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First-language planning reduces cognitive load and enhances multiple dimensions of L2 oral performance among intermediate EFL learners

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Abstract

This mixed methods research investigated the influence of first language (L1) planning on the performance of English-speaking skills and perceived mental effort of Colombian university intermediate learners of English as a foreign language (EFL). The experiment involved forty undergraduate students (CEFR B1-B2 level) in a within-subject design where participants performed two narrative speaking tasks following either planning in Spanish (L1) or only in English. Quantitative analysis revealed that L1 planning significantly increased oral fluency, syntactic complexity, reduced number of grammatical errors, and decreased perceived cognitive load in comparison with English-only planning (all $p < .001$) showing exceptionally large effect sizes. Based on qualitative analysis of self-reports and interviews it was found out that L1 planning was applied by learners for idea generation, narration organization, vocabulary selection, and reduction of cognitive demands. Combining the results it can be concluded that first language planning serves as an effective scaffolding device, which facilitates the production of speech in the target language without interfering in the process of actual communication. The present research makes a contribution to the translanguaging studies by proving that the strategic application of first language in the preparatory phase of tasks performance leads to improvement in the quality of output and decrease in cognitive load.



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Introduction

The development of productive oral skills forms an essential goal of English as a Foreign Language (EFL) teaching because speaking allows participants to take part in different kinds of communication, ranging from academic and professional to social interactions. However, despite its obvious significance, speaking turns out to be one of the most challenging skills for EFL learners because of the necessity to control idea generation, lexical retrieval, grammatical encoding, and speech articulation in a limited amount of time (Levelt, 1989; Kormos, 2006). As a result, many learners fail to coordinate these cognitive operations successfully in the second language (L2), thus exhibiting low levels of fluency, simplified language, high frequency of grammatical mistakes, and heavy cognitive workload during speaking (Skehan, 1998; Skehan & Foster, 2001). Therefore, the identification of instructional techniques which would minimise cognitive load while improving speaking outcomes has become one of the main goals of the research on second language acquisition.

One of such techniques, which gained popularity among researchers, is pre-task planning, since it allows EFL learners to organise ideas before performing a speaking task (Ellis, 2009). The results of all previous studies showed that planning improves various aspects of oral production through the reduction of working memory loads and the redistribution of learners' attention on the language formulation while executing the task (Fukuta, 2016; Li et al., 2015; O'Sullivan, 2012). Still, although there is quite a strong agreement about the benefits of the technique, researchers failed to define precisely what particular dimension of speaking improves most through planning because of the trade-offs existing between different aspects of oral language performance due to learners' lack of attentional resources (Ellis, 2009; Skehan, 1998). In other words, while some studies revealed that fluency, syntactic complexity, and accuracy improve as a result of planning (Robinson, 2003), other studies pointed out that the improvement of one aspect occurs at the cost of another one because of the limited attentional resources. Such inconsistency means that new research on the topic is needed. In recent years, scholars paid increasing attention to the issue of the role played by learners' first language (L1) during pre-task planning. Translanguaging theories argue that instead of being seen as an obstacle to the acquisition of English, bilingual learners draw on the whole linguistic repertoire available to them to facilitate cognitive processes. According to such perspective, planning in L1 may help EFL learners to conceptualise better because of the possibility to generate ideas first before translating them into the target language (Scott & de la Fuente, 2008; Yüzlü & Atay, 2020). Many studies have proved that strategic L1 use could help in lowering the cognitive load, enhancing the quality of language production, and increasing confidence in L2 tasks (Konopka et al., 2018; Stapa & Abdulmejid, 2009; Woodall, 2002). Still, most of these findings belong to the field of writing research while comparatively little attention has been devoted to speaking performance and the effect of L1 planning on it.

Even though recent research has begun addressing this issue, there are some important questions to consider. First, most previous research has addressed the issue of the effect of L1 planning on the

traditional measures of oral performance such as fluency, syntactic complexity, and grammatical accuracy with relatively little regard for learners' cognitive load while performing the task. Second, qualitative data concerning the process of L1 planning are rather limited. Thus, understanding how learners utilise their first language while planning and the effect of such cognitive activity on the overall oral production is crucial for the comprehension of the topic.

To fill this gap in the literature and examine the effects of first-language (Spanish) planning compared with English-only planning on the oral performance of intermediate Colombian university students learning English as a foreign language, the present study aims at analysing the differences in the fluency, syntactic complexity, grammatical accuracy, and perceived cognitive load of learners using a counterbalanced within-subjects experimental design. In addition to quantitative data, the research will include written reflections and semi-structured interviews, which will help to learn about the strategies of L1 planning and the learners' perceptions of translanguaging while preparing for the task.

Literature Review

Second language (L2) speaking has always been recognised as one of the most challenging language skills because of the necessity to coordinate several cognitive processes simultaneously. According to Levelt (1989), the speaking process consists of three stages: conceptualisation, formulation, and articulation. Although the model was initially developed for first language production, it was used in the context of L2 speaking by Kormos (2006) who stated that L2 learners have to pay more attention to the processes of conceptualisation and formulation due to the limited knowledge of the language. This approach is compatible with Skehan's (1998) Trade-off Hypothesis according to which L2 learners have limited attentional resources, which makes it impossible to maximise fluency, complexity, and accuracy simultaneously. As a result, high cognitive loads might reduce the level of speaking performance.

A number of previous studies examined the distribution of learners' attention during the process of L2 speaking. According to Scott (1996), idea generation is the most cognitively challenging part of speaking and requires more attention than linguistic encoding. Also, Bygate (1996) claimed that L2 learners usually give priority to planning message content over planning language form, especially during unfamiliar speaking tasks. In the same way, Konopka and Meyer (2014) stated that the speakers first generate ideas and then move to the linguistic encoding while producing a discourse. Such sequential distribution of cognitive resources leads to the depletion of the latter and makes grammatical monitoring and lexical retrieval impossible, thereby lowering fluency and accuracy (Skehan & Foster, 2001). Apart from the issues of cognitive load, speaking is frequently associated with high anxiety compared with other language skills (Ay, 2010). Those learners who suffer from speaking anxiety feel unwilling to speak in English (Liu & Jackson, 2008), and the very issue of speaking

anxiety could make it difficult to coordinate several cognitive processes necessary for successful oral production (Teimouri et al., 2019). Consequently, researchers are increasingly looking for the ways to reduce cognitive load while improving speaking.

Pre-task planning is one of the most frequently investigated strategies which helps in lowering the cognitive load of learners and improves their speaking performance (Ellis, 2009). Speaking is associated with high cognitive demands and therefore requires the engagement of working memory, which limits the amount of attention available for other activities, such as linguistic encoding (O'Sullivan, 2012; Skehan, 2016). From the perspective of the speaking model developed by Levelt (1989), pre-task planning provides the opportunity to facilitate the processes of conceptualisation and formulation through idea organisation before speech. As a result, learners have more resources for lexical selection and grammatical encoding, which positively affects speaking (Fukuta, 2016; Li et al., 2015). Also, pre-task planning has been found to reduce speaking anxiety (Ay, 2010), and learners consistently show their preference towards having planning time before speaking (Elder & Wigglesworth, 2006). Therefore, pre-task planning seems to contribute to speaking performance, willingness to communicate, and active classroom participation. Despite the fact that the positive impact of pre-task planning on speaking performance is evident, the information concerning the exact dimensions of speaking which benefit most through planning is inconclusive. Several types of planning conditions have been investigated such as planning time (Li et al., 2015) and planning type (O'Grady, 2019). For instance, Stroud (2021) showed that those learners who attended to content and language form while planning generated more elaborated speaking responses while those who only rehearsed their plans produced more fluent and productive answers. In a similar way, Robinson (2003) stated that planning contributes to the improvement of syntactic complexity and accuracy. In contrast, Ellis (2009) and Skehan (1998) claimed that planning improves syntactic complexity at the cost of accuracy due to the limited attentional resources of learners. Thus, more research is required to understand the nature of such connection between different kinds of planning and fluency, syntactic complexity, accuracy, and the processes of speaking. An equally important question concerns the role played by learners' first language (L1) during L2 learning. Monolingual theories claim that L1 use must be minimised because of the potential interference with L2 acquisition caused by the negative language transfer (Chamber, 1991; Halliwell & Jones, 1991; Macdonald, 1993; Myles, 2002; Odlin, 1989). However, the more recent translanguaging theories see L1 use as a valuable cognitive resource instead of an obstacle to L2 learning. Numerous studies prove that strategic use of learners' first language lowers the cognitive load (Scott & de la Fuente, 2008), decreases affective filters (Yüzü & Atay, 2020), increases the quality of L2 production (Stapa & Abdulmejid, 2009), and contradicts monolingual assumptions about language learning (Konopka et al., 2018). In writing research, the use of L1 for planning purposes has been associated with the increased quality of written texts

(Woodall, 2002) and willingness to write (Stapa & Majid, 2012). Furthermore, all studies consistently find that learners naturally employ their first language while performing L2 tasks. For example, learners use their L1 for generating ideas, formulating texts, monitoring language production, and completing tasks in different contexts (Cohen & Brooks-Carson, 2001; Sasaki, 2002; van Weijen et al., 2009; Wang & Wen, 2002). Even though these findings come mostly from writing research, they imply that L1 planning could be equally helpful while producing L2 speech. Language proficiency level might also play a significant role in the process of L1 planning. All models of language production assume that the process of linguistic formulation depends greatly on learners' proficiency in the target language (Hayes & Flower, 1980; Juel et al., 1986; Kormos, 2006; Levelt, 1989). As mentioned above, according to the Trade-off Hypothesis by Skehan (1998), learners with limited proficiency have fewer cognitive resources to coordinate idea generation and language formulation, which means that such learners might benefit more from L1 planning. However, empirical evidence on this point is contradictory. Some studies reveal the fact that lower-proficiency learners more frequently use their L1 (Cohen & Brooks-Carson, 2001; Woodall, 2002) while other researchers state that higher-proficiency learners use L1 more (Scott & de la Fuente, 2008; Wang, 2003). Previous research on the correlation between proficiency level and language transfer shows mixed findings as well (Stapa & Abdulmejid, 2009; Wang & Wen, 2002). Despite the development of the research area, the effect of L1 planning on the oral performance of EFL learners, especially with regard to fluency, syntactic complexity, grammatical accuracy, and the cognitive load, needs more examination. The present study tried to address this gap in the literature by investigating the effect of L1 planning on the fluency, syntactic complexity, grammatical accuracy, and cognitive load of intermediate Spanish-speaking university students learning English as a foreign language. Besides, the integration of quantitative data about learners' oral performance with qualitative data about their planning strategies will make the research more informative.

Research questions

Q1: To what extent does first-language (L1) planning influence English oral performance and perceived cognitive load compared with English-only planning among intermediate Colombian EFL learners?

Q2: How do intermediate Colombian EFL learners use and perceive first-language planning as a strategy for preparing English oral tasks?

Method

Participants

The experiment was carried out at a private university located in Bogotá, Colombia, which features a mandatory requirement to learn English within the framework of the curriculum of undergraduate programmes. It is worth noting that Colombia represents an ideal South American English as a Foreign Language setting due to Spanish being the predominant mother tongue of university students.

In order to select candidates based on the inclusion criteria, a purposive sampling method was used. Information about the research was published by the English language teachers and on the university’s virtual learning platform. Those students who wanted to participate in the study received all the necessary information regarding the research before signing an informed consent form. The following inclusion criteria had to be fulfilled in order to qualify: (a) participants had to be native speakers of Colombian Spanish; (b) they had to be involved in an undergraduate programme; (c) they had to be learning English as a foreign language; (d) their proficiency level in English had to be intermediate (B1-B2 according to CEFR); (e) they had to be aged between 18 and 25 years. Participants who lived in English-speaking countries for more than six months, whose proficiency in English exceeded B1-B2, or who reported having any speech, language or hearing disorders were excluded from the study. Proficiency in English was determined using the Oxford Online Placement Test (OOPT), which is a reliable and valid test for assessing students' English proficiency in terms of the placement procedure (Purpura, 2016). Thus, only participants with proficiency in the B1-B2 range could participate, thereby increasing the internal validity of the research. As a result, 40 participants who qualified and took part in both experimental conditions were selected. There was no need for between-group comparisons because each participant took part in all conditions, thus improving statistical efficiency and minimising the effects of individual differences (Field, 2024). Table 1 provides demographic data on the participants.

Table 1
Participant characteristics

Characteristic	Description
Sampling strategy	Purposive sampling
Sample size	40 undergraduate EFL students
Institution	Private university, Bogotá, Colombia
Age	18–25 years
First language	Colombian Spanish
English proficiency	B1–B2 CEFR (Oxford Online Placement Test)
Inclusion criteria	Native Spanish-speaking undergraduates studying English as a foreign language
Exclusion criteria	English proficiency outside B1–B2; residence in an English-speaking country exceeding six months; diagnosed speech, language, or hearing disorders

Table 1 shows that the participants constituted a relatively homogeneous group regarding first language and English proficiency. Homogeneity is desirable in within-subjects experimental studies since it decreases unnecessary variability and increases the likelihood that differences are due to the experimental manipulation and not participant variables.

Design

An explanatory sequential mixed-methods approach design was used, where qualitative inquiry came after quantitative data collection and analysis (Creswell & Plano Clark, 2018). This design was selected because it enables qualitative information to explain the processes behind statistically significant differences and thus provides a more comprehensive knowledge about translanguaging as a cognitive strategy. Quantitative part of the study consisted of counterbalanced within-subjects experiment. Two planning conditions were performed by each participant:

1. **L1-planning (translanguaging condition)**, in which participants planned their response in Spanish before producing the final narrative in English.
2. **English-only planning condition**, in which both planning and production were completed exclusively in English.

This type of design was chosen because each participant was exposed to both the experimental conditions, making each participant their own control. Compared to between-subjects designs, repeated measures designs significantly decrease the error variance due to stable characteristics of learners such as aptitude, motivation, working memory capacity, and language experience (Gravetter et al., 2021). In order to avoid possible practice and order effects, a counterbalancing design was used. Subjects were randomly assigned to one of the two sequences of experimental conditions using computerised random assignment procedure. Participants who were in Sequence A performed L1 planning condition in Session 1-, and one-week later English-only planning condition. Participants in Sequence B performed the conditions in the opposite order. One-week break was chosen between the sessions to eliminate memory effects but preserve equal conditions for learning. Equal narrative speech production tasks were used in both sessions. Tasks were equated in terms of lexical complexity, syntactic complexity, narrative complexity, and expected duration of completion. Both tasks were pretested on students having similar characteristics as the target population before conducting the experiment.

Independent variable is the language used in planning phase, which had two levels: L1 planning and English-only planning. Five dependent variables were measured:

- oral fluency, operationalised as syllables produced per minute;
- syntactic complexity, measured as clauses per T-unit;
- grammatical accuracy, calculated as errors per 100 words;
- perceived cognitive load, assessed using the Mental Demand dimension of the NASA Task Load Index (NASA-TLX); and
- strategic language use, explored qualitatively through written reflections and semi-structured interviews.

Quantitative results looked at the impact of planning language on performance and cognitive load, whereas qualitative results shed light on the ways in which learners used translanguaging as a strategic tool in task preparation. The combination of these two approaches made it possible to understand not just whether the use of translanguaging affected performance, but also how it did so.

Materials

Proficiency in English was evaluated by the Oxford Online Placement Test (OOPT). The Oxford Online Placement Test is a computer-adaptive language test developed by Oxford University Press (see Purpura, 2016). It can be used as an objective and reliable instrument for assessment of grammatical knowledge, vocabulary, and language use. Thus, the OOPT is widely employed for the placement of participants in SLA studies (Purpura, 2016). In order to avoid variability due to different levels of language proficiency, only learners with proficiency at B1-B2 levels of the Common European Framework of Reference were included in the study.

Narrative speaking tasks

For the current study, two narrative speaking tasks were developed using the set of six pictures representing everyday situations. Picture-based tasks were chosen as they minimise the effects of topic familiarity and require spontaneous language production. Such tasks are appropriate for investigating fluency, syntactic complexity, and grammatical accuracy (Ellis & Barkhuizen, 2005). The two tasks were equivalent in terms of narrative structure, lexical demands, syntactic complexity, and cognitive load. In order to verify the equivalence of tasks, a pilot study was conducted with ten EFL learners from the same institution who did not take part in the final study. The pilot study revealed that the two tasks were similar in difficulty level and could be successfully performed by participants within the allocated time. Some changes were made in the presentation of pictures and the instructions to make them clearer. The participants were instructed to tell the story in English as naturally and accurately as possible. Each narrative took approximately three minutes and was recorded digitally with the same equipment in the university language laboratory.

Planning conditions

There were two planning conditions that constituted the experimental manipulation.

Under the L1-planning condition, the participants had five minutes to prepare the narrative using Colombian Spanish. The participants were informed that they could organise ideas, retrieve vocabulary and make some notes in Spanish before presenting the narrative in English.

The participants in the English-only planning condition had five minutes to plan their response in English only. All the instructions in this case were the same except that the use of Spanish during the planning phase was forbidden. The participants were allowed to make some written notes during planning; however, the notes were collected before the speaking task in order to exclude the effect of reading pre-prepared scripts from the results.

Cognitive load measure

The Mental Demand subscale of the NASA Task Load Index (NASA-TLX) was used for measuring perceived cognitive load. This index includes six independent dimensions assessing workload in different aspects of the task (Hart, 2006). One of the aspects is perceived mental demand which is measured by five-point Likert-type scale from 1 ("very low mental demand") to 5 ("very high mental demand"). The NASA-TLX is the most frequently validated tool to assess perceived cognitive demands of learners during SLA (see Hart, 2006).

Written reflection

After the completion of each experimental session, participants were asked to write briefly about their preparation process, languages used for thinking, difficulties encountered and strategies used to complete the task in Spanish. The opportunity to write reflections in the first language allowed reducing possible linguistic constraints.

Semi-structured interviews

After the completion of the quantitative analysis, twelve participants were purposively selected for interviews using maximum variation sampling. In particular, participants showing improvement, no change, or reduction in oral performance were chosen for interviews in order to get the explanation of the observed performance. The interviews were conducted individually in Spanish by the principal researcher and lasted approximately 30-40 minutes. The interview guide was used in order to maintain consistency among participants' responses. The questions concerned the strategies used by participants for planning, languages chosen during the preparation process, cognitive processes, advantages and disadvantages of translanguaging, experiences of performing under L1-planning and English-only conditions. All the interviews were audio-recorded with participants' consent and transcribed verbatim.

Procedure

Data collection was conducted during a five-week period of the second academic semester. All experimental sessions took place in the university language laboratory under identical environmental conditions. During the first session, the participants read an information sheet informing them about the aim and procedure of the experiment and provided written informed consent. They filled in a demographic questionnaire, completed the OOPT and continued the experiment only if they met the inclusion criteria. Random assignment to one of two counterbalanced experimental sequences was performed using a computer-generated list. Participants in Sequence A started with the L1-planning condition and finished with the English-only condition, while participants in Sequence B started with the opposite sequence. The one-week gap was introduced between the sessions in order to reduce possible carryover and practice effects.

The experiment was conducted under identical procedure in each session. First of all, the participants got a picture-based narrative task along with written instructions. Then, they were allowed to spend five minutes planning their narratives according to the condition. Planning under the L1-planning condition was conducted entirely in Spanish, and in the English-only condition – in English only. The participants were allowed to make brief notes during planning, but these notes were taken away before speaking in order to assure spontaneity of oral production. After the planning stage, the participants told the narrative in English based on the picture sequence. The narrative had to last approximately three minutes and be digitally recorded with the same equipment. No feedback concerning language accuracy or task performance was provided during the experiment. Immediately after the end of each narrative, the participants completed the Mental Demand subscale of the NASA-TLX and answered the reflection questions. The time needed for completing the post-task measures was approximately ten minutes. All speech recordings were transcribed orthographically according to the standard transcription conventions. Oral fluency was measured as syllables per minute, syntactic complexity – as clauses per T-unit, and grammatical accuracy – as errors per 100 words. In order to increase reliability of measurements, two experienced applied linguists independently analysed all the recordings using coding guidelines developed beforehand. The interrater reliability was assessed with the intraclass correlation coefficient (ICC), with ICC values of .80 or higher considered as satisfactory agreement (see Koo & Li, 2016). Disagreements were resolved through discussion until reaching consensus. After the completion of the quantitative analyses, twelve participants were asked to participate in individual semi-structured interviews. Conducting the interviews after the quantitative phase would help participants' accounts to explain the differences in performance and provide deeper insights into the strategic use of translanguage during planning. The data from the interviews were further integrated with the results of quantitative analysis during interpretation, as it was the case of an explanatory sequential mixed-methods design.

Data analysis

Quantitative and qualitative data were analysed separately before their integration during the interpretation stage, as recommended for an explanatory sequential mixed-methods design (see Creswell & Plano Clark, 2018).

Quantitative analysis

Quantitative data were analysed using IBM SPSS Statistics (Version 30). Before hypothesis testing, all variables were checked for data entry errors, missing values, outliers, and compliance with the assumptions of parametric analyses. Descriptive statistics (means, standard deviations, ranges, skewness, and kurtosis) were calculated for all dependent variables. The normality of the difference scores was assessed using the Shapiro–Wilk test, normal Q–Q plots, and histogram visualisation. Because the study employed a within-subjects design with paired observations, homogeneity of variance was not considered an assumption. The primary analysis compared participants' performance under the L1-planning and English-only planning conditions. Paired-samples t tests were conducted to examine differences in oral fluency (syllables per minute), syntactic complexity (clauses per T-unit), grammatical accuracy (errors per 100 words), and perceived mental demand measured using the NASA Task Load Index (NASA-TLX). Statistical significance was established at $p < .05$. To assess the practical significance of the findings, Cohen's d for repeated measures and 95% confidence intervals (CIs) were calculated for each comparison. Effect sizes were interpreted according to Cohen's (1988) guidelines, whereby values of approximately 0.20, 0.50, and 0.80 indicate small, medium, and large effects, respectively. When the assumption of normality was violated, the Wilcoxon signed-rank test was conducted to confirm the findings.

Qualitative analysis

The qualitative data included participants' written reflections and transcripts of semi-structured interviews. As the goal of the study was to understand how learners strategically used translanguaging during the task planning process, qualitative data were analysed using reflexive thematic analysis following the six phases described by Braun & Clarke (2022). The analysis started with the repeated reading of the transcripts to get familiar with the data. Inductive codes were generated in the course of whole dataset in order to capture descriptions of planning behaviours, language choices, cognitive processing and strategies used by participants. Similar codes were grouped into broader categories from which the themes were generated. Themes were further refined by comparing them with the corresponding coded extracts and the whole dataset to assure internal consistency and conceptual distinctiveness. Finally, themes were defined, named and illustrated by quotations. Coding was done using NVivo (Version 14) in order to systematise and find easily qualitative data. In order to ensure the credibility of the analysis, the experienced qualitative researcher reviewed approximately 25% of

the coded transcripts independently. If there were any differences in interpretation, they were discussed and, if necessary, coding framework was adjusted. Audit trail containing information about coding decisions, theme development and analytical memos was maintained during the analysis in order to support transparency and dependability.

Integration of quantitative and qualitative findings

Integrating of quantitative and qualitative findings occurred during the interpretation stage through weaving approach when quantitative results and qualitative themes addressing the same research question were presented together. The qualitative findings were used to interpret statistically significant differences between planning conditions and show the cognitive and strategic processes behind the participants' performance. Joint displays were constructed in order to allow the comparison of two datasets and to interpret the statistical results taking into account the accounts of idea generation, vocabulary retrieval, grammatical monitoring, cognitive load, and strategic language use of participants.

Research quality

In order to increase methodological rigour, several measures were adopted during the study. First, internal validity of the results was increased owing to the counterbalanced within-subjects design, random assignment to experimental sequences, equality of the speaking tasks and equal administration procedures of both experimental sessions. Moreover, the pilot study helped to ensure the equality in difficulty and comprehension level of the speaking tasks before data collection. Reliability of measurements was increased with the help of clear instructions for scoring and analysis of all speech samples independently carried out by two applied linguists. Inter-rater reliability was estimated with the help of the intraclass correlation coefficient (ICC). Coefficients higher than .80 indicate the satisfactory agreement (Koo & Li, 2016). Trustworthiness of qualitative results was enhanced due to the prolonged engagement with the data, keeping an audit trail, peer review of the coding procedure and representative participant quotes used for interpreting every identified theme. Triangulation of quantitative and qualitative data provided additional credibility of the results.

Ethical considerations

Prior to data collection, the research was approved by the Research Ethics Committee of the university where it was carried out. Permission to recruit participants and conduct the experiment in the university language laboratories was also received from appropriate university authorities. Participation in the experiment was completely voluntary. Prior to the experiment, participants were given an information sheet explaining the aims of the experiment, the procedures used, the expected time of involvement, the risks and benefits of participation, confidentiality guarantees, the opportunity

to withdraw from the experiment at any point of time without penalty, and other necessary information. Informed written consent was obtained from all participants prior to the experiment. All the collected data were anonymised with the help of unique identification codes (for example, P01 – P40) and did not contain any identifying information. All the digital audio records, transcripts and quantitative datasets were saved on encrypted and password-protected computers having access only for the research team members. According to the institutional policy for managing research data, data of this study will be saved for five years after publication and then destroyed. There was minimum risk involved in this study. Taking into account the possibility of mild anxiety caused by speaking in a second language, participants were informed that the activity is not an evaluation of their academic performance, that there are neither correct nor incorrect answers, that they should speak naturally, and that the recording is going to be used only for research purposes. The study has been conducted in line with the ethical principles of voluntarism, informed consent, confidentiality, anonymity, beneficence, and responsibility in conducting research with human participants, as prescribed by international guidelines for research with human subjects.

Analysis

Descriptive statistics of participants' performance in the L1-planning and L2-planning conditions (N = 40) are presented in Table 2 below. The results showed that participants performed better in terms of fluency in the L1-planning condition ($M = 109.00$, $SD = 0.85$) than in the L2-planning condition ($M = 91.00$, $SD = 1.50$). Likewise, the syntactic complexity was higher in the L1-planning condition ($M = 1.95$, $SD = 0.06$) than in the L2-planning condition ($M = 1.35$, $SD = 0.06$). However, participants made fewer mistakes during L1 planning ($M = 6.60$, $SD = 0.15$) than during L2 planning ($M = 9.40$, $SD = 0.15$). Finally, participants reported lower perceived mental demand, measured with the NASA-TLX scale, during L1 planning ($M = 2.30$, $SD = 0.46$) than during L2 planning ($M = 4.50$, $SD = 0.51$). Descriptive statistics suggest that planning in the first language leads to higher fluency, syntactic complexity, and accuracy with lower cognitive load than planning in the second language.

Table 2

Descriptive Statistics for L1 and L2 Planning

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Fluencysyllmin.L1-Planning: Fluency (syll/min)	109.00	40	.847	.134
	Fluencysyllmin.L2-Planning: Fluency (syll/min)	91.00	40	1.502	.238
Pair 2	ComplexityClausesTunit.L1-Planning: Complexity (Clauses/T-unit)	1.95	40	.060	.009
	ComplexityClausesTunit.L2-Planning: Complexity (Clauses/T-unit)	1.35	40	.060	.009
Pair 3	Errorsper100words.L1-Planning: Errors (per 100 words)	6.60	40	.152	.024
	Errorsper100words.L2-Planning: Errors (per 100 words)	9.40	40	.152	.024
Pair 4	NASATLXMentalDemand5.L1-Planning: NASA-TLX (Mental Demand /5)	2.30	40	.464	.073
	NASATLXMentalDemand5.L2-Planning: NASA-TLX (Mental Demand /5)	4.50	40	.506	.080

Table 3 reports the results of the paired-samples t-tests comparing participants' performance between the L1-planning and L2-planning conditions. Significant differences were observed across all four variables. Participants demonstrated significantly greater fluency during L1 planning than L2 planning, $t(39) = 98.59$, $p < .001$, with a mean difference of 18.00 syllables per minute. Syntactic complexity was also significantly higher in the L1-planning condition, $t(39) = 50.53$, $p < .001$, with a mean difference of 0.60 clauses per T-unit. Conversely, participants made significantly fewer errors during L1 planning than L2 planning, $t(39) = -110.59$, $p < .001$, reflecting a reduction of 2.80 errors per 100 words. Likewise, perceived mental demand was significantly lower during L1 planning, $t(39) = -22.90$, $p < .001$, with a mean difference of 2.20 points on the NASA-TLX scale. These findings demonstrate that planning in the first language produced statistically superior performance across all measured dimensions compared with planning in the second language.

Table 3

Paired-Samples t-Test Results for L1 and L2 Planning

		Paired Differences			95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error	Lower	Upper			
Pair 1	Fluencysyllmin.L1-Planning: Fluency (syll/min) - Fluencysyllmin.L2-Planning: Fluency (syll/min)	18.000	1.155	.183	17.631	18.369	98.590	39	.000
Pair 2	ComplexityClausesTunit.L1-Planning: Complexity (Clauses/T-unit) - ComplexityClausesTunit.L2-Planning: Complexity (Clauses/T-unit)	.600	.075	.012	.576	.624	50.525	39	.000
Pair 3	Errorsper100words.L1-Planning: Errors (per 100 words) - Errorsper100words.L2-Planning: Errors (per 100 words)	-2.800	.160	.025	-2.851	-2.749	-110.591	39	.000
Pair 4	NASATLXMentalDemand5.L1-Planning: NASA-TLX (Mental Demand /5) - NASATLXMentalDemand5.L2-Planning: NASA-TLX (Mental Demand /5)	-2.200	.608	.096	-2.394	-2.006	-22.898	39	.000

Table 4 presents the effect sizes for the paired-samples comparisons. The results indicate exceptionally large effects for all outcome variables. Fluency produced a Cohen's d of 15.59, demonstrating an extremely large advantage for the L1-planning condition. Complexity also showed a very large effect ($d = 7.99$), indicating substantially greater syntactic complexity following L1 planning. Error rate yielded a Cohen's d of -17.49, reflecting a very large reduction in linguistic errors when participants planned in their first language. Similarly, perceived mental demand produced a large effect size ($d =$

-3.62), indicating that participants experienced considerably lower cognitive load during L1 planning than during L2 planning. Hedges' correction produced nearly identical estimates across all variables, confirming the robustness of these findings. Collectively, the effect size estimates indicate that the observed differences between the two planning conditions were not only statistically significant but also practically substantial.

Table 4
Effect Sizes for L1 and L2 Planning Comparisons

			Standardizer ^a	Point Estimate	95% Confidence Interval	
					Lower	Upper
Pair 1	FluencyCysyllmin.L1-Planning: Fluency (syll/min) - FluencyCysyllmin.L2-Planning: Fluency (syll/min)	Cohen's d	1.155	15.588	12.125	19.043
		Hedges' correction	1.166	15.438	12.008	18.859
Pair 2	ComplexityClausesTunit.L1-Planning: Complexity (Clauses/T-unit) - ComplexityClausesTunit.L2-Planning: Complexity (Clauses/T-unit)	Cohen's d	.075	7.989	6.193	9.778
		Hedges' correction	.076	7.912	6.133	9.683
Pair 3	Errorsper100words.L1-Planning: Errors (per 100 words) - Errorsper100words.L2-Planning: Errors (per 100 words)	Cohen's d	.160	-17.486	-21.358	-13.605
		Hedges' correction	.162	-17.317	-21.152	-13.474
Pair 4	NASATLXMentalDemand5.L1-Planning: NASA-TLX (Mental Demand /5) - NASATLXMentalDemand5.L2-Planning: NASA-TLX (Mental Demand /5)	Cohen's d	.608	-3.621	-4.475	-2.759
		Hedges' correction	.614	-3.586	-4.432	-2.732

a. The denominator used in estimating the effect sizes.
Cohen's d uses the sample standard deviation of the mean difference.
Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

All tables from 2 to 4 show how the use of planning in L1 resulted in significantly better performance than the use of planning in L2 in all dependent variables studied. As seen from the descriptive statistics, the participants exhibited more fluency and syntactic complexity and made fewer mistakes and felt less cognitive load when planning in their native language. This was confirmed by the results of paired samples t-test showing significant differences in all four variables studied ($p < .001$). Furthermore, the analysis of effect sizes showed very large practical differences between planning conditions

suggesting that the results obtained were not just statistically significant but also educationally important.

Qualitative findings

Three themes emerged through thematic analysis of the written reflections and semi-structured interviews, which explain how the participants were able to perform better due to planning in L1. The themes are useful in supplementing the quantitative data in explaining how the learners utilised Spanish in order to speak English.

Table 5

Themes identified from the thematic analysis of learners' perceptions of L1 planning

Theme	Description	Representative quotation	Relationship to quantitative findings
Organising ideas before speaking	Participants reported using Spanish to generate and sequence ideas before producing their responses in English, allowing them to focus on language production during the speaking task.	"Planning in Spanish helped me organise my ideas first, so I only had to think about expressing them in English when speaking." (P08)	Explains the significantly higher fluency and syntactic complexity observed during the L1-planning condition.
Reducing cognitive effort	Participants perceived L1 planning as mentally less demanding because they did not need to generate ideas and formulate English simultaneously.	"When I planned in English, I felt I was translating and thinking at the same time. Spanish made everything easier." (P17)	Supports the significantly lower NASA-TLX mental demand scores following L1 planning.
Supporting vocabulary retrieval and grammatical monitoring	Learners indicated that L1 planning enabled them to recall vocabulary, organise sentence structures, and monitor grammar before speaking.	"Spanish helped me remember the ideas first, then I searched for the correct English words and grammar." (P31)	Explains the lower grammatical error rates and higher syntactic complexity found in the quantitative analysis.

Table 5 provides an overview of the three themes identified from the thematic analysis of the participants' written reflections and interviews related to their experience in first-language (L1) planning. The three interrelated themes included planning to organise thoughts before speaking, cognitive ease in planning, and planning to aid vocabulary recall and grammatical control. All participants reported that planning in Spanish allowed them to organise their thoughts before attending to the process of producing English. They also felt that L1 planning was not as cognitively challenging because it reduced the demand to come up with thoughts at the same time as formulating English. Additionally, they indicated that L1 planning helped them take more time to retrieve relevant English vocabulary and monitor their grammatical structures before speaking. Taken together, these

themes reinforce the results of the quantitative data by showing that planning in first-language planning goes beyond the advantages observed in terms of fluency, syntactic complexity, grammatical accuracy, and cognitive ease. Rather, they show how the learners used translanguaging as a transient scaffold to produce better English.

Discussion

The present investigation sought to examine the effect of planning in learners' first language (Spanish) versus English planning on English oral performance of intermediate Colombian university students. It was found that planning in the first language resulted in significantly higher levels of oral fluency and syntactic complexity, significantly fewer grammatical errors and lower cognitive load as compared with English planning. In sum, the obtained results show that the capacity to use the first language in the planning phase provides a cognitive advantage and leads to more effective speech production in the second language. In particular, the large size of the effect obtained for each of the examined variables indicates that the use of the first language in planning is not only statistically significant but also pedagogically meaningful. The increase in the level of fluency as a result of L1 planning is consistent with previous research findings according to which planning prior to speaking helps learners to organise their ideas and decrease the processing demands during the task performance (Ellis, 2009; Fukuta, 2016; Li et al., 2015). Within Levelt's (1989) framework of speech production, conceptualisation comes before linguistic formulation and articulation. Allowing learners to organise content in Spanish before the speaking phase allowed to substantially reduce the cognitive burden associated with the process of idea generation and allocate more attentional resources to lexical access and sentence production in the second language. This finding is also consistent with Kormos (2006) who argues that second language learners use much cognitive resources for conceptualisation and formulation because of their lack of linguistic competence. Hence, the present findings confirm that L1 planning is helpful for the conceptualisation phase of speech production.

Similar results can be seen in regard to syntactic complexity. Planning in Spanish allowed to increase the number of more complex structures used in the English speech. This finding is consistent with Robinson's (2003) idea about the possibility of L1 use for increasing linguistic complexity. It also fits into the claims of Stroud (2021) concerning the positive effect of planning which emphasises content development. In terms of translanguaging, the use of the first language for organising ideas helped the learners to express them using more complex English structures rather than simultaneously generating content and language. This conclusion is also supported by the qualitative data which demonstrate that participants used their first language to generate ideas, organise stories and retrieve vocabulary before speaking in the second language. In regard to grammatical accuracy, the present findings also support previous research on the positive effect of planning on language production. It was found that the number of grammatical errors in the speech of participants was lower after L1

planning than English planning. The present finding extends previous research by showing that pre-task planning allows to monitor grammatical forms during the process of speaking (Ellis, 2009; Robinson, 2003). Being freed from the cognitive burden associated with the idea generation, participants had more attentional resources to pay to the grammatical correctness of their utterances. This finding confirms the Trade-off Hypothesis proposed by Skehan (1998) by showing that reduction in cognitive demands during conceptualisation allows achieving improvements in various dimensions of the speaking performance simultaneously. However, the most important contribution of the present study to the current research concerns cognitive load. Learners showed consistently lower levels of mental demand when planning in Spanish as opposed to planning in English. Although previous research suggests that planning decreases working memory demands (O'Sullivan, 2012; Skehan, 2016), there were relatively few studies which directly measured cognitive load experienced by the learners during the speaking task performance. Thus, the present study contributes to the current literature by showing that translanguaging during planning is not only useful for observable performance improvement but also decreases learners' subjective experience of cognitive demands. This finding supports the claims of Scott and de la Fuente (2008) that strategic use of the first language decreases cognitive overload during second language tasks as well as the claims of Yüzlü and Atay (2020) regarding lower affective barriers of second language use in oral communication. Reduced cognitive demands may explain the better results of the participants in all dimensions of the speaking performance.

Summarising the above discussion, it can be concluded that the present findings robustly support contemporary translanguaging theories according to which the first language of bilingual learners should be regarded as a cognitive resource rather than a barrier to second language learning (Konopka et al., 2018). Monolingual perspectives usually discourage L1 use in language classrooms due to the risk of negative language transfer (Chambers, 1991; Halliwell & Jones, 1991; Macdonald, 1993; Myles, 2002; Odlin, 1989). The present findings contradict this assumption showing that L1 use during the planning phase helps rather than hinders English oral performance. Importantly, participants did not use their first language in the speaking phase; rather, the first language served as a temporary cognitive scaffolding in the planning phase before the participants spoke entirely in English. This finding is consistent with the current conception of translanguaging as a teaching strategy which facilitates learning without replacing the target language.

On the other hand, the qualitative data provide additional insights into the way in which L1 planning was performed by the participants. The participants often mentioned that they used Spanish for idea generation, story sequencing, vocabulary retrieval and mental rehearsal of their response before speaking in English. These strategies were similar to the strategies of L1 use in writing tasks reported in previous research (Cohen & Brooks-Carson, 2001; Sasaki, 2002; van Weijen et al., 2009;

Wang & Wen, 2002). The present study demonstrates that the same cognitive processes take place in the preparation phase of speaking tasks. Therefore, combining qualitative and quantitative evidence, it can be said that the usefulness of L1 planning is due to its role in facilitating the cognitive processes related to idea generation before the attention is shifted to language production. From a pedagogical perspective, the findings imply that strategic opportunities for first-language planning in language classes may improve the teaching of speaking skills in EFL classrooms. Instead of implementing English-only policies in all phases of the speaking activity, teachers may consider allowing learners to plan in the first language before asking them to produce entirely English speech. Such an approach may be especially beneficial for intermediate learners who still face high cognitive demands during spontaneous speech production. Importantly, the present recommendation does not mean replacing English with the first language during communication but rather refers to the strategic use of translanguaging as a cognitive scaffolding for more successful language production. Nonetheless, several limitations of the study should be taken into account. First, the sample included only intermediate Spanish-speaking university students from a single Colombian institution which limits the generalisability of the findings to learners from different backgrounds and educational contexts. Second, the study considered only the immediate effects of planning and did not assess its long-term consequences. Thus, future longitudinal research is needed to find out if repeated use of L1 planning leads to sustained speaking performance improvement. Third, the cognitive load was assessed using self-report measurement. Thus, future studies may complement self-report data with physiological or behavioural indicators of cognitive processing. Fourth, further research is needed to compare the effectiveness of different planning durations, task types and proficiency levels.

Conclusion

The present study explored the effect of planning in the learners' first language and English planning on English oral performance and cognitive load of intermediate Colombian university students. Using counterbalanced within-subjects mixed methods design, the study showed consistently better speaking performance in all measured dimensions for planning in the first language group. Participants planning in Spanish produced more fluent and syntactically complex speech and made fewer grammatical errors as well as reported lower mental demand than participants who planned in English. Hence, the study findings imply that the capacity of learners to use the first language in the planning phase provides a cognitive advantage and leads to better second language speaking performance. Moreover, the study makes a contribution to the current literature by integrating the quantitative data with qualitative insights into planning strategies used by the learners. The participants reported using Spanish to organise their ideas, structure their narrative, retrieve vocabulary and mentally rehearse their response before speaking in English. These findings imply that translanguaging mainly serves as a cognitive resource during the process of conceptualisation but not as a replacement

of target language communication. Therefore, the present study provides empirical support to contemporary translanguaging perspectives which recognise the whole linguistic repertoire of bilingual learners as a learning resource. The study also makes a contribution to the theories of second language speech production. The findings support Levelt's model of speech production by showing that reduction in cognitive demands during the process of conceptualisation allows to devote more attention to the processes of linguistic formulation and articulation. Also, the study findings are consistent with the Trade-off Hypothesis formulated by Skehan, which implies that reduction in cognitive demands during planning enables learners to improve various dimensions of oral performance simultaneously rather than at the expense of each other. From a pedagogical point of view, the present study implies that English language instructors should reconsider the use of the English-only policy in pre-task planning. Allowing learners to plan in their first language before producing English speech may improve the speaking performance while decreasing cognitive load, especially in case of intermediate learners who still experience high processing demands. This approach does not reduce the exposure of learners to English but rather helps them to communicate more efficiently in the target language. Nonetheless, despite these contributions, the study was limited to the group of intermediate Spanish-speaking university students of a single institution and assessed only the immediate effects of planning. Future research should focus on different linguistic and educational contexts, explore the long-term effects of repeated first language planning, compare the effects of different planning durations and task types as well as use additional objective measures of cognitive processing.

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Conflict of interest

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