



Bidirectionality in bilingualism? Asymmetry in L1 Spanish-L2 English vs. L1 English-L2 Spanish bilinguals

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Abstract

Anaphora Resolution (AR) is a complex phenomenon at the syntax-discourse interface, which is problematic in the acquisition of an L2. Previous studies show that late sequential bilinguals (i.e., adult L2 learners) with different language pairs accept and produce more explicit referring expressions (REs) than pragmatically required. This can be accounted for by the Pragmatic Principles Violation Hypothesis (PPVH), which claims that L2 learners violate the Informativeness/Economy Principle more frequently than the Manner/Clarity Principle, which results in L2 learners being more redundant than ambiguous. Crucially, it is not known to what extent this redundancy strategy is modulated by L2 learners' language pair and proficiency level. This study investigates whether the acquisition of AR is asymmetrical by comparing two mirror-image language pairs (L1 Spanish-L2 English vs. L1 English-L2 Spanish) across proficiency levels (A2-C2) under the same methodological conditions. We used two equally-designed and comparable corpora (COREFL and CEDEL2) and manually annotated the anaphoric written production of L2 learners plus two monolingual (English and Spanish) control groups (N = 138) using the same annotation scheme. The results not only confirmed the redundancy strategy previously reported, but, importantly, revealed that the acquisition of anaphora resolution is asymmetrical between language pairs and across development. These findings are captured by proposing an updated version of the PPVH, the PPVH2, which paves the way for new studies on bilingualism at the syntax-discourse/pragmatics interface. © 2025 Published by Elsevier B.V.

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1. INTRODUCTION

The acquisition of Anaphora Resolution (AR) is a widely debated phenomenon in the field of Second Language Acquisition (SLA) and Bilingualism (Lozano, 2021). AR refers to the relationship between a referring expression (RE) (i.e., null/overt pronoun or repeated noun phrase (NP)) and its antecedent in the discourse. For instance, the overt pro-

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noun (*he*) in (1) refers back to the NP antecedent (*Charles Chaplin*). Importantly, the use of a RE in a particular context not only depends on the type of language, but also on multiple factors.

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- (1) Charlie Chaplin_i is walking along a street smoking when **he**_i gets hit on the head. . . (English monolingual: EN_WR_20_14_SK)¹
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Firstly, we must distinguish between null-subject languages like Spanish and non-null-subject languages like English. The former offers a wide distribution of REs as in (2a), where the alternation of null/overt pronouns is licensed in subject position in all clauses (cf. REs in bold). The distribution of REs in English is more restrictive, as in (2b), where null pronouns are licensed in coordinate sentences (Leclercq and Lenart, 2013) but, crucially, only when the antecedent of the RE occupies subject position in the previous clause² (i.e., topic-continuity contexts) (native English: Givón, 1983, 2001; native and L2 English: Quesada and Lozano, 2020). Thus, the null pronouns in parentheses in (2b) would be ungrammatical.

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- (2) a. Un hombre_i camina por el parque mientras **Ø/él**_i escucha música. De repente, **Ø/él**_i ve un gato y **Ø/él**_i sonríe.
b. A man_i walks in the park while (*Ø_i)/**he**_i listens to music. Suddenly, (*Ø_i)/**he**_i sees a cat and **Ø/he**_i smiles.
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Additionally, there are multiple factors constraining the use of REs like the information status of the RE (i.e., topic continuity vs. topic shift), the syntactic or structural configuration, or the number of activated antecedents, amongst others (inter alia: Lozano, 2009, 2016; Lozano and Quesada, 2023; Martín-Villena and Lozano, 2020; Quesada and Lozano, 2020). For instance, when an RE refers to the previous antecedent in subject position, i.e., there is a topic-continuity or topic-maintenance context, minimal REs like null or overt pronouns are used, as in (3) (i.e., **Ø**_i is crying), but full REs like NPs are used when the topic shifts to an antecedent in non-subject position (i.e., topic-shift context), as in (3) (i.e., **The baby**_j is).

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- (3) Charles Chaplin_i is walking when he_i finds a baby_j. **The baby**_j is wrapped up in a blanket on the ground and **Ø**_j is crying (English monolingual: EN_WR_21_14_SM)
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In terms of configuration, the Position of Antecedent Strategy (PAS) formulated by Carminati (2002) has been an influential proposal in the field of AR. The PAS was proposed for Italian, a null-subject language, and predicted that, in sentences like (4), null pronouns bias towards subject antecedents (*Mario*), but overt pronouns bias towards non-subject antecedents (*Giovanni*). Importantly, the PAS has been mostly investigated experimentally, but the analysis of contextualized PAS scenarios in natural production (i.e., corpus) shows that the PAS can be more complex than previously assumed (e.g., other REs than null or overt pronouns are produced in these scenarios) (Lozano and Quesada, 2023).

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- (4) Quando Mario_i ha telefonato a Giovanni_j, **Ø/lui**_j aveva appena finito di mangiare. (Source of example: Carminati, 2002: 58)
(‘When Mario_i has telephoned to Giovanni_j, **Ø/he**_j had just finished eating’.)
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Therefore, AR is a complex phenomenon involving the simultaneous integration of syntactic and discursive information at the syntax-discourse interface, which turns to be problematic in the acquisition of an L2 (Lozano, 2021), as proposed by the Interface Hypothesis, IH (Sorace, 2011, 2016). In particular, L2 learners³ show deficits at this interface by accepting/producing pragmatically infelicitous REs. Departing from the IH, the Pragmatic Principles Violation Hypothesis (Lozano, 2016) further predicts that L2 learners are redundant (a.k.a., overexplicit) by producing fuller REs than pragmatically required, like NPs in topic-continuity contexts (e.g., *Charlie Chaplin_i stumbles upon a baby_j in an alley. **Charlie Chaplin**_i attempts to foist the child. . .*), where a more economical RE (i.e., *he*) is expected. The PPVH (Fig. 1) accounts

¹ Examples with this code comes from the corpora employed in the present study: *Corpus of English as a Foreign language* (COREFL) and *Corpus Escrito del Español L2* (CEDEL2) (see Method for an overview).

² Note that 1st person *deictic* null pronouns are also used in diary-drop styles in English (Haegeman, 1997, 2009), but such null pronouns are not of interest for the present study because we focus on 3rd person *anaphoric* pronouns.

³ Note that we refer to late sequential bilinguals throughout the paper, but use the term ‘L2 learners’ for simplicity.

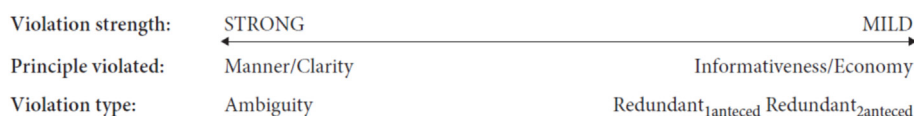


Fig. 1. PPVH (Lozano, 2016: 261).

for this redundancy strategy by incorporating pragmatic principles in discourse and proposing their violation to different degrees: the Manner/Clarity Principle (i.e., the use of minimal REs when full REs are required to resolve the anaphor and avoid ambiguity) and the Informativeness/Economy Principle (i.e., the redundant use of full REs when minimal REs are pragmatically preferred). The former involves a strong violation leading to ambiguity, but the latter involves a mild violation leading to redundancy. Lozano (2016) showed that L2 learners were more redundant than ambiguous, so the Informativeness/Economy Principle was violated more frequently. Crucially, the PPVH was confirmed in other studies investigating AR (Lozano, 2018; Quesada, 2021; Quesada and Lozano, 2020; Margaza and Gavarró, 2022; Martín-Villena, 2023) or related phenomena (pragmatic implicatures: Feng, 2022; clitics: García-Tejada, 2022), but there is no study testing L2 learners' redundancy strategy in terms of the PPVH *bidirectionally* (e.g., L1 Spanish-L2 English vs. L1 English-L2 Spanish learners) and *across* proficiency levels, which motivates the present study.

Crucially, we explore and further develop the PPVH considering two key aspects: bidirectional language pairs and equivalent proficiency levels (A2-C2) in both language pairs. This will lead to a more fine-tune version of the PPVH, i.e., PPVH2, as we will show in the final discussion below (cf. Fig. 17 in the General Discussion section). These aspects will prove to be crucial since we want to put to the test *asymmetry* (i.e., whether the acquisition of AR differs depending on the language pair) and *development* (i.e., whether the acquisition of AR occurs developmentally across proficiency levels), which has not been explored simultaneously in the same study before.

This paper is structured as follows. Section 2 reviews previous studies on AR in L2 English and L2 Spanish. Section 3 poses the research questions and hypotheses followed by the methodology in Section 4. Section 5 shows the results and discussion. Finally, section 6 provides a general discussion and a conclusion.

2. ANAPHORA RESOLUTION IN L2 ENGLISH AND L2 SPANISH

As the present study investigates L2 English and L2 Spanish learners, this section reviews previous experimental- and production-based studies in each of these L2s.

2.1. L2 English studies

The L2 English literature on AR includes both experimental- and production-based studies (see Quesada and Lozano, 2020 for a detailed revision of L2 English studies). Regarding experimental studies, some have investigated whether L2 English learners (with different L1 null-subject languages) transferred ungrammatical null subjects from their L1s (Mitkovska and Bužarovska, 2018; Pladevall Ballester, 2013; Prentza, 2014). Using acceptability judgement tasks and correction/completion tasks, the overall finding is that ungrammatical null subjects were accepted and produced by beginner and intermediate L1 Spanish-L2 English learners (Pladevall Ballester, 2013), intermediate L1 Greek-L2 English learners (Prentza, 2014), and beginner and low-intermediate L1 Macedonian-L2 English learners (Mitkovska and Bužarovska, 2018) confirming that null subjects were transferred by L2 learners' L1 into their L2 English. However, these studies present several issues that could be affecting their results: (i) no analysis of the information status of the RE (i.e., topic continuity vs. topic shift); (ii) inclusion of different pronouns (i.e., 1st, 2nd, and 3rd person) within the same study without considering that 1st and 2nd person pronouns are deictic and less problematic than 3rd person pronouns, which are anaphoric and thus problematic for L2 learners (see Lozano, 2009 for a discussion); and (iii) heterogeneity in the stimuli used (e.g., sentence type, connectors between sentences, or number and position of antecedents). Importantly, the above-mentioned studies including upper-intermediate and advanced L2 learners (Mitkovska and Bužarovska, 2018; Pladevall Ballester, 2013 respectively) showed that the acceptance rate of ungrammatical null subjects was low among these learners suggesting that native-like attainment was eventually possible. Crucially, the low production of ungrammatical null subjects is additionally confirmed in Mitkovska and Bužarovska (2018), who also analysed L2 learners' written production using a corpus. This was observed across proficiency levels, which contradicts the high acceptance of null subjects reported in the experimental studies cited just above. The native-like attainment found in some of the studies above (production: Mitkovska and Bužarovska, 2018; experimental: Pladevall Ballester, 2013) was in line with Contemori and Dussias (2016)'s experimental study using a storytelling task. They showed that very-advanced L1 Spanish-L2 English learners did not produce ungrammatical null subjects. In fact, they did analyse

REs according to information status and found that L2 learners produced both overt pronouns and NPs in topic continuity, but NPs in topic shift, so they seemed to have acquired the division of labour of English REs.

By contrast, other experimental studies in L2 English rather focused on the interpretation of overt pronouns biasing towards subject antecedents (Contemori et al., 2019; Contemori and Dussias, 2020; Cummings et al., 2017; Santoro, 2020). These studies investigated PAS-like contexts like (5) to check whether L2 English learners (with different L1 null-subject languages) had acquired the predicted subject bias of overt pronouns in English.⁴

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- (5) After Peter_i spoke to Mr. Smith_j by the till in the shop, he_i paid for the expensive ice cream that looked tasty. (Source of example: Cummings et al., 2017: 627, our indices)
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Employing different methods (eye-tracking: Contemori and Dussias (2020), Cummings et al. (2017); sentence comprehension task: Contemori et al. (2019); self-paced reading task: Santoro (2020)), these studies overall found that intermediate and very-advanced L1 Spanish-L2 English learners (Contemori et al., 2019; Contemori and Dussias, 2020 respectively), intermediate L1 Greek-L2 English learners (Cummings et al., 2017), and advanced L1 Chinese-L2 English learners (Santoro, 2020) biased overt pronouns towards subject antecedents as English monolinguals did, so they did not transfer bias interpretations from their L1s suggesting that L2 English learners have acquired the distribution of REs in these contexts (i.e., overt pronouns are markers of topic continuity). However, Contemori et al. (2019) also tested their intermediate L1 Spanish-L2 English learners in other contexts more complex than (5). They found that L2 learners' bias of overt pronouns towards subject antecedents in contexts like (6) was not native-like as they interpreted the overt pronoun in bold (*he*) as a topic-shift marker referring to *Martin* and not as a topic-continuity marker referring to *Carlos*. Thus, they claimed that the type of context affects L2 English learners' interpretations.

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- (6) Carlos_i and Martín_j are at the office. Martín_j is one of the best employees in the company. While Carlos_i is working, **he_i** is eating lunch. (Source of example: Contemori et al., 2019: 983, our indices)
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Importantly, production-based studies in L2 English have investigated AR in contextually-rich scenarios than those used in the experiments above. Such studies did not report production of ungrammatical null subjects but rather claimed that L2 English learners tended to be overexplicit (i.e., they produced more explicit REs than required) (Quesada and Lozano, 2020; Crosthwaite, 2011; Hendriks, 2003; Kang, 2004; Leclercq and Lenart, 2013; Ryan, 2015). Some of these studies analysed the overall production of REs without considering information status and showed that L2 English learners and English monolinguals produced more NPs than overt pronouns (Quesada and Lozano, 2020; Crosthwaite, 2011; Hendriks, 2003; Kang, 2004), but sometimes they produced more overt pronouns than NPs (Ryan, 2015). Additionally, all these studies reported an overall low production of null pronouns both in English monolinguals and L2 English learners. Instead of analysing REs according to information status (i.e., topic continuity and topic shift), some of these studies distinguished between coreferential vs. non-coreferential contexts (roughly equivalent to our topic continuity and topic shift respectively) and showed that the production of overt pronouns is higher in coreferential contexts, but NPs were more frequent in non-coreferential contexts (Crosthwaite, 2011; Hendriks, 2003). By contrast, others used the Accessibility Hierarchy (Ariel, 1990) and distinguished between high accessibility contexts vs. low accessibility contexts (which also resemble to our topic continuity and topic shift respectively) (Leclercq and Lenart, 2013; Ryan, 2015). They showed that high accessibility contexts were marked via overt pronouns but sometimes via null pronouns, while low accessibility contexts were marked via NPs and overt pronouns. Although these studies showed the production of REs in different discursive contexts, they did not always show a strict delimitation of such contexts. Additionally, these studies did not investigate L2 learners across proficiency levels and did not address the issue of transfer, which was previously addressed in experimental studies. In order to fill in this research gap, Quesada and Lozano (2020) investigated the production of L1 Spanish-L2 English learners across proficiency levels (beginner, intermediate, advanced) plus a control group of English monolinguals by analysing multiple factors, like the information status, following a complex and linguistically-motivated annotation scheme. They found that, in topic continuity, both L2 learners and monolinguals produced mainly overt pronouns followed by either null pronouns (advanced L2 learners and monolinguals) or NPs (beginner and intermediate L2 learners), but all groups produced mostly NPs in topic shift. Importantly, there were

⁴ Recall that the PAS proposed that, in a null-subject language like Italian, null pronouns bias towards subject antecedents, but overt pronouns bias towards non-subject antecedents. If L1 Spanish-L2 English learners (with a null-subject L1) had acquired the interpretation of overt pronouns in English, they would show bias of overt pronouns towards subject antecedents and not towards non-subject antecedents (as they would do in their L1s).

differences between all groups of L2 learners and monolinguals in topic continuity showing that L2 learners were redundant (i.e., they produced a redundant overt pronoun instead of a null pronoun, or a redundant NP instead of an overt pronoun). Thus, topic-continuity contexts were more problematic than topic shift, which confirmed the PPVH discussed in the introduction above. [Quesada and Lozano \(2020\)](#) additionally investigated the issue of transfer in topic continuity and coordinate vs. non-coordinate contexts. L2 English learners restricted their production of null pronouns to topic-continuity and coordinate contexts showing lack of transfer of null pronouns from their L1 Spanish, which contradicted previous experimental findings.

The experimental and production/corpus-based studies on L2 English will be summarised in 2.3 together with the L2 Spanish findings, which we discuss next.

2.2. L2 Spanish studies

The L2 Spanish literature also includes both experimental- and production-based studies. Experimental studies in L2 Spanish have investigated the alternation of null and overt pronouns in topic-continuity, topic-shift and contrastive-focus contexts ([Lozano, 2002, 2018](#); [Judy, 2015](#); [Pérez-Leroux and Glass, 1999](#); [Rothman, 2009](#)). Using Acceptability Judgement Tasks or/and Translation Tasks, these studies showed that the acquisition of the discursive properties of the null/overt alternation was acquired gradually across proficiency levels in: beginner, intermediate and advanced L1 English-L2 Spanish learners ([Pérez-Leroux and Glass, 1999](#)); advanced L1 English-L2 Spanish and advanced L1 Greek-L3 Spanish ([Lozano, 2002](#)); intermediate and advanced L1 English-L2 Spanish learners ([Rothman, 2009](#)); very-advanced L1 Farsi-L2 Spanish ([Judy, 2015](#)); and intermediate, low-advanced and upper-advanced L1 Greek-L2 Spanish ([Lozano, 2018](#)). While some of these studies reported native-like attainment⁵ at advanced levels ([Rothman, 2009](#)), others showed that native-like attainment was not possible even at such levels ([Lozano, 2002](#); [Pérez-Leroux and Glass, 1999](#)). Crucially, some of these experimental studies showed that native-like attainment depended on the context since not all contexts were equally problematic ([Judy, 2015](#); [Lozano, 2018](#)) being topic-continuity contexts more problematic than topic-shift contexts, which was also shown in the L2 English literature above (cf. [Contemori et al., 2019](#); [Quesada and Lozano, 2020](#)).

Importantly, most experimental studies in Spanish have focused on PAS scenarios, as exemplified in (4). Unlike Italian, where there is a clear division of labour (i.e., null-subject antecedent, overt-non-subject antecedent), Spanish monolinguals' biases are not that clear-cut since offline and online experimental studies (inter alia: [Alonso-Ovalle et al., 2002](#); [Filiaci et al., 2014](#); [Gelormini-Lezama and Almor, 2011](#); [Keating et al., 2011](#)) typically show clear null-subject antecedent biases but flexible biases of overt pronouns towards subject and non-subject antecedents (but see a discussion in [Lozano and Quesada, 2023](#), which is reviewed below). As for L2 learners, these studies showed a gradual acquisition of PAS-biases, but advanced L2 learners did not typically show native-like attainment (inter alia: [Bel et al., 2016](#); [Jegerski et al., 2011](#); [Keating et al., 2011](#)), which is in line with the studies just reported above.

Since native-like attainment seems to be determined by the context, production-based studies investigating REs in contextualized scenarios are crucial to understand how different factors affect the production and processing of REs. An example of this is a study by [Lozano and Quesada \(2023\)](#), who investigated the controversial PAS biases in Spanish using natural production. They analysed a corpus of intermediate, lower-advanced and upper-advanced L1 English-L2 Spanish learners plus Spanish monolinguals. Crucially, they found that the division of labour in Spanish monolinguals is clear when analysing the anaphoric role of repeated NPs (and overt/null pronouns, as traditionally done). In particular, they showed that null pronouns biased towards subject antecedents, but NPs (and a small proportion of overt pronouns, which are hardly used) biased towards non-subject antecedents. L2 learners showed an increasing trend towards the monolingual norm by producing null pronouns towards subject antecedents, but no native-like attainment was eventually achieved due to some redundant use of overt pronouns and NPs in these contexts. As for non-subject antecedent biases, L2 learners showed indeterminacy between overt and NPs, but their production was not statistically different from monolinguals' production. Additionally, they showed that PAS scenarios were infrequent in natural production both in Spanish monolinguals and L2 learners, so they claimed that the experimental literature has overestimated these scenarios.

Similarly, other production-based studies in the L2 Spanish literature on AR found that L2 learners were redundant. Additionally, they have uncovered new factors that were previously overlooked in experimental studies. [Montrul and Rodríguez-Louro \(2006\)](#) investigated morphosyntactic and discursive properties of subjects in the oral production of intermediate, advanced and near-native L1 English-L2 Spanish learners plus Spanish monolinguals showing that inter-

⁵ Note that native-like attainment of null/overt pronouns interpretations is also found in [Margaza and Gavarró \(2022\)](#), but they investigated other contexts with deictic forms. However, we limit our review to contexts that are roughly comparable to the contexts investigated in the present study.

mediate L2 learners acquired most morphosyntactic properties of subjects compared to the complete acquisition of such properties in the advanced groups. As for the discursive constraints, their learners showed a developmental acquisition of REs in what we consider topic-continuity contexts (cf. (3)) by producing felicitous null subjects across proficiency levels but redundant overt subjects at intermediate and advanced levels, implying that native-like attainment is only achieved in near-natives. However, this study made no distinction between overt pronouns and NPs within their “overt subjects” category, and the information status contexts were not considered.

These limitations were addressed in a later study by [Lozano \(2009\)](#), who analysed not only null and overt pronouns but also NPs in topic-continuity and topic-shift contexts. Using a written corpus of lower-advanced and upper-advanced L1 English-L2 Spanish learners plus Spanish monolinguals, he found that all groups produced mostly null pronouns in topic continuity, but L2 learners significantly differed from monolinguals since they produced redundant overt pronouns and NPs. In topic shift, L2 learners and monolinguals produced mainly NPs (and not overt pronouns as assumed in the experimental literature) and there were no significant differences between them. These results were further corroborated in a later study by [Lozano \(2016\)](#) investigating the written production of very-advanced L1 English-L2 Spanish learners and Spanish monolinguals. These learners did not achieve native-like levels since they produced more redundant than ambiguous REs, as formulated in the PPVH (cf. [Fig. 1](#)). In particular, learners were redundant in topic-continuity contexts, which were more problematic than topic-shift contexts, where they were hardly ambiguous.

Following a different approach, [Blackwell and Quesada \(2012\)](#)’s results suggest similar findings. They investigated the oral production of REs according to the different cognitive statuses (e.g., in focus, activated, familiar, etc.) following the Givenness Hierarchy ([Gundel et al., 1993](#)). They tested beginner, intermediate and advanced L1 English-L2 Spanish learners plus Spanish monolinguals and found that, in the cognitive status “in focus” (which roughly corresponds to our topic continuity), L2 learners and monolinguals produced mostly null pronouns, but there were significant differences between all groups of L2 learners and monolinguals since L2 learners also produced overt pronouns suggesting that they were redundant (in line with [Lozano’s 2016 PPVH](#)). In “activated cognitive status” contexts (which are roughly similar to our topic-shift contexts),⁶ they found that both L2 learners and monolinguals produced null pronouns followed by overt pronouns and NPs in recoverable contexts,⁷ but there were differences between monolinguals and L2 learners. In “non-recoverable contexts”, both L2 learners and monolinguals produced overt pronouns and NPs and there were no significant differences between them. Thus, these results suggested that topic-continuity contexts were more problematic for L2 learners, as they were redundant, but their cognitive statuses were not well-delimited in relation to the notions of topic continuity vs. topic shift. This redundancy strategy is also observed in [Vande Castele and Collewaert \(2016\)](#), who analysed the overall production of REs in the oral production of L1 Dutch-L3 Spanish learners and Spanish monolinguals. They found that L2 learners produced mostly NPs followed by null pronouns and overt pronouns, while monolinguals produced mainly null pronouns followed by overt pronouns and NPs suggesting that learners produced explicit REs, although this is not known since the authors did not analyse their results according to information status. Learners’ redundancy is further found in a study by [Martin-Villena and Lozano \(2020\)](#), which focuses only on topic continuity since this has been reported to be the most problematic scenario. Analysing the written production of beginner, intermediate and advanced L1 English-L2 Spanish learners, they found that beginner L2 learners produced more overt pronouns and NPs than null pronouns, but intermediate, advanced and monolinguals produced mainly null pronouns. However, there were significant differences between all groups of L2 learners and monolinguals. Additionally, they found that L2 learners transferred null pronouns from their L1 English as null pronouns were produced mostly in topic-continuity and coordinate contexts (but note that null pronouns are also allowed in non-coordinate contexts in Spanish), a finding that was later corroborated in [Lozano and Quesada \(2023\)](#) for PAS contexts.

Finally, it is worth reviewing some production-based studies that are in line with the findings above but additionally report the production of felicitous null pronouns in topic-shift contexts, a finding that is not typically reported in the literature. [García-Alcaraz and Bel \(2019\)](#) investigated the written production of Moroccan Arabic-Spanish sequential bilinguals plus Spanish monolinguals and found that null pronouns were clear markers of topic continuity regardless of the syntax where the RE appeared (i.e., intersentential vs. intrasentential configuration). By contrast, overt pronouns were produced both in topic continuity and topic shift depending on the type of syntax, but note that they did not analyse NPs. Importantly, they found that felicitous null pronouns were also produced in certain topic-shift contexts both in bilinguals and monolinguals like the REs in bold in (7).

⁶ They include 3 categories within activated cognitive statuses: i) activated and recoverable; ii) activated; and iii) activated but non-recoverable (see [Blackwell and Quesada, 2012: 149-150](#) for an overview). After comparison, these 3 categories are considered roughly like our topic shift.

⁷ The production of null pronouns in “topic-shift contexts” could seem odd but note that they included null pronouns that were resolved by the semantics of the verb, an issue that we will further explore/discuss in the present study.

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- (7) 2. *STU: y mi hermano_j lo_i estampó contra la pared. ('and my brother crashed him into the wall')
 3. *STU: y Ø_j le_i rompió la muñeca. ('and Ø broke his wrist')
 4. *STU: bueno, Ø_k no sé. ('well, Ø don't know')
 5. *STU: si Ø_j se_i la rompió. ('if Ø broke it')
 6. *STU: pero al día siguiente Ø_i la llevaba enyesada [. . .]. ('but the following day Ø had the wrist in plaster')
 (García-Alcaraz and Bel, 2019: 507)
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Curiously, these findings are in line with a previous study by Licerias et al. (2010) who reported the felicitous production of null pronouns in topic shift in intermediate and advanced L1 English-L2 Spanish learners and Spanish monolinguals. Similarly, production-based studies on native Spanish also report production of null pronouns in topic shift (Lozano et al, 2023; Giannakou and Sitaridou, 2020). Therefore, it seems that null pronouns could also play a role in topic-shift contexts, but this finding still requires further investigation. Importantly, we must consider that such null pronouns are occasionally produced because they are resolved via the semantics of the verb (e.g., directive verbs) or via world knowledge (Lozano, 2016; Lozano and Quesada, 2023). Additionally, the type of pronouns involved (e.g., singular vs. plural or 1st vs. 2nd vs. 3rd person) can certainly have an influence (cf. section 2.1 for a justification), but some studies have mixed different pronouns in their analysis, so it is unclear the role of null pronouns in topic shift. For instance, we observe the use of 1st person (Ø_k no sé) and 3rd person (si Ø_j se_i la rompió) in (7). The current study therefore takes stock of the limitations of these studies.

2.3. Interim discussion and novelty of the current study

Table 1 offers an overview of the key findings in the literature reviewed above to shed light on the similarities and differences in the acquisition of REs in L2 English and L2 Spanish. L2 English experimental studies address the issue of transfer showing different results depending on the study (i.e., transfer of ungrammatical null subjects vs. no transfer of overt interpretations), but this is not investigated in L2 Spanish experimental studies. As for the degree of attainment in the distribution of REs, both L2 English and L2 Spanish experimental studies showed a gradual acquisition of REs but native-like attainment is not always achieved being highly dependent on the context. The transfer issue is addressed both in L2 English and L2 Spanish production studies and the findings suggest an asymmetry in these L2s since there is no transfer in L2 English but the opposite holds for L2 Spanish. Regarding the distribution of REs, we argued that not all production studies showed a strict delimitation of topic-continuity vs. topic-shift contexts but considering the roughly equivalent contexts, we observe that overall topic continuity is more problematic than topic shift. Having spotted potential similarities and asymmetries in these two language pairs, we now proceed to check these findings in a felicitous manner by comparing these language pairs under the same conditions.

3. RESEARCH QUESTIONS

3.1. Overall production of REs

Previous English studies not considering information status above show that English monolinguals and L2 learners overall produced higher percentages of NPs and overt pronouns than null pronouns. By contrast, Spanish studies showed that Spanish monolinguals overall produced mostly null pronouns, which varies in L2 learners depending on their proficiency level. Importantly, no previous study analysed these two language pairs under the same conditions to offer felicitous comparisons, which leads to the following research questions.

RQ1a (monolinguals): What is the overall distribution of REs (i.e., without considering information status or any other factor) in English and Spanish monolinguals?

H1a (monolinguals): We expect that the distribution of REs will be asymmetrical in English and Spanish. In particular, English monolinguals will produce mostly NPs and overt pronouns, while Spanish monolinguals will produce mostly null pronouns.

RQ1b (L2 learners): Do L1 Spanish-L2 English and L1 English-L2 Spanish learners across proficiency levels show the same overall distribution of REs as monolinguals?

H1b (L2 learners): L1 Spanish-L2 English learners will show more native-like behaviour than L1 English-L2 Spanish learners. In particular, L1 Spanish-L2 English learners will show a gradual production of NPs and overt pronouns, and the advanced group will eventually show native-like behaviour. By contrast, L1 English-L2 Spanish learners will initially

Table 1
Overview of key findings.

		L2 English	L2 Spanish
Experimental	Transfer?	✓ Transfer of ungrammatical null subjects ¹ × No transfer: correct overt-subject biases ²	NA (Not investigated)
	Native-like distribution of REs?	× Acceptance of ungrammatical null subjects ¹ (except for advanced levels ³)	× Gradual but eventually not native-like ⁵ (but depends on context ⁶)
		✓ Correct overt-subject biases ² (except for complex contexts ⁴)	✓ Correct null-subject and overt-non-subject biases at very advanced ⁷
Production	Transfer?	× No transfer from L1 null subject language ⁸	✓ Transfer from L1 non-null subject language ⁹
	Native-like distribution of REs?	✓ Native-like production in topic shift ¹⁰ × No native-like production in topic continuity → redundant ¹⁰	✓ Native-like production in topic shift ¹¹ × No native-like production in topic continuity → redundant ¹¹

Observation: Grey-shaded cells represent common findings between L2 English and L2 Spanish.

1 (Mitkovska and Bužarovska, 2018 – L1 Macedonian-L2 English; Pladevall Ballester, 2013 – L1 Spanish-L2 English; Prentza, 2014 – L1 Greek-L2 English).

2 (Contemori et al., 2019 – L1 Spanish-L2 English; Contemori and Dussias, 2020 – L1 Spanish-L2 English; Cunnings et al., 2017 – L1 Greek-L2 English; Santoro, 2020 – L1 Chinese-L2 English).

3 (Mitkovska and Bužarovska, 2018; Pladevall Ballester, 2013).

4 (Contemori et al., 2019).

5 (inter alia: Bel et al., 2016 – L1 Moroccan Arabic-L2 Spanish; Jegerski et al., 2011 – L1 English-L2 Spanish; Keating et al., 2011 – L1 English-L2 Spanish; Pérez-Leroux and Glass, 1999 – L1 English-L2 Spanish).

6 (Lozano, 2018 – L1 Greek-L3 Spanish).

7 (Rothman, 2009 – L1 English-L2 Spanish).

8 (Mitkovska and Bužarovska, 2018).

9 (Lozano and Quesada, 2023 – L1 English-L2 Spanish; Lozano et al., 2020 – L1 English-L2 Spanish).

10 (Crosthwaite, 2011 – L1 Korean-L2 English; Hendriks, 2003 – L1 Chinese-L2 English; Leclercq and Lenart, 2013 – L1 French-L2 English; Ryan, 2015 – L1 Chinese-L2 English).

11 (Blackwell and Quesada, 2012 – L1 English-L2 Spanish).

produce more NPs than null pronouns (unlike Spanish monolinguals), whereas advanced learners will show the opposite pattern (like Spanish monolinguals), though they will fail to attain native-like behaviour.

3.2. Information status

The studies reviewed above showed that the use of REs is constrained by the information status in English and Spanish, but the division of labour partially differs: topic continuity is mainly marked via overt (English) or null (Spanish) pronouns, and topic shift is marked via NPs (both languages). In topic continuity, L2 English learners showed native-like attainment of overt pronouns in experimental studies, yet they showed no native-like biases (i.e., redundancy) in production. By contrast, L2 English learners showed native-like attainment in topic shift. Similarly, topic continuity was more problematic for L2 Spanish learners than topic shift since they showed a gradual acquisition of null pronouns in topic continuity, but no native-like attainment was achieved in either experimental or production studies, which partially differs from L2 English studies. These findings show some differences between language pairs, but they have not been systematically and bidirectionally compared, which lead us to our next research questions and hypotheses.

RQ2a (monolinguals): What REs do English and Spanish monolinguals produce in topic-continuity and topic-shift contexts?

H2a (monolinguals): In topic continuity, English monolinguals will produce more overt pronouns followed by null pronouns and NPs, while Spanish monolinguals will produce mostly null pronouns. By contrast, both groups are expected to produce mostly NPs in topic shift.

RQ2b (L2 learners): Do L1 Spanish-L2 English and L1 English-L2 Spanish learners across proficiency levels show the same division of labour of REs as monolinguals?

H2b (L2 learners): In topic continuity, both groups will show a gradual acquisition of REs: overt pronouns (L2 English) or null pronouns (L2 Spanish). However, native-like attainment will be observed only in very-advanced L1 Spanish-L2 English learners. By contrast, in topic-shift context both groups will converge with monolinguals by producing mainly NPs.

3.3. Null pronouns in topic shift

As seen in [section 2](#), in L2 English topic-shift contexts, null pronouns are accepted in experimental studies but are not produced in corpus studies. In L2 Spanish, null pronouns have been investigated pragmatically in the context of topic shift: they are correctly rejected in experimental studies, and hardly produced in corpus studies, though a few production studies report some felicitous use in certain topic-shift scenarios. This issue therefore requires further clarification, which leads to the following exploratory research questions.

RQ3a (English): Do L1 Spanish-L2 English and English monolinguals produce ungrammatical null pronouns in topic shift?

H3a: L1 Spanish-L2 English learners and monolinguals are not expected to produce null pronouns in topic shift.

RQ3b (Spanish): Do L1 English-L2 Spanish and Spanish monolinguals produce felicitous null pronouns in topic shift?

H3b: We expect that Spanish learners and monolinguals will produce null pronouns in specific topic-shift scenarios.

3.4. Cross-linguistic effects

As explained in [Section 1](#), English allows null pronouns only in topic-continuity and coordinate contexts (cf. 2b), but null pronouns are possible in both coordinate and non-coordinate contexts in Spanish. Production studies investigating L2ers' L1 influence on the L2 focusing on topic-continuity and coordinate vs. non-coordinate contexts showed no transfer of null pronouns from L1 Spanish to L2 English, but transfer from L1 English to L2 Spanish. However, there is no study corroborating these findings bidirectionally, which leads us to our next research questions and hypotheses.

RQ4: In topic continuity, will L1 Spanish-L2 English and L1 English-L2 Spanish learners transfer null pronouns where they are allowed in their L1?

H4a (transfer): If L1 transfer is taking place in topic continuity, then we would expect (i) L1 Spanish-L2 English learners to produce null pronouns in both coordination and non-coordination, but (ii) L1 English-L2 Spanish learners to produce them only in coordination.

H4b (no transfer): If no transfer is taking place, then we would predict (i) L1 Spanish-L2 English learners to produce null pronouns only where they are allowed in native English (topic continuity and coordination), but (ii) L1 English-L2 Spanish learners to produce them where they are allowed in native Spanish (topic continuity in both coordination and non-coordination).

4. MATERIAL AND METHODS

4.1. Corpora and participants

Two learner corpora were employed for the present study: Corpus of English as a Foreign Language (COREFL) ([Lozano et al., 2021](#) for an overview) and *Corpus Escrito del Español L2* (CEDEL2) ([Lozano, 2022](#) for an overview).⁸ COREFL (version 1.0) contains a total of 495,383 words including the written/oral production of L2 English learners (with L1 Spanish and also L2 German) (N = 1,810 texts), plus an equally designed control subcorpus of English monolinguals (N = 637 texts). CEDEL2 (version 2.0) contains 1,105,936 words including the written/oral production of L2 Spanish learners (with eleven different L1s: English, German, Dutch, French, Portuguese, Italian, Greek, Russian, Japanese, Chinese, Arabic) (N = 3,034 texts), plus an equally designed control subcorpus of Spanish monolinguals (N = 1,365 texts). These two corpora are comparable as they follow the same design criteria (see [Lozano, 2022](#) for a discussion).

⁸ Both corpora can be consulted and downloaded free of charge on the following sites: <https://corefl.learnercorpora.com/> (COREFL) and <https://cedel2.learnercorpora.com/> (CEDEL2).

Table 2
Participants.

Group name	Proficiency level	N texts ¹	Mean age	AoO ²	AoI ³	Total tags ⁴ per group
English	A2	13	23.1	9	9.8	234
	B1	11	21.2	7.1	12.5	242
	B2	10	22.2	7.4	14.8	241
	C1	10	20.8	7.5	12.9	267
	C2	8	23.7	6	17.4	257
	Monolingual	13	22.2	NA	NA	288
Spanish	A2	14	21.6	15.6	2.8	183
	B1	15	20.9	13.7	4.8	220
	B2	14	21.1	13.6	6.6	230
	C1	10	21.2	12.5	8.3	221
	C2	8	25.5	12.5	8.4	243
	Monolingual	12	20.7	NA	NA	341

¹ Each text comes from one participant, so the number of texts in this column equals the number of participants.

² Age of Onset.

³ Age of Instruction

⁴ Linguistic features included in our tagset (cf. section 4.3).

For the purposes of this study, we took a written sample of i) L1 Spanish-L2 English learners (across different proficiency levels: A2-C2) plus English monolinguals from COREFL; and ii) L1 English-L2 Spanish learners (across different proficiency levels: A2-C2) plus Spanish monolinguals from CEDEL2 (cf. Table 2).

4.2. Task

Our participants retold a Charles Chaplin video⁹ that included several characters (i.e., *Charles Chaplin, the baby, the woman, the man, and the policeman*). They first watched the video and then wrote the text. This task was suitable for the purpose of this study for several reasons. Firstly, it promotes the production of 3rd person animate [+ human] REs avoiding potential effects of inanimate and/or [- human] characters (Quesada and Lozano, 2020). Secondly, there are characters of feminine and masculine gender creating scenarios where two characters of same or different gender are involved. Finally, this task creates a wide range of topic-continuity and topic-shift scenarios with different number of potential antecedents. For instance, the video starts with Charles Chaplin with a leading role (resulting in topic-continuity contexts), but then other characters (e.g., *a woman, a policeman or an old man*) are introduced (resulting in topic-shift contexts).

4.3. Tagging procedure and analyses

The tagset, the tagging procedure and the analyses were carried out with UAM Corpus Tool¹⁰ (O'Donnell, 2008), which is a free annotation tool. As shown in Fig. 2, we created a linguistically-informed tagset, which was based on previous research (Lozano, 2016; Lozano and Quesada, 2023; Quesada and Lozano, 2020), with the features that were of our interest. We assigned the features in Fig. 2 to each 3rd person RE in subject position. Importantly, the original tagset included additional features, but we did not analyse them in this study and leave them for future research.

Firstly, we tagged the anaphor form, which includes null pronoun (\emptyset), overt pronoun (e.g., *he*), and proper NP (e.g., *Chaplin*) or common NP (e.g., *the policeman*), as illustrated in (8).

(8) **The policeman**_i turns up again so **Chaplin**_j takes the baby_k again and \emptyset _j sits down on the pavement. While holding it_k, **he**_j discovers a note saying. . . (English monolingual: EN_WR_20_14_SK)

Then, we tagged the anaphor number (i.e., singular or plural), as shown in (9), but we analysed singular REs only, as the literature shows that 3rd person singular REs are problematic for L2 learners and not plural forms (Lozano, 2009).

⁹ The video was a short clip from the film *The Kid*. It can be found in: <https://www.youtube.com/watch?v=4QkTNJFhu-g>.

¹⁰ We used UAM Corpus Tool version 6.2j (February 2023). For more information visit: <https://www.corpustool.com/>.

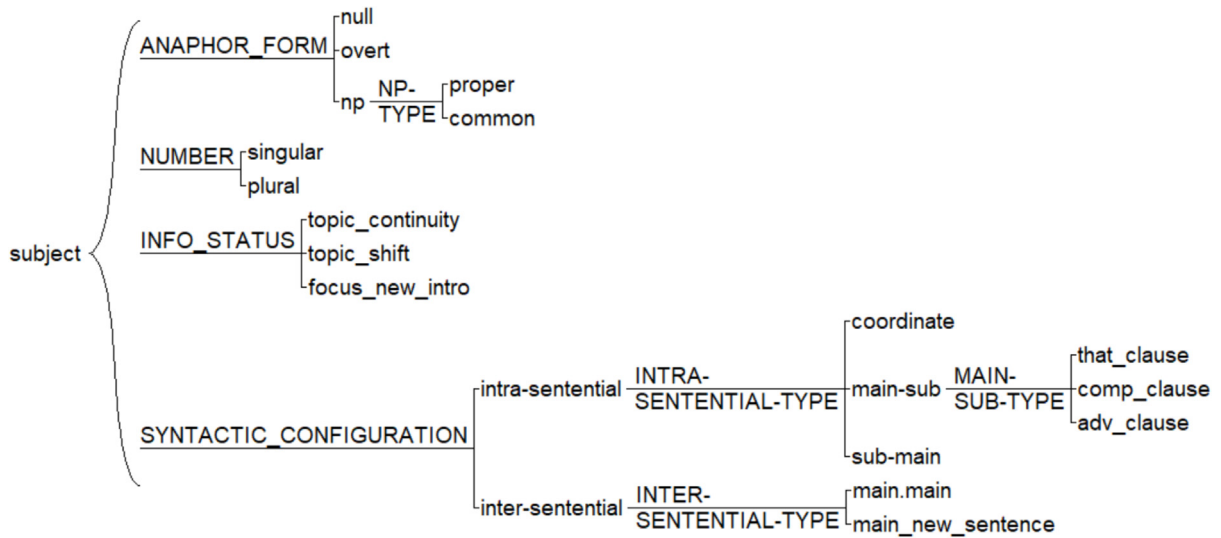


Fig. 2. Linguistic tagset.

We also tagged the information status including topic continuity as in (3a), topic shift as in (3b), and focus new introduction, where a new character is introduced in the discourse for the first time, as in (10).

- (9) ...**the man**_i walks past the angry woman_j and \emptyset _i is chased with an umbrella. **They**_{ij} get into an argument about. . . (English monolingual: EN_WR_26_14_NM)
- (10) Suddenly, **a police officer**_i appears and he_j is forced to keep the child_k. (English monolingual: EN_WR_21_14_TS)

Finally, we tagged the syntactic configuration where the RE appeared including intra-sentential configurations (i.e., coordinate and subordinate sentences) as underlined in (11a-b) and inter-sentential configurations (i.e., main sentences at the beginning of a text or main sentences after a full stop) as in (12).

- (11) a. He_i is hit on the head by something that falls from above him_i and \emptyset _i proceeds to smoke. (English monolingual: EN_WR_20_14_CP)
 b. A woman_i passes through the alley with a stroller, so he_j returns the baby_k to her_i. (English monolingual: EN_WR_26_14_BD)
- (12) Bricks fell down from the building, something was shot at him_i. He_i then found a baby lying on the ground. (English monolingual: EN_WR_20_14_SM)

In order to address the exploratory research questions related to the production of null pronouns in topic shift (cf. 3.3), we additionally carried out a qualitative analysis of such null pronouns. We classify them into temporarily ambiguous or unambiguous: a null pronoun is temporarily ambiguous when the anaphor cannot be resolved at the moment the RE appears¹¹ but is resolved later (e.g., through the context, world knowledge, or morphology), as in (13), whereas a null pronoun is unambiguous when it is resolved at the moment the RE appears (i.e., due to prior syntax, semantics or morphology) as in (14).

¹¹ Note that we are dealing with null pronouns. As the null pronoun does not appear as a word, we consider that the resolution occurs at the point where the RE is expected (i.e., in preverbal position) or next (i.e., at the verb, since it is morphologically marked for person and number).

- (13) He_i takes the child_j in his_i arms and Ø_i thinks what to do while a woman_k passes by with a baby trolley and Ø_i goes towards her_k, thinking that was her baby_j. [L2 English Learner: ES_WR_C2_21_14_14_ETC]
[The null pronoun in bold could refer to *the woman* in the previous clause, but we know it refers to *Chaplin (he)* when we read *towards her*]
- (14) The strange man_i looks strangely at the baby_j, and as Chaplin_k did shortly before, Ø_i leaves the baby_j again in the woman's_i stroller which is stopped in front of a shop. [L2 English Learner: ES_WR_B2_22_10_14_ASMR]
[The intervening subordinate clause *as Chaplin did shortly before* does not affect the coordination and the context and world knowledge make it]

Additionally, we created a tagset with the participants as shown in Fig. 3, which allowed us to make several comparisons between the different groups. We assigned one of the features in Fig. 3 to each participant.

Finally, once all the REs were tagged and the participants were classified according to their group, we carried out the analyses with the same software, which provides the descriptive and inferential statistics. UAM Corpus Tool allows between-group comparisons and reports chi square (χ^2) together with their significance level (p) and their effect size (Cohen's h). We analysed a total of 2.976 REs (cf. Table 2 to see number of tags per group).

5. RESULTS AND DISCUSSION

5.1. Overall production of REs

RQ1 addresses the overall distribution of REs irrespective of information status. We firstly focus on English and Spanish monolinguals' production and then L1 Spanish-L2 English and L1 English-L2 Spanish learners. Fig. 4 shows that English monolinguals produce mainly overt pronouns (43.3%) followed by NPs (31.7%) and null pronouns (25%), while Spanish monolinguals produce mostly null pronouns (60.4%) followed by NPs (36.6%) and overt pronouns (3%).

Regarding L1 Spanish-L2 English learners' production, Fig. 5 shows that all groups produce more overt pronouns (A2: 46.3%; B1: 51.5%; B2: 46.3%; C1: 49.4%; C2: 50.2%) than NPs (A2: 36.4%; B1: 36.7%; B2: 38.7%; C1: 32.1%; C2: 31.3%), followed by null pronouns (A2: 17.3%; B1: 11.8%; B2: 15%; C1: 18.5%; C2: 18.5%). However, there are significant differences between English monolinguals and beginner and intermediate L2 learners (A2-B2), for null pronouns only [A2 ($\chi^2 = 4.445$, $p = 0.0349$, $h = 0.189$); B1 ($\chi^2 = 14.59$, $p < 0.0001$, $h = 0.345$); and B2 ($\chi^2 = 8.00$, $p = 0.0047$, $h = 0.2525$)], there being no significant differences in the rest of between-group contrasts for either overt pronouns or NPs ($p > 0.05$ in all contrasts).

As for L1 English-L2 Spanish learners, Fig. 6 shows that lower levels (A2, B1 and B2 groups)¹² produce more NPs (A2: 46.2%; B1: 46.5%; B2: 46.9%) than null pronouns (A2: 32.9%; B1: 34.1%; B2: 30.9%) followed by overt pronouns (A2: 20.9%; B1: 19.4%; B2: 22.2%), but higher levels (C1 and C2 groups) show the monolinguals' pattern producing more null pronouns (C1: 51.4%; C2: 49%) than NPs (C1: 39.5%; C2: 38.2%) followed by overt pronouns (C1: 9.1%; C2: 12.8%). Importantly, there are significant differences between almost all groups of L2 learners and Spanish monolinguals for: null pronouns [A2 ($\chi^2 = 35.42$, $p < 0.001$, $h = 0.558$); B1 ($\chi^2 = 36.32$, $p < 0.001$, $h = 0.534$); B2 ($\chi^2 = 47.46$, $p < 0.001$, $h = 0.603$); C1 ($\chi^2 = 4.42$, $p = 0.0355$, $h = 0.183$); C2 ($\chi^2 = 7.42$, $p = 0.0064$, $h = 0.231$)]; overt pronouns [A2 ($\chi^2 = 44.16$, $p < 0.001$, $h = 0.600$); B1 ($\chi^2 = 40.71$, $p < 0.001$, $h = 0.562$); B2 ($\chi^2 = 51.37$, $p < 0.001$, $h = 0.631$); C1 ($\chi^2 = 9.46$, $p = 0.0021$, $h = 0.263$); C2 ($\chi^2 = 20.30$, $p < 0.001$, $h = 0.384$)]; and NPs [A2 ($\chi^2 = 4.51$, $p = 0.0337$, $h = 0.195$); B1 ($\chi^2 = 5.43$, $p = 0.0198$, $h = 0.203$); B2 ($\chi^2 = 6.08$, $p = 0.0137$, $h = 0.211$)].

Results show that the overall distribution of REs in English and Spanish monolinguals is different, which confirms H1a. In particular, English monolinguals predominantly produce overt pronouns and NPs, while Spanish monolinguals produce mostly null pronouns. As for L2 learners, L1 Spanish-L2 English learners show the same pattern of production as English monolinguals, although there are significant differences between lower levels and monolinguals, which confirms H1b. By contrast, L1 English-L2 Spanish learners at lower levels show a different pattern of production compared to monolinguals, but at higher levels they follow the monolinguals' pattern of production. Importantly, all groups of L1 English-L2 Spanish learners show significant differences with respect to monolinguals' production, which also confirms H1b. While these results just show the overall production of REs without considering any factor, they initially suggest an asymmetry in the overall acquisition of REs since L1 Spanish-L2 English learners' production is closer to English monolinguals than L1 English-L2 Spanish learners' production to Spanish monolinguals.

¹² When analysing the data, we noticed that there were different patterns of production between A2-B2 and C1-C2 levels at certain contexts, so we decided to name them lower and higher levels respectively for simplicity throughout the paper.

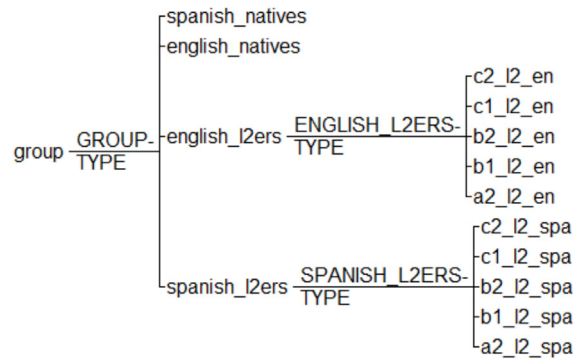


Fig. 3. Tagset with groups.

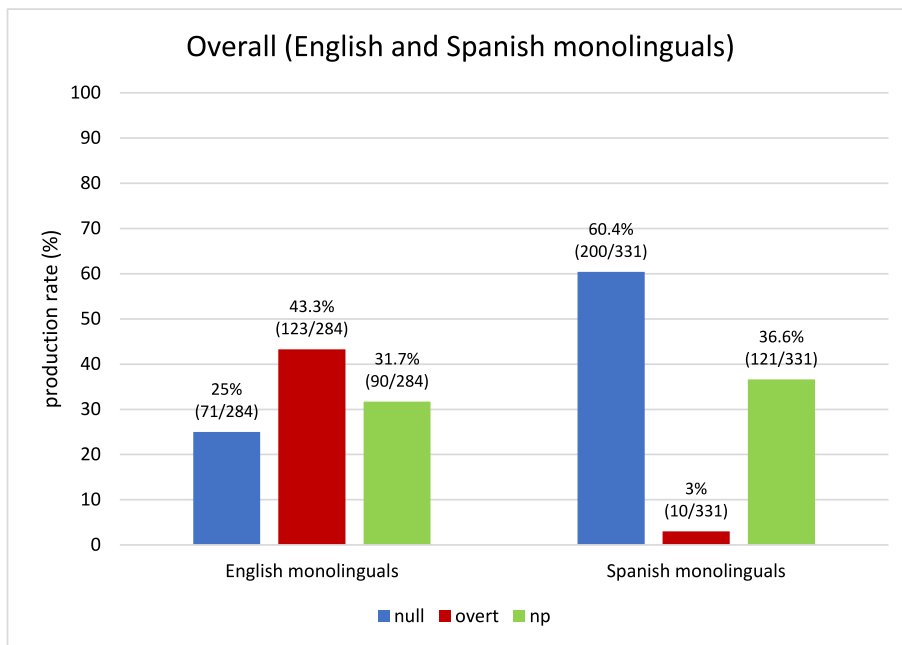


Fig. 4. REs by group: monolingual speakers.

5.2. Information status

This section addresses RQ2. Firstly, we focus on topic continuity showing monolinguals' production and then L2 learners' production. Secondly, we focus on topic shift following the same order of presentation (monolinguals and then L2 learners).

In topic continuity, Fig. 7 shows that English monolinguals produce more overt pronouns (51.5%) than null pronouns (40.1%), which still is a considerable percentage (cf. section 5.4 for a discussion), followed by NPs (8.4%), but Spanish monolinguals produce mostly null pronouns (83.6%), followed by NPs (15.4%) and hardly any overt pronouns (1%), which is a remarkably low percentage indicating their infrequent use in production in native Spanish (only 1 token in our corpus sample).

As shown in Fig. 8, L1 Spanish-L2 English learners follow the pattern of production found in English monolinguals in topic continuity. This holds across proficiency levels: high production of overt pronouns (A2: 59.8%; B1: 67.9%; B2: 65.4%; C1: 60.4%; C2: 60.5%), followed by null pronouns (A2: 27.7%; B1: 18.7%; B2: 25.2%; C1: 32.2%; C2: 29.6%) and NPs (A2: 12.4%; B1: 13.4%; B2: 9.4%; C1: 7.4%; C2: 9.9%). However, there are significant differences

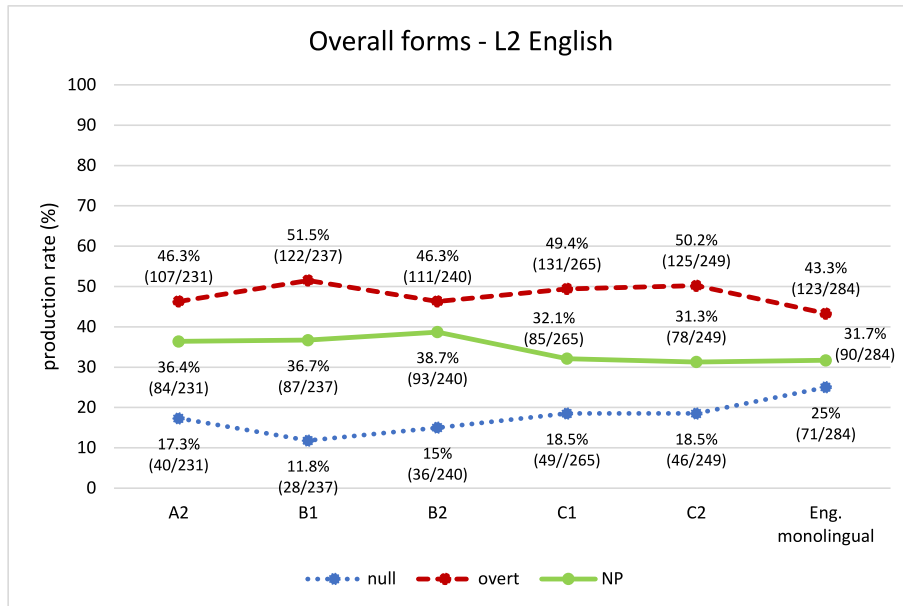


Fig. 5. REs by group: L1 Spanish-L2 English.

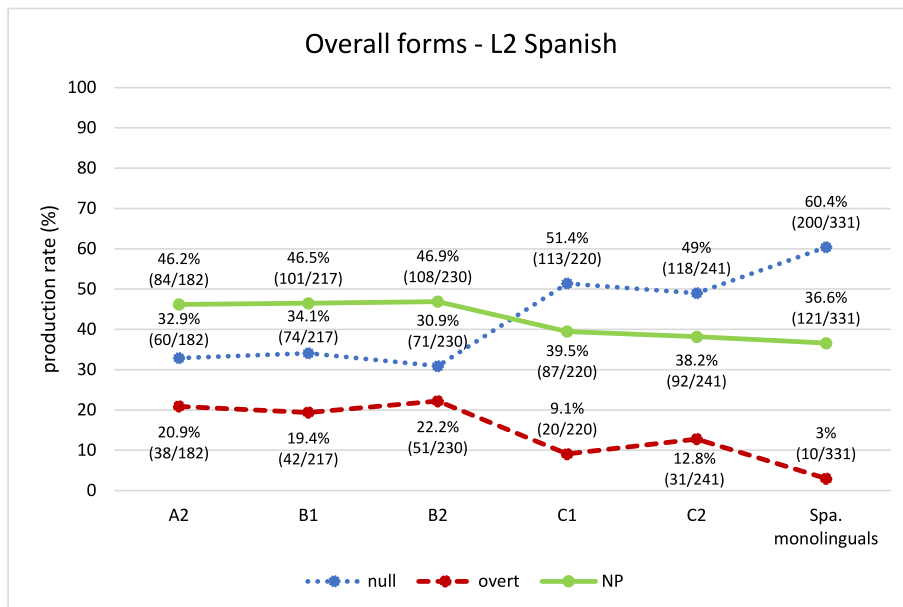


Fig. 6. REs by group: L1 English-L2 Spanish.

between most groups of L1 Spanish-L2 English learners and English monolinguals for null pronouns [A2 ($\chi^2 = 5.10$, $p = 0.0239$, $h = 0.263$); B1 ($\chi^2 = 16.14$, $p = 0.0001$, $h = 0.479$); B2 ($\chi^2 = 7.19$, $p = 0.0073$, $h = 0.320$); C2 ($\chi^2 = 3.86$, $p = 0.0494$, $h = 0.221$)] and overt pronouns [B1 ($\chi^2 = 8.27$, $p = 0.0040$, $h = 0.336$); B2 ($\chi^2 = 5.67$, $p = 0.0173$, $h = 0.282$)], but there are no significant differences for NPs. Importantly, higher level learners show native-like attainment for overt pronouns.

Fig. 9 shows that L1 English – L2 Spanish learners increasingly produce mostly null pronouns (A2: 47.7%; B1: 61.5%; B2: 55.4%; C1: 73.9%; C2: 71.6%) in topic continuity, as monolinguals do, followed decreasingly by overt pro-

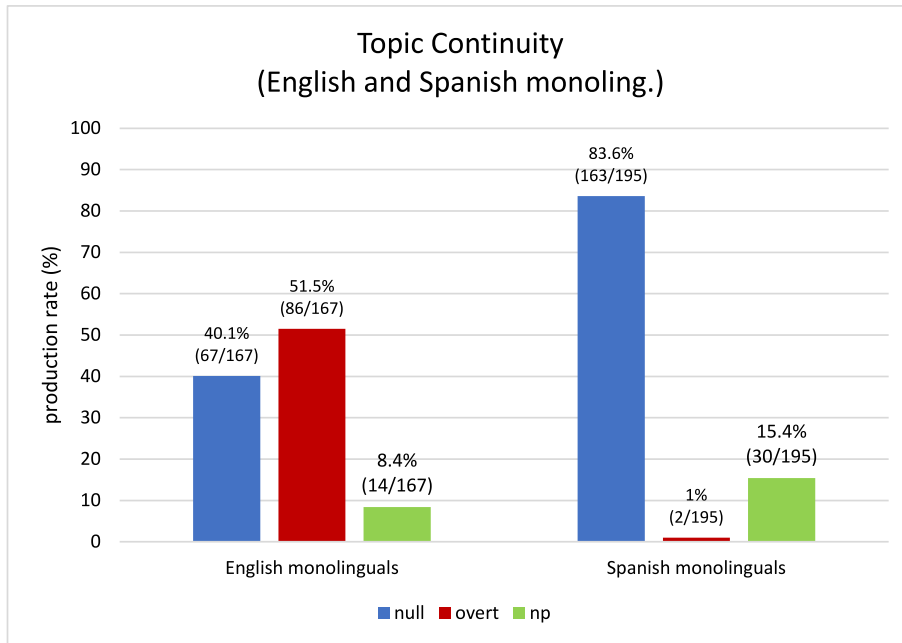


Fig. 7. REs according to topic continuity by group: monolingual speakers.

nouns (A2: 33.7%; B1: 23.9%; B2: 24%; C1: 7.1%; C2: 10.1%) and NPs (A2: 18.6%; B1: 14.6%; B2: 20.6%; C1: 19%; C2: 18.3%). Importantly, there are highly significant differences between all groups of L2 learners and Spanish monolinguals for null pronouns [A2 ($\chi^2 = 38.70$, $p < 0.0001$, $h = 0.783$); B1 ($\chi^2 = 17.42$, $p = 0.0000$, $h = 0.505$); B2 ($\chi^2 = 30.01$, $p = 0.0000$, $h = 0.629$); C1 ($\chi^2 = 4.70$, $p = 0.0302$, $h = 0.237$); C2 ($\chi^2 = 7.12$, $p = 0.0076$, $h = 0.289$)] and overt pronouns [A2 ($\chi^2 = 65.00$, $p < 0.001$, $h = 1.036$); B1 ($\chi^2 = 43.08$, $p < 0.001$, $h = 0.820$); B2 ($\chi^2 = 44.42$, $p < 0.001$, $h = 0.820$); C1 ($\chi^2 = 8.66$, $p = 0.0032$, $h = 0.334$); C2 ($\chi^2 = 14.82$, $p = 0.0001$, $h = 0.445$)]. Despite these significant differences, note a sharp increase for null pronouns (and a sharp decrease for overt pronouns) between B2 and C1 levels, indicating that at advanced levels learners approach the native norm. Importantly, there are no significant differences for NPs between any group of learners and natives ($p > 0.05$ in all contrasts).

Turning to topic shift, Fig. 10 shows that both English and Spanish monolinguals produce mostly NPs (English: 56.8%; Spanish: 60.5%). Importantly, this is followed mainly by overt pronouns (39%) in English monolinguals, but by null pronouns (32.5%) in Spanish monolinguals, which is an unexpected finding that will be further discussed in the next section.

As for L2 learners' production in topic shift, Fig. 11 shows that L1 Spanish-L2 English learners follow monolinguals' production by producing mostly NPs (A2: 63.5%; B1: 61.9%; B2: 65.2%; C1: 55.8%; C2: 60.2%) followed by overt pronouns (A2: 33.8%; B1: 35.7%; B2: 30.4%; C1: 43.2%; C2: 38.6%) and low percentages of null pronouns (A2: 2.7%; B1: 2.4%; B2: 4.4%; C1: 1%; C2: 1.2%). Crucially, there are no significant differences between English monolinguals and L2 learners' production.

Similarly, Fig. 12 shows that L1 English-L2 Spanish learners follow Spanish monolinguals' tendency and produce mostly NPs (A2: 62.5%; B1: 65.6%; B2: 69%; C1: 71.4%; C2: 65.8%) in topic shift, but this is followed by overt pronouns (A2: 12.1%; B1: 18.8%; B2: 26.2%; C1: 15.9%; C2: 20.3%) in most groups (except for the A2 level) rather than by null pronouns (A2: 25.7%; B1: 15.6%; B2: 4.8%; C1: 12.7%; C2: 13.9%), as monolinguals do. These differences are statistically significant for null pronouns [B1 ($\chi^2 = 7.92$, $p = 0.0049$, $h = 0.400$); B2 ($\chi^2 = 22.59$, $p < 0.001$, $h = 0.772$); C1 ($\chi^2 = 8.35$, $p = 0.0039$, $h = 0.484$); C2 ($\chi^2 = 8.58$, $p = 0.0034$, $h = 0.447$)] and overt pronouns [B1 ($\chi^2 = 6.61$, $p = 0.0101$, $h = 0.359$); B2 ($\chi^2 = 13.83$, $p = 0.0002$, $h = 0.538$); C2 ($\chi^2 = 7.51$, $p = 0.0061$, $h = 0.397$)]. Despite these differences, L1 English-L2 Spanish learners follow the native norm by producing mostly NPs in topic shift.

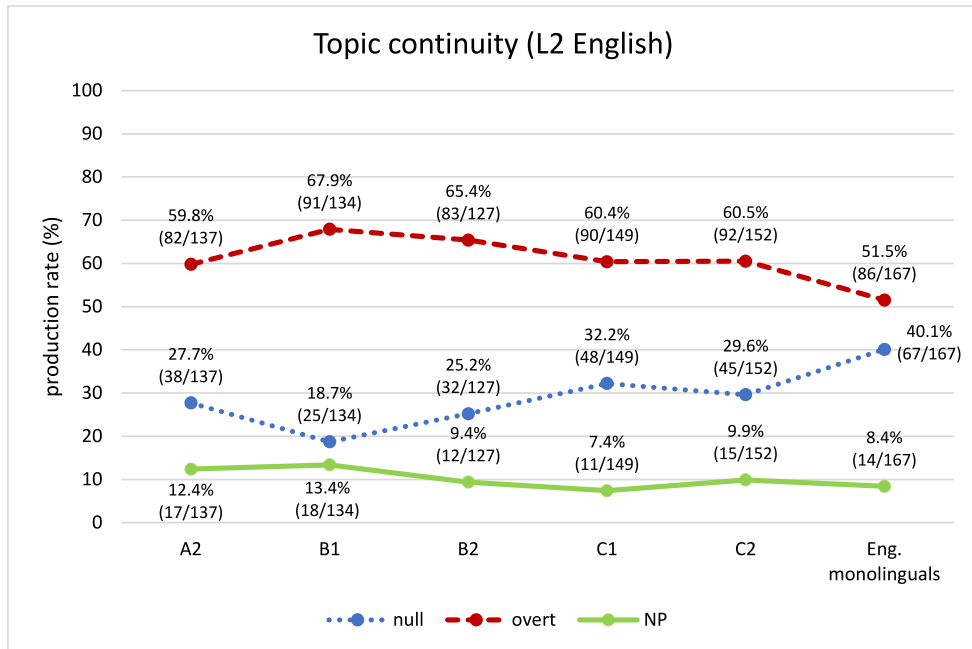


Fig. 8. REs according to topic continuity by group: L1 Spanish-L2 English.

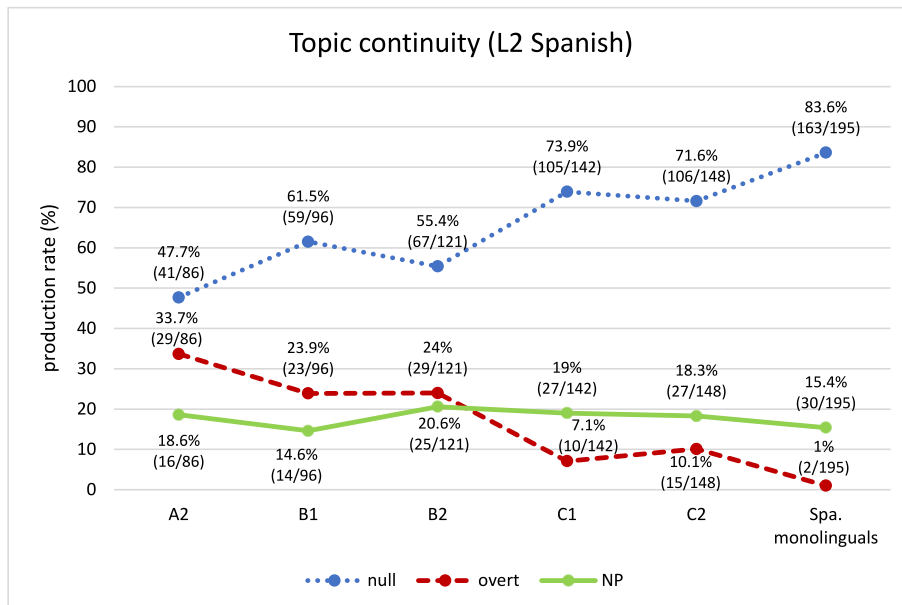


Fig. 9. REs according to topic continuity by group: L1 English-L2 Spanish.

To summarize, English and Spanish monolinguals differ in topic continuity, but share some similarities in topic shift. In particular, topic-continuity contexts are mainly marked via overt pronouns in English, but also via null pronouns as in (15), which is not typically reported in the literature (but see [Quesada and Lozano, 2020](#) for similar findings). By contrast, topic continuity is clearly marked via null pronouns in Spanish as in (16). In topic shift, both languages share that these contexts are mainly marked by NPs as in (17a-b), while such production is followed by overt pronouns in English, but by

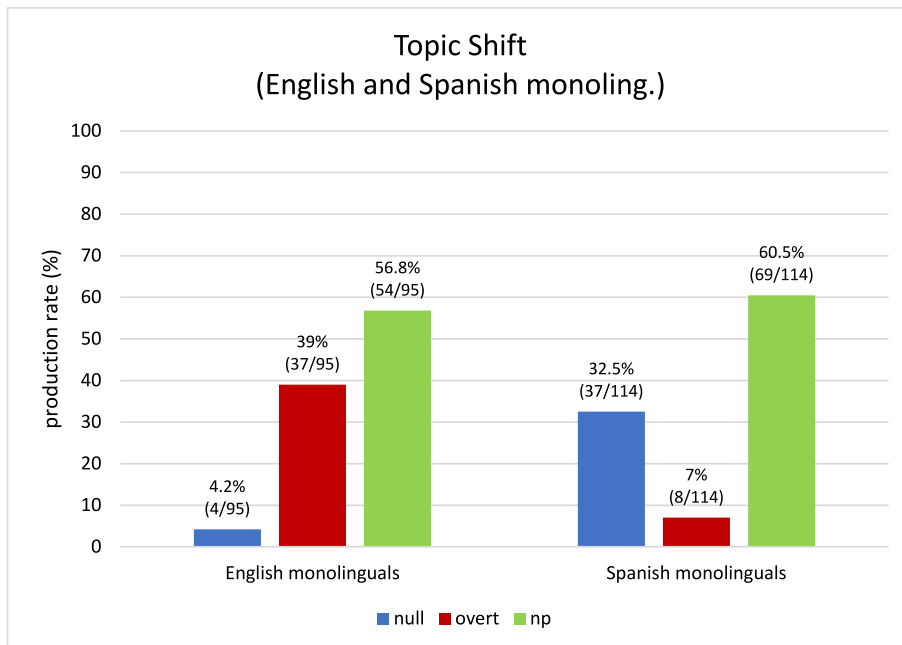


Fig. 10. REs according to topic shift by group: monolingual speakers.

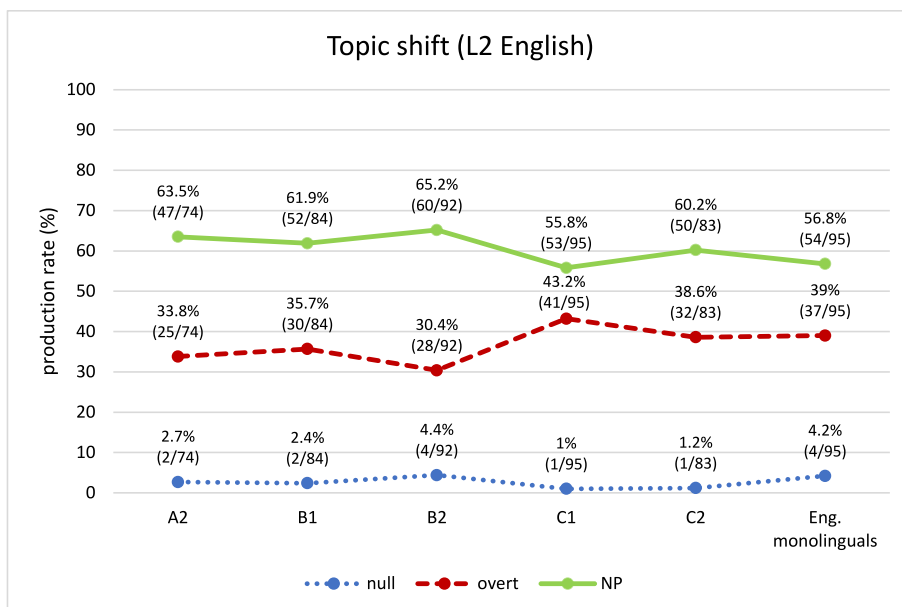


Fig. 11. REs according to topic shift by group: L1 Spanish-L2 English.

null pronouns in Spanish. These results confirm H2a. Importantly, the Spanish literature has previously reported cases of null pronouns in topic shift, but this issue has received insufficient attention (cf. [section 2.2](#)), so we further discuss this in our next research question ([section 5.3](#)).

- (15) The man_i scurries away with the child_j and Ø_i sits on the street next to a water drain. **He**_i opens the drain to see. . . [English monolingual: EN_WR_26_14_NM]
- (16) Chaplin_i aparece por una calle estrecha y Ø_i se encuentra a un bebé abandonado en el suelo. Ø_i Decide cogerlo_j y Ø_i ve . . . [Spanish monolingual: EN_WR_19_14_JMR]
'Chaplin_i appears in a narrow street and Ø_i finds an abandoned baby_j on the ground. Ø_i Decides to take him_j and Ø_i sees . . .'
- (17) a. Just as the woman_i notices the second child_j in her buggy, **Chaplin**_k passes by. **The woman**_i infers. . . [English monolingual: EN_WR_21_14_AH]
b. En ese instante aparece el policía_i que se percata de la discusión y **la mujer**_j empieza a explicarle_i lo ocurrido. **Charles**_k coge . . . [Spanish monolingual: ES_WR_21_14_L]
'At that moment the policeman_i, who notices the argument, appears and **the woman**_j starts explaining him_i what happened. **Charles**_k takes . . .'

As for L2 learners, the initial differences between them and monolinguals shown in the overall distribution of REs above are clear-cut in this section. In topic continuity, L1 Spanish-L2 English learners across proficiency levels seem to behave as monolinguals, but there are significant differences between A2-B2 and C2 groups vs. English monolinguals because they produce more explicit REs than required. For instance, they produce i) NPs when overt pronouns would be felicitous as in (18a), or ii) overt pronouns when null pronouns would be pragmatically expected, as in (18b), which will be further discussed in RQ4. As for L1 English-L2 Spanish learners, all groups produce mainly null pronouns in topic continuity, but there are significant differences between all groups of Spanish learners and monolinguals, which means that they also produce more explicit REs, like NPs or overt pronouns as in (19a-b) respectively, than required (i.e., null pronouns in (19a-b) would be sufficient to refer to the antecedent in the previous clause). In topic shift, all L2 learners in both language pairs behave as monolinguals by producing mostly NPs, as in (20a-b). Importantly, L1 Spanish-L2 Eng-

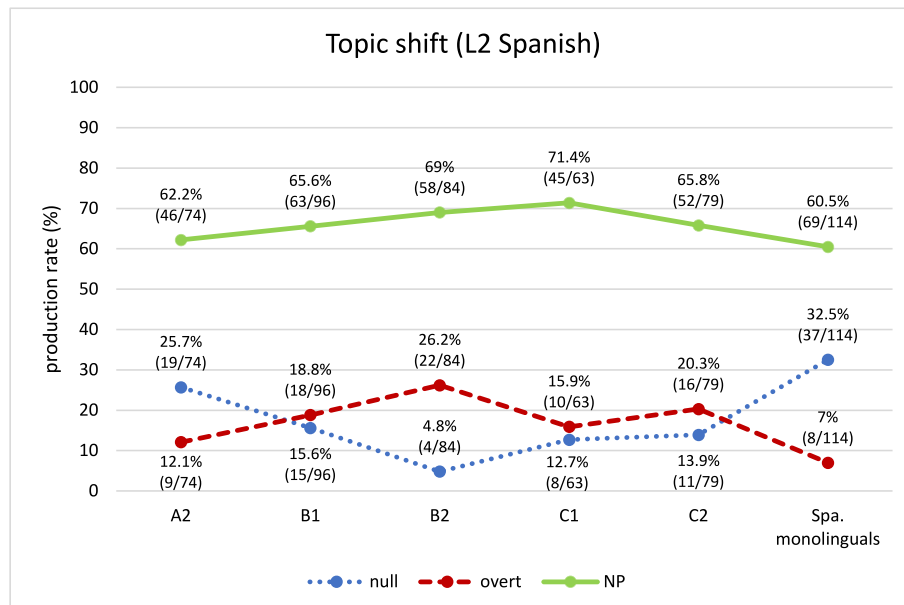


Fig. 12. REs according to topic shift by group: L1 English-L2 Spanish.

lish learners behave as English monolinguals in the production of overt pronouns in topic shift, but L1 English-L2 Spanish learners show differences with respect to the production of null pronouns in topic shift, which will be further explored in our next research question.

-
- (18) a. ...until Chaplin_i takes again the baby_j from the stroller. **Chaplin_i** sits on the sidewalk with the baby_j. . . [L2 English Learner: ES_WR_B2_21_17_14_VCR]
 b. Then, he_i looks at the baby's_j clothing and **he_i** find a note that . . . [L2 English Learner: ES_WR_A2_19_12_14_IRM]
- (19) a. El hombre_i está caminando alrededor de la ciudad. **El hombre_i** encuentra un bebé_j. **El hombre_i** trata encontrar la madre_k. [L2 Spanish Learner: EN_WR_17_20_2.5_14_EO]
 'The man_i is walking around the city. **The man_i** finds a baby_j. **The man_i** tries to find the mother_k.'
 b. El hombre_i encuentra un bebé_j en la calle. **Él_i** trata encontrar la madre_k de bebe_j. Por error, **él_i** pone él bebé_j con una madre_k incorrecto. [L2 Spanish learners: EN_WR_22_19_3.5_14_SC]
 'The man_i finds a baby_j in the street. **He_i** tries to find the mother_k of the baby_j. By mistake, **he_i** puts the baby_j with the wrong mother_k.'
- (20) a. The man_i escapes, but right in that moment **Chaplin_i** walks past the shop and **the woman_k** goes running after him_j. . . [L2 English Learner: ES_WR_B2_21_17_14_VCR]
 b. El hombre_i se pone el bebé_j en el coche de la mujer_k. **Charlie_i** camina por la mujer_k y **la mujer_k** se da el bebé_j. [L2 Spanish learners: EN_WR_34_21_8_14_SM]
 'The man_i puts the baby_j in the pram of the woman_k. Charlie_i walks close to the woman_k and the woman_k gives him_i the baby_j.'
-

Thus, these results partially confirm H2b since learners show a gradual acquisition of RE, as expected, but native-like attainment is not always achieved. In particular, topic-continuity contexts are more problematic than topic-shift contexts for all L2 learners, which supports the PPVH (cf. [section 1](#)) since L2 learners tend to violate more the Informativeness/Economy Principle than the Manner/Clarity principle by being more redundant than ambiguous. Crucially, topic-continuity contexts are problematic to different extents depending on the language pair. L1 English-L2 Spanish learners' production of REs according to information status differs from Spanish monolinguals' production more than L1 Spanish-L2 English learners from English monolinguals, which shows that there is an asymmetry in the acquisition of REs, as suggested in the previous section. We will further discuss this in the final discussion.

5.3. Null pronouns in topic shift

This section explores the production of null pronouns in topic shift, which addresses RQ3a and RQ3b. We firstly focus on the production of null pronouns in L1 Spanish-L2 English and then in L1 English-L2 Spanish.

[Table 3](#) shows the production of null pronouns in topic shift in English monolinguals and L1 Spanish-L2 English learners across proficiency level. The frequency of temporarily ambiguous (13) and unambiguous (14) null pronouns is very low across groups and note that such null pronouns are pragmatically infelicitous.

Regarding Spanish monolinguals and L1 English-L2 Spanish learners, [Table 4](#) shows that the production of temporarily ambiguous and unambiguous null pronouns in topic shift is somewhat higher than in English (cf. [Table 3](#)). The frequency of null pronouns is higher in Spanish monolinguals than in L2 learners (except for the A2 group). Importantly, all instances of temporarily ambiguous null pronouns are felicitous because they can be resolved later, as in

(21), except for 2 cases at A2 level and 4 cases at B1 level that cannot be resolved,¹³ as in (22). These results show that despite the fact that null pronouns are less frequent in topic shift compared to the high production of NPs, they are still possible in Spanish. Previous studies argued that null pronouns in topic shift are produced due to directive verbs ([Lozano, 2016; García-Alcaraz, 2015](#)), but note that only 11 null pronouns (B1: 1; C1: 3; C2: 1; Monolingual: 6) out of 94 were produced due to directive verbs, as in (23).

¹³ Note that these cases can be resolved only if one watches the video. So, the writer assumes there is a shared knowledge with the reader (i.e., the reader has watched the video as well).

Table 3

Null pronouns in topic shift by group (English).

Proficiency levels (English)	N (Ambiguous)	N (Unambiguous)	N (Total)
A2	1	1	2
B1	1	1	2
B2	1	3	4
C1	1	0	1
C2	1	1	2
Monolinguals	3	1	4

Table 4

Null pronouns in topic shift by group (Spanish).

Proficiency levels (Spanish)	N (Ambiguous)	N (Unambiguous)	N (Total)
A2	14	5	19
B1	13	2	15
B2	4	0	4
C1	3	5	8
C2	5	6	11
Monolinguals	9	28	37

- (21) Chaplin_i agarra al bebé_j y Ø_i lo_j coloca en su cochecito. La mujer_k se enoja por sus acciones y Ø_i se ve obligado a recoger al bebé_j. [L2 Spanish Learner: EN_WR_19_23_3_14_EN]
 ‘Chaplin_i takes the baby_j and Ø_i puts it_j in her pram. The woman_k gets angry for his actions and Ø_i is forced to pick up the baby_j.’
 [We initially think that the null pronoun in Ø se ve refers to *the woman*, but the RE is resolved in the adjective *obligado* [masculine], so we know it must be Chaplin].
- (22) La mujer_i no quería al niño_j. El hombre_k dio al bebé_j a otra persona_i, pero el hombre_i devolvió al niño_j a la mujer_i. Al final Ø_j tomó al bebé. [L2 Spanish Learner: EN_WR_20_22_0.5_14_KR]
 ‘The woman_i didn’t want the baby_j. The man_k gave the baby_j to another person_i, but the man_i gave the baby_j back to the woman_i. Finally Ø_j took the baby_j.’
 [According to our interpretation, this anaphor is not resolved because a man [*Chaplin*] gives the baby to another person (i.e., an old man) and then this second man gives the baby to the woman. Finally, a null pronoun is used to say that somebody takes the baby. The reader does not know who takes the baby (unless the reader watches the video: see Footnote 9), which shows that it is Chaplin who takes the baby].
- (23) Al dar la vuelta a la esquina, Ø_i se encuentra con un hombre_j que_j iba paseando, al que Ø_i se acerca, y Ø_i le_j pide que Ø_j sujete al bebé_k ... [Spanish monolingual: ES_WR_20_14_ASR]
 ‘When turning around the corner, Ø_i meets a man_j walking along, to whom_j Ø_i approaches, Ø_i asks him_j to hold the baby_k ...’
 [In Spanish, the verb ‘pide’ (ask [somebody to do something]) is a directive verb that requires a *that* clause with a null pronoun referring to the object of the previous clause].

The results above show the different behaviour of null pronouns depending on the language pair. L1 Spanish-L2 English learners hardly produce infelicitous null pronouns in topic shift despite this being a possibility in their L1 Spanish confirming H3a. By contrast, the distribution of null pronouns in Spanish can be richer than previously assumed since Spanish monolinguals produce null pronouns in these contexts, which confirms H3b. Importantly, it is essential to explore and describe i) under which conditions they are produced; and ii) if they can be resolved and when (i.e., temporarily ambiguous vs. unambiguous). These aspects are further discussed in the general discussion below.

5.4. Cross-linguistic effects

This section addresses RQ4 and compares topic-continuity in coordinate vs. non-coordinate sentences in English first, and then in Spanish.

English monolinguals produce mostly null pronouns (90.5%) in topic-continuity and coordinate contexts, which is a considerable percentage that has typically been overlooked in the literature (Fig. 13), but mostly overt pronouns (86%) and some NPs (14%) in topic-continuity and non-coordinate contexts (Fig. 14). L1 Spanish-L2 English learners show the same pattern of production as monolinguals: higher production of null pronouns (A2: 50%; B1: 41.7%; B2: 59.3%; C1: 70.6%; C2: 81.8%) in coordinate contexts except for the B1 group (Fig. 13), but high production of overt pronouns (A2: 76.8%; B1: 78.4%; B2: 86.3%; C1: 88.9%; C2: 85.6%) and some NPs (A2: 17.4%; B1: 21.6%; B2: 13.7%; C1: 11.1%; C2: 14.4%) in non-coordinate contexts (Fig. 14). Crucially, all groups except for the C2 level group show significant differences when compared to English monolinguals for null pronouns in topic-continuity and coordinate contexts [A2 ($\chi^2 = 28.36$, $p < 0.001$, $h = 0.946$); B1 ($\chi^2 = 37.78$, $p < 0.001$, $h = 1.113$); B2 ($\chi^2 = 17.43$, $p < 0.001$, $h = 0.759$); C1 ($\chi^2 = 9.16$, $p = 0.0025$, $h = 0.521$)] and overt pronouns [A2 ($\chi^2 = 22.76$, $p < 0.001$, $h = 0.846$); B1 ($\chi^2 = 35.31$, $p < 0.001$, $h = 1.093$); B2 ($\chi^2 = 16.14$, $p < 0.001$, $h = 0.731$); C1 ($\chi^2 = 8.51$, $p = 0.0035$, $h = 0.503$)], but there are no significant differences in non-coordinate contexts ($p > 0.05$ in all contrasts).

We now turn to Spanish. Spanish monolinguals produce mostly null pronouns both in coordinate (93.1%) and in non-coordinate contexts (73.4%) (cf. Fig. 15 and Fig. 16), as expected. L1 English-L2 Spanish learners follow the same pattern of production in coordinate contexts by mostly producing null pronouns (cf. Fig. 15) but differ from monolinguals in non-coordinate contexts. In non-coordinate contexts (cf. Fig. 16), L1 English-L2 Spanish learners at lower levels perform at chance level by producing null pronouns (A2: 25%; B1: 41.4%; B2: 31.3%), overt pronouns (A2: 48.3%; B1: 36.2%; B2: 35.8%), and NPs (A2: 26.7%; B1: 22.4%; B2: 32.9%) to similar extents. By contrast, L1 English-L2 learners at higher levels behave as monolinguals producing mostly null pronouns (C1: 50%; C2: 54.2%) followed by NPs (C1: 36.8%; C2: 30.1%) and overt pronouns (C1: 13.2%; C2: 15.7%). However, there are significant differences between all groups of L2 learners and monolinguals in non-coordinate contexts for null pronouns [A2 ($\chi^2 = 34.61$, $p < 0.001$, $h = 1.011$); B1 ($\chi^2 = 15.49$, $p = 0.0001$, $h = 0.660$); B2 ($\chi^2 = 28.07$, $p < 0.001$, $h = 0.870$); C1 ($\chi^2 = 9.33$, $p = 0.0022$, $h = 0.487$); C2 ($\chi^2 = 7.08$, $p = 0.0078$, $h = 0.403$)] and overt pronouns [A2 ($\chi^2 = 52.17$, $p < 0.001$, $h = 1.331$); B1 ($\chi^2 = 35.79$, $p < 0.001$, $h = 1.085$); B2 ($\chi^2 = 36.03$, $p < 0.001$, $h = 0.870$); C1 ($\chi^2 = 10.09$, $p = 0.0015$, $h = 0.538$); C2 ($\chi^2 = 12.90$, $p = 0.0003$, $h = 0.607$)], but no significant differences for NPs.

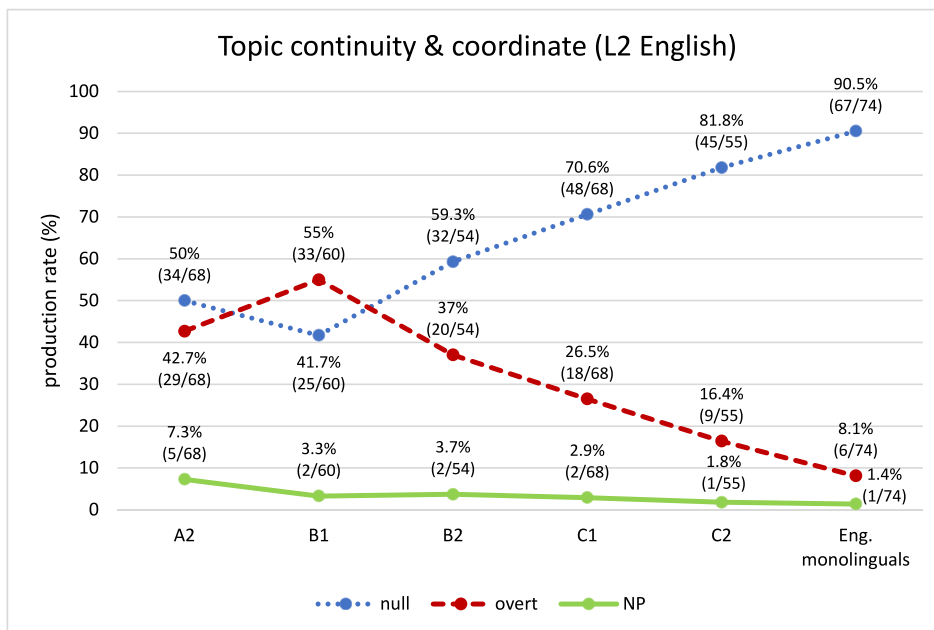


Fig. 13. REs in topic-continuity and coordinate contexts by group: L1 Spanish-L2 English.

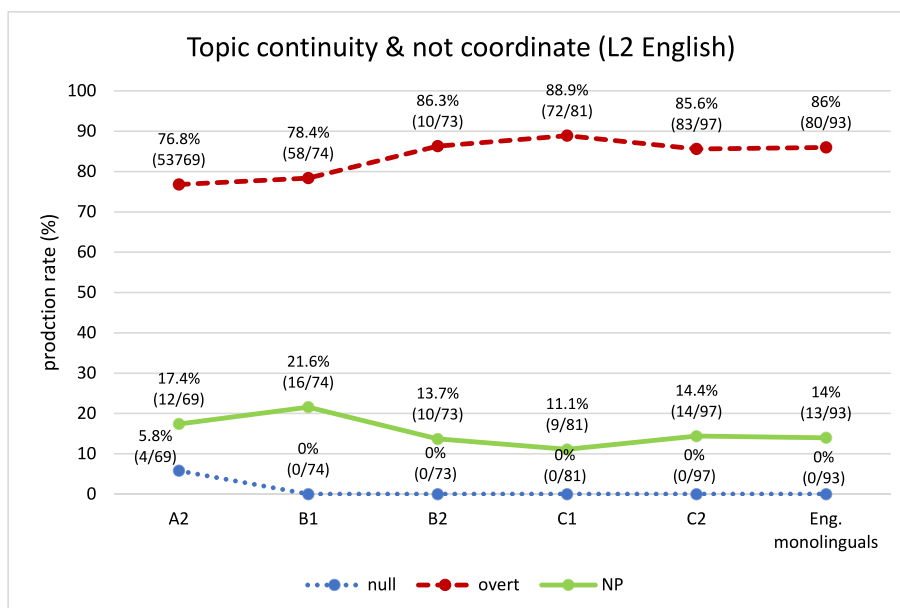


Fig. 14. REs in topic-continuity and non-coordinate contexts by group: L1 Spanish-L2 English.

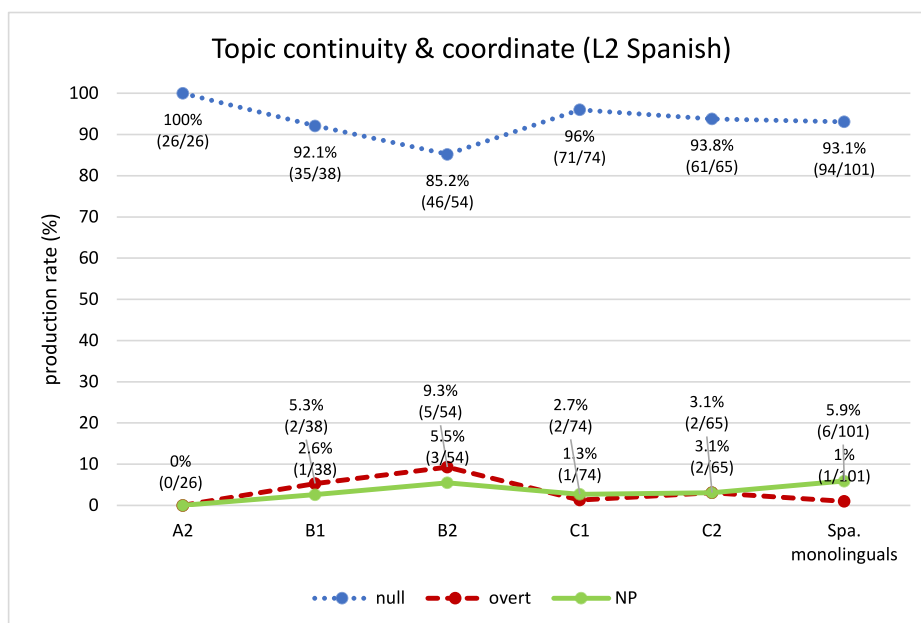


Fig. 15. REs in topic-continuity and coordinate contexts by group: L1 English-L2 Spanish.

To summarize, L1 Spanish-L2 English learners across proficiency levels produce null pronouns in coordinate contexts but not in non-coordinate ones, indicating that they do not transfer null pronouns from their L1 Spanish (otherwise they would produce them in both contexts). These results confirm H4b (no transfer hypothesis). Despite the lack of transfer, L1 Spanish-L2 English learners' production of null pronouns in coordinate contexts is not straightforward because they show a gradual acquisition of null pronouns by initially producing redundant overt pronouns and NPs, (24a-b), but later producing null pronouns as their proficiency level increases. Crucially, native-like attainment at C2 level is achieved, which shows that null pronouns are acquirable in L1 Spanish-L2 English.

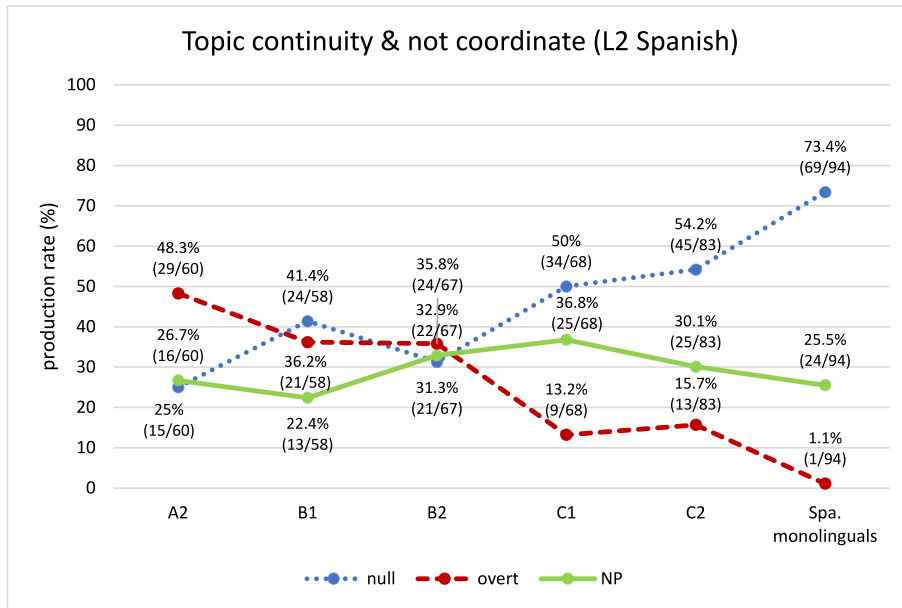


Fig. 16. REs in topic-continuity and non-coordinate contexts by group: L1 English-L2 Spanish.

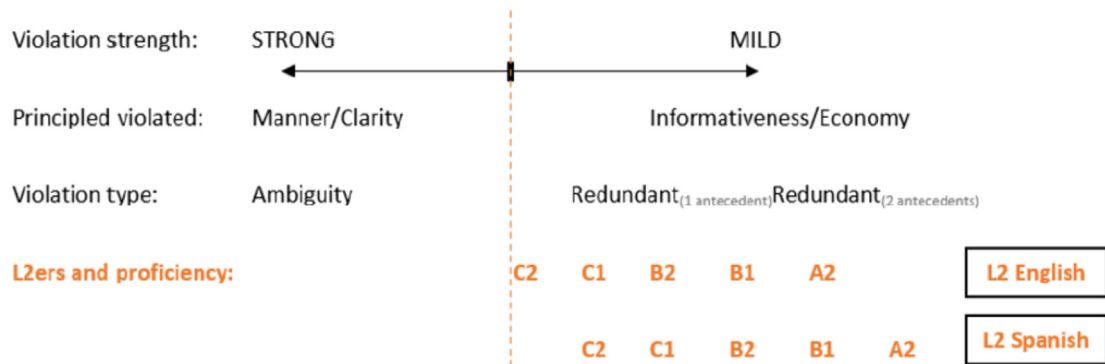


Fig. 17. New version of PPVH: The PPVH2.

- (24) a. The old man_i passed in front of the same woman_j, and **he**_i left the baby_k in the baby carriage... [L2 English Learner: ES_WR_B1_20_14_2_ASJ]
 b. He_i finds a baby_j who are crying in the floor and **Charles**_i calls a woman_k... [L2 English Learner: ES_WR_A2_19_12_14_IRM]

By contrast, L1 English-L2 Spanish learners' production shows an asymmetry with respect to L1 Spanish-L2 English learners' production. Firstly, L1 English-L2 Spanish learners show the same pattern of production as Spanish monolinguals in coordinate contexts, but not in non-coordinate contexts, which means that they transfer null pronouns from their L1 English since they restrict their use to contexts where they are allowed in their native English: topic continuity and coordinate contexts. This confirms H4a (transfer hypothesis). While coordinate contexts reveal transfer of null pronouns, in non-coordinate contexts we observe a development in the acquisition of REs. At lower levels, L1 English-L2 Spanish learners start producing REs at chance level in non-coordinate contexts, but there is an increase in the production of null pronouns at higher levels. This means that they are redundant at these contexts by producing overt pronouns and NPs when null pronouns would be more economical, as in (25a-b). Importantly, despite a developmental acquisition of null

pronouns in non-coordinate contexts in L2 Spanish, there is no native-like attainment even at C2 level, which reinforces the idea that there is an asymmetry between these two language pairs. Finally, it is worth highlighting the mirror-image pattern observed in the results above. The developmental acquisition with the increase of null pronouns is shown in coordinate contexts in L1 Spanish-L2 English, but non-coordinate contexts show that there is a lack of transfer. By contrast, the developmental acquisition in L2 Spanish is observed in non-coordinate contexts, but transfer of null pronouns is confirmed in coordinate contexts.

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- (25) a. Cuando el hombre_i vea la policía_j el_i corre porque el_i no quiere problema con udstedes. [L2 Spanish Learner: EN_WR_15_19_1_14_YD]
 'When the man_i sees the policeman_j he_i runs because he_i doesn't want trouble with you.'
- b. La persona_i que escribió el mensaje quiere el hombre_j a tener el bebe_k. En el fin, **el hombre_j** decidió que el_i pudo cuidar por el niño_k. [L2 Spanish Learner: EN_WR_31_27_14_AS]
 'The person_i who wrote the message wants the man_j keeps the baby_k. At the end, the man_j decided to take care of the baby_k.'
-

6. GENERAL DISCUSSION AND CONCLUSION

Research question 1 addressed the overall production of REs comparing two different languages. Our results confirmed previous studies by showing that the overall distribution of REs in English and Spanish monolinguals is different (inter alia: Quesada and Lozano, 2020; Kang, 2004; Montrul and Rodríguez Louro, 2006; Ryan, 2015; Vande Castele and Collewaert, 2016), but, importantly, we corroborated these findings by systematically comparing these two groups within the same study and under the same conditions (e.g., task or L2 learners proficiency levels). Results from the English learners are in line with a previous study (Ryan, 2015), which showed higher production of overt pronouns than NPs. Other studies found the opposite pattern (i.e., higher production of NPs) (inter alia: Quesada and Lozano, 2020; Crosthwaite, 2011; Kang, 2004), but this could be related to task-effects since previous literature has shown that the transition between pictures in the task can lead to redundant REs (cf. Quesada and Lozano, 2020 for a discussion). However, all these studies showed that overt material (i.e., overt pronouns and NPs) is overall favoured in English monolinguals and L2 learners. Regarding L1 English-L2 Spanish learners, our results confirmed previous findings by showing that lower levels did not follow Spanish monolinguals' pattern of production, but higher levels did (Montrul and Rodríguez Louro, 2006; Vande Castele and Collewaert, 2016). We additionally revealed that there were significant differences between all groups of L1 English-L2 Spanish learners and monolinguals, which was not shown in previous studies. All in all, these general results confirmed previous findings, but additionally reveal an asymmetry in the acquisition of REs in L1 Spanish- L2 English vs. L1 English-L2 Spanish.

Importantly, such differences were well-delimited in our second set of research questions, where we investigated the information status of the RE. Firstly, our results confirmed the division of labour in English and Spanish monolinguals shown in previous studies (inter alia: Lozano, 2009, 2016; Quesada and Lozano, 2020; García-Alcaraz and Bel, 2019; Giannakou and Sitaridou, 2020), but we additionally showed similarities and differences between these language pairs in an adequate manner by comparing them within the same study and under the same methodological intervention. Regarding L1 Spanish-L2 English learners' production, the high production of overt pronouns in topic continuity is in line with previous experimental and production-based studies (inter alia: Quesada and Lozano, 2020; Contemori and Dussias, 2020; Cummings et al., 2017; Ryan, 2015). Additionally, our production results showed that there was a developmental acquisition of overt and null pronouns in topic continuity: L2 learners were initially redundant by producing more explicit REs than required, but this redundancy strategy was overcome at higher levels (showing no or marginal significant differences). By contrast, topic-shift contexts were not problematic for L1 Spanish-L2 English learners across proficiency levels, thus supporting previous literature (Quesada and Lozano, 2020). Similarly, the acquisition of null pronouns in topic continuity in L1 English-L2 Spanish learners was developmental, as shown in previous experimental and production-based studies (inter alia: Lozano, 2016, 2018; Martín-Villena and Lozano, 2020; Judy, 2015), but this time the redundancy strategy was not overcome at higher levels. The production of REs in topic shift was similar between L1 English-L2 Spanish learners and monolinguals with a higher production of NPs, but there were some differences for null pronouns, which will be discussed below. Therefore, the comparisons between these two language pairs allowed us to find that: i) topic-continuity contexts were more problematic for L2 learners than topic-shift contexts; ii) L1 Spanish-L2 English and L1 English-L2 Spanish learners were initially redundant in topic continuity but showed a developmental acquisition of the pragmatics of REs; iii) L2 learners' developmental acquisition and final attainment were asymmetric due to differences between these language pairs (i.e., L1 Spanish-L2 English learners' production was closer to English

monolinguals than L1 English-L2 Spanish learners to Spanish monolinguals); iv) the division of labour was different in English and Spanish monolinguals (despite some similarities in topic shift); and v) topic shift contexts in Spanish are more complex than previously assumed, as discussed next.

The production of null pronouns in topic shift was further addressed in RQ3. Our results revealed that null pronouns in topic shift in L1 Spanish-L2 English learners and monolinguals were marginally produced. Importantly, these results contradict the high acceptance of ungrammatical null pronouns in previous experimental studies (Mitkovska and Bužarovska, 2018; Pladevall Ballester, 2013; Prentza, 2014), but are in line with previous production-based studies (inter alia: Quesada and Lozano, 2020; Kang, 2004; Ryan, 2015). As for the production of null pronouns in L1 English-L2 Spanish learners and monolinguals, our results showed that null pronouns were possible in topic shift in Spanish, a finding that was not typically reported in experimental studies, but was found in production-based studies (inter alia: García-Alcaraz and Bel, 2019; Licerias et al., 2010). Importantly, previous corpus studies included 1st person (deictic use) and 3rd person (anaphoric use) singular and plural REs, and animate and inanimate referents, but we restricted our analysis to 3rd person singular REs and still found that felicitous null pronouns were possible in these contexts and not all of them occurred due to directive verbs, as previously argued in the literature (Lozano, 2016; Lozano and Quesada, 2023). In our analysis, we observed that some null pronouns were preceded by an intervening subordinate clause that would not break the continuity of the topic. In fact, previous studies analysed these scenarios and considered them as topic-continuity scenarios (Collewaert, 2019; Díaz-Negrillo and Espinola Rosillo, 2024). Also, we noticed that most of these null pronouns referred to the main character (*Chaplin*), which is in line with the idea of *Chaplin* as discourse topic as proposed by Lozano et al. (2023). After analysing the production of Spanish and Greek monolinguals, the authors formulated the Type of Topic Hypothesis (TTH) to account for the distinction between discourse-topic vs. sentential-topic oriented languages. Null pronouns in topic shift were more frequent in Greek than in Spanish, so the former was considered a discourse-oriented language, but such null pronouns were not neglected in Spanish. We believe the null pronouns in topic shift in the present study are related to the TTH. Since our analysis was an exploratory one, we are far from capitalizing on the importance of null pronouns in topic shift, as done in previous studies, given that we found that topic-shift contexts are mostly marked by NPs. We intend to point out that felicitous null pronouns can occur in topic shift but need to be further investigated systematically considering the different factors previously addressed.

Finally, we investigated potential transfer effects in RQ4. Our results showed that L1 Spanish-L2 English learners did not transfer null pronouns from their L1 Spanish which is in line with previous production-based studies (Quesada and Lozano, 2020), but not with experimental studies (Mitkovska and Bužarovska, 2018; Pladevall Ballester, 2013; Prentza, 2014). By contrast, L1 English-L2 Spanish learners did transfer null pronouns from their L1 English by restricting their use to topic-continuity and coordinate contexts, which is in line with previous production-based studies (Lozano and Quesada, 2023; Martín-Villena and Lozano, 2020). Crucially, our bidirectional comparisons showed that the acquisition of REs is developmental in both language pairs but at the same time asymmetric. The developmental acquisition of null pronouns in L2 English is shown in topic-continuity and coordinate contexts, where we additionally observe native-like attainment at C2 level. By contrast, topic-continuity and non-coordinate contexts reveal the gradual acquisition of null pronouns in L2 Spanish, which is asymmetric in two respects: i) lower levels show a higher degree of indeterminacy; and ii) native-like attainment is not achieved even at C2 level. Additionally, these results and the ones discussed above show that the discursive properties of NPs are easily acquired by both L1 Spanish-L2 English and L1 English-L2 Spanish learners.

To summarize, our results demonstrate the importance of investigating these two mirror-image language pairs using comparable corpora (from learners and monolinguals), and same task and annotation scheme, as we could corroborate previous findings in a more systematic manner, but additionally could reveal new findings that were previously unexplored. Regarding English and Spanish monolinguals' production, we showed that these two language pairs worked differently, as it is well-known in the literature, but shared the use of NPs in topic shift. This is a crucial finding that is not typically considered in experimental studies (inter alia: Chamorro et al., 2016; Contemori and Dussias, 2020; Cummings et al., 2017; Filiaci et al., 2014). As for L1 Spanish-L2 English and L1 English-L2 Spanish learners, we revealed that all L2 learners were redundant and showed a developmental acquisition of REs regardless of the language pair, but the degree of redundancy varied depending on the language pair, which reveals an asymmetry between them.

As pointed out in the results section, our findings are in line with the PPVH (cf. Fig. 1) (Lozano, 2016), but we go beyond the original proposal by postulating a new version: the PPVH2. Recall that the PPVH was based on Grice's maxims of Quantity and Manner (Grice, 1975), but adapted to the phenomenon of anaphora resolution, as formulated by Lozano (2016: 261): "the Manner/Clarity Principle requires the use of full forms when the anaphor cannot be resolved via minimal forms (overt pronoun or even NP in topic-shift contexts) and the Informativeness/Economy Principle requires the use of minimal forms as long as the anaphora can be resolved (\emptyset in topic-continuity contexts)". Originally, the PPVH was proposed for a unidirectional study investigating advanced L1 English-L2 Spanish learners. Crucially, our bidirectional study compares two language pairs symmetrically (L1 Spanish-L2 English vs. L1 English-L2 Spanish) and

developmentally (i.e., across proficiency levels), which allows us to further develop the PPVH's original postulation. In particular, our results in RQ2, RQ3, and RQ4 confirmed that our L1 Spanish-L2 English and L1 English-L2 Spanish learners produced more explicit REs than required, so they were redundant, but additionally showed that the degree of redundancy: i) is attenuated as L2 learners' proficiency increases, and ii) varies in degree depending on the language pair. Our PPVH2 incorporates these new findings. As shown in Fig. 17, we include a dashed vertical line in the middle of the scale, which is the cut-off point between ambiguity and redundancy. We place our L2 learners on the right side of the scale to indicate that they are redundant but not ambiguous, as results showed they tended to produce more explicit REs than required in different contexts (e.g., topic continuity). L2 learners at lower levels are closer to the right side of the scale than L2 learners at higher levels, which indicates that their acquisition is developmental: lower levels are the most redundant groups, but this redundant tendency is mitigated as their proficiency level increases. Such development comes to an end when the dashed vertical line is encountered, meaning that native-like attainment is achieved (i.e., results showed native-like attainment of L1 Spanish-L2 English learners at C2 level). Importantly, the position of L1 Spanish-L2 English and L1 English-L2 Spanish learners in the scale is different since we observed an asymmetric acquisition of REs implying a delayed development in L1 English-L2 Spanish learners, which could occur due to the more complex distribution of REs in null-subject languages than in non-null-subject languages.

The results in the present study revealed that, despite some similarities, the acquisition of REs is asymmetric. Firstly, L1 English-L2 Spanish learners were more redundant than L1 Spanish-L2 English learners. Then, L1 English-L2 Spanish learners did transfer null pronouns from their L1 English, but L1 Spanish-L2 English learners showed no transfer. Finally, native-like attainment was possible at C2 level in L1 Spanish-L2 English learners, but not in L1 English-L2 Spanish learners. Our results confirmed the PPVH, as done in previous studies (cf. section 1), but added new insights to the original proposal, which were postulated in the PPVH2. Thus, the present study added a valuable contribution to the field of SLA in general and to the investigation of AR in particular. This contribution can pave the way for future studies investigating AR in a bidirectional manner but using different language pairs so that we have further evidence on how this complex linguistic phenomenon works. Crucially, bidirectional comparisons are possible with existing mirror-image corpora such as CORFEL (for L2 English) and CEDEL2 (for L2 Spanish). This is an remarkable implication for the field of Learner Corpus Research since these types of learner corpora are needed (Lozano, 2022). Finally, our study has some limitations that require future research. Our findings would be more solid with a larger sample of L2 learners. The investigation of null pronouns in topic shift was rather exploratory, but larger instances of this phenomenon would disentangle to what extent null pronouns play a role in topic shift.

7. RESEARCH DATA

Publicly available datasets were analysed in this study. This data can be found at: <https://cedel2.learnercorpora.com>. <https://corefl.learnercorpora.com/>.

CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

Teresa Quesada: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Cristóbal Lozano:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

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Data availability

In the manuscript I have shared the link to my data.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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