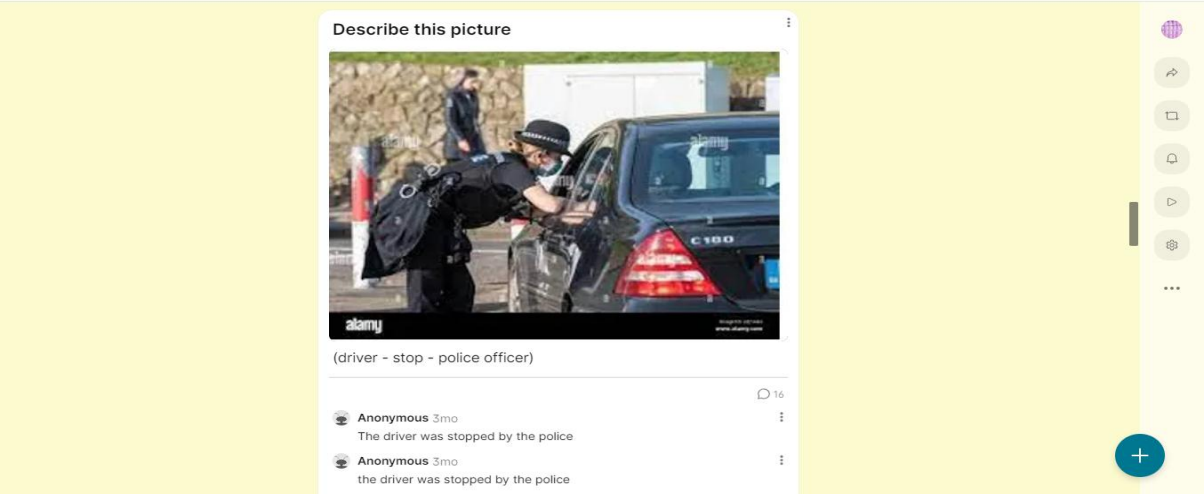
4.2.9 Picture-description task

The picture-description task was designed to measure learners' production of English passive constructions. The task was administered through Padlet and involved learner–researcher interaction.

Each version contained 16 pictures depicting transitive events. Eight pictures were followed by passive prime sentences, and eight were followed only by a target verb. Participants were instructed to write a sentence describing each picture using the words provided. Although target items could be described using either active or passive constructions, the task was designed to encourage production of passive structures while still allowing natural language use.

To facilitate comparisons across test phases, stimulus pictures were matched across pretest, immediate posttest, and delayed posttest. The same target verbs were used across corresponding items, while visual details such as agents and patients were modified to minimise repetition effects and reduce reliance on explicit memory. Following Conroy (2013), maintaining verb consistency across test phases helped control for potential verb-specific preferences in sentence production. The complete set of stimuli is presented in Appendix 14. Figure 4 shows an example of the picture description interface.

Figure 4: Stimuli in the picture description task used in the pre- and posttest.



4.2.10 Treatment materials: experimental group

The experimental treatment consisted of a reading-comprehension and summary-writing activity designed to provide repeated exposure to passive constructions while eliciting meaningful language production. Participants read a text consisting of approximately 660 words divided into four paragraphs. The text was adapted from a Level 1 ESOL coursebook and manipulated to include 28 passive constructions distributed evenly across the four sections (See Appendix 15).

Participants received one paragraph at a time in printed format. After reading each paragraph, they returned the text to the researcher and completed six comprehension questions using Microsoft Forms. Five questions targeted factual information from the text, while one invited participants to provide a personal opinion. After answering the questions, learners completed a short written summary directly in the digital form using four nouns and four verbs provided as prompts. This procedure was repeated for all four paragraphs, resulting in a total of 24 comprehension questions and four summary-writing tasks.

Importantly, participants did not have access to the original text while answering the comprehension questions or writing their summaries. This procedure was implemented to encourage learners to rely on their memory and internal representations of the text rather than copying linguistic forms directly from the

stimulus material. Table 18 shows a structural overview of the items distributed across the treatment phase.

Table 18: Overview of Experimental Group Treatment Content Distribution

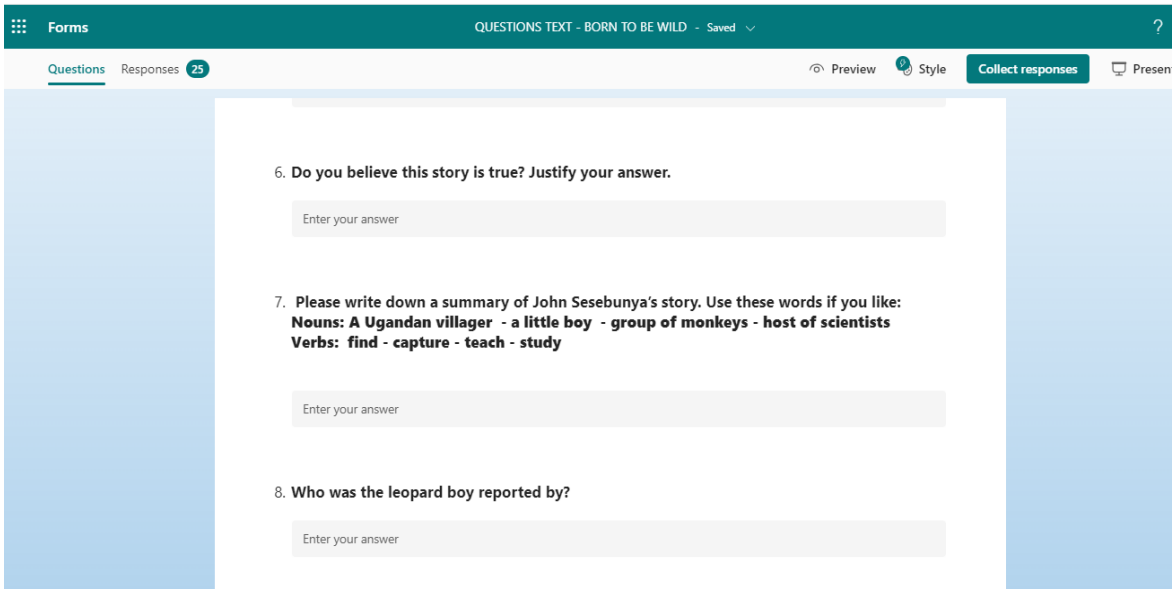
Total Paragraphs Covered	*Comprehension Questions per Paragraph*	*Production Summaries per Paragraph*	*Total Items Administered*
1	6	1	7
1	6	1	7
1	6	1	7
1	6	1	7
4	24	4	28

An example paragraph excerpt from the experimental group treatment is provided below:

> One day in 1991, a Ugandan villager called Milly Sebba went further than usual in search of firewood and came across a little boy with a group of monkeys. She summoned help and the boy was captured and brought back to Milly's village. The boy was identified by a villager as John Sesebunya, who was last seen by his family in 1998 at the age of two or three. Later, John claimed that he had got into the forest and that he remembered being offered roots and nuts by a pack of five monkeys. He also says that he was taught to search for food and to climb trees. John has been studied by a host of scientists, who are convinced that he was brought up by monkeys and that he is a genuine feral child. When left with a group of monkeys, he avoids eye contact and approaches them from the side with open palms, just as monkeys do. (Text adapted from FCE Result. Oxford University Press, 2012).

Figure 5 illustrates the layout of the comprehension and summary prompts used in this treatment block.

Figure 5: Sample comprehension and production interface used during the treatment stage



4.2.11 Treatment materials: control group

The control group completed the same sequence of reading, comprehension, and summary-writing activities as the experimental group. The procedures, number of questions, summary prompts, and timing were identical across groups.

The only difference between conditions was the linguistic content of the reading passages. Whereas the experimental texts contained multiple passive constructions, the control texts were modified to minimise passive voice usage and present information primarily through active constructions. This design ensured that any differences observed between groups could be attributed to exposure to passive constructions during the treatment phase rather than to differences in task format, content, or procedure.

An example paragraph excerpt from the control group treatment is provided below:

> One day in 1991, a Ugandan villager called Milly Sebba went further than usual in search of firewood and came across a little boy with a group of monkeys. She summoned help and some villagers captured the boy and brought him back to Milly's village. A villager identified the boy as John Sesebunya, who was last seen in 1998 at the age of two or three. Later, John

claimed that he had got into the forest and that he remembered monkeys coming up to him and offering roots and nuts. He also says they taught him to search for food and to climb trees. A host of scientists have studied the boy and they are convinced that he is a genuine feral child. When left with a group of monkeys he avoids eye contact and approaches them from the side with open palms, just as monkeys do. (Text adapted from FCE Result. Oxford University Press, 2012).

4.3 Procedure

The study followed a pretest–treatment–posttest design and was conducted over three sessions across seven days. The procedure was identical for the experimental and control groups except for the priming manipulation implemented during the treatment session. Participants were informed that the study investigated how classroom activities involving reading, picture description, and sentence comprehension might support English language development. They were not informed that the study specifically targeted passive constructions.

4.3.1 Day 1: Pretest session

The active pretest tasks lasted approximately 45 minutes (plus an initial 15-minute demographic administration window) and were conducted in a classroom equipped with laptops and internet access.

At the beginning of the session, participants were welcomed by the researcher, provided with an information sheet explaining the purpose of the study, and asked to sign a consent form. Participants then completed the demographic questionnaire, collecting information about their age, educational background, first language, and previous English language learning experiences. This preliminary intake stage required approximately 15 minutes.

Following completion of the questionnaire, participants completed the grammaticality judgment task (GJT) using Microsoft Forms. The researcher explained that they

would read a series of sentences and decide whether each sentence was grammatical, ungrammatical, or whether they were unsure. Participants completed the task individually without discussing their answers with peers. The GJT required exactly 15 minutes.

Participants then completed the picture-description task through Padlet. Before beginning the activity, the researcher demonstrated how to access the platform and explained that they would see pictures accompanied by either a model sentence or a target verb. Participants were instructed to write a sentence describing each picture using the words provided. The task required exactly 15 minutes.

The final activity was the picture-matching task administered through Kahoot. Participants were informed that they would view pictures accompanied by sentences and would need to decide whether each sentence accurately described the image. All participants were already familiar with Kahoot from their regular classroom activities. The task required exactly 15 minutes to complete. Throughout the session, participants worked individually and were not permitted to discuss their responses with classmates.

4.3.2 Day 2: Treatment session and immediate posttest

The treatment session took place two days after the pretest, and the combined sequence lasted approximately 1 hour and 45 minutes (60 minutes for treatment + 45 minutes for the immediate posttest block).

At the beginning of the session, participants engaged in a brief introductory discussion about sentence structure in English. Examples of active and passive constructions were presented to illustrate differences in sentence organisation. However, no explicit instruction regarding passive formation was provided, and participants were not informed that the study focused on passive constructions.

Participants were then introduced to the reading-comprehension and summary-writing activity. The researcher explained that they would read a text divided into four sections and complete comprehension and writing activities after each section.

Participants completed all activities individually using laptops available in the classroom.

The reading text was presented one paragraph at a time. Participants first read a paragraph at their own pace. Once they had finished reading, they returned the printed paragraph to the researcher. Participants were therefore unable to consult the original text while completing subsequent tasks.

After returning the text, participants answered six comprehension questions using Microsoft Forms. Five questions assessed understanding of factual information presented in the passage, whereas one question invited participants to express an opinion related to the content.

Following completion of the comprehension questions, participants completed a summary-writing activity. Learners were provided with four nouns and four verbs extracted from the text and were instructed to write a short summary of the paragraph they had read. Because the original text was no longer available, participants were required to rely on memory when producing their summaries.

This sequence of reading, returning the text, answering comprehension questions, and writing a summary was repeated four times, once for each paragraph. Across the complete treatment session, participants answered 24 comprehension questions and produced four written summaries. The treatment activity lasted exactly 60 minutes (allotting approximately 15 minutes per paragraph cycle).

The experimental and control groups completed identical procedures. The only difference between groups concerned the linguistic content of the reading passages. The experimental group received texts containing multiple passive constructions, whereas the control group received texts in which passive constructions had been largely replaced by active alternatives. Participants were permitted to ask the researcher questions about vocabulary meanings or sentence comprehension during the reading activity. However, no grammatical explanations were provided, and no feedback was given regarding passive constructions.

Immediately following completion of the treatment session, participants completed the immediate posttest. The posttest followed the same sequence as the pretest and consisted of a grammaticality judgment task (15 minutes), a picture-description task

(15 minutes), and a picture-matching task (15 minutes). Parallel versions of the instruments were used to minimise practice effects while maintaining comparability across testing phases. The immediate posttest required approximately 45 minutes to complete.

4.3.3 Day 3: Delayed posttest

The delayed posttest was administered five days after the treatment session and followed the same standardised procedures as the pretest and immediate posttest stages.

Participants completed the grammaticality judgment task (15 minutes), followed by the picture-description task (15 minutes) and the picture-matching task (15 minutes). The researcher reminded participants of the instructions for each activity but did not provide any feedback concerning previous performance. As in earlier sessions, participants worked individually and were not permitted to discuss responses with classmates. The delayed posttest required approximately 45 minutes to complete.

Table 19 provides a fully standardised chronological overview of all experimental steps, operational intervals, and procedural scopes across the timeline of the study.

Table 19: Chronology of Experimental Stages

Phase	*Day/Timing*	*Activities*	*Duration*	*Assessment focus*
Phase	Day/Timing	Activities	Duration	Assessment focus
1 – Pretest	Day 1	Informed consent & demographic questionnaire; GJT; Picture-Description Task; Picture-Matching Task	60 min	Baseline grammatical knowledge; baseline production and comprehension of passives
2 – Treatment	Day 2	Per cycle (×4): read paragraph → return text to researcher → 6 comprehension questions (Microsoft Forms) → summary writing from memory (4 nouns + 4 verbs provided)	60 min	Structural priming exposure; passive production from memory
3 – Immediate Posttest	Day 2 (post-treatment)	GJT; Picture-Description Task; Picture-Matching Task	45 min	Immediate gains in grammatical knowledge, production, and comprehension
4 – Delayed Posttest	Day 3 (5 days later)	GJT; Picture-Description Task; Picture-Matching Task	45 min	Retention of treatment effects

Note. GJT = Grammaticality Judgment Task. IPT = Immediate Posttest. DPT = Delayed Posttest. The delayed posttest was administered five days after the treatment session. Both groups followed identical procedures; groups differed only in the linguistic content of reading passages (passive-rich vs. active-rewritten).

4.4 Scoring and data analysis

This study addressed two research questions: (1) To what extent do structural priming tasks implemented in a classroom setting influence ESOL learners' production and grammatical development of English passive constructions? (2) To what extent do structural priming tasks facilitate ESOL learners' comprehension of English passive constructions?

To evaluate the impact of the intervention, a 2 × 3 factorial analysis of variance (ANOVA) was conducted for each dependent measure, with test phase (pretest,

immediate posttest, and delayed posttest) as the within-subjects factor and group (experimental vs control) as the between-subjects factor. Where the overall effect test for the time factor reached significance, post hoc pairwise comparisons were conducted. For the production ANOVA, Least Significant Difference (LSD) corrections were applied to pairwise comparisons of test phases; for the comprehension and GJT analyses, Bonferroni corrections were applied. Data from the treatment session were analysed using an independent-samples t-test to compare passive production between groups.

Prior to all analyses, the assumption of homogeneity of error variances was tested using Levene's test. Normality of the sample was assessed, and the absence of significant outliers was verified. The significance level was set at $\alpha = .05$. All analyses were performed in SPSS version 29.0 (IBM, Greenville, SC).

4.5 Results

4.5.1 Picture-description task: Scoring rationale

In the picture-description task, although each version contained 16 items in total (8 primes and 8 targets), only the 8 target items, which were accompanied solely by a target verb and no structural model, were scored for the production analysis. This yielded a total of 24 analysed target sentences per participant across the three test phases (8 sentences per participant per session). The 8 prime items were excluded entirely from the production score to ensure that high passive rates reflected internalised syntactic choices rather than immediate structural copying. Responses on the target items were scored for the production of passive constructions, defined as a sentence containing the pattern: patient-subject + auxiliary verb + past participle (optionally followed by *by* + *agent*). Morphological errors related to tense, aspect, number agreement, or spelling were not treated as disqualifying features. Following Pickering and Branigan (1998), such elements are not central to structural priming, as they do not affect the syntactic frame being activated. However, incomplete responses or sentences in active voice were excluded from analysis. Some examples of acceptable ill-formed passives included:

• The pupil *was praising by* the teacher;

• The girl *being told off by* her father.

This lenient scoring approach is consistent with previous L2 structural priming research (Conroy, 2013; Wei, Kim and Shin, 2022).

4.5.2 Picture-description task: production analysis

Each participant produced 8 sentences per session (96 per group per session; 288 per group total across three sessions). Table 6 presents the frequency and proportion of passive constructions produced by each group at each test phase.

Table 20: Frequency and Proportion of Passive Constructions in the Picture-Description Task

Group	*Phase*	*Passives n (%)*	*Active/Other n*	*Total sentences*	*% Passive*
Experimental	Pretest	40 (41.7%)	56	96	41.7%
	Immediate posttest	78 (81.3%)	18	96	81.3%
	Delayed posttest	91 (94.8%)	5	96	94.8%
Control	Pretest	36 (37.5%)	60	96	37.5%
	Immediate posttest	76 (79.2%)	20	96	79.2%
	Delayed posttest	84 (87.5%)	12	96	87.5%

Note. Proportions are calculated as passives / total sentences per group per phase (96 sentences per group per phase).

Table 21 presents descriptive statistics (means and standard deviations of percentage-correct scores) for the production measure prior to inferential testing.

Table 21: Descriptive Statistics for Production Scores by Group and Test Phase

Group	*Phase*	*M*	*SD*	*n*	*Minimum*	*Maximum*
Experimental	Pretest	54.25	31.14	12		
	Immediate posttest	65.75	21.38	12	10	100
	Delayed posttest	91.83	9.66	12		
Control	Pretest	68.00	23.49	12		
	Immediate posttest	60.75	22.44	12	13	88
	Delayed posttest	80.50	8.50	12		

Note. Scores represent the percentage of passive constructions produced out of total sentences. SD = standard deviation.

Before the ANOVA, Levene's test of equality of error variances was conducted. Results indicated a violation of the homogeneity assumption, $F(5, 66) = 4.43$, $p = .002$, suggesting that error variances differed across cells. This finding should be interpreted with caution; where possible, results are discussed with reference to the observed pattern of means and effect sizes.

A 2 x 3 factorial ANOVA on production scores revealed a statistically significant main effect of test phase, $F(2, 66) = 10.49$, $p < .001$, $\eta^2p = .241$, indicating that overall passive production changed significantly across the three test points. The main effect of group was not significant, $F(1, 66) = 0.03$, $p = .862$, $\eta^2p = .000$, nor was the Group × Test Phase interaction, $F(2, 66) = 2.31$, $p = .107$, $\eta^2p = .066$. These results indicate that, while passive production increased significantly across time for the sample as a whole, the rate of change did not differ significantly between the experimental and control groups at the group level.

Post hoc pairwise comparisons (LSD) on the time main effect indicated that delayed posttest scores ($M = 86.17$, $SD = 10.61$) were significantly higher than both pretest scores ($M = 61.13$, $SD = 27.87$; mean difference = 25.04, $p < .001$) and immediate posttest scores ($M = 63.25$, $SD = 21.59$; mean difference = 22.92, $p < .001$). The difference between pretest and immediate posttest was not significant (mean difference = −2.13, $p = .727$). The Tukey B homogeneous subsets procedure confirmed that the pretest and immediate posttest formed one subset, with the delayed posttest forming a separate, higher subset.

4.5.3 Priming treatment session analysis

In the priming treatment session, participants wrote four summaries of stories they had read. Each participant, therefore, produced four written texts. Passive constructions were identified and coded manually by the researcher. An inspection of raw results suggested qualitative differences between groups in passive production. Table 22 presents mean word counts per participant per summary to contextualise the production data.

Table 22: Word Count per Participant per Summary (with Group Means)

	S1 Exp	*S1 Con*	*S2 Exp*	*S2 Con*	*S3 Exp*	*S3 Con*	*S4 Exp*	*S4 Con*
1	60	29	45	42	65	39	66	50
2	31	42	31	31	21	26	27	35
3	52	30	40	33	41	27	33	30
4	37	24	42	31	44	24	30	24
5	20	28	37	40	44	44	27	31
6	20	13	46	50	45	72	30	30
7	35	58	45	56	43	48	30	62
8	37	80	45	96	44	98	30	29
9	30	33	45	34	40	11	32	43
10	30	26	37	56	27	57	34	30
11	23	18	33	37	44	31	34	30
12	45	66	37	79	31	61	40	45
M	35.00	35.58	40.25	49.58	37.42	44.50	32.08	34.92

Note. S = Summary. Exp = Experimental group; Con = Control group. Row M = mean word count per group per summary across 12 participants.

Table 23 presents the frequency and proportion of passive constructions produced by each group across the four summaries.

Table 23: Passive Construction Production by Group in the Treatment Session: Frequencies and Proportions

Summary	*Exp passives (n)*	*Exp total sent.*	*Exp proportion*	*Con passives (n)*	*Con total sent.*	*Con proportion*
1	15	48	0.31	12	48	0.25
2	24	48	0.50	10	48	0.21
3	15	48	0.31	2	48	0.04
4	44	48	0.92	12	48	0.25
Total	98	192	0.51	36	192	0.19

Note. Total sentences = 4 summaries × 12 participants = 48 sentences per group per summary. Proportions = passives / total sentences.

An independent-samples t-test was conducted to compare passive production during the treatment phase. Levene's test indicated homogeneity of variance, $F(1, 22) = 0.08$, $p = .781$; therefore, equal variances were assumed. Table 24 presents descriptive statistics and inferential results.

Table 24: Independent-Samples t-Test: Passive Production in the Treatment Session

Group	*M*	*SD*	*t*	*df*	*p*	*Cohen's d*	*Hedges' g*
Experimental	9.25	3.47	5.02	22	< .001	2.05	1.98
Control	2.83	2.76					

Note. M = mean number of passive constructions per participant across four summaries; SD = standard deviation; Cohen's d and Hedges' g are effect size estimates. Hedges' g corrects for small sample size and is preferred for n < 20 per group.

Independent-Samples t-Test: Passive Production in the Treatment Session. Hedges' g corrects for small sample size and is preferred for n < 20 per group.

Results revealed a statistically significant difference between the experimental group ($M = 9.25$, $SD = 3.47$) and the control group ($M = 2.83$, $SD = 2.76$), $t(22) = 5.02$, $p < .001$, mean difference = 6.42, 95% CI [3.76, 9.07]. The effect size was large (Cohen's $d = 2.05$; Hedges' $g = 1.98$), indicating that the priming treatment substantially increased the production of passive constructions relative to the control condition.

4.5.4 Picture-matching task: comprehension analysis

The picture-matching task consisted of 20 critical items per test phase (10 requiring a 'yes' response, 10 requiring 'no'), for a total of 60 items per participant across three phases. Descriptive statistics for comprehension scores (percentage correct) are presented in Table 25 before inferential testing.

Table 25: Descriptive Statistics for Comprehension Scores by Group and Test Phase

Group	*Phase*	*M (%)*	*SD*	*n*	Minimum	Maximum
Experimental	Pretest	66.75	11.23	12		
	Immediate posttest	79.67	8.80	12	52	90
	Delayed posttest	83.58	5.14	12		
Control	Pretest	64.25	4.26	12		
	Immediate posttest	73.17	4.21	12	54	82
	Delayed posttest	75.50	4.07	12		

Note. M = mean percentage correct; SD = standard deviation.

Levene's test of equality of error variances was significant, $F(5, 66) = 7.575$, $p < .001$, indicating that the homogeneity of variance assumption was violated. However, given that group sizes were equal across cells (n = 12 per cell), the ANOVA is considered reasonably robust to this violation, and results should be interpreted accordingly. A 2 x 3 Factorial ANOVA revealed a significant main effect of group, $F(1, 66) = 9.994$, $p = .002$, $\eta^2p = .131$, indicating that the experimental group (M = 76.67%) outperformed the control group (M = 70.97%) overall. There was also a significant main effect of test phase, $F(2, 66) = 22.334$, $p < .001$, $\eta^2p = .403$, indicating that comprehension improved significantly across the three test points. The Group × Test Phase interaction was not significant, $F(2, 66) = 0.851$, $p = .432$, $\eta^2p = .025$, suggesting that, although both groups improved, the rate of change across test phases did not differ significantly between groups.

Bonferroni-adjusted pairwise comparisons for the time main effect indicated that pretest scores (M = 65.50%) were significantly lower than both immediate posttest scores (M = 76.42%; mean difference = −10.92, $p < .001$) and delayed posttest scores (M = 79.54%; mean difference = −14.04, $p < .001$). The difference between

the immediate and delayed posttest was not significant (mean difference = −3.13, p = .484), suggesting that comprehension gains were largely achieved by the immediate posttest and maintained thereafter.

4.5.5 Grammaticality judgement task analysis

The GJT comprised 12 critical items per session (6 grammatical, 6 ungrammatical passive constructions), for a total of 36 items per participant across three sessions. Responses were scored as correct acceptances of grammatical sentences and correct rejections of ungrammatical ones, following Gutierrez (2013). 'Maybe' responses and missing data were excluded from accuracy calculations. Table 26 presents descriptive statistics.

Table 26: Descriptive Statistics for Grammaticality Judgement Scores (score_grammar) by Group and Test Phase

Group	*Phase*	*M (%)*	*SD*	*n*	*Minimum*	*Maximum*
Experimental	Pretest	45.80	9.06	12		
	Immediate posttest	65.93	19.61	12	16.6	91.6
	Delayed posttest	54.82	18.62	12		
Control	Pretest	59.00	13.50	12		
	Immediate posttest	59.69	17.70	12	0.0	83.3
	Delayed posttest	59.00	25.47	12		

Note. M = mean percentage correct; SD = standard deviation.

In terms of descriptive patterns, the experimental group showed an increase in accuracy of 20.13 percentage points from pretest to immediate posttest, followed by a decline of 11.11 percentage points from immediate to delayed posttest, suggesting that gains in metalinguistic sensitivity may not have been fully retained. The control group's performance remained comparatively stable across all three phases (range: 0.69 percentage points), indicating limited development in grammatical sensitivity to passive constructions over the study period.

Levene's test of equality of error variances was non-significant, $F(5, 66) = 1.943$, $p = .099$, indicating that the homogeneity of variance assumption was met. A 2 x3

factorial ANOVA revealed no statistically significant main effect of group, $F(1, 66) = 0.759$, $p = .387$, $\eta^2p = .011$, indicating that overall GJT performance did not differ significantly between the experimental group (M = 55.52%, SD = 18.04) and the control group (M = 59.23%, SD = 18.98). The main effect of test phase was also non-significant, $F(2, 66) = 2.002$, $p = .143$, $\eta^2p = .057$, as was the Group × Test Phase interaction, $F(2, 66) = 1.738$, $p = .184$, $\eta^2p = .050$. As the overall analysis for the time factor did not reach significance, post hoc comparisons were not conducted. These findings suggest that the intervention did not produce a statistically significant or sustained group-level effect on explicit grammatical knowledge of passive constructions as measured by the GJT.

4.6 Discussion

This section discusses the key findings of the classroom-based study regarding the impact of structural priming tasks on ESOL learners' development of English passive constructions. The discussion is organised into four subsections: (4.6.1) production of passives in the posttest phases, (4.6.2) passive production during the priming treatment session, (4.6.3) comprehension of passives, and (4.6.4) development of grammatical knowledge as measured by the grammaticality judgement task (GJT). Each subsection examines the findings in the light of relevant theoretical frameworks and previous research before considering the pedagogical implications. Limitations relevant to each finding are addressed within the corresponding subsection, rather than in a separate section. The final part of the discussion (4.6.5) returns to the two research questions.

Overall, the results suggest a differentiated pattern of syntactic performance and performance outcomes. Exposure to priming tasks produced a clear increase in passive production during the treatment session itself and yielded significant and lasting improvements in comprehension. By contrast, effects on posttest production and metalinguistic judgement were not statistically significant at the group level. The following sections discuss each of these findings in turn.

4.6.1 Posttest production of passive constructions

With respect to learners' production of English passive forms in the picture-description posttests, passive production increased significantly across the three test phases for the sample as a whole. However, neither the group effect nor the group × time interaction reached significance, indicating that although both groups increased their use of passive forms over time, the rate and pattern of that change did not differ significantly between the experimental and control conditions. It should be noted that Levene's test indicated a violation of the homogeneity of error variances assumption, and findings from this analysis should therefore be interpreted with appropriate caution.

Post hoc pairwise comparisons on the time main effect showed that delayed posttest scores were significantly higher than both pretest scores and immediate posttest scores, while the difference between pretest and immediate posttest was not significant. This pattern suggests that gains in passive production were consolidated over time rather than emerging immediately following the intervention, and that this trajectory was broadly similar across both groups.

The absence of a significant group effect in the posttest data is consistent with findings from several previous L2 structural priming studies, which have noted that brief interventions do not always produce lasting group-level differences in production (McDonough and Chaikitmongkol, 2010; Conroy, 2013; Coumel, 2021). One possible explanation is that participants at Level 1 already possessed some familiarity with passive constructions, limiting the additional benefit the experimental group could gain from the intervention. The treatment period may also have been too brief for differential gains to emerge and consolidate into detectable posttest differences. In addition, the relatively small sample size (n = 12 per group) reduced statistical power, making it harder to detect modest treatment effects.

A further consideration concerns the design of the picture-description task itself. In half of the target pictures, the patient noun was visually prominent, appearing as the most salient entity in the image. This feature may have promoted passive sentence construction in both groups by increasing the conceptual accessibility of the patient as a subject candidate. The conceptual accessibility hypothesis (Bock and Warren,

1985; Bock, 1986) proposes that grammatical function assignment is influenced by the relative ease with which lexical concepts can be retrieved and the animacy or salience of referents (Christianson and Ferreira, 2005). When patients are particularly salient, speakers are more likely to assign them to the subject position, thereby producing passive constructions even in the absence of explicit priming (Chang, 2002). If this interpretation holds, the task design may have elevated passive production rates in both groups, reducing the visible distance between them in the posttests. This does not invalidate the findings, but it is an important contextual factor in interpreting the equivalence of the two groups' posttest trajectories.

Finally, it is worth noting that both groups showed significant improvement between the immediate and delayed posttests. While this pattern cannot be attributed conclusively to the priming intervention, given the non-significant group effect, the mechanisms driving this delayed gain may differ between conditions. The experimental group's repeated engagement with passive constructions through meaning-focused priming tasks is consistent with usage-based accounts of implicit learning, in which syntactic knowledge consolidates gradually through frequent and meaningful encounters with target patterns (Ellis, 2002; Bybee, 2010). The control group's improvement, by contrast, may reflect incidental learning arising from task repetition, increased familiarity with the testing format, or general classroom exposure. These interpretations remain speculative, however, and the quantitative data alone cannot distinguish between them.

4.6.2 Passive production in tasks during the treatment session

In marked contrast to the posttest production results, analysis of passive production during the priming treatment session itself revealed a large and statistically significant group difference. The experimental group produced substantially more passives than the control group, with the experimental group producing approximately 2.7 times as many passive constructions overall. These word counts were broadly comparable across groups, confirming that the production difference was not a result of differential text length.

This finding is consistent with a large body of L2 structural priming research demonstrating that exposure to target syntactic structures through written input and

output tasks can reliably increase production of those structures in the short term (Kim and McDonough, 2008; McDonough, Crawford and Mackey, 2015; Hopp *et al.,* 2025). Unlike McDonough, Crawford and Mackey (2015), who reported no significant prime effect on individual written passive tasks, the present findings indicate that the experimental group's written production was meaningfully modified by the priming stimuli they received. The size of the effect was notably large, suggesting that the treatment had a strong immediate impact on the syntactic choices learners made during free writing.

The central interpretive question is why this strong treatment-session effect did not translate into a detectable advantage for the experimental group in the subsequent posttests. Several mechanisms may account for this dissociation. First, it is possible that the online processing effect was primarily short-lived, facilitating passive production through temporary activation of the relevant syntactic frame (Pickering and Ferreira, 2008) without producing lasting restructuring of the learners' interlanguage. Short-term priming of this kind is well-documented in both L1 and L2 research and does not necessarily imply durable learning (Bock, 1986; Hartsuiker and Kolk, 1998).

Second, the collaborative features of the web-based task platform may have contributed to passive production during the treatment session through mechanisms that differ from priming in the strict sense. Participants were able to revise their responses and, in some cases, view peers' output on a shared screen. Such exposure could have reinforced target-structure use through peer scaffolding or collaborative noticing (Schmidt, 1990; Swain, 2005), processes that operate at the level of social learning rather than individual syntactic processing. While these interactions represent a genuine pedagogical gain, they may have inflated production rates during the treatment session, specifically, without necessarily contributing to the more independent posttest performance.

Third, as a speculative interpretation of within-task continuity, self-priming may have played a role in sustaining passive production across the four summaries. Research suggests that speakers are more likely to reproduce syntactic structures they have recently generated themselves than structures produced by others (Gries, 2005; Konopka and Bock, 2009; Jacobs, Cho and Watson, 2019). As the experimental

group produced more passives in earlier summaries, they may have reinforced their own tendency to use passives in subsequent ones, amplifying the observed group difference within the treatment session. This mechanism, while theoretically plausible, was not directly measured in the present study and therefore remains an interpretation rather than an established finding.

From a usage-based perspective (Ellis, 2002; Bybee, 2010; Tomasello, 2003), the treatment session results align with the prediction that frequent, meaningful engagement with a target structure in contextualised communicative tasks supports procedural activation more effectively than decontextualised drills. The striking contrast between the experimental group's treatment-session performance (approximately 2.7 times more passives than the control group) and their posttest performance (a non-significant mean difference of less than one percentage point) highlights both the power of in-context priming and its limitations as a mechanism for producing durable free-production gains within a brief intervention.

4.6.3 Comprehension of passive constructions

The comprehension findings indicate an overall performance advantage for the experimental group, though the nature of this advantage requires cautious interpretation. The experimental group outperformed the control group overall across the three test phases, and comprehension accuracy increased substantially across testing points for the sample as a whole. The group effect reflects a consistent advantage for the experimental group in overall comprehension level. This advantage does not indicate a differential improvement trajectory, as the rate of change over time did not differ significantly between conditions. Because the group x time interaction was not statistically significant, this main effect of group cannot be definitively interpreted as differential learning caused by the intervention. Statistically, it remains equally possible that the experimental group possessed a non-significant numerical advantage at baseline that was sustained throughout the study, meaning the group variance could partially reflect a baseline difference instead of pure treatment-induced growth.

Pairwise comparisons for the time main effect showed that pretest accuracy was significantly lower than both the immediate posttest and the delayed posttest, while the difference between the immediate and delayed posttest was not significant, suggesting that comprehension gains were largely consolidated by the immediate posttest and maintained rather than further increased one week later. The experimental group's descriptive trajectory (pretest M = 66.75%, immediate posttest M = 79.67%, delayed posttest M = 83.58%) and the control group's trajectory (pretest M = 64.25%, immediate M = 73.17%, delayed M = 75.50%) both show improvement, with the experimental group maintaining a higher absolute level at each time point.

These findings provide empirical support for the pedagogical application of structural priming as a means of facilitating syntactic comprehension, extending previous work conducted in laboratory settings (Kim and McDonough, 2016) to a classroom context. The significant and sustained group effect suggests that the intervention produced durable comprehension gains rather than merely temporary facilitation. This interpretation is consistent with findings reported by Kim and McDonough (2016), who observed that gains in both comprehension and production were maintained two weeks after the intervention in a sample of Korean EFL learners, supporting the view that classroom-based priming can support lasting syntactic development.

Theoretically, these results align with error-based implicit learning models (Chang, Dell and Bock, 2006, 2012; Dell and Chang, 2014), which propose that syntactic representations are gradually refined through prediction error during language processing. Under this account, repeated exposure to passive constructions during the treatment session would have generated prediction errors whenever learners' internal syntactic expectations differed from the input they encountered, thereby strengthening the form-meaning mappings associated with English passive syntax over successive trials. This process would explain why the experimental group demonstrated superior comprehension accuracy not only immediately after the intervention but also one week later, consistent with a gradual updating of syntactic representations rather than a purely temporary activation effect (Pickering and Ferreira, 2008; Pickering and Gambi, 2018).

It should be noted, however, that the picture-matching task employed here measures accuracy on a written comprehension task and does not directly capture the speed or automaticity of syntactic processing. The claim that gains reflect specifically implicit learning mechanisms must therefore be treated with caution: the present task design does not allow implicit and explicit learning processes to be distinguished, as improved accuracy could in principle reflect more conscious application of structural knowledge as well as more automatic processing. A timed comprehension task or a response-time measure would have provided stronger evidence for automatised syntactic processing. Future research should incorporate such measures to clarify the nature of the comprehension gains observed here.

The contrast between the present classroom-based findings and those of the laboratory study reported in Chapter 3 is instructive. The data suggest that effects vary depending on whether priming is measured online or embedded in instruction. In the laboratory setting, the reading-time sensitivity to priming appeared closely tied to lexical overlap, consistent with a lexicalist account in which short-term activation of specific lexical representations drives facilitation. In the classroom, different task contexts gave rise to different observable outcomes; richer semantic and communicative contexts appear to have supported a more durable and generalised improvement in comprehension accuracy. These two patterns are not mutually exclusive: lexical activation may serve as an initial mechanism through which syntactic representations are accessed and refined, with repeated exposure in meaningful contexts then enabling greater consolidation. This synthesis suggests that the two studies are complementary, with the laboratory findings illuminating the cognitive mechanisms of priming and the classroom findings demonstrating its pedagogical potential.

4.6.4 Grammaticality judgement task

The GJT findings indicate that the priming intervention did not produce a significant improvement in learners' metalinguistic judgement of passive constructions. Neither the group effect, the main effect of the test phase, nor the group × time interaction reached significance, and post hoc comparisons were therefore not conducted.

These findings indicate that neither group showed statistically reliable development in grammatical sensitivity to passive constructions over the course of the study.

Numerically, however, the two groups showed noticeably different patterns. The control group maintained relatively stable accuracy across all three phases (pretest M = 59.00%, immediate posttest M = 59.69%, delayed posttest M = 59.00%), suggesting minimal change in grammatical knowledge of the target structure regardless of condition. The experimental group, by contrast, showed an increase of 20.13 percentage points from pretest (M = 45.80%) to immediate posttest (M = 65.93%), followed by a decline of 11.11 percentage points to the delayed posttest (M = 54.82%). This non-linear pattern, an initial gain that was only partially retained, is noteworthy despite its failure to reach statistical significance and requires careful interpretation.

The transient nature of the experimental group's descriptive gains is consistent with findings reported by Shin and Christianson (2012) and Coumel (2021), who observed similarly limited and unstable GJT gains following priming activities and argued that such tasks tap into receptive and metalinguistic knowledge rather than the implicit processing skills that structural priming is more likely to influence. Wei, Kim and Shin (2022) further note that the development of abstract syntactic knowledge in L2 learners requires prolonged and consistent exposure, which cannot be achieved within the scope of a brief classroom intervention. The present results align with this view: the short-lived descriptive improvement in the experimental group may reflect a temporary heightening of attention to form during and immediately after the treatment, rather than genuine consolidation of abstract syntactic knowledge.

This interpretation is supported by the distinction between procedural and declarative language knowledge (DeKeyser, 2007). Structural priming tasks primarily engage procedural mechanisms, the implicit activation and reuse of syntactic frames in context, and are less likely to directly strengthen the declarative, rule-based knowledge that underlies performance on decontextualised metalinguistic tasks such as the GJT. The fact that the experimental group showed improved passive production in context (both in the treatment session and descriptively in the posttests) while failing to show sustained GJT gains is consistent with this theoretical

account, suggesting that the intervention strengthened procedural but not declarative knowledge of the target structure.

A further methodological consideration is that the GJT used in the present study was untimed. Research in instructed SLA suggests that untimed grammaticality judgements primarily measure explicit metalinguistic knowledge, as participants have sufficient opportunity for conscious rule application (Ellis, 2005). A timed GJT would more directly assess implicit syntactic processing by preventing deliberate rule access and might therefore have been more sensitive to priming-induced changes in underlying syntactic representations. The absence of GJT gains in the present study may thus partly reflect a mismatch between the implicit learning processes that priming promotes and the explicit knowledge that the untimed task measures, rather than an absence of any syntactic development.

4.6.5 Responses to the research questions

Returning to the two research questions that guided this study: with respect to RQ1: to what extent do structural priming tasks influence ESOL learners' production and grammatical development of English passive constructions? The findings suggest a dissociation between short-term and longer-term effects. During the treatment session, the intervention produced a large and significant increase in passive production, demonstrating that priming tasks can effectively elicit the target structure in a communicative context. However, this advantage did not persist at the group level in the posttests, and the GJT showed no significant improvement. The intervention therefore appears to have strengthened procedural use of passives in context without producing equivalent gains in posttest production or metalinguistic knowledge, at least within the timeframe of the present study.

With respect to **RQ2**: to what extent do structural priming tasks facilitate ESOL learners' comprehension of English passive constructions? The evidence is more clearly positive. The experimental group demonstrated significantly higher comprehension accuracy overall ($p = .002$, $\eta^2_p = .131$), and gains were maintained at the delayed posttest one week later. This finding indicates that even a brief, classroom-based structural priming intervention can produce measurable and lasting

improvements in the comprehension of a target syntactic structure. Overall, the two findings suggest that structural priming is a promising but contextually sensitive pedagogical tool: most effective when embedded in meaning-focused communicative tasks and evaluated through comprehension-based measures, and likely to be more productive when sustained over a longer period or repeated across multiple sessions.

This chapter has detailed the key findings of the classroom-based study and considered their theoretical and pedagogical implications. The following and final chapter provides a general discussion of the thesis as a whole, synthesising the findings from both studies, reflecting on their contributions to second language acquisition research and ESOL pedagogy, and outlining directions for future research.

Chapter 5 General Discussion

This chapter presents the key findings from the two empirical studies conducted for this thesis. It discusses their contribution to our understanding of structural priming in second language learning and explores its implications for L2 pedagogy. The chapter then considers how structural priming can be integrated into language teaching practice. Finally, it addresses certain limitations of the investigations that may have influenced the conclusions and outlines potential directions for future research.

5.1 Overview of the findings

This thesis investigated the effects of structural priming on the comprehension and production of passive constructions by ESOL learners, with a particular focus on understanding how implicit syntactic learning mechanisms observed in laboratory contexts can be applied in pedagogical practice. Psycholinguistic research has provided substantial evidence that structural priming reflects a learning mechanism that can gradually strengthen learners' abstract syntactic representations (Pickering and Ferreira, 2008; Hartsuiker and Bernolet, 2017), favouring syntactic knowledge that is essential for grammatical competence and fluent language use (McDonough and Trofimovich, 2009). The research was motivated by my experience as an ESOL tutor, where I observed firsthand the difficulties learners face in acquiring and using complex syntactic structures despite repeated exposure and practice in classroom settings. It was also informed by the observation that, although structural priming has been extensively studied in L1 contexts, its role in L2 comprehension and classroom learning environments remains less well understood.

Although research findings have contributed significantly to psycholinguistic theory, most previous studies have examined priming primarily as a theoretical phenomenon in language production, leaving important questions about its role in comprehension and its potential pedagogical applications in L2 classrooms unanswered. L2 research has also tended to focus on homogeneous L2 learner groups, overlooking how priming mechanisms may operate across different proficiency levels and in

classroom-based learning environments that bring together learners from varied language backgrounds. Thus, this thesis sought to investigate two key gaps: the limited understanding of how structural priming functions during L2 sentence comprehension and the lack of empirical research testing whether priming-based tasks can be effectively integrated into instructional settings to promote both implicit and explicit aspects of grammatical development.

To address these gaps, the thesis comprised two complementary studies. A self-paced reading study investigated whether structural priming occurs during L2 comprehension. ESOL learners across three proficiency levels read prime and target sentences in the passive voice, and reaction times were measured to assess facilitation effects. The findings revealed that learners exhibited structural priming in comprehension, evidenced by faster reading times for target sentences following structurally similar primes. However, these effects were lexically mediated: priming was stronger when the main verb was repeated across prime and target sentences, consistent with the residual activation account, which proposes that recently activated lexical and syntactic representations remain temporarily accessible, facilitating the reuse of familiar structures (Pickering and Branigan, 1998). In the context of L2 comprehension, such reliance on lexical overlap may reflect the development of structural representations that are not yet fully abstract (Hartsuiker and Bernolet, 2017). Thus, the findings support a hybrid account of structural priming (Bernolet, Collina and Hartsuiker, 2016), in which both short-term activation and long-term implicit learning contribute to priming effects, depending on task demands and the strength of learners' syntactic representations. The pedagogical implications of these findings are significant, as they suggest that repeated exposure to target structures can facilitate comprehension even among less proficient learners.

Across the two studies, a theoretical interpretation emerges in which structural priming in L2 comprehension is best understood within a hybrid framework combining short-term activation processes and longer-term adaptation mechanisms. Structural repetition and lexical overlap can be interpreted as increasing the accessibility of recently processed lexical–syntactic configurations, without requiring a strict separation between implicit learning and explicit memory systems. While models of residual activation and error-based learning provide useful accounts of how priming effects may arise and develop over time (Pickering and Branigan, 1998;

Chang, Dell and Bock, 2006; Pickering and Ferreira, 2008), the present findings do not allow these mechanisms to be directly separated. Instead, the results indicate that priming effects are sensitive to both lexical repetition and learner proficiency, suggesting an interaction between item-based processing facilitation and the gradual strengthening of syntactic representations. Accordingly, claims about underlying learning mechanisms should be interpreted as theoretically informed explanations and not as direct empirical demonstrations, with priming effects reflecting both immediate processing dynamics and potentially longer-term changes in representational accessibility.

The classroom-based study extended this investigation into a classroom context, exploring whether repeated engagement with structural priming tasks could enhance learners' comprehension and production of passive constructions and contribute to their explicit grammatical awareness. The intervention involved activities modelled on priming paradigms but adapted for classroom use with an experimental and a control group. The results demonstrated that learners in the experimental group showed measurable gains in both comprehension and production of passives, whereas improvements in explicit grammatical knowledge were less evident. These findings suggest that structural priming supports the implicit proceduralisation of syntactic knowledge, helping learners internalise form-meaning mappings through repeated exposure and use. However, the limited effects on explicit knowledge indicate that implicit learning mechanisms alone may not suffice to foster metalinguistic understanding, which may require complementary forms of explicit instruction.

Overall, the findings from both studies contribute to theoretical and pedagogical debates in SLA by showing that structural priming can shape both L2 comprehension and production. They also provide empirical evidence for the role of lexical repetition in facilitating syntactic processing and offer a perspective into how priming-based tasks can be adapted to classroom settings. By linking laboratory-based psycholinguistic research with classroom practice, this thesis advances understanding of how implicit learning mechanisms may support syntactic development in instructed L2 contexts.

The following discussion elaborates on these theoretical and practical implications. It examines how the findings inform current models of structural priming and implicit learning, considers the pedagogical potential of priming-based activities for language instruction, and reflects on the limitations and future directions of this research.

5.2 Theoretical implications

The findings of this thesis provide important theoretical insights into the nature of structural priming and its role in second-language syntactic learning. They contribute to ongoing debates about whether structural priming reflects transient activation of recently processed structures or constitutes a mechanism of implicit learning that promotes long-term changes in syntactic representations (Chang, Dell and Bock, 2006; Pickering and Ferreira, 2008; Hartsuiker and Bernolet, 2017). By examining both comprehension and classroom-based priming effects among ESOL learners, this research extends psycholinguistic accounts of priming to contexts that more closely reflect authentic language use and pedagogical practice.

Although the two studies presented in this thesis approached structural priming from different methodological and pedagogical perspectives, their combined findings indicate that priming operates at multiple levels of L2 processing and learning. On the one hand, priming functions as an online psycholinguistic mechanism that facilitates the processing of recently encountered structures during comprehension. On the other hand, repeated exposure and production opportunities may contribute to longer-term adaptation and the development of L2 grammatical knowledge. Together, these findings support usage-based perspectives of language learning in which repeated experience with linguistic structures strengthens syntactic representations over time.

5.3 Modality-specific mechanisms: comprehension vs production and Usage-Based perspectives on structural priming

The findings from the two studies reported in this thesis draw attention to an important but frequently under-researched distinction in the structural priming literature: the mechanisms by which priming operates are not identical across

modalities. Although structural priming is often treated as a single, uniform phenomenon, the experimental evidence presented here suggests that comprehension-based and production-based priming are driven by overlapping but distinct cognitive processes. This section addresses that distinction directly to provide a more complete cognitive account of the results, before situating those findings within the broader framework of usage-based linguistics.

5.3.1 Mechanisms in comprehension

In comprehension, structural priming is understood as a facilitation effect arising from the predictive and incremental nature of syntactic parsing (Pickering and Ferreira, 2008). As a reader or listener processes a prime sentence, the syntactic frame associated with the target construction, in this case, the English passive, is activated. When a subsequent target sentence uses the same structural frame, the cost of parsing is reduced because the relevant syntactic predictions are already available (Pickering and Ferreira, 2008). The self-paced reading data from the first study are consistent with this account. Specifically, reading times in the critical passive region were numerically lower for target sentences in the repetition condition than in the non-repetition condition across all three proficiency groups. Regression analyses confirmed that lexical overlap was the main predictor of processing facilitation. Under the residual activation account (Pickering and Branigan, 1998), this facilitation occurs because shared lexical items maintain connections to combinatorial syntactic nodes, keeping the passive frame partially pre-activated in working memory. Consequently, the parser experiences less resistance when it encounters the same syntactic structure, leading to the faster reading times observed in the self-paced reading study.

A complementary account can be drawn from expectation-based models of sentence comprehension. Levy (2008) proposed that processing difficulty is determined by the surprisal of incoming input: structures that are less expected given prior context require greater processing effort. Building on this, Jaeger and Snider (2013) extended the surprisal framework specifically to structural priming, arguing that language users continuously adjust their syntactic expectations in response to prediction error. It is this adaptation mechanism that most directly explains the

comprehension facilitation observed in the present data, differently from Levy's moment-to-moment surprisal alone. For example, the repeated exposure to passive constructions observed during the treatment session in the classroom-based study would have incrementally raised the probability assigned to that structure, reducing surprisal and producing the lasting comprehension advantage observed at delayed posttest.

Essentially, this expectation-updating process is assumed to be implicit, occurring through exposure alone without requiring explicit attention to grammatical form (Jaeger and Snider, 2013). It should be noted that the error-based implicit learning model (Chang, Dell and Bock, 2006; Dell and Chang, 2014), whilst influential in explaining production priming, was originally developed to account for adaptation within the production planning system and is typically not extended straightforwardly to comprehension (e.g. in contrast to comprehension-based accounts such as Levy, 2008; Jaeger and Snider, 2013).

It is important to acknowledge, however, that the present thesis measured comprehension priming through two distinct methods: online reaction times in the self-paced reading paradigm (Study 1) and offline comprehension accuracy in the classroom pre- and posttests (Study 2). These two measures capture different aspects of syntactic processing. Reaction time data reflect moment-by-moment parsing facilitation, whereas accuracy data tap into the consolidation of syntactic knowledge into longer-term representations. The divergence between these measures, facilitation in processing that does not always translate to durable accuracy gains, is theoretically significant and points to the need to distinguish between facilitation at the level of parsing and the deeper entrenchment of form–meaning mappings that produce lasting comprehension competence.

The inclusion of the grammaticality judgment task (GJT) also allowed the findings of the present classroom study to be situated alongside previous structural priming research that has incorporated explicit grammatical measures (e.g., Shin and Christianson, 2012; Kim and McDonough, 2008, 2016; Wei, Kim and Shin, 2022). Consistent with those studies, gains in explicit grammatical knowledge were more limited than improvements observed in production and comprehension measures. This result indicates that exposure to structurally primed input and repeated use of

target constructions may facilitate procedural adaptation and performance without necessarily producing immediate changes in learners' explicit metalinguistic representations. The relatively stable GJT scores may not indicate that learning was absent; it may reflect the possibility that structural priming influences knowledge that is not fully accessible through conscious grammatical judgement. The GJT findings therefore provide an important comparative point: they support previous observations that priming-based instruction may affect different dimensions of grammatical development in irregular ways, and that explicit knowledge measures do not always capture subtle changes in emerging syntactic representations.

5.3.2 Mechanisms in production

The mechanisms underlying production-based priming operate along related but distinct lines. In sentence production, a speaker must not only represent the syntactic structure of an intended message but also select and perform a structural frame during planning. Structural priming in production has traditionally been explained through syntactic persistence: the idea that a structural choice, once made, temporarily lowers the threshold for making that same choice again (Bock, 1986). This process operates at the level of abstract syntactic representation, independently of the specific lexical items involved. In the classroom study, the large and significant group difference in passive production during the priming treatment session provides evidence of syntactic persistence. The experimental group produced approximately 2.7 times as many passives as the control group (Cohen's d = 2.05), indicating that learners exposed to passive-rich input were substantially more likely to produce passive constructions in their own writing.

A key difference between production and comprehension priming concerns the role of self-priming. Research suggests that speakers are more readily primed by structures they have recently produced themselves than by structures they have merely encountered in the input (Gries, 2005; Konopka and Bock, 2009; Jacobs, Cho and Watson, 2019). In particular, Jacobs, Cho and Watson (2019) provide additional evidence that self-produced utterances lead to stronger subsequent structural facilitation than externally perceived primes, reinforcing the claim that production-based activation has a more durable effect on syntactic accessibility. This

self-priming advantage is understood to arise because producing a structure requires the speaker to actively select and execute a syntactic frame, not merely parse one; this active re-selection reinforces the amount of activation needed to select the same structure again, contributing to syntactic persistence (Segaert *et al.,* 2012).

The progressive increase in passive production observed across the four summary tasks in the treatment session is consistent with this account: as learners produced more passive constructions in each successive summary, those productions served as additional primes for subsequent output, generating a cumulative self-priming cycle. The fourth summary yielded the highest proportion of passives in the experimental group (0.92), consistent with self-priming accumulating over successive production cycles. It should be noted, however, that the present findings complicate any simple claim that production priming produces inherently more durable learning than comprehension priming. The pattern observed here shows the opposite: comprehension gains were maintained at the delayed posttest, while production priming did not persist beyond the treatment session. This suggests that, in the present design at least, the implicit expectation-updating that drives comprehension learning may produce representations that are more resistant to decay than the threshold-reduction mechanism that drives within-session production priming. This finding is consistent with Tooley, Traxler and Swaab (2009) observation that comprehension priming can be as durable as production priming over longer intervals, and it demonstrates the importance of not assuming a uniform relationship between modality and priming durability.

It should also be noted that the production data in the present thesis derive from written summary tasks following exposure to priming-enriched reading input, that is, from a cross-modal priming design in which comprehension-based primes drove subsequent production. This cross-modal element is theoretically important. Within-modal production-to-production priming is typically understood to operate through the repeated selection of the same abstract syntactic frame during sentence planning, which directly reinforces the procedural representation responsible for frame selection (Bock, 1986; Hartsuiker and Kolk, 1998). Cross-modal priming, by contrast, involves activating a syntactic structure during comprehension, a process that does not engage the production planning system in the same procedural way, and then requiring that structure to be retrieved and executed in a subsequent

production task (Pickering and Ferreira, 2008). Because the structural representation activated during comprehension parsing has not been rehearsed through the same procedural planning mechanism as production-generated primes, cross-modal priming may rely more heavily on the residual activation of abstract syntactic nodes than on the direct strengthening of production planning routines (Pickering and Ferreira, 2008). The strong production effects observed during treatment, despite this cross-modal constraint, suggest that the density of passive exposure in the reading texts was sufficient to activate the passive construction schema strongly enough to influence subsequent written production. The absence of a persistent group effect at the delayed production posttest is consistent with this interpretation: cross-modal priming that operates primarily through residual activation would be expected to decay more rapidly than within-modal production priming that strengthens procedural planning representations directly.

The lexical boost operates differently across the two modalities, although it is present in both. In comprehension (Study 1), repeating the same lexical verb in both the prime and target sentences produced stronger processing facilitation, consistent with the view that shared lexical items activate overlapping syntactic nodes and thereby reduce parsing effort (Pickering and Branigan, 1998; Segaert, Wheeldon and Hagoort, 2016). In production, the lexical boost is understood to work through the retrieval of lemma-specific syntactic frames during sentence planning: when a speaker retrieves a verb that was recently used in a passive construction, they are more likely to select the passive frame again because it is associated with that specific lemma in long-term memory (Pickering and Branigan, 1998; Hartsuiker and Pickering, 2008). The design of the second study did not permit a direct test of the lexical boost in production, as the treatment input exposed learners to a range of different passive verbs rather than controlling for the repetition of specific lemmas. Nevertheless, the substantial production advantage observed in the experimental group is consistent with a broader lexical-structural priming effect, where exposure to multiple passive prime sentences activates the passive construction schema more generally.

The contrast between the two studies also reveals a theoretically important divergence in how durable priming effects are across modalities. Comprehension priming in the first study was both significant and maintained at the delayed posttest.

This matches the view that repeated exposure to a syntactic structure in a meaningful communicative context produces lasting updates to syntactic representations (Pickering and Ferreira, 2008; Chang, 2002). Conversely, while production priming during the treatment session was large, this advantage did not translate into a detectable group difference in the posttest production task. This pattern is consistent with findings in the broader L2 structural priming literature (McDonough and Chaikitmongkol, 2010; Coumel, 2021), which note that short-lived, procedurally driven production priming does not necessarily produce durable changes in learners' free production. It also suggests that comprehension-based consolidation, which operates through implicit learning mechanisms over successive trials, may transfer to new contexts more easily than in-session production priming driven by residual activation. This modality-specific asymmetry in durability has direct implications for how priming-based pedagogy is designed and evaluated: the type of priming targeted, receptive or productive, should determine both the task format and the outcome measures used to assess learning.

5.3.3 A Usage-Based linguistic framework: construction grammar and language representation

The results of both studies can be interpreted not only within psycholinguistic accounts of structural priming but also through the theoretical lens of usage-based linguistics (UBL), and in particular, Construction Grammar (CG). Instead of serving as a simple addition to the psycholinguistic results, a usage-based framework offers a separate and justified explanation for major tendencies in this thesis. Specifically, it explains the impact of lexical overlap and the different priming effects observed across the studies. As such, UBL and psycholinguistic accounts are treated here as co-equal explanatory frameworks that inform different aspects of the same findings.

Usage-based models of language hold that grammatical knowledge is not innate, it is emergent (Tomasello, 2003), developing through the discovery of patterns across many real instances of language use (Ellis and Cadierno, 2009; Bybee, 2010). The models do not view syntax as a set of formal rules that apply to abstract words, they propose that linguistic knowledge consists of constructions, conventionalised pairings of form and meaning that range from fully specific idioms to abstract

structural patterns. Within Construction Grammar specifically (Goldberg, 1995, 2006; Hoffmann and Trousdale, 2013), the passive voice is not generated by applying a transformational rule to an active sentence. Instead, it is represented as a distinct argument-structure construction with its own semantic and pragmatic content, independently of the meaning contributed by the verb that fills it. As Croft (2001) and Goldberg (2006) make clear in their treatments of argument structure constructions, the English passive construction has a characteristic meaning: it profiles the patient argument as the grammatical subject and optionally demotes or suppresses the agent. This meaning is a property of the construction as a whole, not derived from the active counterpart by rule. From a pedagogical standpoint, this means that acquiring the English passive requires learners to build a distinct form–meaning representation for the construction as an independent unit, not as simply learning to apply a syntactic rearrangement rule to active sentences.

A central prediction of Construction Grammar that is directly relevant to the findings of this thesis is that constructions are learned and represented along a continuum of schematicity, a scale from fully specific, item-based representations to fully abstract, productive patterns (Langacker, 2008). At one end of this scale are stored, lexically specific instances (such as the conventionalised phrase ‘’The letter was written by hand’’). At the other end are fully abstract schemas (such as [NP be V-en (by NP)]) that can be used productively with new verbs and arguments. This continuum maps directly onto developmental patterns in L2 acquisition. Earlier stages of learning are characterised by item-based, lexically dependent representations; as learners gain more experience with the target language, these specific instances gradually give way to more abstract, generalisable constructions (Gries and Wulff, 2005; Ellis, 2002).

This developmental prediction provides a principled explanation for the lexical boost effect observed in the self-paced reading study. If lexical boost effects reflect greater reliance on lexically specific representations of the English passive, rather than a fully abstract constructional schema, then priming should be stronger when prime and target sentences share the same verb, because the repeated verb serves as a retrieval cue for the specific stored instance. As proficiency increases and more abstract representations develop, structural priming should depend less on lexical identity, since the abstract construction itself can be activated by the prime and it is

not dependent on any specific verb. The findings of the first study are compatible with this interpretation: descriptively, the lexical boost effect appeared numerically larger among Entry Level 3 participants, suggesting greater reliance on item-based representations among lower-proficiency learners. It should be noted, however, that no significant interaction between proficiency and lexical condition was observed, which means that these descriptive patterns cannot be treated as confirmatory evidence. The null result is an important boundary on the UBL claims that can be made here: the data are consistent with a usage-based developmental account but do not provide direct statistical support for it. This distinction between compatibility and confirmation should be maintained throughout the interpretation.

The concept of entrenchment in UBL (Bybee, 2010; Schmid, 2020) also provides a principled account of the lasting comprehension gains observed in the classroom study. In usage-based models, a construction becomes progressively more deeply established in the mind the more frequently and consistently it is encountered in meaningful contexts. Every encounter with the passive construction activates and incrementally strengthens that specific form-meaning pairing. In the classroom study, the experimental group was exposed to 28 passive constructions across four reading paragraphs and immediately completed summary-writing tasks that required active retrieval of passive forms. Under a usage-based account, this concentrated, meaningful exposure may create the conditions necessary to begin increasing the entrenchment of the construction in the learner's developing interlanguage grammar. The maintenance of comprehension gains at delayed posttest is compatible with the gradual and cumulative nature of entrenchment, and it distinguishes this pattern from what would be expected from short-term residual activation alone, which would be expected to decay within minutes to hours.

Proficiency differences observed across both studies also align with the usage-based concept of form-meaning mapping strength (Ellis, 2007; Ellis, 2013). In UBL, proficiency does not simply mean the size of a learner's vocabulary or the number of rules they have learned; it reflects how reliably and automatically a learner can activate existing form–meaning pairings in context. Lower-proficiency learners in the first study (Entry Level 3) showed longer overall reading times and a greater sensitivity to lexical repetition, consistent with less robust and automatic passive representations. Higher-proficiency learners (Level 2) processed the passive region

more quickly across all conditions, consistent with more entrenched and automatically accessible representations. These patterns align with Ellis's (2002) account of how frequency of exposure drives the gradual abstraction and automation of constructional knowledge in L2 acquisition.

Finally, a usage-based perspective offers a productive reframing of the relationship between structural priming and language learning that connects the findings of both studies. From a Construction Grammar viewpoint, structural priming is not merely a transient processing effect but also a mechanism through which form-meaning mappings are incrementally updated and strengthened with each encounter. The psycholinguistic distinction between residual activation (a short-term effect) and implicit learning (a longer-term effect) maps onto the usage-based distinction between the temporary activation of a stored instance and the gradual entrenchment of a construction through repeated experience. Under this synthesis, the comprehension gains observed in the classroom study may reflect the early stages of constructional entrenchment, while the temporary production priming during treatment reflects short-term activation that was insufficient, in the present single-session context, to produce durable changes in learners' independent production. The implication for pedagogy is that priming-based tasks are most likely to produce lasting learning when they provide repeated, distributed, and meaningful encounters with the target construction over time, allowing entrenchment to accumulate gradually rather than peaking and dissipating within a single session.

The contrast between the two modalities suggests that structural priming should not necessarily be treated as a unitary mechanism operating identically across comprehension and production (e.g., Branigan & Pickering, 2017; Pickering and Ferreira, 2008). The findings are more consistent with a view in which shared syntactic representations, where they exist, are accessed through modality-specific processing systems. In comprehension, priming may influence incremental parsing and expectation updating (e.g., Arai *et al.,* 2007; Tooley *et al.,* 2009), whereas in production it may influence syntactic frame selection and sentence planning (e.g., Bock and Griffin, 2000; Chang *et al.,* 2006). The persistence of comprehension gains alongside the disappearance of the production advantage in the present study further suggests that processing facilitation and longer-term adaptation cannot be assumed to have identical temporal profiles across modalities. From a usage-based

perspective, this distinction is compatible with the possibility that repeated encounters strengthen constructional representations (e.g., Gries & Wulff, 2005; Ellis, 2002), while the observable consequences of such strengthening depend on how the construction is accessed and measured in a particular modality.

5.4 Pedagogical implications

The findings of both studies have several implications for second language teaching in ESOL contexts and for language pedagogy more broadly. This section consolidates these implications into an integrated discussion, beginning with the evidence base for priming-based pedagogy in general, before considering its position within established pedagogical frameworks, including Task-Based Language Teaching (TBLT), Presentation–Practice–Production (PPP), and emergent language approaches, and its potential implementation in AI-mediated instructional environments.

5.4.1 Structural priming as a pedagogical tool: evidence and task design

At a general level, the findings provide empirical support for the view that structured exposure to grammatical constructions can facilitate both comprehension and production of target forms, even in the absence of explicit metalinguistic instruction. The comprehension gains observed in the classroom-based study, which were maintained at delayed posttest, suggest that relatively brief exposure to priming-enriched input may contribute to measurable learning outcomes beyond the immediate task context.

However, the findings also indicate that the effects of priming are not uniformly stable across all task types and timeframes. The absence of a significant group effect in the delayed production task, despite strong effects during treatment, suggests that short, single-session priming activities may be insufficient to support durable changes in learners' free production. This pattern highlights the importance of considering the dosage and distribution of exposure in classroom-based applications of structural priming. From a usage-based perspective, a single dense treatment session may not provide sufficient repetitions to entrench the construction

beyond the point at which residual activation has decayed (Bybee, 2008; Ellis, 2002). This suggests that pedagogical applications of priming will be most effective when the target construction is encountered repeatedly across multiple lessons and task types, instead of concentrated into a single intensive session.

The lexical boost effect found in the self-paced reading study has a further implication for task design. For lower-proficiency learners, whose passive constructions may rely more heavily on lexically specific representations than on fully abstract patterns, priming activities may initially benefit from the repeated use of the same verbs across prime and target sentences. This provides additional lexical support and may facilitate access to the target structure. As learners develop more abstract representations of the construction, the degree of lexical repetition can be gradually reduced, encouraging generalisation of the passive structure to a wider range of verbs. This stepwise progression, from lexically supported priming to more abstract structural priming, mirrors developmental patterns proposed in Construction Grammar and provides a principled basis for sequencing priming activities within a course.

From an instructional perspective, this suggests that priming-based activities are likely to be most effective when they are not treated as isolated interventions, but rather embedded within a sequence of repeated and thematically coherent tasks. In this sense, the pedagogical value of priming lies not only in short-term activation effects but also in its potential contribution to the gradual entrenchment of target constructions through repeated meaningful encounters across time.

5.4.2 Structural priming within TBLT and current pedagogical approaches

A question in the relationship between structural priming and established teaching frameworks concerns the extent to which priming is already embedded, either implicitly or explicitly, within current approaches to language pedagogy, and under what circumstances priming-based activities of the kind used in this thesis would be appropriate for classroom use.

Task-Based Language Teaching (TBLT) holds that language learning is best promoted when learners complete communicative tasks that have real-world

meaning, with attention to grammatical form arising naturally when communication breaks down without the need for pre-planned grammar instruction (Ellis, 2013; Long, 2015). At first glance, structural priming appears to conflict with TBLT because it involves deliberately controlling linguistic input to bias learners towards a specific grammatical structure. A closer examination, however, reveals that structural priming may already function as a covert mechanism within several well-established TBLT task types, and that the two frameworks are more complementary than they are opposed.

Within TBLT, the concept of focus on form (Long, 2015) acknowledges that incidental attention to grammar can arise during communicative tasks. Several TBLT task types implicitly create the conditions for structural priming without any deliberate management by the teacher. Spot-the-difference tasks and jigsaw tasks (Ellis, 2013), for example, require learners to describe the same types of events from different perspectives, naturally generating prime-target sequences in which the same grammatical structure recurs across turns. Structural priming has been documented to emerge from such communicative task designs across a range of target structures, including wh-questions (McDonough and Kim, 2009) and stranded prepositions (Conroy and Antón-Méndez, 2015). Similarly, information-gap tasks that involve describing events in which the patient is visually prominent often elicit passive constructions naturally, creating interactional priming conditions similar to those documented in L2 interactional priming research (McDonough and Kim, 2009; Kim and McDonough, 2008; Conroy and Antón-Méndez, 2015). The empirical evidence from these studies supports the view that structural priming is not merely incidental to TBLT outcomes but may constitute one of the key mechanisms through which some TBLT tasks promote syntactic learning, even when neither teachers nor learners explicitly recognise it as such. The important distinction is that in TBLT these effects are incidental and interaction-driven, whereas the priming-based intervention in the present thesis involves a more systematic and deliberate manipulation of exposure to the target construction.

The classroom intervention in Study 2 can be understood as an example of priming-enriched TBLT. Learners completed reading, comprehension, and writing tasks with real communicative goals, but the input text was modified to increase the density of passive constructions. No explicit grammar instruction was given, and learners were

not told that the study targeted passive constructions. These conditions are broadly compatible with the principles of incidental focus on form within a task-based framework, although the intervention introduces a higher degree of control over the distribution of target constructions than is typical in standard TBLT. The significant comprehension gains and large production effect during the treatment session provide empirical support for this approach, showing that implicitly structured, priming-enriched tasks are both practical and effective within communicative language teaching.

In traditional Presentation–Practice–Production (PPP) frameworks, grammatical instruction typically begins with the explicit presentation of a rule, followed by controlled practice and freer production activities (Ellis, 2013). This places metalinguistic explanation at the centre of instruction, with practice designed to consolidate rule-based knowledge. In contrast, priming-based pedagogy reduces or removes explicit explanation and instead relies on structured input that exposes learners to repeated instances of the target construction, allowing syntactic patterns to be acquired implicitly through activation and use. This makes it particularly well-suited to learner groups such as adult ESOL students, for whom technical grammar explanations may be inaccessible due to limited formal educational backgrounds or unfamiliarity with grammatical terminology. It is also more consistent with the communicative principles of contemporary ESOL practice, which prioritises meaning and functional language use (Richards and Rodgers, 2014). Importantly, however, the present findings also suggest that implicit priming-based exposure alone may not be sufficient to support explicit grammatical awareness: the limited effects on explicit knowledge measures in Study 2 indicate that priming-based activities may be most powerful when they complement rather than replace explicit instruction. This points to a possible role for hybrid approaches in which priming-enriched input is combined with selective explicit focus on form where learner needs require it.

Regarding which learner groups are likely to benefit most from priming-based activities, several considerations emerge from the data. Study 1 demonstrated that structural priming in comprehension is effective across a range of proficiency levels (Entry Level 3 to Level 2), suggesting that priming-based input activities are accessible to learners at different stages of development. The finding that lower-proficiency learners benefit particularly from lexical repetition implies that carefully

scaffolded priming tasks, using controlled, high-frequency vocabulary and repeated target verbs, may be especially valuable for beginners and lower-intermediate learners. Study 2, which focused on Level 1 learners, showed clear production effects during treatment and sustained comprehension gains, indicating that priming-enriched tasks are feasible and effective for intermediate learners.

Beyond proficiency level, the ESOL population studied here, adult learners with diverse linguistic backgrounds, some of them with limited formal instruction in grammar, and primarily functional language goals, represents a group for whom the implicit, exposure-based nature of priming-based pedagogy may be particularly well matched. Priming operates through the same frequency-driven learning mechanisms that underlie naturalistic language acquisition (Chang, Dell and Bock, 2006; Bybee, 2008), making it accessible to learners regardless of their prior educational experience. Future research should extend this work to beginner-level learners and to learners with low literacy in English, to establish whether priming-based activities remain effective across the full proficiency range and across different educational contexts. The present findings also raise questions about the relative effectiveness of priming in oral versus written modalities, which has implications for the design of listening- and speaking-based priming tasks for use with learners whose primary communicative needs are oral.

In summary, TBLT provides the communicative conditions in which structural alignment can happen naturally, while priming-based pedagogy is a deliberate way to increase and control this alignment through repeated exposure to the target construction. The two approaches work well together: TBLT gives the meaningful context for tasks, and priming explains the learning mechanism behind them. Priming also differs from PPP in one keyway: PPP begins with an explicit rule, while priming relies on implicit exposure, which may suit adult ESOL learners with limited grammar training and mainly functional goals. However, the present findings show that implicit exposure alone may not be enough to build explicit grammatical knowledge. This suggests that priming-based tasks work best not as a replacement for explicit instruction, but as a useful addition to it, within a communicative, TBLT-based framework.

5.4.3 Structural priming in AI-Mediated language learning

The rapid expansion of artificial intelligence (AI) in education creates an important context in which the pedagogical principles demonstrated in this thesis can be further developed and applied. AI-powered tools, including large language model (LLM)-based chatbots, intelligent tutoring systems, and AI-integrated language learning platforms, are increasingly present in both formal and informal ESOL and EFL settings (Godwin-Jones, 2022; Liu and Zhong, 2025). The present findings suggest that structural priming can be meaningfully implemented within AI-mediated instructional environments. However, for this integration to be effective, it must be based on established learning science principles and not in the uncritical adoption of technology (Holmes, Bialik and Fadel, 2022).

A central principle established in recent frameworks for AI in education is that technology should extend and deepen existing evidence-based pedagogy instead of replacing it (Holmes, Bialik and Fadel, 2022). Structural priming, as demonstrated in this thesis, offers precisely this kind of evidence-based foundation. The mechanisms underlying priming, residual activation, error-based implicit learning, and expectation adaptation (Pickering and Branigan, 1998; Chang, Dell and Bock, 2006; Jaeger and Snider, 2013) are well-documented in psycholinguistic research and have been shown to operate in both L1 and L2 populations. The application of priming within AI-mediated environments is therefore not a matter of imposing a novel instructional device onto the language classroom; rather, it represents the extension of a theoretically motivated and empirically supported approach into a new delivery context. This alignment between pedagogical design and learning science is essential if AI tools are to contribute meaningfully to second language development (Holmes, Bialik and Fadel, 2022; Liu and Zhong, 2025).

The most direct pedagogical application concerns the use of AI to generate syntactically controlled priming input for comprehension. Large language models are capable of producing extended passages of text that are semantically coherent and syntactically constrained. For example, generating reading texts that contain a specified density of passive constructions at an appropriate proficiency level and with controlled lexical selection. This is closely aligned with the type of priming-enriched input used in the classroom study of this thesis, but with the additional advantage

that it can be produced on demand and tailored to individual learners' needs. From an expectation-based perspective (Levy, 2008; Jaeger and Snider, 2013), repeated exposure to a target construction within such AI-generated texts would incrementally raise the probability that the parser assigns to that structure, reducing surprisal and lowering processing costs over time. The comprehension gains observed in the classroom study of this thesis are consistent with this gradual expectation-updating mechanism, and AI-mediated environments are well-placed to support and extend it by providing sustained and varied exposure that is difficult to achieve within the time constraints of a single classroom session.

A further application concerns the use of conversational AI as a source of structural primes in meaning-focused interaction. Recent evidence suggests that AI-powered chatbots can create low-anxiety communicative environments in which learners engage in oral and written production without the social pressure of face-to-face interaction (Zhang, 2026; Huang and Kakham, 2026). If a conversational AI interlocutor is configured to preferentially use target constructions, such as passive structures, in its responses to learner input, it can function as a consistent source of structural primes within communicative exchanges that require learners to attend to meaning. This aligns with interactional accounts of structural priming in second language acquisition (McDonough and Kim, 2009; Coumel, 2021) and with the interactional alignment model proposed by Pickering and Garrod (2004), which holds that interlocutors converge on shared syntactic representations through the mutual processes of priming and alignment during dialogue. From a Task-Based Language Teaching (TBLT) perspective, such AI-mediated interaction can be understood as integrating structural priming into communicative task performance without requiring explicit grammatical instruction, combining the implicit learning potential of priming with the communicative authenticity valued in task-based approaches.

A key finding of this thesis concerns the role of proficiency in moderating priming effects, with lower-proficiency learners appearing to rely more heavily on lexically specific representations. This finding has direct implications for how AI systems should be designed to support learners at different stages of development. Holmes, Bialik and Fadel (2022) emphasise that AI tools in education should be designed for learner variability, adjusting content, pacing, and support in response to individual needs. Applied to structural priming, this suggests that AI systems could provide

higher degrees of lexical repetition in the initial priming input for lower-proficiency learners, consistent with the lexical boost mechanism identified in the structural priming literature (Pickering and Branigan, 1998), and gradually reduce this lexical support as the learner develops more abstract structural representations. Godwin-Jones (2022) similarly argues that AI-enabled personalisation should not impose a uniform learning path; instead, it should foster learner agency by adjusting instruction to individual proficiency trajectories rather than imposing a uniform learning path. This kind of adaptive and graduated supporting is difficult to implement consistently in classroom teaching but is well-suited to AI-mediated environments, where learner responses can be monitored and instructional parameters adjusted in real time.

A related application concerns the use of AI to support repeated and distributed exposure to target constructions over time. The classroom study demonstrated comprehension gains, but production gains were more limited, which may reflect the insufficient quantity or distribution of input provided within a single treatment session. From a usage-based perspective, the consolidation of a syntactic construction into a learner's productive system requires repeated encounters across varied contexts and over extended time periods (Bybee, 2008; Ellis, 2002). Unlike the classroom context, AI systems can support learners in encountering the target construction repeatedly across multiple sessions, spaced over time, and embedded in different communicative tasks and discourse types. Holmes, Bialik and Fadel (2022) describe this kind of sequenced support as consistent with the principle of productive struggle: learners are supported at the appropriate level of challenge and progressively exposed to increasing complexity as their representation of the target structure becomes more stable. An AI system that embeds passive constructions consistently across reading texts, listening tasks, and conversational exchanges over several weeks could, in principle, provide the quantity and distribution of exposure that usage-based accounts suggest is necessary to move from short-term priming activation to durable constructional entrenchment.

AI-mediated environments also offer the possibility of providing immediate and targeted feedback when target constructions are produced or avoided. Automated writing evaluation (AWE) and automated written corrective feedback (AWCF) systems can provide fast, consistent feedback on grammatical form that is difficult for teachers to provide at scale in traditional classroom settings (Godwin-Jones, 2022;

Liu and Zhong, 2025). In the context of structural priming, implicit corrective feedback could take the form of recasts, that is, reformulations of a learner's active-voice production into a passive-voice equivalent, which function simultaneously as corrective feedback and as an additional structural prime (McDonough, 2006). This type of feedback could be implemented within conversational AI interactions without interrupting communicative flow, as it operates implicitly through meaning-focused reformulation rather than explicit attention to grammatical form. Godwin-Jones (2022) notes that such feedback tools are particularly effective when they support a revision cycle that helps learners identify systematic patterns in their own production, which is consistent with the error-based learning account of structural priming, whereby prediction error drives the gradual adjustment of syntactic expectations (Chang, Dell and Bock, 2006; Jaeger and Snider, 2013).

It is important to acknowledge that the integration of priming-based pedagogy within AI-mediated environments raises questions that the present research is not yet in a position to answer. A significant concern identified in recent frameworks for AI in education is that effective implementation requires collaboration between technology developers, subject-matter experts, and educators, and must be supported by transparent ethical guidelines regarding data privacy and algorithmic bias (Liu and Zhong, 2025). In addition, it remains uncertain whether repeated exposure to target constructions in interaction with an artificial agent produces the same quality of implicit learning as exposure in human-human interaction. AI interlocutors lack the social contact and affective responsiveness that characterise human conversation. In addition, the social and interactional factors known to modulate priming strength in human communication, including perceived interlocutor status and motivation to converge linguistically (Branigan *et al*., 2011; Weatherholtz *et al.,* 2014) may operate differently, or not at all, in interactions with artificial agents. Furthermore, Porayska-Pomsta, Holmes and Nemorin (2024) warn against excessively automated instructional experiences that reduce learners' cognitive engagement. They argue that excessive reliance on AI support may encourage learner dependence if instructional support is not carefully designed to foster autonomy and self-regulated learning. Applied to structural priming, this concern is relevant: if AI systems provide unnecessary lexical or structural scaffolding, they may prevent the kind of prediction error that the error-based learning account identifies as the primary driver of implicit

syntactic learning (Chang, Dell and Bock, 2006). These questions point to a productive agenda for future research, considered further in Section 5.6.

Overall, AI-mediated environments offer a promising avenue for implementing priming-based pedagogy at scale. The principles demonstrated in this thesis, syntactically controlled input, graduated lexical support, repeated exposure to target constructions, and integration within meaningful communicative tasks, are well aligned with emerging frameworks for evidence-based and learner-centred AI in language education (Holmes, Bialik and Fadel, 2022; Godwin-Jones, 2022; Liu and Zhong, 2025). At the same time, the effectiveness of AI-mediated priming instruction will depend on careful pedagogical design that preserves the implicit, meaning-focused nature of the priming mechanism and avoids the over-scaffolding that may reduce the prediction error necessary for implicit syntactic learning. These developments suggest that structural priming may be particularly well suited to integration within emerging educational technologies, especially in ESOL contexts where personalised and input-rich instruction is required but difficult to deliver through traditional classroom means.

5.5 Limitations of the present investigation

This study has several limitations that should be acknowledged. Reflecting on these constraints is important not only to situate the findings appropriately within the wider research context but also to identify productive directions for future research. The following discussion addresses participant-related, methodological, and contextual constraints, highlighting their theoretical and pedagogical implications.

First, the high level of participant heterogeneity in both studies must be considered. The inclusion of learners from multiple L1 backgrounds, such as Portuguese, Arabic, Farsi, and Bulgarian, enhanced the ecological validity of the study by mirroring the composition of real-world ESOL classrooms. However, this diversity also complicates the interpretation of the data, as L1 transfer effects, proficiency trajectories, and syntactic processing strategies can differ considerably across typologically distinct languages. This variation may have masked subtle effects of structural priming, particularly in comprehension tasks, and it leaves open the theoretically significant question of whether priming mechanisms operate universally

across L2 learners or are moderated by typological distance and cross-linguistic influence. Future research could address this by systematically comparing homogeneous and heterogeneous L1 groups, which would permit stronger claims about the universality versus context-specificity of priming effects.

Second, the self-paced reading paradigm introduced specific methodological constraints. Because participants could not preview upcoming words, they had to rely heavily on working memory throughout each trial, which may have inflated processing load and produced spillover effects in the reaction time data. This means the observed priming effects might partially reflect task-specific demands rather than purely syntactic facilitation, complicating the mapping of experimental outcomes onto naturalistic comprehension processes. A more nuanced future approach could triangulate self-paced reading with eye-tracking, which allows incremental parsing to be captured without the working memory demands of word-by-word presentation. The length of the comprehension experiment, requiring participants to read 300 sentences, also posed a risk of fatigue; indeed, some learners reported declining attention towards the end of the session, which may have attenuated priming effects in later trials. Future studies might distribute trials across shorter sessions with embedded rest periods to maintain both experimental validity and learner engagement.

Third, the classroom study was conducted within a single institutional context with a relatively small sample, which limits the generalisability of the findings to other ESOL settings, learner populations, and linguistic backgrounds. The single-session treatment design, while sufficient to demonstrate in-session production priming and short-term comprehension gains, may not provide enough repeated exposure to produce durable changes in production. As argued in Section 5.4, usage-based accounts of entrenchment suggest that lasting constructional learning requires repeated encounters distributed over time; a single 135-minute session, although intensive, may not meet this threshold. Future classroom research should adopt multi-session designs and multi-site recruitment to explore how variables such as treatment duration, session distribution, L1 background, and task modality influence the magnitude and persistence of priming effects.

Finally, the present thesis examined structural priming primarily as a cognitive phenomenon, with limited attention to the social dimensions of the learning context. Learner motivation, the nature of the teacher-learner relationship, levels of social anxiety, and the interpersonal dynamics within the classroom group are all factors that may influence the degree of alignment between learners and their interlocutors, and thus the strength of structural priming effects (Pickering and Garrod, 2004). These socio-cognitive dimensions represent an important and underexplored area for future research. Overall, these limitations illustrate that while the present study provides clear evidence for the role of structural priming in L2 comprehension and classroom learning, its conclusions must be considered in light of methodological, contextual, and participant-related constraints. They also define a productive agenda for future empirical work, discussed in the following section.

5.6 Future research directions

The limitations identified in Section 5.5 point to several productive avenues for future research. These can be grouped into four broad areas: socio-cognitive factors in structural priming, structural priming across the full L2 proficiency range, the role of technology and AI in priming-based language learning, and methodological refinements to the experimental paradigms used in the present thesis.

Concerning socio-cognitive factors, future research should examine more systematically how structural priming interacts with the social and affective dimensions of language use. Most psycholinguistic research has examined priming under controlled laboratory conditions that deliberately isolate cognitive variables, but in real communicative contexts, language users engage in interactive alignment that is shaped by factors such as interlocutor relationship, social status, motivation to converge, and levels of anxiety (Pickering and Garrod, 2004). In a classroom setting, a learner may demonstrate stronger priming effects not only because a structure has been repeated but also because they are motivated to align linguistically with a supportive teacher or a peer they wish to engage. On the other hand, social anxiety or perceived power imbalances may increase processing demands and reduce the effectiveness of implicit alignment mechanisms. Future studies could investigate these effects by comparing priming outcomes when the source of structural primes is

a teacher, a peer, or an automated system, and by measuring individual differences in motivation and social anxiety as moderating variables.

Regarding proficiency, the present thesis focused primarily on learners at the intermediate range of the ESOL proficiency scale. Future research should extend this work across a wider range, including beginner-level learners (Entry Level 1 and 2), advanced learners, and near-native speakers. Such research would help clarify the developmental trajectory of constructional abstraction from item-based to schematic representations and would address whether priming-based pedagogy is equally effective, or requires different designs, at different stages of L2 development. Research with very early-stage learners would also be valuable for establishing whether priming can function as a tool for initial construction acquisition rather than only for the consolidation and automatisation of partially acquired forms.

The role of AI-mediated environments in priming-based language learning represents a third major area for future investigation, as discussed in Section 5.4.3. Key questions include whether interaction with AI interlocutors produces the same depth of implicit learning as human–human interaction, how the durability of AI-mediated priming effects compares with those observed in classroom settings, and how learners allocate attention to form versus meaning in sustained AI-mediated conversation. Longitudinal designs tracking learner development across multiple AI-mediated sessions, combined with comparison conditions involving human teachers and peers, would help to establish the unique contribution of AI-based priming and identify the conditions under which it is most beneficial.

Finally, methodological refinements would substantially strengthen future research in this area. Eye-tracking provides a more naturalistic window onto incremental comprehension than self-paced reading and would allow spillover effects to be distinguished from genuine priming. Electroencephalographic (EEG) measures, including event-related potentials (ERPs) sensitive to syntactic violations and predictions (such as the ELAN and P600 components), could provide neurophysiological evidence for the strengthening of syntactic representations through priming exposure, addressing questions about the neural underpinnings of constructional entrenchment that behavioural measures alone cannot resolve. Combining these measures with longitudinal classroom designs would enable

researchers to track the trajectory from short-term activation to durable implicit learning, and ultimately to determine the conditions under which structural priming can reliably be harnessed as a tool for L2 grammatical development.

5.7 Overall contributions

Despite certain limitations, the present study makes a relevant contribution to understanding the mechanisms underlying structural priming and its potential role in second language acquisition. By demonstrating that structural priming occurs in L2 comprehension within a linguistically diverse sample of learners, this research provides preliminary support for the view that repeated exposure to target structures can facilitate implicit syntactic learning, while also highlighting that the role of L1 background and typological distance in moderating this effect remains an open empirical question. Moreover, the classroom-based experiment shows that strategically designed priming tasks can enhance both comprehension and production of complex constructions, suggesting a practical pathway for linking psycholinguistic findings with classroom pedagogy.

Theoretically, the thesis advances the field by examining structural priming across two modalities, comprehension and production, and by revealing important asymmetries in the cognitive mechanisms and durability of priming effects across these modalities. It also demonstrates the value of integrating usage-based linguistic frameworks, and in particular Construction Grammar, with psycholinguistic accounts of structural priming, showing that these two perspectives provide complementary and mutually illuminating explanations of the same empirical patterns.

Pedagogically, the thesis contributes evidence that priming-based tasks are compatible with communicative and task-based approaches to language teaching, and that they may offer specific advantages for adult ESOL learners for whom explicit grammar instruction is less accessible. It also proposes a principled framework for the design and sequencing of priming-based activities, grounded in both psycholinguistic and usage-based accounts of how syntactic representations develop.

Chapter 6 Conclusion

In summary, the present findings show that structural priming functions as a significant mechanism supporting L2 comprehension and production, even across diverse learner conditions. The classroom study's group comparison should be interpreted with some caution, however, as the relevant interaction did not reach statistical significance; the production and comprehension gains reported here rest on the main effects rather than on this interaction. With this caveat in mind, the results demonstrate that psycholinguistic principles can be meaningfully applied to real classroom practice. This thesis contributes to the theoretical understanding of structural priming by documenting its presence in L2 comprehension, its lexical mediation, its modality-specific mechanisms, and its relationship with proficiency, findings that together are consistent with a hybrid account of implicit syntactic learning in which both residual activation and cumulative error-based learning may play a role.

In addition, the thesis extends priming research beyond controlled laboratory settings by demonstrating its pedagogical potential in real ESOL classrooms, and by situating that potential within the established frameworks of TBLT and PPP, with further consideration of its extension to emergent language approaches and AI-mediated instructional contexts. This provides practical implications for grammar pedagogy, suggesting that priming-based tasks can support implicit syntactic learning and complement explicit instruction, particularly for learner groups for whom metalinguistic explanation is less accessible.

Some questions remain open, particularly regarding the optimal conditions, learner variables, and distributional characteristics that maximise priming-based learning. These include the role of socio-cognitive factors, the extension of priming research to the full L2 proficiency range and to more typologically diverse L1 groups, and the potential of AI-mediated environments to deliver the repeated, distributed exposure that usage-based accounts of entrenchment suggest is necessary for durable constructional learning. Future research that addresses these questions will help to establish structural priming not merely as a controlled experimental phenomenon but as a reliable, generalisable mechanism that can be connected in the service of L2 grammatical development across a range of instructional contexts.

References

Alzahrani, A. (2022) Priming the Arabic dative: Evidence for syntactic abstractness and implicit learning. *Frontiers in Education*, 7, p. 951898. Frontiers Media SA.

Arai, M., Van Gompel, R.P.G. and Scheepers, C. (2007) 'Priming ditransitive structures in comprehension', *Cognitive Psychology*, 54(3), pp. 218-250.

Bell, P. and Collins, L. (2025) 'Grammar instruction in ESL coursebooks and in second language acquisition research: convergences and divergences', *TESL Canada Journal*, 42(1), pp.65-88. Available at: https://files.eric.ed.gov/fulltext/EJ1481074.pdf (Accessed: 02 November 2025).

Bencini, G.M. (2025) *Structural priming in sentence production*. Cambridge University Press.

Bernolet, S. and Hartsuiker, R.J. (2010) 'Does verb bias modulate syntactic priming?', *Cognition*, 114(3), pp. 455-461. Available at: https://doi.org/10.1016/j.cognition.2009.11.005

Bernolet, S., Collina S. and Hartsuiker R.J. (2016) 'The persistence of syntactic priming revisited', *Journal of Memory and Language,* 91, pp. 99-116. Available at: https://doi.org/10.1016/j.jml.2016.01.002

Bernolet, S., Hartsuiker, R.J. and Pickering, M.J. (2007) 'Shared syntactic representations in bilinguals: Evidence for the role of word-order repetition', *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 33(5), pp. 931-949.

Bernolet, S., Hartsuiker, R.J. and Pickering, M.J. (2013). 'From language-specific to shared syntactic representations: The influence of second language proficiency on syntactic sharing in bilinguals'. *Cognition*, 127(3), pp. 287-306.

Bidgood, A., Pine, J.M., Rowland, C.F. and Ambridge, B. (2020) 'Syntactic representations are both abstract and semantically constrained: evidence from children's and adults' comprehension and production/priming of the English passive, *Cognitive Science*, 44, e12892. Available at: https://doi.org/10.1111/cogs.12892

Bock, J.K. (1986) 'Syntactic persistence in language production', *Cognitive psychology*, 18(3), pp.355-387. Available at: https://doi.org/10.1016/0010-0285(86)90004-6

Bock, J.K. and Warren, R.K. (1985) 'Conceptual accessibility and syntactic structure in sentence formulation', *Cognition*, 21(1), pp. 47-67. Available at: https://doi.org/10.1016/0010-0277(85)90023-X

Bock, K. and Griffin, Z.M. (2000) ‘The persistence of structural priming: transient activation or implicit learning?’, *Journal of experimental psychology: General*, 129(2), p. 177. Available at: 10.1037/0096-3445.129.2.177

Bock, K., Dell, G.S., Chang, F. and Onishi, K.H. (2007) ‘Persistent structural priming from language comprehension to language production’, *Cognition*, 104(3), pp. 437-458. Available at: https://doi.org/10.1016/j.cognition.2006.07.003

Branigan, H.P. and Gibb, C.L. (2018) ‘Structural Priming’, in A.M.B. Groot and P. Hagoort (eds) *Research Methods in Psycholinguistics and the Neurobiology of Language: a practical guide*. Wiley Blackwell, pp. 130-150.

Branigan, H.P. and Pickering, M.J. (2017) ‘An experimental approach to linguistic representation’, *Behavioral and Brain Sciences*, 40: e282. Available at: 10.1017/S0140525X16002028

Branigan, H.P., Pickering, M.J. and Cleland, A.A. (2000) ‘Syntactic coordination in dialogue’, *Cognition*, 75(2), B13-B25. Available at: 10.1016/s0010-0277(99)00081-5

Branigan, H.P., Pickering, M.J. and McLean, J.F. (2005) ‘Priming prepositional-phrase attachment during comprehension’, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 31(3), pp. 468-481. Available at: 10.1037/0278-7393.31.3.468

Branigan, H.P., Pickering, M.J., Liversedge, S.P., Stewart, A.J. and Urbach, T.P. (1995) ‘Syntactic priming: Investigating the mental representation of language’, *Journal of Psycholinguistic Research*, 24(6), pp.489-506.

Branigan, H.P., Pickering, M.J., McLean, J.F. and Cleland, A.A. (2007) ‘Syntactic alignment and participant role in dialogue’, *Cognition*, 104(2), pp. 163-197. Available at: 10.1016/j.cognition.2006.05.006

Branigan, H. P., Pickering, M. J., Pearson, J., McLean, J. F., & Brown, A. (2011). The role of beliefs in lexical alignment: Evidence from dialogs with humans and computers. *Cognition*, *121*(1), 41–57. https://doi.org/10.1016/j.cognition.2011.05.011

Branigan, H.P., Pickering, M.J., Pearson, J. and McLean, J.F. (2010) Linguistic alignment between people and computers. *Journal of pragmatics*, *42*(9), pp. 2355-2368

Bybee, J. (2008) *Usage-based theory and language acquisition*. Oxford University Press.

Bybee, J. (2010) *Language, usage and cognition*. Cambridge University Press.

Bygate, M. (2001) ‘Effects of task repetition on the structure and control of oral language’, in Bygate, M., Skehan, P. and Swain, M. (eds.) *Researching pedagogic tasks: Second language learning, teaching and testing*. Harlow: Longman, pp. 23–48.

Cambridge University Press (2020) *English vocabulary profile*. Available at: https://www.englishprofile.org (Accessed:12 February 2022).

Carlsen, C.H. and Rocca, L. (2021) ‘Language test misuse’, *Language Assessment Quarterly*, 18(5), pp. 477–491. Available at: https://doi.org/10.1080/15434303.2021.1947288.

Carminati, M. N., van Gompel, R. P., Scheepers, C. and Arai, M. (2008) ‘Syntactic priming in comprehension: the role of argument order and animacy’, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 34(5), pp. 1098-110. Available at: 10.1037/a0012795

Celce-Murcia, M. and Larsen-Freeman, D. (2015) *The Grammar Book: an ESL/EFL teacher’s course.* 2nd ed. Heinle and Heinle.

Chang, F. (2002) ‘Symbolically speaking: a connectionist model of sentence production’, *Cognitive Science*, 26(5), pp. 609-651. Available at: https://doi.org/10.1016/S0364-0213(02)00079-4

Chang, F., Bock, K. and Goldberg, A.E. (2003) ‘Can thematic roles leave traces of their places?’, *Cognition*, 90(1), pp. 29-49. Available at: https://doi.org/10.1016/S0010-0277(03)00123-9

Chang, F., Dell, G.S. and Bock, K. (2006) ‘Becoming syntactic’, *Psychological Review*, 113(2), pp. 234-272. Available at: https://doi.org/10.1037/0033-295X.113.2.234

Chang, F., Janciauskas, M. and Fitz, H. (2012) ‘Language adaptation and learning: Getting explicit about implicit learning’, *Language and Linguistics Compass*, 6(5), pp. 259–278. Available at: https://doi.org/10.1111/j.1749-818X.2012.00200.x.

Chen, Q., Xu, X., Tan, D., Zhang, J. and Zhong, Y., (2013) ‘Syntactic priming in Chinese sentence comprehension: evidence from Event-Related Potentials’, *Brain and cognition*, 83(1), pp.142-152. Available at: https://doi.org/10.1016/j.bandc.2013.07.005

Chen, X., Wang, S. and Hartsuiker, R.J. (2022) ‘Error-based structure prediction in language comprehension: Evidence from verb bias effects in a visual-world structural priming paradigm for Mandarin Chinese’, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 48(1), pp. 60–71. Available at: https://doi.org/10.1037/xlm0001048.

Chen, X., Wang, S. and Hartsuiker, R.J. (2023) ‘Do structural priming and inverse preference effect demand cognitive resources? Evidence from structural priming in production’, *Language, Cognition and Neuroscience*, 38(6), pp. 843-859. Available at: https://doi.org/10.1080/23273798.2022.2159991

Chia, K. and Kaschak, M.P. (2023) ‘Is the Levelt and Kelter (1982) Repetition Effect Lexical or Structural Priming?’, *Collabra: Psychology*, 9(1). Available at: https://doi.org/10.1525/collabra.88948

Chia, K., Axelrod, C., Johnson, C., Bressler, M., Cooperman, H., Chu, A., Dash, E., Di Bella, J. and Kaschak, M. P. (2019) ‘Structural Repetition in Question Answering: a replication and extension of Levelt and Kelter (1982)’, *Discourse Processes*, 56(1), pp. 2-23. Available at: 10.1080/0163853X.2018.1515556

Christianson, K. and Ferreira, F. (2005) ‘Conceptual accessibility and sentence production in a free word order language (Odawa)’, *Cognition*, 98(2), pp. 105-135. Available at: https://doi.org/10.1016/j.cognition.2004.10.006

Cleland, A.A. and Pickering, M.J. (2003) ‘The use of lexical and syntactic information in language production: Evidence from the priming of noun-phrase structure’, *Journal of Memory and Language*, 49(2), pp. 214-230. Available at: https://doi.org/10.1016/S0749-596X(03)00060-3

Conroy, M. A. (2013) *Structural Priming and Second Language Learning*. PhD Thesis. University of New England.

Conroy, M.A. and Antón-Méndez, I. (2015) ‘A preposition is something you can end a sentence with: Learning English stranded prepositions through structural priming’, *Second Language Research*, 31(2), pp. 211-237. Available at: https://doi.org/10.1177/0267658314555

Coumel, M. (2021) *An exploration of second language learning via syntactic priming*. PhD Thesis. The University of Warwick.

Coumel, M., Muylle, M., Messenger, K. and Hatsuko, R.J. (2024) ‘The role of explicit memory across second language syntactic development: A structural priming study’, *Language Learning*, 74(2), pp. 402–435. Available at: https://doi.org/10.1111/lang.12604.

Coumel, M., Ushioda, E. and Messenger, K. (2020). Between- and within- group variation in first and second language syntactic priming. *PsyArXiv*. Available at: https://doi.org/10.31234/osf.io/wzj7g

Council of Europe. Common European Framework of Reference for Languages (CEFR). Available at: https://www.coe.int/en/web/common-european-framework-reference-languages (Accessed on 05 August 2025)

Croft, W. (2001) *Radical construction grammar: Syntactic theory in typological perspective*. Oxford: Oxford University Press.

Cunnings, I. (2017) ‘Parsing and working memory in bilingual sentence processing’. *Bilingualism: Language and Cognition*, 20(4), pp. 659–678. https://doi.org/10.1017/S1366728916000675.

DeKeyser, R. (2017) ‘Knowledge and skill in ISLA’, in S. Loewen and M. Sato (eds) *The Routledge handbook of instructed second language acquisition.* Routledge, pp. 15-32.

DeKeyser, R.M. (2007) 'Skill acquisition theory', in B. VanPatten and J. Williams (eds.) *Theories in Second Language Acquisition: An Introduction*. Mahwah, NJ: Lawrence Erlbaum Associates, pp. 97-113.

Dell, G. S. and Chang, F. (2014) ‘The P-chain: relating sentence production and its disorders to comprehension and acquisition’, *Royal Society*, 369(1634). Available at: 10.1098/rstb. 2012.0394

Dell, G. S. and Ferreira, V. S. (2016) ‘Thirty years of structural priming: An introduction to the special issue’, *Journal of Memory and Language*, 91, pp. 1-4. Available at: https://doi.org/10.1016/j.jml.2016.05.005

Diessel, H. (2019) *‘The Grammar Network: How Linguistic Structure Is Shaped by Language Use’*. Cambridge: Cambridge University Press.

Dussias, P.E., Kroff, J.V. and Gerfen, C. (2013) ‘Visual world eye-tracking’, in J. Jegerski and B. VanPatten (eds) *Research methods in second language psycholinguistics*. Routledge, pp. 93-126.

Ellis, N. (2013) ‘Constructions, chunking and connectionism: The emergence of second language structure’, in C. Doughty and M. Long (eds) *The Handbook of Second Language Acquisition*. Blackwell, pp. 63-103.

Ellis, N. C. (2002) ‘Frequency effects in language acquisition: a review with implications for theories of implicit and explicit language acquisition’, *Studies in Second Language Acquisition*, 24(2), pp. 143-188. Available at: https://doi.org/10.1017/S0272263102002024

Ellis, N.C. and Cadierno, T. (2009) 'Constructing a second language: Introduction to the special section', *Annual Review of Cognitive Linguistics*, 7, pp. 111–139. https://doi.org/10.1075/arcl.7.05ell.

Ellis, N.C. and Wulff, S. (2014) 'Usage-based approaches to SLA', in B. VanPatten and J. Williams (eds.) *Theories in Second Language Acquisition: An Introduction*. 2nd edn. New York: Routledge, pp. 75–93.

Ellis, R. (2005) ‘Measuring implicit and explicit knowledge of a second language: a psychometric study’, *Studies in second language acquisition*, 27(2), pp.141-172. Available at: https://doi.org/10.1017/S0272263105050096

Ellis, R. (2006) ‘Researching the effects of form-focused instruction on L2 acquisition’, *AILA review*, 19(1), pp.18-41. Available at: 10.1075/aila.19.04ell

Ellis, R. (2017) *Task-based language teaching: theory and practice*. Cambridge University Press.

Felicio, A. R. (2018) *Cross-linguistic syntactic priming effects in sentence comprehension: a study with Brazilian Portuguese-bilinguals* (Master’s thesis). Federal University of Santa Catarina.

Ferreira, F. (2003) ‘The misinterpretation of noncanonical sentences’, *Cognitive Psychology*, *47*(2), pp. 164-203. Available at: https://doi.org/https://doi.org/10.1016/S0010-0285(03)00005-7

Ferreira, V.S. and Bock, J.K. (2006) ‘The functions of structural priming’, *Language and Cognitive Processes*, 21, pp. 1011-1029. Available at: https://doi.org/10.1080/01690960600824609

Fujita, H. and Cunnings, I. (2021) ‘Lingering misinterpretation in native and non-native sentence processing: evidence from structural priming’, *Applied Psycholinguistics*, 42(2), pp. 475-504. Available at: 10.1017/S0142716420000351

Fukuta, J., Goto, A., Kawaguchi, Y., Kurita, A. and Murota, D. (2018) ‘Syntactically–driven algorithmic processing of PP-attachment ambiguity in a second language’, *International Review of Applied Linguistics in Language Teaching*, 56(3), pp. 253-277. Available at: https://doi.org/10.1515/iral-2017-0038

Gass, S. M., Behney, J. and Plonsky, L. (2013) *Second language acquisition: an introductory course*. Routledge.

Giavazzi, M., Sambin, S., Diego-Balaquer, R., Le Stanc, L., Bachoud-Levi, A-C., Jacquwmot, C. (2018) ‘Structural Priming in Sentence Comprehension: a single Priming is Enough’, *PLoS ONE*, 13(4). Available at: https://doi.org/10.1371/journal.pone.0194959

Godwin-Jones, R. (2022). Emerging technologies: Intelligent language tutoring using artificial intelligence—Theory, practice and future directions. *Language Learning & Technology*, 26(1), 6–25.

Goldberg, A.E. (1995) *‘Constructions: A Construction Grammar Approach to Argument Structure’,* University of Chicago Press.

Goldberg, A.E. (2006) *'Constructions at Work: The Nature of Generalization in Language'*. Oxford: Oxford University Press.

Grabe, W. (2009) *Reading in a second language: moving from theory to practice*. Cambridge University Press, 2009.

Grey, S. and Tagarelli, K.M. (2018) 'Psycholinguistic Methods', in A. Phakiti, P. De Costa, L. Plonsky and S. Starfield (eds) *The Palgrave Handbook of Applied Linguistics Research Methodology*. Palgrave Macmillan, p. 287-312.

Gries, S.T. (2005) 'Syntactic priming: a corpus-based approach', *Journal of Psycholinguistic Research*, 34(4), pp. 365-399. Available at: https://doi.org/10.1007/s10936-005-6139-3

Gries, S.T. and Wulff, S. (2005) 'Do foreign language learners also have constructions? Evidence from priming, sorting, and corpora', *Annual Review of Cognitive Linguistics*, 3, pp. 182–200. https://doi.org/10.1075/arcl.3.08gri

Hale, J. (2001) 'A probabilistic Earley parser as a psycholinguistic model', *Proceedings of the 2nd North American Chapter of the Association for Computational Linguistics Meeting* (NAACL-2001), 2, pp. 159-166. Available at: https://doi.org/10.3115/1073336.1073357

Hardy, S.M., Messenger, K. and Maylor, E.A. (2017) 'Aging and syntactic representations: evidence of preserved syntactic priming and lexical boost', *Psychology and Aging*, 32(6), pp. 588-596. Available at: https://doi.org/10.1037/pag0000180

Hardy, S.M., Wheeldon, L. and Segaert, K. (2020) 'Structural priming is determined by global syntax rather than internal phrasal structure: Evidence from young and older adult', *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 46(4), pp. 720-740. Available at: https://doi.org/10.1037/xlm0000754

Hartsuiker, R.J., Bernolet, S., Schoonbaert, S., Speybroeck, S. and Vanderelst, D. (2008) 'Syntactic priming persists while the lexical boost decays: Evidence from written and spoken dialogue', *Journal of Memory and Language*, 58(2), pp. 214–238. Available at: https://doi.org/10.1016/j.jml.2007.07.003.

Hartsuiker, R.J. and Bernolet, S. (2017) 'The development of shared syntax in second language learning', *Bilingualism: Language and Cognition*, *20*(2), pp. 219-234. Available at: https://doi.org/10.1017/S1366728915000164

Hartsuiker, R.J. and Pickering, M.J. (2008) 'Language integration in bilingual sentence production', *Acta Psychologica*, 128(3), pp. 479-489. Available at: https://doi.org/10.1016/j.actpsy.2007.08.005

Hartsuiker, R.J. and Westenberg, C. (2000) ‘Word order priming in written and spoken sentence production’, *Cognition*, 75(2), B27-B39. Available at: https://doi.org/10.1016/S0010-0277(99)00080-3

Hartsuiker, R.J., Pickering, M.J. and Veltkamp, E. (2004) ‘Is Syntax Separate or Shared Between Languages? Cross-Linguistic Syntactic Priming in Spanish-English Bilinguals’, *Psychological Science,* 15(6), pp. 409-414. Available at: https://doi.org/10.1111/j.0956-7976.2004.00693.x

Herring, S.C. (1999) 'Interactional coherence in CMC', *Journal of Computer-Mediated Communication*, 4(4). Available at: https://doi.org/10.1111/j.1083-6101.1999.tb00106.x

Heyselaar, E., Segaert, K., Walvoort, S. J., Kessels, R. P. and Hagoort, P. (2017) ‘The role of nondeclarative memory in the skill for language: evidence from syntactic priming in patients with amnesia’, *Neuropsychologia*, 101, pp. 97-105. Available at: 10.1016/j.neuropsychologia.2017.04.033

Hoffmann, T. and Trousdale, G. (eds.) (2013) ‘The Oxford Handbook of Construction Grammar’. Oxford: Oxford University Press.

Holmes, W., Bialik, M., and Fadel, C. (2022). *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning.* Boston, MA: Center for Curriculum Redesign.

Hopp, H. (2016) ‘The timing of lexical and syntactic processes in L2 sentence comprehension’, *Applied Psycholinguistics*, 37(5), pp. 1253–1280. Available at: https://doi.org/10.1017/S0142716415000569.

Hopp, H. (2017) ‘Cross-linguistic lexical and syntactic co-activation in L2 sentence processing’, *Linguistic Approaches to Bilingualism*, *7*(1), pp. 96-130. Available at: https://doi.org/10.1075/lab.14027.hop

Hopp, H. and Grüter, T. (2023) ‘The time-course of competition from the L1 grammar in L2 sentence processing: evidence from cross-linguistic structural priming’, *Second Language Research*, 39(1), pp. 133-159. Available at: https://doi.org/10.1177/02676583211009

Hopp, H., Schimke, S., Öwerdieck, D., Gastmann, F. and Poarch, G.J. (2025) ‘Learning via Processing: Structural Priming Across Grammatical Structures and Languages in Early Second Language Development’, *Language Learning*. Available at: https://doi.org/10.1111/lang.12711

Hsieh, Y. (2017) ‘Structural priming during sentence comprehension in Chinese-English bilinguals’, *Applied psycholinguistics*, 38(3), pp. 657-678. Available at: https://doi.org/10.1017/S0142716416000382

Huang, Y. and Kakham, P. (2026) ‘The impacts of AI conversational agents on EFL learners' oral proficiency and foreign language speaking anxiety’, *Frontiers in Education*, 11, p. 1799269, Frontiers Media SA.

Huettig, F., Rommers, J. and Meyer, A. S. (2011) ‘Using the visual world paradigm to study language processing: A review and critical evaluation’, *Acta Psychologica*, 137(2), pp. 151-171. Available at: https://doi.org/10.1016/j.actpsy.2010.11.003

Hwang, H. and Shin, J. A. (2019) ‘Cumulative effects of syntactic experience in a between-and a within-language context: Evidence for implicit learning’, *Journal of Memory and Language*, 109(104054). Available at: http://dx.doi.org/10.1016/j.jml.2019.104054

Hwang, H. (2022) ‘L2 learners’ adaptation to an L2 structure that is different from L1: Priming of an English causative structure in Korean learners’, *Studies in Second Language Acquisition*, 44(4), pp. 1181–1193. Available at: https://doi.org/10.1017/S0272263121000620.

Jackson, C. and Hopp, H. (2020) ‘Predictor error and Implicit Learning in L1 and L2 Syntactic Priming’, *International Journal of Bilingualism*, 24(5-6), pp. 895-911. Available at: https://doi.org/10.1177/1367006920902851

Jackson, C.N. and Hopp, H. (2021) ‘Prediction error and implicit learning in L1 and L2 syntactic priming’, *Language, Cognition and Neuroscience*, 36(6), pp. 714–735. Available at: https://doi.org/10.1080/23273798.2020.1860993.

Jackson, C.N. (2018) ‘Second language structural priming: A critical review and directions for future research’, *Second Language Research*, *34*(4), pp.539-552.

Jackson, C.N. and Ruf, H. (2017) ‘The priming of word order in second language German’, *Applied Psycholinguistics*, 38(2), pp. 315-345. Available at: https://doi.org/10.1017/S0142716416000205

Jacob, G., Katsika, K., Family, N. and Allen, S.E. (2017) ‘The role of constituent order and level of embedding in cross-linguistic structural priming’, *Bilingualism: Language and Cognition*, *20*(2), pp.269-282. Available at: https://doi.org/10.1017/S1366728916000717

Jacobs, C. L., Cho, S. J. and Watson, D. G. (2019) ‘Self-priming in production: evidence for a hybrid model of syntactic priming’, *Cognitive science*, 43(7). Available at: https://doi.org/10.1111/cogs.12749

Jaeger, T. F. and Snider, N. E. (2013) ‘Alignment as a consequence of expectation adaptation: syntactic priming is affected by the prime’s prediction error given both prior and recent experience’, *Cognition*, 127(1), 57-83. Available at: https://doi.org/10.1016/j.cognition.2012.10.013

Jegerski, J. (2014) ‘Self-paced reading’, in J. Jegerski and B. Van Patten (eds) *Research Methods in Second Language Psycholinguistics*. Routledge.

Just, M.A., Carpenter, P.A. and Woolley, J.D. (1982) 'Paradigms and processes in reading comprehension', *Journal of Experimental Psychology: General*, 111(2), pp. 228–238.

Kaan, E. and Chun, E. (2018) ‘Priming and adaptation in native speakers and second-language learners’, *Bilingualism: Language and Cognition*, 21(2), pp. 228-242. Available at: https://doi.org/10.1017/S1366728916001231

Kaiser, E. (2013). Experimental paradigms in psycholinguistics. In R. J. Podesva & D. Sharma (Eds.), *Research Methods in Linguistics* (pp. 135–168). Cambridge University Press. https://doi.org/10.1017/CBO9781139013734.009

Kamide, Y. (2012) ‘Learning individual talkers’ structural preference’, *Cognition*, 124(1), pp. 66-71. Available at: 10.1016/j.cognition.2012.03.001

Kaschak, M.P. and Borreggine, K.L. (2008) ‘Is long-term structural priming affected by patterns of experience with individual verbs?’, *Journal of Memory and Language*, *58*(3), pp. 862-878. Available at: https://doi.org/10.1016/j.jml.2006.12.002

Kaschak, M.P., Loney, R.A. and Borreggine, K.L. (2006) ‘Recent experience affects the strength of structural priming’, *Cognition*, 99(3), pp. B73–B82. Available at: https://doi.org/10.1016/j.cognition.2005.07.002

Keating, G. D. (2014) ‘Eye-tracking with text’, in J. Jegerski and B. VanPatten (eds) *Research methods in second language psycholinguistics*. Routledge, pp. 69-92.

Khoe, Y. H., Tsoukala, C., Kootstra, G. J. and Frank, S. L. (2023) ‘Is structural priming between different languages a learning effect? Modelling priming as error-driven implicit learning. Language’, *Cognition and Neuroscience*, 38(4), pp. 537-557. Available at: https://doi.org/10.1080/23273798.2021.1998563

Kim, K.M. and Godfroid, A. (2019) ‘Should we listen or read? Modality effects in implicit and explicit knowledge’, *The Modern Language Journal*, 103(3), pp. 648–664. Available at: https://doi.org/10.1111/modl.12583.

Kim, Y. and McDonough, K. (2008) ‘Learners' production of passives during syntactic priming activities’, *Applied Linguistics*, 29(1), pp. 149-154. Available at: https://doi.org/10.1093/applin/amn004

Kim, Y. and McDonough, K. (2016) ‘Prime repetition and Korean EFL learners’ comprehension and production of passives’, *International Review of Applied Linguistics in Language Teaching*, 54(4), pp. 319-346. Available at: 10.1515/iral-2015-0028

Kim, Y., Skalicky, S. and Jung, Y. (2020) ‘The role of linguistic alignment on question development in face-to-face and synchronous computer-mediated communication contexts: a conceptual replication study’, *Language Learning*, 70(3), pp. 643-684. Available at: https://doi.org/10.1111/lang.12393

Köhne, J., Pickering, M.J. and Branigan, H.P. (2014) ‘The relationship between sentence meaning and word order: Evidence from structural priming in German’, *Quarterly Journal of Experimental Psychology*, 67(2), pp. 304-318. Available at: 10.1080/17470218.2013.807855

Konopka, A. and Bock, K. (2009) ‘Lexical or syntactic control of sentence formulation? Structural generalizations from idiom production’, *Cognitive Psychology*, 58(1), pp. 68-101. Available at: https://doi.org/10.1016/j.cogpsych.2008.05.002

Kramer, R. (2017) *‘O efeito de priming sintático na leitura de sentenças na voz passiva por bons e maus leitores dos 5 e 6 anos do ensino fundamental’*. (PhD Thesis). Pontifical Catholic University of Rio Grande do Sul/PUCRS.

Kurten, A. B. (2017) *‘Investigating syntactic priming during sentence comprehension in developmental dyslexia: evidence for behavioral and neuronal effects’.* (PhD Thesis). Federal University of Santa Catarina.

Kyle, K. and Crossley, S. (2017) ‘Assessing syntactic sophistication in L2 writing: A usage-based approach’. *Language Testing*, *34*(4), pp.513-535.

Langacker, R.W. (2008) *‘Cognitive Grammar: A Basic Introduction’.* Oxford University Press.

Ledoux, K., Traxler, M.J. and Swaab, T.Y. (2007) Syntactic priming in comprehension: evidence from event-related potentials. *Psychological Science*, 18(2), pp.135-143. Available at: https://doi.org/10.1111/j.1467-9280.2007.01863.x

Lee, J., Hosokawa, E., Meehan, S., Martin, N. and Branigan, H. P. (2019) ‘Priming sentence comprehension in aphasia: effects of lexically independent and specific structural priming’, *Aphasiology*, *33*(7), pp. 780-802. Available at: https://doi.org/10.1080/02687038.2019.1581916

Leow, R.P. (2018) ‘Noticing hypothesis’, in J.I. Liontas (ed.) *The TESOL encyclopedia of English language teaching*. Hoboken, NJ: Wiley. Available at: https://doi.org/10.1002/9781118784235.eelt0086.

Leung, J.H.C. and Williams, J.N. (2011). ‘The implicit learning of mapping rules in a second language’*, Second Language Research*, 27(1), pp. 77-103. Available at: https://doi.org/10.1177/0267658310382068

Levelt, W.J.M. and Kelter, S. (1982) ‘Surface form and memory in question answering’, *Cognitive Psychology*, 14(1), pp. 78-106. Available at: https://doi.org/10.1016/0010-0285(82)90005-6

Levy, R. (2008) ‘Expectation-based syntactic comprehension’, *Cognition*, 106(3), pp. 1126–1177. Available at: https://doi.org/10.1016/j.cognition.2007.05.006.

Lightbown, P.M. and Spada, N. (2013) *How languages are learned*. 4and edn. Oxford University Press.

Liu, X. (2023) ‘A review of structural priming’, *Journal of Linguistics and Communication Studies*, 2(2), pp.43-49. Available at: 10.1080/02687038.2014.961122

Liu, X. and Zhong, B. (2025). Integrating generative artificial intelligence into student learning: A systematic review from a TPACK perspective. *Computers & Education: Artificial Intelligence*, 8, 100347.

Long, M. (2015) *Second language acquisition and task-based language teaching*. Blackwell.

Lowder, M. W., Cardoso, A., Pittman, M. and Zhou, A. (2023) ‘Effects of syntactic structure on the processing of lexical repetition during sentence reading’, *Memory & Cognition*, 51(5), pp. 1249-1263. Available at: https://doi.org/10.3758/s13421-022-01380-5

Luka, B. J. and Barsalou, L. W. (2005) ‘Structural facilitation: mere exposure effects for grammatical acceptability as evidence for syntactic priming in comprehension’, *Journal of Memory and Language*, 52(3), pp. 436-459. Available at: 10.1016/j.jml.2005.01.013

Mahowald, K., James, A., Futrell, R., Gibson, E. (2016) ‘A meta-analysis of syntactic priming in language production’, *Journal of Memory and Language*, 91, pp. 5-27. Available at: https://doi.org/10.1016/j.jml.2016.03.009

Marsden, E., Thompson, S. and Plonsky, L. (2018) ‘A methodological synthesis of self-paced reading in second language research’, *Applied Psycholinguistics*, 39(5), pp. 861-904. Available at: https://doi.org/10.1017/S0142716418000036

McDonough, K. (2006) ‘Interaction and syntactic priming: English L2 speaking production of dative constructions’, *Studies in Second Language Acquisition*, 28(2), pp. 179-207. Available at: https://doi.org/10.1017/S0272263106060098

McDonough, K. (2011) ‘Eliciting Wh-questions through collaborative syntactic priming activities during peer interaction’, in P. Trofimovich and K. McDonough (eds) *Applying priming methods to L2 learning, teaching and research: Insights from psycholinguistics*. John Benjamins, pp. 131-151.

McDonough, K. and Chaikitmongkol, W. (2010) ‘Collaborative syntactic priming activities and EFL learners’ production of wh-questions’, *Canadian Modern Language Review*, 66(6), pp. 817-841. Available at: doi:10.3138/cmlr.66.6.817

McDonough, K. and De Vleeschauwer, J. (2012) ‘Prompt-type frequency, auditory pattern discrimination, and EFL learners ’ production of wh-questions’, *Studies in Second Language Acquisition*, 34(3), pp. 355-377. Available at: 10.1017/S0272263112000113

McDonough, K. and Fulga, A. (2015) ‘The detection and primed production of novel constructions’, *Language Learning*, 65(2), pp. 326-357. Available at: https://doi.org/10.1111/lang.12103.

McDonough, K. and Kim, Y. (2009) Syntactic priming, type frequency, and EFL learners' production of wh-questions’, *The Modern Language Journal*, 93(3), pp. 386-398. Available at: https://doi.org/10.1111/j.1540-4781.2009.00897.x

McDonough, K. and Mackey, A. (2008) ‘Syntactic priming and ESL question development’, *Studies in second language acquisition*, 30(1), pp. 31-47. Available at: https://doi.org/10.1017/S0272263108080029

McDonough, K. and Trofimovich, P. (2009) *Using priming methods in second language research.* Routledge.

McDonough, K., Crawford, W.J. and Mackey, A. (2015) ‘Creativity and EFL students' language use during a group problem-solving task’, *TESOL quarterly*, 49(1), pp. 188-199. Available at: https://doi.org/10.1002/tesq.211

McDonough, K., Neumann, H. and Trofimovich, P. (2015) ‘Eliciting production of L2 target structures through priming activities’, *Canadian Modern Language Review*, 71(1), 75-95. Available at: 10.3138/cmlr.2023

Messenger, K., Branigan, H. P., McLean, J. F. and Sorace, A. (2012) ‘Are children’s early passives semantically constrained? Evidence from syntactic priming’, *Journal of Memory and Language*, 66(4), 568-587. Available at: https://doi.org/https://doi.org/10.1016/j.jml.2012.03.008

Meyer, A.S. (2017) ‘Structural priming is not a Royal Road to representations’, *Behavioral and Brain Sciences*, 40, e305. Available at: https://doi.org/10.1017/S0140525X1700053X.

Michel, M. and Stiefenhöfer, L. (2019) ‘Priming Spanish subjunctives during synchronous computer-mediated communication: German peers’ classroom-based and homework interactions’, in M. Sato and S. Loewen (eds) *Evidence-based second language pedagogy.* Routledge, pp. 191-218.

Muylle, M., Bernolet, S. and Hartsuiker, R.J. (2021) 'The development of shared syntactic representations in late L2-learners: Evidence from structural priming in an artificial language', *Journal of Memory and Language*, 119, 104233. https://doi.org/10.1016/j.jml.2021.104233

Nassaji, H. (2017) ‘Grammar acquisition’, in M. Sato and S. Loewen (eds) *The Routledge handbook of instructed second language acquisition*. Routledge, pp. 205-223.

Nassaji, H. and Fotos, S. (2011) *Teaching grammar in second language classrooms: Integrating form-focused instruction in communicative context*. Routledge.

Norris, J. M. and Ortega, L. (2000) ‘Effectiveness of L2 instruction: A research synthesis and quantitative meta-analysis’, *Language Learning*, 50(3), pp. 417-528. Available at: https://doi.org/10.1111/0023-8333.00136

Office of National Statistics (2022) International migration, England and Wales: census 2021. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/internationalmigration/bulletins/internationalmigrationenglandandwales/census2021 (Accessed on 05 August 2025).

Ortega, L. (2009) ‘Studying writing across EFL contexts: looking back and moving forward’, in R. M. Manchón (ed) *Writing in foreign language contexts: Learning, teaching, and research*. Multilingual Matters & Channel View Publications, pp.232-255.

Oxford University Press (2013) *The Oxford 3000™ and The Oxford 5000™ word lists*. Available at: https://www.oxfordlearnersdictionaries.com/wordlists/oxford3000-5000#google_vignette (Accessed on 05 August 2025)

Paget, A. and Stevenson, N. (2014) *On Speaking Terms: making ESOL policy work better for migrants and wider society*. Demos.

Paolazzi, C. L., Grillo, N., Alexiadou, A. and Santi, A. (2019) ‘Passives are not hard to interpret but hard to remember: evidence from online and offline studies’, *Language, Cognition and Neuroscience*, 34(8), pp. 991-1015. Available at: https://doi.org/https://doi.org/10.1080/23273798.2019.1602733

Pappert, S. and Pechmann, T. (2014) ‘Priming word order by thematic roles: no evidence for an additional involvement of phrase structure’, *Quarterly Journal of Experimental Psychology*, 67(11), pp. 2260-2278. Available at: https://doi.org/10.1080/17470218.2014.918632

Pellicer-Sánchez, A. and Conklin, K. (2019) ‘Eye tracking as a data collection method’, in J. McKinley and H. Rose (eds) *The Routledge handbook of research methods in applied linguistics*. Routledge, pp. 370-382.

Pickering, M.J. and Branigan, H. (1998) ‘The Representation of verbs: evidence from syntactic priming in language production’, *Journal of Memory and Language*, 39(4), pp. 633-651. Available at: https://doi.org/10.1006/jmla.1998.2592

Pickering, M.J. and Ferreira, V.S. (2008) ‘Structural priming: A critical review’, *Psychological Bulletin*, 134(3), pp. 427–459. Available at: https://doi.org/10.1037/0033-2909.134.3.427.

Pickering, M.J. and Gambi, C., (2018) ‘Predicting while comprehending language: a theory and review’, *Psychological bulletin*, 144(10), pp.1002-1044. Available at: https://doi.org/10.1037/bul0000158

Pickering, M.J. and Garrod, S. (2004) ‘Toward a mechanistic psychology of dialogue’, *Behavioral and Brain Sciences,* 27(2), pp. 169-190. Available at: https://doi.org/10.1017/S0140525X04000056

Pickering, M.J. and Garrod, S. (2013) ‘An integrated theory of language production and comprehension’, *Behavioral and brain sciences*, 36(4), pp. 329-347. Available at: 10.1017/S0140525X12001495

Pickering, M.J., McLean, J.F. and Branigan, H.P. (2013) ‘Persistent structural priming and frequency effects during comprehension’, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 39(3), pp. 890-897. Available at: 10.1037/a0029181

Porayska-Pomsta, K., Holmes, W., and Nemorin, S. (2024). *The Ethics of AI in Education.* arXiv preprint arXiv:2406.11842.

Rebuschat, P. and Williams, J.N. (2012) ‘Implicit and explicit knowledge in second language acquisition’, *Applied Psycholinguistics*, 33(4), pp. 829–856. Available at: https://doi.org/10.1017/S0142716411000580.

Reitter, D., Keller, F. and Moore, J.D. (2011) ‘A computational cognitive model of syntactic priming’, *Cognitive Science*, 35(4), pp. 587-637. Available at: https://doi.org/10.1111/j.1551-6709.2010.01165.x

Richards, J.C. and Rodgers, T.S. (2014) *‘Approaches and Methods in Language Teaching’*. 3nd edn. Cambridge University Press.

Robinson, P. (1995) 'Attention, memory, and the noticing hypothesis', *Language Learning*, 45(2), pp. 283–331. https://doi.org/10.1111/j.1467-1770.1995.tb00441.x

Robinson, P. (2003) 'Attention and memory during SLA', in C.J. Doughty and M.H. Long (eds.) *The Handbook of Second Language Acquisition*. Oxford: Blackwell, pp. 631–678. https://doi.org/10.1002/9780470756492.ch19

Roden, J. and Osmaston, M. (2021) *ESOL Learners and Functional Skills English*. Commissioned by the Education and Training Foundation on behalf of the Department for Education, conducted by the National Association for Teaching English and Community Languages to Adults (NATECLA).

Salamoura, A. and Williams, J.N. (2007) 'Processing verb argument structure across languages: Evidence for shared and language-specific representations in the bilingual lexicon', *Applied Psycholinguistics*, 28(4), pp. 627-660.

Santos, F. F. D. and Mota, M.B. (2022) ‘Structural priming effects during the oral production of English as L2’, *Revista Linguística*, 18(3), pp. 50-72. Available at: 10.31513/linguistica.2022.v18n3a57465

Santos, M. P. and Mota, M.B. (2018) ‘Effects of intra and translinguistic syntactic priming on the processing of French as L2’, *Linguas & Letras*, 19(43), pp. 77-94. Available at: http://dx.doi.org/10.5935/1981–4755.20180017

Savill, N., Pickering, M.J. and Branigan, H.P. (2017) ‘Priming and long-term syntactic learning in the second language’, *Language and Cognitive Processes*, 32(6), pp. 753-772. Available at: https://doi.org/10.1080/01690965.2016.1247757

Scheepers, C., Raffray, C.N. and Myachykov, A. (2017) ‘The lexical boost effect is not diagnostic of lexically-specific syntactic representations’, *Journal of Memory and Language*, 95, pp.102-115. Available at: https://doi.org/10.1016/j.jml.2017.03.001

Scheffler, P. and Cinciała, M. (2011) ‘Explicit grammar rules and L2 acquisition’, *Elt Journal*, 65, pp. 13-23. Available at: 10.1093/ELT/CCQ019

Schmidt, R. (1990) ‘The role of consciousness in second language learning’, *Applied Linguistics*, 11(2), pp. 129-58. Available at: https://doi.org/10.1093/applin/11.2.129

Schmidt, R. W. (1994) ‘Implicit learning and the cognitive unconscious: of artificial grammars and SLA’, in N. Ellis (ed) *Implicit and explicit learning of languages*. Academic Press, pp. 165-209.

Schoonbaert, S., Hartsuiker, R.J. and Pickering, M.J., (2007) ‘The representation of lexical and syntactic information in bilinguals: evidence from syntactic priming’, *Journal of Memory and Language*, 56(2), pp. 153-171. Available at: https://doi.org/10.1016/j.jml.2006.10.002

Schoot, L., Hagoort, P. and Segaert, K. (2019) ‘Stronger syntactic alignment in the presence of an interlocutor’, *Frontiers in Psychology*, 10, Article 685. Available at: https://doi.org/10.3389/fpsyg.2019.00685

Segaert, K. (2019) ‘Priming Effects’, in V. Zeigler-Hill and T. Shackelford (eds) *Encyclopedia of Personality and Individual Differences*. Springer International Publishing, pp. 1-4.

Segaert, K., Kempen, G., Petersson, K. M. and Hagoort, P. (2013) ‘Syntactic priming and the lexical boost effect during sentence production and sentence comprehension: an fMRI study’, *Brain and Language*, 124(2), pp. 174-183. Available at: https://doi.org/10.1016/j.bandl.2012.12.003

Segaert, K., Menenti, L., Weber, K. and Hagoort, P. (2011) ‘A paradox of syntactic priming: why response tendencies show priming for passives, and response latencies show priming for actives’, *PloS one*, 6(10), Article 24209. Available at: https://doi.org/10.1371/journal.pone.0024209

Segaert, K., Menenti, L., Weber, K., Petersson, K. M. and Hagoort, P. (2012). ‘Shared syntax in language production and language comprehension: an fMRI study’, *Cerebral Cortex,* 22(7), pp. 1662-1670. Available at: https://doi.org/10.1093/cercor/bhr249

Segaert, K., Wheeldon, L. and Hagoort, P. (2016) ‘Unifying structural priming effects on syntactic choices and timing of sentence generation’, *Journal of Memory and Language*, 91, pp. 59-80. Available at: https://doi.org/10.1016/j.jml.2016.03.011

Shin, J.A. and Christianson, K., (2012) ‘Structural priming and second language learning’, *Language Learning*, 62(3), pp. 931-964. Available at: https://doi.org/10.1111/j.1467-9922.2011.00657.x

Simpson, J. (2019) ‘Policies and Adult Language Education in the UK’, in M. Cooke and R. Peutrell (eds) *Brokering Britain, Educating Citizens: exploring ESOL and Citizenship*. Multilingual Matters.

Slim, M.S., Lauwers, P. and Hartsuiker, R.J. (2021) ‘Monolingual and bilingual logical representations of quantificational scope: evidence from priming in language comprehension’, *Journal of Memory and Language*, 116, article 104184. Available at: https://doi.org/10.1016/j.jml.2020.104184

Son, M. (2020) ‘Cross-linguistic syntactic priming in Korean learners of English’, *Applied Psycholinguistics*, 41(5), pp. 1223-1247. Available at: https://doi.org/10.1017/S0142716420000545

Song, Y. and Do, Y. (2018) ‘Cross-linguistic structural priming in bilinguals: priming of the subject-to-object raising construction between English and Korean’, *Bilingualism: Language and Cognition*, 21(1), pp. 47-62. Available at: https://doi.org/10.1017/S1366728916001152

Sprouse, J. (2007) ‘Continuous acceptability, categorical grammaticality, and experimental syntax’, *Biolinguistics*, 1, pp. 118-129. Available at: 10.5964/bioling.8597

Sprouse, J. and Aronoff, M. (2013) *Acceptability judgments*. Oxford University Press.

Staub, A. (2015) ‘The effect of lexical predictability on eye movements in reading: Critical review and theoretical interpretation’, *Language and Linguistics Compass, 9*(8), 311-327. Available at: https://doi.org/10.1111/lnc3.12151

Swain, M. (2005) The output hypothesis: theory and research, in E. Hinkel (ed) *Handbook of research in second language teaching and learning*. Routledge, pp. 471-483.

Swain, M. and Lapkin, S. (2000) ‘Task-based second language learning: The uses of the first language’, *Language teaching research*, 4(3), pp. 251-274. Available at: https://doi.org/10.1177/136216880000400304

Swan, M. (2005) ‘Legislation be hypothesis: the case of task-based instruction’, *Applied Linguistics*, 26(3), pp. 376-401. Available at: https://doi.org/10.1093/applin/ami013

Thothathiri, M. and Snedeker, J. (2008) ‘Give and take: syntactic priming during spoken language comprehension’, *Cognition*, 108(1), pp. 51-68. Available at: https://doi.org/10.1016/j.cognition.2007.12.012

Tomasello, M. (2003) ‘On the different origins of symbols and grammar’, in M.H. Christiansen and S. Kirby (eds) *Studies in the Evolution of Language*. Oxford Scholarship Online, pp.94-110. Available at: https://www.eva.mpg.de/documents/Oxford/Tomasello_Different_Language-evolution_2003_1555825.pdf (Accessed on 05 August 2025)

Tooley, K.M. (2020) ‘Contrasting mechanistic accounts of the lexical boost’, *Memory & cognition*, 48(5), pp. 815-838. Available at: https://doi.org/10.3758/s13421-020-01019-3

Tooley, K.M. (2022) ‘Structural priming during comprehension: a pattern from many pieces’, *Psychonomic Bulletin & Review*, 30(3), pp. 882-896. Available at: 10.3758/s13423-022-02209-7

Tooley, K.M. and Bock, K. (2014) ‘On the parity of structural persistence in language production and comprehension’, *Cognition*, 132(2), pp. 101-136. Available at: https://doi.org/10.1016/j.cognition.2014.04.002

Tooley, K.M. and Traxler, M.J. (2010) ‘Syntactic priming effects in comprehension: a critical review’, *Language and Linguistics Compass*, 4(10), pp. 925-937. Available at: https://doi.org/10.1111/j.1749-818X.2010.00249.x

Tooley, K.M., Pickering, M.J. and Traxler, M.J. (2019) ‘Lexically-mediated syntactic priming effects in comprehension: sources of facilitation’, *Quarterly Journal of Experimental Psychology,* 72(9), pp. 2176-2196. Available at: https://doi.org/10.1177/1747021819834247

Tooley, K.M., Traxler, M.J. and Swaab, T.Y. (2009) ‘Electrophysiological and behavioral evidence of syntactic priming in sentence comprehension’, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 35(1), 19. Available at: 10.1037/a0013984

Traxler, M.J. (2008) ‘Lexically independent priming in online sentence comprehension’, *Psychonomic Bulletin & Review*, 15(1), pp. 149–155. Available at: https://doi.org/10.3758/PBR.15.1.149.

Traxler, M.J. and Tooley, K.M. (2007) ‘Lexical mediation and context effects in sentence processing’, *Brain Research*, 1146, pp. 59-74. Available at: https://doi.org/10.1016/j.brainres.2006.10.010

Traxler, M.J., Tooley, K.M. and Pickering, M.J. (2014) ‘Syntactic priming during sentence comprehension: evidence for the lexical boost’, *Journal of Experimental Psychology: Learning, Memory, and Cognition,* 40(4), 905-918. Available at: https://doi.org/10.1037/a0036377

Trofimovich, P. and McDonough, K. (eds) (2011) *Applying priming methods to L2 learning, teaching and research: insights from psycholinguistics*. 30nd edn. John Benjamins Publishing.

Truscott, J. and Sharwood Smith, M. (2004) 'Acquisition by processing: A modular approach to language development', *Bilingualism: Language and Cognition*, 7(1), pp. 1–20.

Ur, P. (2011). Grammar teaching: research, theory, and practice’, in E. Hinkel (ed.) *Handbook of research in second language teaching and learning*. Routledge, pp. 507-522.

Van Boxtel, W. S. and Lawyer, L. A. (2023) ‘Syntactic comprehension priming and lexical boost effects in older adults’, *Language, Cognition and Neuroscience*, 38(1), pp. 105-120. Available at: https://doi.org/10.1080/23273798.2022.2091151

Van Lieburg, R. and Bernolet, S. (2025) ‘The lexical boost effect is stronger in main clauses than in subordinate clauses’, *Frontiers in Language Sciences*, 3(3), article1462269. Available at: https://doi.org/10.3389/flang.2024.1462269

Weatherholtz, K., Campbell-Kibler, K. and Jaeger, T.F. (2014) ‘Socially-mediated syntactic alignment’, *Language Variation and Change*, 26(3), pp. 387–420. Available at: https://doi.org/10.1017/S0954394514000155.

Weber, K. and Indefrey, P. (2009) ‘Syntactic priming in German: English bilinguals during sentence comprehension’, *NeuroImage*, 46(4), pp. 1164-1172. Available at: https://doi.org/10.1016/j.neuroimage.2009.03.040

Wei, H., Boland, J. E., Cai, Z. G. and Yuan, F. (2019) ‘Persistent structural priming during online second-language comprehension’, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 45(2), 349-359. Available at: 10.1037/xlm0000584

Wei, H., Boland, J. E., Zhang, C., Yang, A. and Yuan, F. (2024) ‘Lexically independent structural priming in second language online sentence comprehension’, *Language Learning*, 74(2), pp. 299-331. Available at: https://doi.org/10.1111/lang.12588

Wei, R., Kim, S. A. and Shin, J. A. (2022) ‘Structural priming and inverse preference effects in L2 grammaticality judgment and production of English relative clauses’, *Frontiers in Psychology*, 13, article 845691. Available at: 10.3389/fpsyg.2022.845691

Williams, J. N. (2005) ‘Learning without awareness’, *Studies in Second Language Acquisition*, 27(2), pp. 269-304. Available at: https://doi.org/10.1017/S0272263105050138

Wittenberg, E., Khan, M. and Snedeker, J., (2017) ‘Investigating thematic roles through implicit learning: evidence from light verb constructions’, *Frontiers in Psychology*, *8*, Available at: https://doi.org/10.3389/fpsyg.2017.01089

Yi, E. and Koenig, J.P. (2016) ‘Why verb meaning matters to syntax’, *Explorations of the syntax-semantics interface*, *3*, pp. 57-76. Available at: 10.1515/9783110720297-003

Yoshida, M. (2023) ‘Self-paced reading’, *The Oxford Handbook of Experimental Syntax*, pp. 313-332. Available at: 10.1093/oxfordhb/9780198797722.013.10

Zhang, C., Bernolet, S. and Hartsuiker, R. J. (2020) ‘The role of explicit memory in syntactic persistence: effects of lexical cueing and load on sentence memory and sentence production’, *PloS one*, 15(11), e0240909. Available at: https://doi.org/10.1371/journal.pone.0240909

Zhang, P. (2022) ‘How does repetition affect vocabulary learning through listening to the teacher’s explicit instruction? The moderating role of listening proficiency and preexisting vocabulary knowledge’, *Language Teaching Research*, 0(0). Available at: https://doi.org/10.1177/13621688221140521

Zhang, R., Zou, D. and Cheng, G. (2024) ‘A review of chatbot-assisted learning: pedagogical approaches, implementations, factors leading to effectiveness, theories, and future directions’. *Interactive Learning Environments*, 32(8), pp. 4529-4557. Available at: 10.1080/10494820.2023.2202704

Zhang, W. (2026). ‘The impact of AI chatbots on EFL learners’ oral proficiency and willingness to communicate’. *System*, *136*, p.103919.

Zhang, X., Huang, Y. and Liu, Y. (2022) ‘Enhancing language task engagement in the instructed language classroom: voices from Chinese English as a foreign language students and teachers’, *International Journal of Chinese Education*, 11(2). Available at: 10.1177/2212585X221097718

Zhou, J. (2022) ‘The effects of syntactic awareness on L2 Chinese passage-level reading comprehension’, *Frontiers in Psychology,* 12. Available at: https://doi.org/10.3389/fpsyg.2021.783827.

Ziegler, J. and Snedeker, J. (2018) ‘How broad are thematic roles? Evidence from structural priming’, *Cognition*, 179, pp. 221-240. Available at: https://doi.org/10.1016/j.cognition.2018.06.019

Ziegler, J., Bencini, G., Goldberg, A. and Snedeker, J. (2019) ‘How abstract is syntax? Evidence from structural priming’, *Cognition*, 193, e104045. Available at: 10.1016/j.cognition.2019.104045

Zingaretti, M. and Spelorzi, R. (2021) ‘Bridging the gap between native and non-native English-speaking teachers: Insights from bilingualism research *Spark: Stirling International Journal of Postgraduate Research*, *7*(1).

Appendices

Appendix 1: College Permission (Study 1)

CONSENT FORM

Research study: *The effect of syntactic priming on reading comprehension by ESOL learners at different levels of proficiency*

Researcher: Sidriana Scheffer

Objectives of the study:

The topic of the research is second language (L2) reading comprehension in English for Speakers of Other Languages (ESOL) learners. The study is situated in the psycholinguistics paradigm of syntactic priming and aims to investigate through a behavioural experiment whether previous exposure to passive voice syntactic structures facilitates reading comprehension in English as a second language by reducing the reading time and increasing accuracy. The primary focus of this study will be L2 syntactic priming and whether it can generate learning opportunities in L2 classrooms.

Description:

In a voluntary condition, 60 ESOL learners at 3 levels of proficiency – Entry 3, Level 1, and Level 2; and 20 monolingual English speakers will participate in the study. All participants will be students at Doncaster College, enrolled on to Functional Skills English Skills for Life programme and over 18 years old. No financial compensation will be given for participation. Participants will be required to sign a consent form to take part in the experiment and the researcher will provide all the information necessary for their understanding of the study. Participants will take a self-paced reading syntactic priming task set up in E-Prime 3.0 software (Psychology Software

Tools, Pittsburgh, PA) to measure response time and accuracy. The task consists in reading a passage word-by-word on a computer screen pressing a button to get the next word displayed so that the software can capture their reading time.

The researcher will recruit the participants verbally in their classrooms and the experiment will take place in the assessment room (S3800) outside participants' classes and the researcher's working hours.

This project was approved by the Human Research Ethics Committee of York St John University on 26/03/2022 – Approval Code RECLL00038.

Declaration of Consent:

I have been informed of the aims and procedures involved in the research project outlined above. I reserve the right to terminate the project altogether if I think it necessary. I understand that the information gained will be anonymous and that the participants and the college's names will be removed from any materials used in the research.

Name: Naomi Nikhata

ESOL Curriculum Lead DN College Groups

Doncaster College and University Centre

naomi.nikhata@don.ac.uk

01302 55355 3 ext 2850

Signed:

Appendix 2: Consent Form Participant – Pilot Study (Study 1)

CONSENT FORM

Title of the study: *The effect of syntactic priming on reading comprehension by ESOL learners at different levels of proficiency*

Name of researcher: *Sidriana Scheffer*

I have been informed about the nature of this research and willingly consent to take part in the pilot study. I understand that if I decide to participate and later change my mind, I am free to withdraw up to 2 weeks from participating in the study and this will not affect my routine and my relationship with the researcher.

I understand I will have to do a self-paced reading task in the Psychology Laboratory - room FS 212 on YSJ campus and in the assessment room (N380) at DN College The task will take approximately 40 to be completed.

I am over 18 years of age.

Name …….

Signed ……..

Email ……..

Date ……..

Appendix 3: Ethical Consent (Study 1)

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Lord Mayor's Walk
York YO31 7EX

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School of Education, Language and Psychology

2 November 2026

Dear Sidriana Scheffer,

The School of Education, Language and Psychology Ethics Committee has reviewed the application "**The effect of syntactic priming on reading comprehension by ESOL learners at different levels of proficiency** ".

Based on your responses on 6th and 14th March, we are happy to approve this project.

Approval code: RECLL00038

We wish you luck in your project, but do let us know if you plan any substantial amendments.

Yours sincerely,

Dr Scott Cole

Ethics committee

School of Education, Language and Psychology.

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Appendix 4: Information sheet for participants

Research Project:

The effect of syntactic priming on reading comprehension by ESOL learners at different levels of proficiency

Researcher's name: Sidriana Scheffer

Researcher's contact: (sidriana.scheffer@yorksj.ac.uk)
(sidriana.scheffer@don.ac.uk)

I would like to invite you to take part in a study of second language reading processing and learning. This research project is part of the Professional Doctorate in Applied Linguistics at York St John University, under the supervision of Dr Ann-Marie Hunter (a.hunter@yorksj.ac.uk) and Dr Leesa Clarke (l.clarke@yorksj.ac.uk). Before you decide, it is important you understand why the research is being done and what it would involve for you. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

Aim of the Study

This study requires adults aged 18+ English for Speaker of Other Languages (ESOL) students at Entry level 1, Level 1, and Level 2 and English monolingual students. I will investigate reading techniques for sentence comprehension. The findings of this study can be useful for promoting the development of additional pedagogical tools to help ESOL tutors in a classroom context and as a support to develop second language teaching resources.

Procedures and Activities

If you agree to take part in this study, your participation will be outside of your college timetable, for example, after 12.30 pm if you study in the morning or 4.30 pm if you study in the afternoon. You might be required to perform one or more tasks during the college half-term period from 30/05/2022 to 03/06/2022 or after the end of the term on 16/06/2022.

You will be asked to do three different tasks. The details of each task are described below:

1. Reading test

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You will have to do a reading test on the SkillsForward Elearning assessment platform for Functional Skills and GCSE in the assessment room (S3800) in Doncaster College and University Centre.

When?
You can choose to do the reading test after one of your ESOL sessions or on another day of the week.

How long will the test take?
The assessment is predicted to last approximately 1 hour.

2. Complete a questionnaire about your language and educational background on Microsoft Forms.

   When?
   You can complete the form at home. I will share it with you on your Microsoft Teams account provided by Doncaster College.

   How long will it take?
   You will take approximately 10 minutes to answer all the questions and submit the form.

3. Take a self-paced reading syntactic priming task.
   You will read sentences (a total number of 300) presented word-by-word on a computer screen. After reading a word, your task will be to press the spacebar on the keyboard so that the next word can appear. Occasionally, you will have to answer one comprehension question.

   When?
   You can choose to do the task after one of your sessions or on another day of the week. You will do this task in the assessment room (S3800) in Doncaster College and University Centre with the researcher's assistance.

   How long will it take?
   It will take at least 1 hour to do this task. It will depend on how fast you read the sentences on the computer.

Important
*The **reading test** and the **self-paced reading syntactic priming task** will not take place on the same day. Therefore, you will be required to attend the sessions on two different days of the week. You can choose to do the tasks in the same week or at an interval of two or more weeks.*

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Expenses

There will not be financial compensation for your participation in the study. However, I will pay for the cost of your travel (bus ticket or parking) if you choose to do the activities on a day you do not have ESOL class. I will reimburse you on the day you are timetabled to be in college to do the tasks.

Benefits

Your participation in this study will be voluntary and you will be contributing to the research on second language learning. Additionally, you will have the opportunity to assess your reading performance in English.

Risks

The risks associated with this study are minimal or inexistent. Any potential risk would be related to assessment issues experienced by some people, for example, nervousness and/or tiredness. To minimise these risks, you will have the opportunity to practise on the computer before taking the self-paced reading task so that you will be familiar with the task and have any possible questions answered by me. You may experience some discomfort during the self-paced reading task such as visual fatigue. To minimise this, I will ensure the room is well lit and with a comfortable temperature.

Participation

Your participation is voluntary. If you do not wish to take part, you do not have to. If you decide to take part and later change your mind, you can withdraw up to 2 weeks from participating in the study.

If you decide to take part, you will be given a Participant Consent Form to sign and a copy to keep.

Data storage

All the information and data you may provide for this study will be securely stored in a file hosting service (OneDrive) provided by York St John University. The information will only be seen by me and my project tutors.

Research Process

It is anticipated that this research will be completed by the end of 2023. The results may be presented at conferences or written up in journals but no individual will be identified in any publication of the results. This project was approved ON 26/03/2022

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by the Human Research Ethics Committee of York St John University. Approval Code RECLL00038.

Should you have any complaints concerning how this research is conducted, please contact my supervisor Ann-Marie Hunter – a.hunter@yorksj.ac.uk.

Thank you for taking the time to read this information sheet and for considering volunteering for this research.

Sidriana Scheffer
Doctoral candidate
School of Education, Language and Psychology
York St John University

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Appendix 5: Main Study Participants' Consent Form (Study 1)

CONSENT FORM

Title of the study: *The effect of syntactic priming on reading comprehension by ESOL learners at different levels of proficiency*

Name of researcher: *Sidriana Scheffer*

I have been informed about the nature of this study and willingly consent to take part in it. I understand that if I decide to participate and later change my mind, I am free to withdraw up to 2 weeks from participating in the study and this will not affect my routine and my relationship with the researcher.

I understand I will have to do three different activities:

1 A reading placement test

2 A self-paced reading task

These tasks will take place at Doncaster College in the assessment room (S3800). They will take at least 1 hour each to be completed and will not be done on the same day. I will have to do the activities after one of my ESOL sessions or on another day of the week or during the college half term.

I will be reimbursed for my travel expenses (bus ticket or parking) every time I have to travel to college to do the tasks.

3 Answering a questionnaire on Microsoft Forms

I can complete the questionnaire at home. It will take approximately 10 minutes to answer all the questions and submit the form to the researcher.

I am over 18 years of age.

Name …….

Signed ……..

Email ……..

Date ……..

Preferred days of the week or date to do the reading placement test and the self-paced reading task.

……. and ……..

Appendix 6: Full Set of Sentences Self-Paced Reading Experiment (300 Sentences) (Study 1)

Pair_ID	Condition	Role	Morphology	Reversibility	Stimuli sentence
1	Repetition	Prime	Regular	Reversible	The suspect was questioned by the officer.
1	Repetition	Target	Regular	Reversible	The man was questioned by the inspector.
2	Repetition	Prime	Regular	Reversible	The doctor was rejected by the clinic.
2	Repetition	Target	Regular	Reversible	The player was rejected by the coach.
3	Repetition	Prime	Regular	Reversible	The visitor was welcomed by the driver.
3	Repetition	Target	Regular	Reversible	The student was welcomed by the teacher.
4	Repetition	Prime	Regular	Reversible	The detective was contacted by the boy.
4	Repetition	Target	Regular	Reversible	The officer was contacted by the man.
5	Repetition	Prime	Regular	Reversible	The athlete was covered by the reporter.
5	Repetition	Target	Regular	Reversible	The teacher was covered by the substitute.
6	Repetition	Prime	Regular	Reversible	The athlete was reviewed by the scout.
6	Repetition	Target	Regular	Reversible	The worker was reviewed by the manager.
7	Repetition	Prime	Regular	Reversible	The worker was charged by the court.
7	Repetition	Target	Regular	Reversible	The man was charged by the detective.
8	Repetition	Prime	Regular	Reversible	The project was finished by the boy.
8	Repetition	Target	Regular	Reversible	The task was finished by the worker.
9	Repetition	Prime	Regular	Reversible	The schedule was changed by the officer.
9	Repetition	Target	Regular	Reversible	The routine was changed by the worker.
10	Repetition	Prime	Regular	Reversible	The office was cleaned by the worker.
10	Repetition	Target	Regular	Reversible	The clinic was cleaned by the doctor.
11	Repetition	Prime	Regular	Reversible	The laptop was repaired by the student.
11	Repetition	Target	Regular	Reversible	The engine was repaired by the mechanic.
12	Repetition	Prime	Regular	Reversible	The driver was invited by the worker.
12	Repetition	Target	Regular	Reversible	The student was invited by the man.
13	Repetition	Prime	Regular	Reversible	The man was selected by the writer.
13	Repetition	Target	Regular	Reversible	The officer was selected by the doctor.
14	Repetition	Prime	Irregular	Reversible	The race was lost by the runner.
14	Repetition	Target	Irregular	Reversible	The game was lost by the team.
15	Repetition	Prime	Irregular	Reversible	The letter was written by the teacher.
15	Repetition	Target	Irregular	Reversible	The report was written by the officer.

16	Repetition	Prime	Irregular	Reversible	The teacher was driven by the manager.
16	Repetition	Target	Irregular	Reversible	The worker was driven by the driver.
17	Repetition	Prime	Irregular	Reversible	The manager was forgotten by the executive.
17	Repetition	Target	Irregular	Reversible	The writer was forgotten by the student.
18	Repetition	Prime	Irregular	Reversible	The decision was made by the coach.
18	Repetition	Target	Irregular	Reversible	The arrest was made by the officer.
19	Repetition	Prime	Irregular	Reversible	The house was sold by the agent.
19	Repetition	Target	Irregular	Reversible	The car was sold by the boy.
20	Repetition	Prime	Irregular	Reversible	The phone was made by the company.
20	Repetition	Target	Irregular	Reversible	The table was made by the carpenter.
21	Repetition	Prime	Irregular	Reversible	The assistant was told by the student.
21	Repetition	Target	Irregular	Reversible	The child was told by the writer.
22	Repetition	Prime	Irregular	Reversible	The speech was made by the writer.
22	Repetition	Target	Irregular	Reversible	The point was made by the doctor.
23	Repetition	Prime	Irregular	Reversible	The man was helped by the doctor.
23	Repetition	Target	Irregular	Reversible	The colleague was helped by the student.
24	Repetition	Prime	Irregular	Reversible	The letter was written by the doctor.
24	Repetition	Target	Irregular	Reversible	The speech was written by the driver.
25	Repetition	Prime	Irregular	Reversible	The window was broken by the officer.
25	Repetition	Target	Irregular	Reversible	The glass was broken by the student.
26	Repetition	Prime	Irregular	Non-reversible	The glass was broken by the boy.
26	Repetition	Target	Irregular	Non-reversible	The door was broken by the man.
27	Repetition	Prime	Regular	Non-reversible	The bridge was cleaned by the crew.
27	Repetition	Target	Regular	Non-reversible	The floor was cleaned by the student.
28	Repetition	Prime	Regular	Non-reversible	The car was changed by the company.
28	Repetition	Target	Regular	Non-reversible	The machine was changed by the factory.
29	Repetition	Prime	Regular	Non-reversible	The suspect was arrested by the police.
29	Repetition	Target	Regular	Non-reversible	The thief was arrested by the officer.
30	Repetition	Prime	Regular	Non-reversible	The umbrella was changed by the customer.
30	Repetition	Target	Regular	Non-reversible	The order was changed by the shop.
31	Repetition	Prime	Regular	Non-reversible	The machine was borrowed by the manager.
31	Repetition	Target	Regular	Non-reversible	The car was borrowed by the officer.
32	Repetition	Prime	Regular	Non-reversible	The mobile was repaired by the expert.
32	Repetition	Target	Regular	Non-reversible	The car was repaired by the mechanic.

33	Repetition	Prime	Regular	Non-reversible	The cheese was praised by the chef.
33	Repetition	Target	Regular	Non-reversible	The laptop was praised by the reviewer.
34	Repetition	Prime	Regular	Non-reversible	The suspect was questioned by the detective.
34	Repetition	Target	Regular	Non-reversible	The witness was questioned by the lawyer.
35	Repetition	Prime	Regular	Non-reversible	The plan was modified by the manager.
35	Repetition	Target	Regular	Non-reversible	The book was modified by the editor.
36	Repetition	Prime	Regular	Non-reversible	The design was modified by the engineer.
36	Repetition	Target	Regular	Non-reversible	The wall was modified by the builder.
37	Repetition	Prime	Regular	Non-reversible	The machine was finished by the worker.
37	Repetition	Target	Regular	Non-reversible	The vase was finished by the potter.
38	Repetition	Prime	Regular	Non-reversible	The file was uploaded by the coach.
38	Repetition	Target	Regular	Non-reversible	The data was uploaded by the officer.
39	Repetition	Prime	Irregular	Non-reversible	The laptop was stolen by the thief.
39	Repetition	Target	Irregular	Non-reversible	The money was stolen by the robber.
40	Repetition	Prime	Irregular	Non-reversible	The door was built by the carpenter.
40	Repetition	Target	Irregular	Non-reversible	The computer was built by the technician.
41	Repetition	Prime	Irregular	Non-reversible	The computer was lost by the boy.
41	Repetition	Target	Irregular	Non-reversible	The key was lost by the officer.
42	Repetition	Prime	Irregular	Non-reversible	The vase was stolen by the thief.
42	Repetition	Target	Irregular	Non-reversible	The machine was stolen by the worker.
43	Repetition	Prime	Irregular	Non-reversible	The story was told by the grandmother.
43	Repetition	Target	Irregular	Non-reversible	The joke was told by the teacher.
44	Repetition	Prime	Irregular	Non-reversible	The bridge was crossed by the tourist.
44	Repetition	Target	Irregular	Non-reversible	The valley was crossed by the hiker.
45	Repetition	Prime	Irregular	Non-reversible	The contract was read by the teacher.
45	Repetition	Target	Irregular	Non-reversible	The email was read by the doctor.
46	Repetition	Prime	Irregular	Non-reversible	The money was hidden by the thief.
46	Repetition	Target	Irregular	Non-reversible	The laptop was hidden by the boy.
47	Repetition	Prime	Irregular	Non-reversible	The document was stolen by the spy.

47	Repetition	Target	Irregular	Non-reversible	The wallet was stolen by the boy.
48	Repetition	Prime	Irregular	Non-reversible	The movie was seen by the worker.
48	Repetition	Target	Irregular	Non-reversible	The contract was seen by the team.
49	Repetition	Prime	Irregular	Non-reversible	The news was told by the writer.
49	Repetition	Target	Irregular	Non-reversible	The story was told by the team.
50	Repetition	Prime	Irregular	Non-reversible	The car was sold by the dealer.
50	Repetition	Target	Irregular	Non-reversible	The window was sold by the company.
51	Non-Repetition	Prime	Regular	Reversible	The officer was ignored by the witness.
51	Non-Repetition	Target	Regular	Reversible	The child was scolded by the boy.
52	Non-Repetition	Prime	Regular	Reversible	The child was questioned by the officer.
52	Non-Repetition	Target	Regular	Reversible	The officer was approved by the chief.
53	Non-Repetition	Prime	Regular	Reversible	The book was borrowed by the teacher.
53	Non-Repetition	Target	Regular	Reversible	The driver was arrested by the police.
54	Non-Repetition	Prime	Regular	Reversible	The assistant was invited by the doctor.
54	Non-Repetition	Target	Regular	Reversible	The child was praised by the man.
55	Non-Repetition	Prime	Regular	Reversible	The budget was reduced by the coach.
55	Non-Repetition	Target	Regular	Reversible	The child was watched by the doctor.
56	Non-Repetition	Prime	Regular	Reversible	The player was rejected by the detective.
56	Non-Repetition	Target	Regular	Reversible	The player was arrested by the officer.
57	Non-Repetition	Prime	Regular	Reversible	The laptop was repaired by the expert.
57	Non-Repetition	Target	Regular	Reversible	The worker was replaced by the manager.
58	Non-Repetition	Prime	Regular	Reversible	The layout was modified by the officer.
58	Non-Repetition	Target	Regular	Reversible	The visitor was praised by the boy.
59	Non-Repetition	Prime	Regular	Reversible	The student was questioned by the teacher.
59	Non-Repetition	Target	Regular	Reversible	The doctor was ignored by the staff.
60	Non-Repetition	Prime	Regular	Reversible	The officer was questioned by the inspector.
60	Non-Repetition	Target	Regular	Reversible	The detective was approved by the chief.
61	Non-Repetition	Prime	Regular	Reversible	The athlete was approved by the committee.
61	Non-Repetition	Target	Regular	Reversible	The man was reviewed by the doctor.
62	Non-Repetition	Prime	Regular	Reversible	The athlete was selected by the coach.
62	Non-Repetition	Target	Regular	Reversible	The doctor was employed by the hospital.
63	Non-Repetition	Prime	Irregular	Reversible	The writer was seen by the officer.

63	Non-Repetition	Target	Irregular	Reversible	The window was broken by the rock.
64	Non-Repetition	Prime	Irregular	Reversible	The package was given by the driver.
64	Non-Repetition	Target	Irregular	Reversible	The visitor was forgotten by the host.
65	Non-Repetition	Prime	Irregular	Reversible	The visitor was seen by the boy.
65	Non-Repetition	Target	Irregular	Reversible	The house was built by the builder.
66	Non-Repetition	Prime	Irregular	Reversible	The wallet was stolen by the thief.
66	Non-Repetition	Target	Irregular	Reversible	The detective was hidden by the bushes.
67	Non-Repetition	Prime	Irregular	Reversible	The announcement was made by the teacher.
67	Non-Repetition	Target	Irregular	Reversible	The report was written by the detective.
68	Non-Repetition	Prime	Irregular	Reversible	The document was hidden by the teacher.
68	Non-Repetition	Target	Irregular	Reversible	The letter was written by the author.
69	Non-Repetition	Prime	Irregular	Reversible	The visitor was seen by the coach.
69	Non-Repetition	Target	Irregular	Reversible	The writer was hidden by the curtain.
70	Non-Repetition	Prime	Irregular	Reversible	The coat was worn by the man.
70	Non-Repetition	Target	Irregular	Reversible	The poem was written by the teacher.
71	Non-Repetition	Prime	Irregular	Reversible	The book was read by the officer.
71	Non-Repetition	Target	Irregular	Reversible	The photo was taken by the writer.
72	Non-Repetition	Prime	Irregular	Reversible	The player was driven by the chauffeur.
72	Non-Repetition	Target	Irregular	Reversible	The nurse was called by the detective.
73	Non-Repetition	Prime	Irregular	Reversible	The picture was drawn by the artist.
73	Non-Repetition	Target	Irregular	Reversible	The athlete was seen by the driver.
74	Non-Repetition	Prime	Irregular	Reversible	The dress was made by the tailor.
74	Non-Repetition	Target	Irregular	Reversible	The visitor was told by the detective.
75	Non-Repetition	Target	Irregular	Reversible	The pupil was taught by the tutor.
75	Non-Repetition	Target	Irregular	Reversible	The car was stolen by the thief.
76	Non-Repetition	Prime	Regular	Non-reversible	The book was questioned by the student.
76	Non-Repetition	Target	Regular	Non-reversible	The project was finished by the team.
77	Non-Repetition	Prime	Regular	Non-reversible	The driver was arrested by the officer.
77	Non-Repetition	Target	Regular	Non-reversible	The computer was cleaned by the worker.
78	Non-Repetition	Prime	Regular	Non-reversible	The laptop was approved by the manager.
78	Non-Repetition	Target	Regular	Non-reversible	The client was contacted by the shop.
79	Non-Repetition	Prime	Regular	Non-reversible	The price was reduced by the company.
79	Non-Repetition	Target	Regular	Non-reversible	The mobile was approved by the team.
80	Non-Repetition	Prime	Regular	Non-reversible	The book was selected by the reader.
80	Non-Repetition	Target	Regular	Non-reversible	The contract was praised by the executive.
81	Non-Repetition	Prime	Regular	Non-reversible	The umbrella was found by the worker.

81	Non-Repetition	Target	Regular	Non-reversible	The contract was signed by the boy.
82	Non-Repetition	Prime	Regular	Non-reversible	The receipt was uploaded by the writer.
82	Non-Repetition	Target	Regular	Non-reversible	The driver was arrested by the officer.
83	Non-Repetition	Prime	Regular	Non-reversible	The plan was approved by the doctor.
83	Non-Repetition	Target	Regular	Non-reversible	The glass was cleaned by the janitor.
84	Non-Repetition	Prime	Regular	Non-reversible	The vase was covered by the cloth.
84	Non-Repetition	Target	Regular	Non-reversible	The mobile was approved by the team.
85	Non-Repetition	Prime	Regular	Non-reversible	The computer was tested by the worker.
85	Non-Repetition	Target	Regular	Non-reversible	The laptop was charged by the man.
86	Non-Repetition	Prime	Regular	Non-reversible	The track was repaired by the team.
86	Non-Repetition	Target	Regular	Non-reversible	The guest was invited by the coach.
87	Non-Repetition	Prime	Regular	Non-reversible	The error was noticed by the worker.
87	Non-Repetition	Target	Regular	Non-reversible	The laptop was fixed by the technician.
88	Non-Repetition	Prime	Irregular	Non-reversible	The door was broken by the boy.
88	Non-Repetition	Target	Irregular	Non-reversible	The money was hidden by the team.
89	Non-Repetition	Prime	Irregular	Non-reversible	The key was lost by the writer.
89	Non-Repetition	Target	Irregular	Non-reversible	The bridge was closed by the agency.
90	Non-Repetition	Prime	Irregular	Non-reversible	The path was taken by the company.
90	Non-Repetition	Target	Irregular	Non-reversible	The portrait was drawn by the team.
91	Non-Repetition	Prime	Irregular	Non-reversible	The book was read by the coach.
91	Non-Repetition	Target	Irregular	Non-reversible	The book was stolen by the thief.
92	Non-Repetition	Prime	Irregular	Non-reversible	The coat was worn by the boy.
92	Non-Repetition	Target	Irregular	Non-reversible	The news was told by the officer.
93	Non-Repetition	Prime	Irregular	Non-reversible	The laptop was hidden by the officer.
93	Non-Repetition	Target	Irregular	Non-reversible	The curtains were drawn by the maid.
94	Non-Repetition	Prime	Irregular	Non-reversible	The vase was seen by the student.
94	Non-Repetition	Target	Irregular	Non-reversible	The paper was read by the man.
95	Non-Repetition	Prime	Irregular	Non-reversible	The article was written by the reporter.
95	Non-Repetition	Target	Irregular	Non-reversible	The ball was caught by the boy.

96	Non-Repetition	Prime	Irregular	Non-reversible	The book was hidden by the doctor.
96	Non-Repetition	Target	Irregular	Non-reversible	The story was told by the writer.
97	Non-Repetition	Prime	Irregular	Non-reversible	The window was found by the driver.
97	Non-Repetition	Target	Irregular	Non-reversible	The book was read by the boy.
98	Non-Repetition	Prime	Irregular	Non-reversible	The contract was signed by the worker.
98	Non-Repetition	Target	Irregular	Non-reversible	The uniform was worn by the team.
99	Non-Repetition	Prime	Irregular	Non-reversible	The document was stolen by the officer.
99	Non-Repetition	Target	Irregular	Non-reversible	The car was driven by the worker.
100	Non-Repetition	Prime	Irregular	Non-reversible	The bad was lost by the woman.
100	Non-Repetition	Target	Irregular	Non-reversible	The bill was paid by the customer.
1	Filler	-	-	-	The shop closed early yesterday.
2	Filler	-	-	-	The boy played video games.
3	Filler	-	-	-	The girl worked yesterday.
4	Filler	-	-	-	The company called yesterday.
5	Filler	-	-	-	The boy studied yesterday.
6	Filler	-	-	-	The boy laughed yesterday.
7	Filler	-	-	-	The driver walked yesterday.
8	Filler	-	-	-	The girl called yesterday.
9	Filler	-	-	-	The teacher called yesterday.
10	Filler	-	-	-	The company arrived yesterday.
11	Filler	-	-	-	The shop worked yesterday.
12	Filler	-	-	-	The driver called yesterday.
13	Filler	-	-	-	The teacher played yesterday.
14	Filler	-	-	-	The company rested yesterday.
15	Filler	-	-	-	The teacher rested yesterday.
16	Filler	-	-	-	The boy called yesterday.
17	Filler	-	-	-	The worker closed yesterday.
18	Filler	-	-	-	The boy played yesterday.
19	Filler	-	-	-	The teacher arrived yesterday.
20	Filler	-	-	-	The girl studied yesterday.
21	Filler	-	-	-	The shop rested yesterday.
22	Filler	-	-	-	The boy played yesterday.
23	Filler	-	-	-	The worker travelled yesterday.
24	Filler	-	-	-	The driver played yesterday.
25	Filler	-	-	-	The shop closed yesterday.
26	Filler	-	-	-	The girl rested yesterday.
27	Filler	-	-	-	The girl travelled yesterday.
28	Filler	-	-	-	The driver closed yesterday.
29	Filler	-	-	-	The driver walked yesterday.
30	Filler	-	-	-	The worker walked yesterday.

31	Filler	-	-	-	The shop travelled yesterday.
32	Filler	-	-	-	The company closed yesterday.
33	Filler	-	-	-	The shop laughed yesterday.
34	Filler	-	-	-	The boy called yesterday.
35	Filler	-	-	-	The worker closed yesterday.
36	Filler	-	-	-	The teacher arrived yesterday.
37	Filler	-	-	-	The driver laughed yesterday.
38	Filler	-	-	-	The teacher played yesterday.
39	Filler	-	-	-	The shop played yesterday.
40	Filler	-	-	-	The shop laughed yesterday.
41	Filler	-	-	-	The girl walked yesterday.
42	Filler	-	-	-	The shop laughed yesterday.
43	Filler	-	-	-	The driver travelled yesterday.
44	Filler	-	-	-	The shop travelled yesterday.
45	Filler	-	-	-	The girl rested yesterday.
46	Filler	-	-	-	The worker laughed yesterday.
47	Filler	-	-	-	The girl travelled yesterday.
48	Filler	-	-	-	The boy laughed yesterday.
49	Filler	-	-	-	The shop closed yesterday.
50	Filler	-	-	-	The shop laughed yesterday.
51	Filler	-	-	-	The company walked yesterday.
52	Filler	-	-	-	The worker closed yesterday.
53	Filler	-	-	-	The girl worked yesterday.
54	Filler	-	-	-	The driver arrived yesterday.
55	Filler	-	-	-	The teacher called yesterday.
56	Filler	-	-	-	The driver closed yesterday.
57	Filler	-	-	-	The student walked yesterday.
58	Filler	-	-	-	The shop travelled yesterday.
59	Filler	-	-	-	The company played yesterday.
60	Filler	-	-	-	The teacher played yesterday.
61	Filler	-	-	-	The shop travelled yesterday.
62	Filler	-	-	-	The company laughed yesterday.
63	Filler	-	-	-	The teacher studied yesterday.
64	Filler	-	-	-	The student studied yesterday.
65	Filler	-	-	-	The student closed yesterday.
66	Filler	-	-	-	The student played yesterday.
67	Filler	-	-	-	The student arrived yesterday.
68	Filler	-	-	-	The company closed yesterday.
69	Filler	-	-	-	The worker played yesterday.
70	Filler	-	-	-	The driver laughed yesterday.
71	Filler	-	-	-	The student closed yesterday.
72	Filler	-	-	-	The company studied yesterday.
73	Filler	-	-	-	The girl arrived yesterday.
74	Filler	-	-	-	The company laughed yesterday.
75	Filler	-	-	-	The boy laughed yesterday.
76	Filler	-	-	-	The girl played yesterday.

77	Filler	-	-	-	The driver worked yesterday.
78	Filler	-	-	-	The worker laughed yesterday.
79	Filler	-	-	-	The company rested yesterday.
80	Filler	-	-	-	The student walked yesterday.
81	Filler	-	-	-	The student studied yesterday.
82	Filler	-	-	-	The boy studied yesterday.
83	Filler	-	-	-	The worker closed yesterday.
84	Filler	-	-	-	The boy studied yesterday.
85	Filler	-	-	-	The shop called yesterday.
86	Filler	-	-	-	The teacher laughed yesterday.
87	Filler	-	-	-	The shop played yesterday.
88	Filler	-	-	-	The teacher worked yesterday.
89	Filler	-	-	-	The shop studied yesterday.
90	Filler	-	-	-	The student laughed yesterday.
91	Filler	-	-	-	The driver laughed yesterday.
92	Filler	-	-	-	The driver studied yesterday.
93	Filler	-	-	-	The worker laughed yesterday.
94	Filler	-	-	-	The shop rested yesterday.
95	Filler	-	-	-	The company closed yesterday.
96	Filler	-	-	-	The teacher worked yesterday.
97	Filler	-	-	-	The girl walked yesterday.
98	Filler	-	-	-	The shop rested yesterday.
99	Filler	-	-	-	The worker travelled yesterday.
100	Filler	-	-	-	The student travelled yesterday.

Full set of Comprehension questions

Question ID	Sentence Type / Source	Sentence Read	Comprehension Question	Correct Answer
1	Provided Sample	“The woman was found by the police”	“Did the woman find the police?”	**N**
2	Pair 1 — Prime	“The suspect was questioned by the officer.”	“Did the officer question the suspect?”	**Y**
3	Pair 1 — Target	“The man was questioned by the inspector.”	“Did the man question the inspector?”	**N**
4	Pair 2 — Target	“The player was rejected by the coach.”	“Did the coach reject the player?”	**Y**

Question ID	Sentence Type / Source	Sentence Read	Comprehension Question	Correct Answer
5	Pair 3 — Target	“The student was welcomed by the teacher.”	“Did the student welcome the teacher?”	**N**
6	Pair 4 — Target	“The officer was contacted by the man.”	“Did the man contact the officer?”	**Y**
7	Pair 5 — Target	“The teacher was covered by the substitute.”	“Did the teacher cover the substitute?”	**N**
8	Pair 6 — Target	“The worker was reviewed by the manager.”	“Did the manager review the worker?”	**Y**
9	Pair 7 — Target	“The man was charged by the detective.”	“Did the man charge the detective?”	**N**
10	Pair 12 — Target	“The student was invited by the man.”	“Did the man invite the student?”	**Y**
11	Pair 13 — Target	“The officer was selected by the doctor.”	“Did the officer select the doctor?”	**N**
12	Pair 16 — Target	“The worker was driven by the driver.”	“Did the driver drive the worker?”	**Y**
13	Pair 17 — Target	“The writer was forgotten by the student.”	“Did the writer forget the student?”	**N**
14	Pair 21 — Target	“The child was told by the writer.”	“Did the writer tell the child?”	**Y**
15	Pair 23 — Target	“The colleague was helped by the student.”	“Did the colleague help the student?”	**N**
16	Pair 51 — Target	“The child was scolded by the boy.”	“Did the boy scold the child?”	**Y**

Question ID	Sentence Type / Source	Sentence Read	Comprehension Question	Correct Answer
17	Pair 52 — Target	“The officer was approved by the chief.”	“Did the officer approve the chief?”	**N**
18	Pair 55 — Target	“The child was watched by the doctor.”	“Did the doctor watch the child?”	**Y**

Appendix 7: Pilot study consent (Study 2)

Title of the Study:

Eliciting ESOL Learners' Reading Comprehension and Production of Passive Form Through Priming Activities: A Classroom Investigation

Name of Researcher:

Sidriana Scheffer

Research Supervisor:

Dr Leesa Clarke (l.clarke@yorkst.ac.uk)

I have read and understood the participant information provided to me by the researcher. I have been informed about the nature, purpose, and procedures of this research project and willingly consent to take part in the pilot study.

I understand that:

- My participation is entirely voluntary, and I am free to withdraw at any stage without giving a reason and without any penalty or impact on my regular college studies or my relationship with the researcher/tutors.
- I am over 18 years of age.
- I am currently enrolled in a Functional Skills English course at Level 1.
- I will complete three digital classroom tasks (a grammaticality judgment task, a picture-matching task, and a picture-description task) using a mobile or computer device in a classroom at the college and university centre.
- The activity will take place on a separate day from my regular sessions and will last approximately 45 to 60 minutes in total.
- All my data will be kept strictly confidential and anonymous, and no personal identifying information will be included in any report or publication resulting from this study.

Name (printed):

……

Signature:

……

Email Address:

……

Date:

……

Appendix 8: Ethical Consent (Study 2)

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Research Ethics Committee - School of Education, Language and

Psychology Outcome of Research Ethics application:

Name: Sidriana Scheffer

Reference: ETH2324-

0277

Project Title: ELICITING ESOL LEARNERS' COMPREHENSION AND PRODUCTION OF PASSIVES THROUGH PRIMING ACTIVITIES: A CLASSROOM INVESTIGATION

Date: 19/04/2024

Thank you for your recent application for ethical approval in relation to the above-named project and for addressing the committees enquiries.

I am pleased to inform you that the School of Education, Language and Psychology Ethics Committee has approved your proposal.

Please notify the committee if you intend to make any amendments to the original research as submitted at the date of this approval, including changes to methodology or accompanying documentation. All changes must receive ethical approval prior to commencing any further research.

The Committee would like to take this opportunity to wish you every success with your research.

Dr Penn Smith, Deputy Chair - Research Ethics Committee - School of Education, Language and Psychology

York St John University

Appendix 9: College Permission (Study 2)

CONSENT FORM

Research study: *ELICITING ESOL LEARNERS' COMPREHENSION AND PRODUCTION OF PASSIVES THROUGH PRIMING ACTIVITIES: A CLASSROOM INVESTIGATION*

Researcher: Sidriana Scheffer

Objectives of the study:

The study is *a focus in the classroom* investigation and seeks to explore L2 learning through priming in ESOL learners of different language and literacy backgrounds. Specifically, this study aims to investigate whether structural priming tasks employed as pedagogical instrument leads to the development of ESOL learners' L2 production and subsequent comprehension of passive constructions.

Description:

In a voluntary condition, two cohorts of ESOL learners at Level 1 will participate in the study. All participants will be students at Doncaster College University Centre, enrolled on to Functional Skills English Skills for Life programme and over 18 years old. No financial compensation will be given for participation. Participants will be required to sign a consent form to participate in the experiment, and the researcher will provide all the information necessary to understand the study. Participants will meet the researcher three times in college, on three different dates following the project timeline of activities.

Declaration of Consent:

I have been informed of the aims and procedures involved in the research project outlined above. I reserve the right to terminate the project altogether if I think it necessary up to weeks from the start by informing the researcher of my decision verbally or in written form.

I understand that the information gained will be anonymous and the participants and the college's names will be removed from any materials used in the research.

Name: Naomi Nikhata

ESOL Curriculum Lead DN College Groups

Doncaster College and University Centre

naomi.nikhata@don.ac.uk

01302 55355 3 ext 2850

Signed:

If you have any concerns or a complaint regarding this research, please contact our independent adviser Olalekan Adekola, Research Ethics Chair of School of Humanities at York St John University. Email: o.adekola@yorksj.ac.uk

Appendix 10: Information Sheet for Participants (Study 2)

Research Project:

Eliciting ESOL Learners' Reading Comprehension and Production of Passive Form Through Priming Activities: A Classroom Investigation

Researcher's Name:

Sidriana Scheffer

Researcher's Contact:

sidriana.scheffer@yorksj.ac.uk | sidriana.scheffer@don.ac.uk

I would like to invite you to take part in a research study investigating second language reading comprehension and sentence production. This research project is part of the Professional Doctorate in Applied Linguistics at York St John University, under the supervision of Dr Leesa Clarke (l.clarke@yorksj.ac.uk) and Dr Yeji Han (y.han@yorksj.ac.uk).

Before you decide whether to participate, it is important that you understand why the research is being conducted and what it will involve for you. Please take the time to read the following information carefully, and feel free to ask if anything is unclear or if you would like more information. Thank you for reading this.

Aim of the Study

This study invites adult English for Speakers of Other Languages (ESOL) students (aged 18+) enrolled at Level 1 to participate. The research investigates how screen-based classroom reading and writing activities (syntactic priming tasks) can help improve ESOL learners' sentence comprehension and production. The findings will support the development of practical pedagogical tools and instructional resources for ESOL tutors in classroom settings.

Procedures and Activities

If you agree to take part, the study will be conducted over **three sessions across a 7-day period** in your college classroom. All tasks will be delivered digitally using familiar educational tools (Microsoft Forms, Kahoot, Padlet, and Microsoft Teams).

Session	Timing	Task / Activity Details	Duration
Session 1: Pretest	Day 1	**1. Intake Protocol:** Sign consent form & complete a language/education background questionnaire on Microsoft Forms. **2. Grammar Judgment Task:** Select *Yes*, *No*, or *Maybe* on	**60 min** (15 min questionnaire + 45 min tasks)

Session	Timing	Task / Activity Details	Duration
		sentence correctness in Microsoft Forms. **3. Picture Description Task:** Write sentences describing pictures on Padlet. **4. Picture Matching Task:** Answer *True*/*False* comprehension items on Kahoot.	
Session 2: Treatment & Posttest	Day 2 *(2 days after Session 1)*	**1. Reading & Summary Task:** Read 4 short story paragraphs. After each paragraph, hand back the text, answer 6 comprehension questions, and write a short summary from memory using word prompts on Microsoft Forms. **2. Immediate Posttest:** Complete parallel versions of the Grammar Judgment, Picture Description, and Picture Matching tasks.	**1 hour 45 min** (60 min reading/summary + 45 min posttest)
Session 3: Delayed Posttest	Day 3 *(5 days after Session 2)*	**1. Delayed Posttest:** Complete the final versions of the Grammar Judgment, Picture Description, and Picture Matching tasks to check progress retention.	**45 min**

Expenses & Reimbursement

Participation takes place during your scheduled college sessions/timetable. There is no direct financial compensation for taking part. However, if any activity requires you to attend college on a non-scheduled day, travel expenses (bus tickets or parking fees) will be fully reimbursed on the day you attend.

Benefits

Your participation is completely voluntary. By participating, you will contribute directly to research aimed at improving second language teaching methods. Additionally, you will gain valuable practice assessing and developing your English reading, writing, and grammar skills.

Risks & Minimisation

The risks associated with this study are minimal. Some participants may experience mild tiredness or nervousness during language tasks. To minimise this:

- Practice opportunities and clear guidance will be provided before all tasks.
- All classroom environments will be well-lit, comfortably temperature-controlled, and scheduled with breaks between task blocks to prevent fatigue.

Participation and Withdrawal

Your participation is entirely voluntary. You do not have to take part if you do not wish to. If you decide to participate and later change your mind, you are free to withdraw from the study at any point without any penalty or impact on your college studies.

If you choose to take part, you will be given a Participant Consent Form to sign and a copy to keep for your records.

Data Storage & Confidentiality

All information and data provided will be kept strictly confidential and anonymous. No individual personal details will be included in any dataset or report. Data and signed consent forms will be stored securely on password-protected university cloud servers (OneDrive) accessible only to the researcher and project supervisors. Data will be retained and destroyed in accordance with institutional guidelines.

Research Process & Ethics Approval

This study was granted formal ethical approval by the Human Research Ethics Committee of York St John University (Approval Code: ETH2324-0277; 19 April 2024). Institutional permission was also granted by the ESOL & Basic Skills Department.

The overall doctoral research project is scheduled for completion in 2026. Summary results may be presented at academic conferences or published in journals, but no individual participant will ever be identified.

Contacts for Further Information or Complaints

If you have any questions or concerns about how this research is being conducted, please contact the researcher or lead supervisor:

- **Researcher:** Sidriana Scheffer – sidriana.scheffer@yorksj.ac.uk
- **Research Lead Supervisor:** Dr Leesa Clarke (l.clarke@yorksj.ac.uk)

Thank you for taking the time to read this information sheet and for considering volunteering for this study.

Appendix 11: Signed permission form (Study 2)

CONSENT FORM

Title of the study: *Eliciting ESOL learners' comprehension and production of passives through priming activities: a classroom investigation*

Name of researcher: *Sidriana Scheffer*

I have been informed about the nature of this research and willingly consent to take part in the pilot study. I understand that if I decide to participate and later change my mind, I am free to withdraw up to 2 weeks from participating in the study and this will not affect my routine and my relationship with the researcher.

As part of this study, I will be asked to:

1. Answer questions related to English grammar and describe a series of pictures.

I am over 18 years of age.

Name …….

Signed ……..

Email ……..

Date ……..

Appendix 12: Grammar Judgment Test – (Set of Sentences Stimuli) (Study 2)

GRAMMAR JUDGMENT TEST

Complete list of test sentences

Pretest

Practice sentences

Is this sentence correct? **A girl is being frightened by a dog in the park.**

Is this sentence correct? **They ought write more carefully.**

Is this sentence correct? **A pedestrian was hit by a car in the town centre.**

Is this sentence correct? **Adam's car was costing a fortune to buy.**

Is this sentence correct? **A doctor was being ignored by a patient in the hospital.**

Is this sentence correct? **A child was disappeared in the crowded park.**

Is this sentence correct? **We have not found a solution for this problem already.**

Is this sentence correct? **The partner was fired the boss immediately.**

Is this sentence correct? **The partner was fired the boss immediately.**

Is this sentence correct? **Many films are made in Hollywood every year.**

Is this sentence correct? **A girl is admiring her cat sleeping.**

Is this sentence correct? **Anna was liked a lot the play last weekend.**

Is this sentence correct? **Someone is following us.**

Is this sentence correct? **Someone is following us.**

Is this sentence correct? **A criminal was chased by a police officer.**

Is this sentence correct? **The professor were answering the students' questions.**

Is this sentence correct? **A child is being amused by his lovely parents.**

Is this sentence correct? **A mouse is chasing by a cat outside the house.**

Is this sentence correct? **A nurse doing overtime in the hospital.**

Is this sentence correct? **Anna is baking a cake.**

Immediate Posttest

Is this sentence correct? **On the floor was lying a crying baby.**

Is this sentence correct? **The child was left alone by her mother.**

Is this sentence correct? **A girl is being frightened by a dog in the park.**

Is this sentence correct? **They ought write more carefully.**

Is this sentence correct? **A pedestrian was hit by a car in the town centre.**

Is this sentence correct? **Adam's car was costing a fortune to buy.**

Is this sentence correct? **A doctor was being ignored by a patient in the hospital.**

Is this sentence correct? **A child was disappeared in the crowded park.**

Is this sentence correct? **We have not found a solution for this problem already.**

Is this sentence correct? **The partner was fired the boss immediately.**

Is this sentence correct? **Abdul was studying hard to pass his exams.**

Is this sentence correct? **Many films are made in Hollywood every year.**

Is this sentence correct? **A girl is admiring her cat sleeping.**

Is this sentence correct? **Anna was liked a lot the play last weekend.**

Is this sentence correct? **Someone is following us.**

Is this sentence correct? **The teacher was met her friend in a restaurant.**

Is this sentence correct? **A criminal was chased by a police officer.**

Is this sentence correct? **The professor were answering the students' questions.**

Is this sentence correct? **A child is being amused by his lovely parents.**

Delayed Posttest

Is this sentence correct? **America was discovered by Cristopher Colombo.**

Is this sentence correct? **Monalisa was painted for Leonardo da Vinci.**

Is this sentence correct? **They may offer Jack a job in sales.**

Is this sentence correct? **The flowers were picking up by the gardener.**

Is this sentence correct? **We must to do something to improve our situation.**

Is this sentence correct? **The assignment was completed by the students.**

Is this sentence correct? **The company has accepted my application.**

Is this sentence correct? **Uniforms are wear by most of the students at school.**

Is this sentence correct? **David has been prescribed some sleeping pills by his doctor some sleeping pills.**

Is this sentence correct? **I have been to Italy twice last year.**

Is this sentence correct? **The woman was never forgiven by John for her angry arguments.**

Is this sentence correct? **Serious future environmental problems are predicted by scientist.**

Is this sentence correct? **We should avoid such mistakes in the future.**

Is this sentence correct? **Students are advised their tutors to always do their homework.**

Is this sentence correct? **Children must be teach by their parents on how to protect the environment.**

Is this sentence correct? **Tim broke into tears when he saw his family.**

Is this sentence correct? **Children must be shown by their parents how to protect animals.**

Is this sentence correct? **Sally is doing very well at university.**

Is this sentence correct? **The customer is been served by the shop assistant.**

Appendix 13: Full Set of Pictures – Picture Matching Task (Study 2)

Picture Matching Task – Full Sample of Pictures

PRACTICE PICTURES

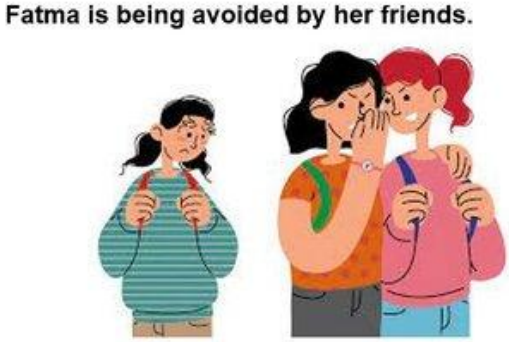
Item 1

Does the following sentence properly describe the picture?



Item 2

Does the following sentence properly describe the picture?



Item 3

Does the following sentence properly describe the picture?

The woman had her hair cut in the saloon.



PRETEST

Item 1

Does the following sentence properly describe the picture?

The doctor was analysed by the man.



Item 2

Does the following sentence properly describe the picture?

The lion is chased by the gazelle.



Item 3

Does the following sentence properly describe the picture?

The senior director is being welcomed by the new staff member.



Item 4

Does the following sentence properly describe the picture?

The student was hugged by the teacher.



Item 5

Does the following sentence properly describe the picture?

The police were caught by the gang.



Item 6

Does the following sentence properly describe the picture?

The waiter was served by the customer.



Item 7

Does the following sentence properly describe the picture?

The footballer who plays for Manchester City scored a goal.



Item 8

Does the following sentence properly describe the picture?

The paparazzi were followed by the artist.



Item 9

Does the following sentence properly describe the picture?

The manager fired the young trainee.



Item 10

Does the following sentence properly describe the picture?

The child is touched by the cat.



Item 11

Does the following sentence properly describe the picture?

The girl is being ignored by the boy.



Item 12

Does the following sentence properly describe the picture?

The son is helped by his father.



Item 13

Does the following sentence properly describe the picture?

The teacher marked the exam for the class



Item 14

Does the following sentence properly describe the picture?

The niece is looked after by her aunt.



Item 15

Does the following sentence properly describe the picture?

The doctor is hugged by the nurses.



Item 16

Does the following sentence properly describe the picture?

The chef who works in a French restaurant is eating.



Item 17

Does the following sentence properly describe the picture?

The husband was fed by his wife.



Item 18

Does the following sentence properly describe the picture?

The tourists are guided by a man.



Item 19

Does the following sentence properly describe the picture?

The clown amused the children.



Item 20

Does the following sentence properly describe the picture?

The zebra was bitten by the lion.



Item 21

Does the following sentence properly describe the picture?

The baby is being kissed by her lovely mother.



Item 22

Does the following sentence properly describe the picture?

The thief is being chased by a determined police officer.



Item 23

Does the following sentence properly describe the picture?

The taxi driver left a passenger in the street.



Item 24

Does the following sentence properly describe the picture?

The girl is being pulled by her older brother.



Item 25

Does the following sentence properly describe the picture?

The mail carrier is being chased by a ferocious dog.



Item 26

Does the following sentence properly describe the picture?

The assistant is sending an email to his boss.



Item 27

Does the following sentence properly describe the picture?

The girl caught an insect that was on the wall.



Item 28

Does the following sentence properly describe the picture?

The man is stealing the thief's bag.



POSTTEST

Item 1

Does the following sentence properly describe the picture?

The customer was served by a man who works in a shop.



Item 2

Does the following sentence properly describe the picture?

The waiter is being served by the woman.



Item 3

Does the following sentence properly describe the picture?

The people are in a meeting.



Item 4

Does the following sentence properly describe the picture?

The cat has been fed by Garry this morning.



Item 5

Does the following sentence properly describe the picture?

2. The mechanic has just finished the car repair.



Item 6

Does the following sentence properly describe the picture?

The man refused the company's offer.



Item 7

Does the following sentence properly describe the picture?

Alex was given some flowers by his mother.



Item 8

Does the following sentence properly describe the picture?

The plumber fixed the shower.



Item 9

Does the following sentence properly describe the picture?

The officer was stopped by the driver.



Item 10

Does the following sentence properly describe the picture?

The waiter is being served by the woman.



Item 11

Does the following sentence properly describe the picture?

The students' questions are answered by the teacher.



Item 12

Does the following sentence properly describe the picture?



Item 13

Does the following sentence properly describe the picture?

The baby is being kissed by her lovely mother.



Item 14

Does the following sentence properly describe the picture?



Item 15

Does the following sentence properly describe the picture?

The child was taken to the zoo by his parent.



Item 16

Does the following sentence properly describe the picture?

The girl's purse was taken by a thief.



Item 17

Does the following sentence properly describe the picture?

The girl was visited by her grandparents.



Item 18

Does the following sentence properly describe the picture?

The child was scared by a huge dog on the street.



Item 19

Does the following sentence properly describe the picture?

The journalists were being interviewed by a politician.



Item 20

Does the following sentence properly describe the picture?

The firefighters were rescued by the man.



Item 21

Does the following sentence properly describe the picture?

The baby is being entertained by his nanny.



Item 22

Does the following sentence properly describe the picture?

The boy is being touched by his sister.



Item 23

Does the following sentence properly describe the picture?



Item 24

Does the following sentence properly describe the picture?

The plumber was called by a client to repair a leak.



Item 25

Does the following sentence properly describe the picture?

The husband was forgiven by his wife after a horrible argument.



Item 26

Does the following sentence properly describe the picture?

The birds were released by the boy after years in a cage.



Item 27

Does the following sentence properly describe the picture?

The husband was carried by his wife.



Item 28

Does the following sentence properly describe the picture?

The officer was stopped by the driver.



DELAYED POSTTEST

Item 1

Does the following sentence properly describe the picture?

The singer was recognised by her fans on the street.



Item 2

Does the following sentence properly describe the picture?

A squirrel was spotted by the children in the park



Item 3

Does the following sentence properly describe the picture?

The woman had her hair cut in the saloon.



Item 4

Does the following sentence properly describe the picture?

The carer was assisted by the old man.



Item 5

Does the following sentence properly describe the picture?

The students are being told off by the teacher.



Item 6

Does the following sentence properly describe the picture?

The clowns were cheered up by the children.



Item 7

Does the following sentence properly describe the picture?

The barber is having his hair cut by the man.



Item 8

Does the following sentence properly describe the picture?

The boy hit the door with a ball.



Item 9

Does the following sentence properly describe the picture?

A picture is being painted by the artist.



Item 10

Does the following sentence properly describe the picture?

The bus driver was stopped by the police.



Item 11

Does the following sentence properly describe the picture?

The man is being frightened by the woman.



Item 12

Does the following sentence properly describe the picture?

The woman refused the company's offer.



Item 13

Does the following sentence properly describe the picture?

The customer was ignored by the waiter.



Item 14

Does the following sentence properly describe the picture?

The security guard pushed the gate.



Item 15

Does the following sentence properly describe the picture?

The nanny was looked after by the children.



Item 16

Does the following sentence properly describe the picture?

16. The police were caught by the robber.



Item 17

Does the following sentence properly describe the picture?

The fox was bitten by the dog.



Item 18

Does the following sentence properly describe the picture?

The artist has just finished painting a picture.



Item 19

Does the following sentence properly describe the picture?

The fans were ignored by the artists.



Item 20

Does the following sentence properly describe the picture?

The doctor who works in a big hospital is treating the patient.



Item 21

Does the following sentence properly describe the picture?

The girl was kicked by the young boy.



Item 22

Does the following sentence properly describe the picture?

The teacher was greeted by the students.



Item 23

Does the following sentence properly describe the picture?

The woman is wrapping the package.



Item 24

Does the following sentence properly describe the picture?

The lorry was hit by the car.



Item 25

Does the following sentence properly describe the picture?

The girl was hit by the boy.



Item 26

Does the following sentence properly describe the picture?

The son was left alone by his father.



Item 27

Does the following sentence properly describe the picture?

The door was opened by the woman.



Item 28

Does the following sentence properly describe the picture?

The painter is painting the living room.



Appendix 14: Full Set of Pictures – Picture Description Task (Study 2)

Picture Description Task – Full Sample of Stimuli

Note. P = passive prime sentence (read by participant). T = production target (participant writes a sentence using the bracketed words). Items are numbered as presented per phase.

PRETEST

Item 1 [P]

Look at this picture and read the sentence.

The students' questions are answered by the teacher.



Item 2 [T]

Describe this picture using the words in brackets.



(WOMAN – ROB – THIEF)

Item 3 [P]

Look at this picture and read the sentence.

The woman was caught by the security guard shoplifting in a shop.



Item 4 [T]

Describe this picture using the words in brackets.



(YOUNG GIRL – PRAISE – TEACHER)

Item 5 [P]

Look at this picture and read the sentence.

The driver was fined by the police officer for speeding.



Item 6 [T]

Describe this picture using the words in brackets.



(WINDOW – CLEAN – WOMAN)

Item 7 [P]

Look at this picture and read the sentence.

The boy was seen cheating on the test by his teacher.



Item 8 [T]

Describe this picture using the words in brackets.



(DOG – CHASE – CAT)

Item 9 [P]

Look at this picture and read the sentence.

The famous actor was acclaimed by his fans.



Item 10 [T]

Describe this picture using the words in brackets.



(STOP – PUPILS – TEACHER)

Item 11 [P]

Look at this picture and read the sentence.

The letters are delivered by a postman every day.



Item 12 [T]

Describe this picture using the words in brackets.



(CATCH - PIRATE – SAILOR)

Item 13 [P]

Look at this picture and read the sentence.

The ball was caught by the young boy.



Item 14 [T]

Describe this picture using the words in brackets.



(WOMAN - KISS –MAN)

Item 15 [P]

Look at this picture and read the sentence.

The house is being painted by the man.



Item 16 [T]

Describe this picture using the words in brackets.



(LADY – HELP – BOY)

POSTTEST

Item 1 [P]

Look at this picture and read the sentence.

The film was seen by hundreds of people.



Item 2 [T]

Describe this picture using the words in brackets.



(CAR – ROB – THIEF)

Item 3 [P]

Look at this picture and read the sentence.

Adam's house was sold by a state agent.



Item 4 [T]

Describe this picture using the words in brackets.



(GRADUATE – PRAISE – BOSS)

Item 5 [P]

Look at this picture and read the sentence.

Fatma's house is cleaned twice a week by her daughters.



Item 6 [T]

Describe this picture using the words in brackets.



(RUG – CLEAN – BOY)

Item 7 [P]

Look at this picture and read the sentence.

Jerry is being chased by Tom.



Item 8 [T]

Describe this picture using the words in brackets.



(ROBBERS – CHASE – POLICE)

Item 9 [P]

Look at this picture and read the sentence.

The poor girl was stung by a bee.



Item 10 [T]

Describe this picture using the words in brackets.



(BRIDE – KISS – GROOM)

Item 11 [P]

Look at this picture and read the sentence.

A picture is being painted by the artist.



Item 12 [T]

Describe this picture using the words in brackets.



(GIRL – HELP – FATHER)

Item 13 [P]

Look at this picture and read the sentence.

The woman is being disturbed by her neighbour.



Item 14 [T]

Describe this picture using the words in brackets.



(BUTTERFLY – CATCH – LITTLE GIRL)

Item 15 [P]

Look at this picture and read the sentence.

The car is being fixed by the mechanic.



Item 16 [T]

Describe this picture using the words in brackets.



(DRIVER – STOP - POLICE)

DELAYED POSTTEST

Item 1 [P]

Look at this picture and read the sentence.

Nails are being painted.



Item 2 [T]

Describe this picture using the words in brackets.

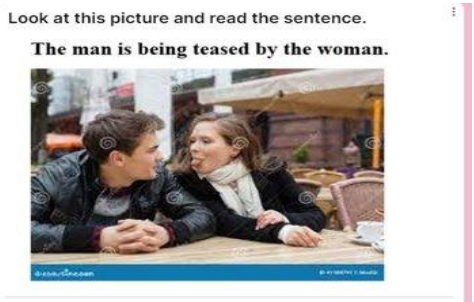


(PRAISE – PUPIL – TEACHER)

Item 3 [P]

Look at this picture and read the sentence.

The man is being teased by the woman.



Item 4 [T]

Describe this picture using the words in brackets.



(KISS – BABY – GRANDMOTHER)

Item 5 [P]

Look at this picture and read the sentence.

The patient is being given very good care by the nurse.



Item 6 [T]

Describe this picture using the words in brackets.



(CATCH – FISH – BOY)

Item 7 [P]

Look at this picture and read the sentence.

The cat is being fed by the girl.



Item 8 [T]

Describe this picture using the words in brackets.

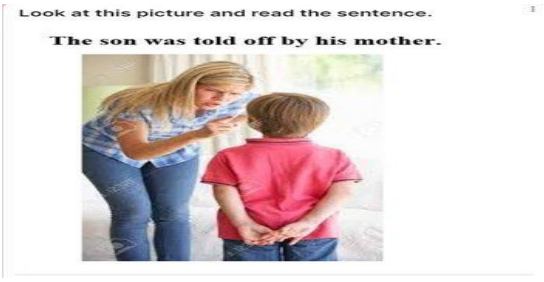


(CHASE - GIRL - BOY)

Item 9 [P]

Look at this picture and read the sentence.

The son was told off by his mother.



Item 10 [T]

Describe this picture using the words in brackets.



(STOP - SECURITY GUARDS - MAN)

Item 11 [P]

Look at this picture and read the sentence.

The heavy bags were carried by the woman.



Item 12 [T]

Describe this picture using the words in brackets.



(CLEAN – TABLE – WOMAN)

Item 13 [P]

Look at this picture and read the sentence.



Item 14 [T]

Describe this picture using the words in brackets.

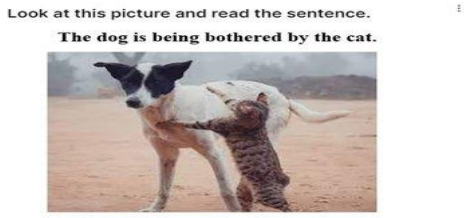


(HELP – ELDERLY – BOY)

Item 15 [P]

Look at this picture and read the sentence.

The dog is being bothered by the cat.



Item 16 [T]

Describe this picture using the words in brackets.

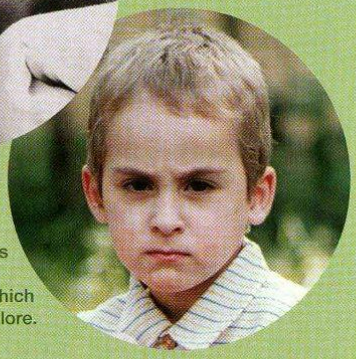


(ROB – THIEF – GIRL)

Appendix 15: Text – Born to Be Wild (Study 2)

BORN TO BE WILD

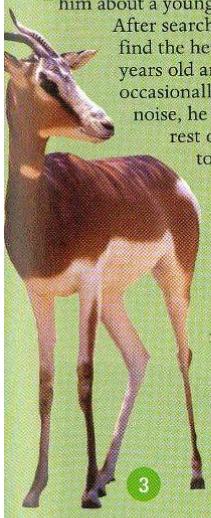




For centuries, people have told stories about children who were brought up by animals and became like animals themselves: so-called 'feral children'. *Tarzan of the Apes* and *The Jungle Book* are two famous fictional accounts. There are many other accounts which claim to be true, although it is sometimes difficult to separate fact from fantasy and folklore.

A One day in 1991, a Ugandan villager called Milly Sebba went further than usual in search of firewood, and came across a little boy with a group of monkeys. She summoned help and the boy was captured and brought back to Milly's village. A villager identified the boy as John Sesebunya, last seen in 1988 at the age of two or three. Later, John claimed that he had got lost in the forest, and that he remembered monkeys coming up to him after a few days and offering him roots and nuts. The pack of five monkeys taught him, he says, to search for food and to climb trees. John has been studied by a host of scientists, who are convinced that he is a genuine feral child. When left with a group of monkeys he avoids eye contact and approaches them from the side with open palms, just as monkeys do.

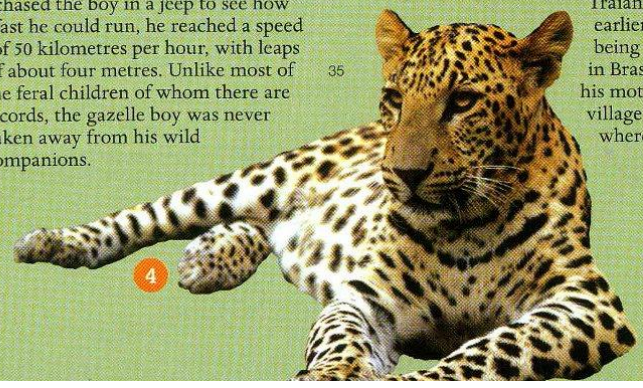
B Jean-Claude Auger, an anthropologist from the Basque country, was travelling alone across the Spanish Sahara in 1960 when he met some Nemadi nomads. They told him about a young boy who lived with a herd of gazelles. After searching for several days, Auger managed to find the herd and the boy. The boy was about 10 years old and walked on all fours, only standing occasionally. Whenever there was an unexpected noise, he twitched his nose and ears, just like the rest of the herd. One senior female seemed to act as his adoptive mother. He would eat roots with his teeth and appeared to be herbivorous. When Auger chased the boy in a jeep to see how fast he could run, he reached a speed of 50 kilometres per hour, with leaps of about four metres. Unlike most of the feral children of whom there are records, the gazelle boy was never taken away from his wild companions.



3

C A leopard-boy was reported by EC Stuart Baker in the Journal of the Bombay Natural History Society (July 1920). According to his report, the boy was stolen from his parents by a leopardess in the North Cachar Hills in India in about 1912, and three years later he was recovered and identified. At that time, the child, who was now five, could run on all fours so fast that an adult man could barely keep up. His knees had hard skin on them and his toes were bent upright, almost at right angles to his feet. The palms of his hands and pads of his toes and thumbs were also covered with very tough skin. When he was first caught, he bit and fought with everyone. If he came across a chicken in the village, he caught it, tore it into pieces and ate it with astonishing speed, just like a wild animal.

D A feral child was caught in the Brasov region of Transylvania, Romania, in February 2002. Early one morning, shepherd Manolescu Ioan came upon a naked, wild-eyed child living in a cardboard box and covered with a plastic sheet. Manolescu reported his find to the police, who later captured the boy. It was believed he had lived alone in the forest for years, but doctors thought that he must have had some protection; perhaps he had been looked after by some of the many wild dogs in the region. He was the size of a normal four-year-old, but his missing front milk teeth suggested an actual age of seven. He ate whatever he was given, but didn't recognise fruit. About a week after his capture, he was identified as Traian Caldarar, lost three years earlier at the age of four. After being re-educated at an orphanage in Brasov, he was reunited with his mother, who lived in a remote village a few kilometres from where he had been found.



4