Adverb placement in L1 and L2 spoken production

The effect of linguistic and extralinguistic factors

Tove Larsson[1], Marcus Callies[2], Tülay Dixon[3], Hilde Hasselgård[4], Nicole Hober[2], Natalia Judith Laso[5], Sanne Van Vuuren[6], Isabel Verdaguer[5], and Magali Paquot[7]
[1] Northern Arizona University | [2] University of Bremen |
[3] Oxford College of Emory University | [4] University of Oslo |
[5] University of Barcelona | [6] Radboud University |
[7] FNRS/Université catholique de Louvain

Most existing research on adverb placement has focused exclusively on writing. This is unfortunate, given that the spoken mode offers limited opportunity for pre-planning and post-editing and may thus more readily reveal patterns of L1 transfer. Further, previous studies rarely consider the impact of the linguistic context surrounding the adverb. This study broadens our understanding of (i) the potential role of L1 transfer, and (ii) the extralinguistic and linguistic factors that influence adverb placement. We look at spoken English produced by students from seven L1 backgrounds: Dutch, English, French, German, Norwegian, Spanish, and Swedish. The results show that the most influential factors in explaining differences in adverb placement were the presence or absence of auxiliaries and the type of adverb. We find only very limited evidence of L1 transfer, suggesting that upper-intermediate to advanced learners have largely mastered the positional preferences of adverbs in English, even in restrictive production contexts.

Keywords: adverb placement, L1 transfer, L1 English, L2 English, spoken production

1. Introduction

While epistemic adverbs (e.g. *probably, actually*) have typically been found to be more frequent in personal than informational registers (Biber et al., 2016; Pérez-Paredes & Bueno-Alastuey, 2019), they are nevertheless important in academic

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contexts, as they enable writers to position themselves in relation to their claims (Biber et al., 2021: 851). Epistemic adverbs typically have scope over the full clause, suggesting that they are used to comment on the content of the whole proposition (e.g. ***clearly,*** *she needs to come to class*; Quirk et al., 1985: 613). Structurally, most epistemic adverbs in English are highly mobile, in that they can occupy any of the five clausal positions: clause-initial, between the subject and verb, between auxiliaries and the main verb, between the main verb and obligatory clause elements, and clause-final (Hasselgård, 2010). For proficient learners of English, the choice among these positions appears to be largely systematic and, in many cases, even fixed (Larsson et al., 2020). This means that misplaced adverbs (e.g. *she needs* ***clearly*** *to come to class*) are likely to be noticed by such learners.

To learn more about what impacts the choice among different adverb positions, previous research has investigated linguistic (e.g. presence or absence of an auxiliary) and extralinguistic factors (e.g. language background). The findings show that both sets of factors can influence English speakers' choice of one position over another, and, thus, that the distribution of adverbs across these positions can be highly systematic (Larsson et al., 2020). As placement patterns differ cross-linguistically, adverb placement is an area where we can expect L1 transfer to occur in learners' production.

Unlike the written mode, which has been the focus of previous studies, the spoken mode offers little or no opportunity for pre-planning and post-editing, which may influence the factors that lead language users to choose one position over another. These production constraints may also increase the likelihood of observing L1 transfer, to the extent that it persists in university-level L2 production. Examining learners' spoken production could therefore offer further insights important for understanding what governs adverb placement — insights that studies of the written mode are unable to provide. Specifically, the present study builds on Larsson et al.'s (2020) investigation of adverb placement in L1 and L2 written data by focusing on spoken data to explore (i) what linguistic factors may have an impact on adverb placement in this mode and (ii) to what extent L1 transfer is present in the learners' production, as outlined below.

2. Adverb placement and adverb use

Syntactically, adverbs can be the head of adverb phrases and can modify various elements, such as other adverbs, adjectives, noun phrases, and prepositional phrases, among others (Biber et al., 2021: 542–548). Semantically, they cover a wide range of meanings that can be divided into seven categories: place adverbs, time adverbs, manner adverbs, degree adverbs, additive or restrictive adverbs,

stance adverbs, and linking adverbs (Biber et al., 2021: 549–556). Such syntactic and semantic diversity often makes it difficult to define what constitutes an adverb, leading linguists to refer to adverbs as a "rag-bag" category (Hasselgård, 2010: 3) or a "catch-all" category (Pullum & Huddleston, 2002: 563).

Previous studies have found that adverb usage can vary according to factors such as proficiency. For example, adverb use has been associated with higher proficiency in an L2 (e.g. Pérez-Paredes & Díez-Bedmar, 2012), which may explain why standardized tests such as the *Test of Written English* consider adverbs in performance ratings (Pérez-Paredes & Sánchez-Tornel, 2014). Many previous studies have also focused on identifying overuse or underuse vis-à-vis a native-speaker reference corpus. Differences across L1 backgrounds have been observed: L1 French learners have been found to make less frequent use of adverbs (Granger & Rayson, 1998), whereas L1 Swedish (Aijmer, 2002) and Norwegian (Hasselgård, 2009, 2015) learners were shown to use them more frequently.

Due to the somewhat elusive nature of the adverb category, and because the function and lexical realization of an adverbial are associated with distributional preferences (Dupont, 2019), we have limited our analysis to epistemic adverbs. These belong to the category referred to as (epistemic) stance adverbials (Biber et al., 2021) or disjunct adverbials (Quirk et al., 1985), which are used to convey the speaker's "observations on the actual content of the utterance and its truth conditions" or the "style and form" of the message (Quirk et al., 1985: 615). This set of adverbs has scope over the entire sentence or utterance (Quirk et al., 1985: 613). Structurally, adverbs in this category tend to be highly mobile (Quirk et al., 1985: 491), but we know from previous research that this rings true for some adverbs more than for others. For example, while *perhaps* can occur in any of these positions (as seen in the examples below), *definitely* has a more limited range, tending to appear almost exclusively in the three clause-medial positions (Larsson et al., 2020: 174). Nonetheless, this structural flexibility, combined with the more subtle inter-lexical distributional preferences of individual adverbs, may pose difficulties for learners.

Additionally, adverb placement may be influenced by both extralinguistic and linguistic factors, specifically linguistic context variables. Larsson et al. (2020) examined the impact of these features on the positional distribution of epistemic adverbs in expert writing (L1 English) and learner writing (L2 speakers of English from six L1 backgrounds: Dutch, German, French, Norwegian, Spanish, and Swedish). With the help of Hasselgård's (2010) framework of adverb placement, based on Quirk et al. (1985), adverbs were classified into five positions relative to other elements in the same clause, broadly identified as follows: clause-initial position, three medial positions (before, inside, and after the verb phrase), and end position (Hasselgård, 2010). These positions are also used in the present study

and illustrated in Examples (1)–(5). The first two letters of the corpus reference (in brackets) indicate the L1 background, and the subsequent number identifies a given text from that subcorpus (see also Section 3.2.1).

(1) *Initial:* **perhaps** I would like to be a teacher (FR044)

(2) *Medial 1:* it would be nice to **perhaps** have a go at something like that later (BR0011)

(3) *Medial 2:* I could **perhaps** talk about a country I have visited (NO003)

(4) *Medial 3:* there you see **perhaps** the British life as it is in real life (SP003)

(5) *End:* It's a bit boring **perhaps** (GE009)

Larsson et al.'s (2020) findings emphasized the importance of taking more specific, localized linguistic features into consideration when examining what affects adverb placement in written data. Eight linguistic features were investigated, with the most prominent predictors explaining differences among adverb positions as follows, in decreasing order of importance: (i) the adverb (e.g. *possibly* vs. *clearly*), (ii) presence or absence of auxiliaries, (iii) subject type (e.g. pronoun, clause), (iv) verb valency pattern (e.g. transitive, ditransitive), (v) L1, and (vi) clause type (main vs. subordinate clause). All in all, the predictive power of these linguistic features was found to be much higher than that of factors such as native-speaker status (L1 vs. L2 English). Whether these patterns would also hold true for L2 spoken production remains unclear.

Finally, negative L1 transfer resulting from typological differences between a learner's L1 and English may affect L2 learners' intuitions regarding adverb placement (e.g. Chan, 2004; Karpava, 2017; White, 1991). One oft-discussed typological difference is the phenomenon known as 'verb raising'. Verb raising refers to the obligatory placement of an adverb between a verb and its direct object and is a syntactic feature of Romance languages such as French and Spanish. This makes the verb-adverb-object pattern a possible source of L1 transfer for speakers of these languages. White (1991) observed instances of verb raising (S-V-Adv-O) in the written production of lower-intermediate L1 French learners and attributed this to L1 transfer. Osborne (2008) identified marked (i.e. unexpected given the context) adverbial placement preferences in L2 argumentative writing that seemed to result from usage patterns in the learners' L1 (i.e. L1 transfer). Example (6) illustrates verb raising in French, followed by an (ungrammatical) English translation (Larsson et al., 2020: 159):

(6) Les employés ont **évidemment** le droit de partir plus tôt que prévu.
(*"Employees have **obviously** the right to leave earlier than expected".)

However, more recent studies on writing have failed to detect clear evidence of L1 transfer in upper-intermediate to advanced L2 production for this type of adverb. For example, van Vuuren (2017) investigated L1 Dutch learners' use of the clause-initial position and found that, contrary to what their L1 would predict, these learners made less frequent use of this position than both their native-speaker peers and expert writers. Furthermore, Larsson et al. (2020) observed only a handful of marked instances in learner production that may have resulted from transfer. The production circumstances of formal writing provide ample opportunity for pre-planning and post-editing of the text. By contrast, the spoken mode offers no or very limited opportunities of this sort. It is thus not unreasonable to expect that effects of L1 transfer, to the extent that they persist in university-level L2 production, would be more prevalent in spoken data.

Against this background, the present study investigates the extent to which the findings from studies on adverb placement in non-native speaker writing extend to spoken production. Specifically, we examine the effects of extralinguistic features (L1 background, native-speaker status) and linguistic features (e.g. verb type, presence or absence of auxiliary) on the positional distribution of epistemic adverbs in spoken L1 English data from the *Louvain Corpus of Native English Conversation* (LOCNEC) (De Cock, 2004) and in L2 data from six L1 backgrounds (Dutch, French, German, Norwegian, Spanish, and Swedish) from the *Louvain International Database of Spoken English Interlanguage* (LINDSEI) (Gilquin et al., 2010), mirroring the design of Larsson et al. (2020). We examine 15 epistemic adverbs — *maybe, perhaps, probably, surely, clearly, actually, apparently, definitely, certainly, evidently, obviously, possibly, really, simply*, and *of course* (see Granath, 2002; based on Jacobson, 1975) — to address the following research questions:

- What extralinguistic (e.g. L1 background) and linguistic (e.g. verb type, presence or absence of auxiliary) factors predict the positional distribution of the adverbs investigated in the spoken production of L2 learners and L1 English speakers?
- What evidence (if any) of L1 transfer is found in the spoken language production of upper-intermediate to advanced learners of English?

While most previous studies have focused exclusively on written production, we may formulate the following predictions for our spoken data based on prior findings. It is reasonable to expect that both extralinguistic and linguistic factors will play a role. Specifically, we expect that (i) distributional preferences will differ across L1 backgrounds, and (ii) adverb placement will be affected by the linguistic context in which the adverb is used. Furthermore, given the production constraints of spoken discourse, we predict (iii) that the chances of L1 transfer are

higher in speech than in writing and, consequently, that (iv) we will see more evidence of L1 transfer in our spoken data, if distributional preferences are indeed affected by learners' L1.

3. Corpora and method

In this section, the corpora we used for the analysis are introduced in Section 3.1. The methods employed are subsequently outlined in Section 3.2.

3.1 Corpora

The spoken data came from the LINDSEI (Gilquin et al., 2010) and LOCNEC (De Cock, 2004) corpora, which consist of transcribed spoken L2 and L1 English data, respectively, from three tasks: set-topic discussion, free discussion, and picture description.

As outlined in Gilquin et al. (2010: 8), the set-topic discussion had the following setup: Learners were presented with a list of three topics. After choosing one, they were given a few minutes to think about it, but they were not allowed to take notes. The topic was then discussed for three to five minutes. The three topics were: "an experience you have had which has taught you an important lesson", "a country you have visited which has impressed you", and "a film or play you have seen which you thought was particularly good or bad". For the free discussion, the interviewer asked the learner questions on various subjects such as university life, hobbies, and travels. In the final task, picture description, the learners were asked to look at four pictures and describe the story they told.

Each L1 subcorpus contained data from 50 university students. Only the students' turns were included in our study (i.e. we excluded the interviewers' turns), as most interviewers were L1 English speakers. This decision did, however, limit the opportunity to study potential effects of the interviewers' wording on the learners' responses. In total, we had data from 350 learners, amounting to 574,208 words. An overview of the corpus files can be found in Table 1.

Table 1. Overview of the corpora used in this study

L1	Files	Words	Median	IQR
English	50	120,202	2298.5	687.8
Dutch	50	75,061	1499.5	688.5
German	50	81,707	1630.0	506.8
French	50	83,285	1571.5	660.0
Norwegian	50	83,724	1610.0	410.5
Spanish	50	62,522	1136.0	1053.0
Swedish	50	68,441	1329.5	551.3
Total	**350**	**574,942**	**1642.7**	**582.9**

Note. IQR = Interquartile range.

3.2 Method

We present the coding procedure in Section 3.2.1. Section 3.2.2 outlines the framework used to look at possible L1 transfer.

3.2.1 *Coding for adverb position and linguistic features*

All the coding for the present project was carried out manually. Following Larsson et al. (2020), we used Hasselgård's (2010) framework of adverb placement, in which adverbs are classified into five categories based on their position in the clause: clause-initial (I), clause-medial 1 (M1), clause-medial 2 (M2), clause-medial 3 (M3), or end position (E). These positions are illustrated in Examples (7)–(12) below. The I position (7) represents the slot "before the subject, or before the verb in cases of S–V inversion or subject ellipsis" (Hasselgård, 2010: 42). In subordinate or coordinated clauses, as in (8), this refers to the position following the conjunction (Quirk et al., 1985: 491). The M1 position (9) is used for adverbs placed "between the subject and any part of the verb phrase"; M2 (10) is the position "after the (first) auxiliary, but before the main verb"; and M3 (11) is "the position between the verb phrase and some other obligatory element, viz. an object, a predicative, or an obligatory adverbial" (Hasselgård, 2010: 42). The E position (12) is used for cases where the adverb comes after any obligatory elements in the clause (Quirk et al., 1985: 498; Hasselgård, 2010: 42). Adverbs not occurring in a clause structure (e.g. response markers) were excluded from the material.

(7) and. **apparently** the painter has (em). altered the th= painting very much (DU028)

(8) if I . had qualified nursing I'd either gone into . teaching nursing a degree or **possibly** come back to hospice work at a higher level where you make the decisions (BR0010)

(9) (eh) she **obviously** (eh) . doesn't think it's good enough .. and (eh) (NO008)

(10) he has **actually** made the picture and I don't know (SW037)

(11) I think it's. it's it's **certainly** the best situation for first years I think er but (SW049)

(12) and if you're unlucky if you're not very smart in school . (em) you don't stand a chance **really**. (SW013)

Our initial tests for inter-rater reliability in the coding of adverb position showed that we were at the upper end of Landis and Koch's (1977) scale (Cohen's Kappa: 0.79, $z=74.7$), indicating substantial agreement. We therefore proceeded to double-code all tokens. Discrepancies were resolved by the first author in collaboration with the fourth author. Larsson et al. (2020) provide a detailed discussion of the coding process.

The third and fifth authors coded for linguistic features in collaboration with the first author. An overview of the categories is presented in Table 2, along with a coded Example (13) of *actually* in M2 position. The coding scheme is freely available (see Larsson et al. 2024 for the URL), and a methods report detailing the steps in the coding process is provided in Hober et al. (2023). Based on 500 independently coded tokens, the coders achieved Cohen's Kappa scores ranging from .78 for clause type to .97 for lexical verbs, indicating "almost perfect agreement" (Landis & Koch, 1977; see also Larsson, Paquot, & Plonsky, 2020) for all categories except clause type, which fell slightly below the .81 cut-off. To maximise reliability, the coding team met weekly to discuss tokens with disagreements and reach a consensus, resulting in a double-coded dataset. These meetings were supported by a Python script (available in Hober et al., 2023) written by the third author, which highlighted differences between the coders' datasets and enabled easy identification of inconsistencies for discussion. Throughout the process, the coding scheme was updated continuously to account for all tokens found in the data, and the coders revisited and recoded earlier annotations as needed.

(13) she: **actually** didn't see . the painting . (erm) . until it was finished . (GE046)
Clause type: Main
Subject type: Pronoun
Subject length: 1
Number of auxiliaries: 1
Negation: Yes
Lexical verb: SEE
Verb type: Monotransitive
Direct object type: Noun phrase
Direct object length: 2

Table 2. Overview of the linguistic features

Linguistic feature	Variable value
clause type	main or subordinate
subject type	pronoun, noun phrase, clause, zero/omitted
object type	pronoun, noun phrase, clause, zero/omitted
subject length	number of words in the subject
object length	number of words in the object
number of auxiliaries	number of auxiliaries used with the main verb
negation	absence or presence of *not* negation
verb type	intransitive, monotransitive, ditransitive, complex transitive, copular/linking
lexical verb	The infinitive form of the main verb of the clause

3.2.2 *A framework for the study of L1 transfer*

At a general level, we used Granger's (2015) updated version of the Contrastive Interlanguage Analysis model, where we compared two sets of language varieties: interlanguage (IL) varieties and a reference language (RL) variety. The six learner subcorpora made up our IL varieties and the L1 English subcorpus served as our RL. To systematically study L1 transfer, we employed Paquot's (2007) adaptation of Jarvis' (2000) unified framework. We carried out three types of comparisons: intra-IL-group, inter-IL-group, and IL vs. L1 (Jarvis, 2000; Paquot, 2007: 413). Put simply, this framework enabled us to identify features of learner language that differ in use between IL varieties and native speakers and may, thus, potentially result from L1 transfer. We drew this conclusion if the features were (i) recurrent in the IL of group A, (ii) absent from the ILs of other language groups, and (iii) used in group A's L1.

As mentioned above, we included learners of English from six L1 backgrounds: Dutch, French, German, Norwegian, Spanish, and Swedish. There are certain typological differences between these languages and English that may lead to L1 transfer and are therefore helpful for our interpretation of the results.

A clear difference between English and the six other L1s is that the SVAO pattern (i.e. where the adverb is in the M3 position in clauses with a direct object rather than a complement) is permitted in these L1s, even when the direct object is not clausal. An example from Swedish is provided in (14), along with the (ungrammatical) English translation.

(14) Studenten tog **faktiskt** boken.
(*"The student took **actually** the book")

Previous studies have found that "[l]earners whose L1 has obligatory verb-raising — Spanish, Italian and French — show the strongest tendency to use V-Adv-O order" (Osborne, 2008: 127), which suggests that we may be especially likely to find this pattern in L1 Spanish and French learners' spoken English production. However, it may still occur in the production of any of the L1 groups.

A difference between English and the other Germanic languages (Norwegian, Swedish, German, and Dutch) is that the latter are verb-second languages (e.g. König & Gast, 2007: 170). This means that clause-initial adverbials trigger inversion of the subject and finite verb, thereby eliminating the M1 position between the subject and the (finite) verb. We may therefore expect L1 speakers of these languages to make less frequent use of this position.

Third, while German — with its rich overt case-marking system — allows comparatively flexible word order (Hawkins, 1986: 40), the E position is considered marked, especially in writing (Zifonun et al., 1997). We may therefore expect to see lower frequencies of this position in L1 German learners' production. However, the fact that we are looking at spoken production may ameliorate any potential effect of L1 transfer for this position.

Fourth, the M2 position is dispreferred in Spanish, as illustrated in (15) (Larsson et al., 2020), which may result in lower frequencies for this position in the English production of the L1 Spanish learners.

(15) (Ella) puede haber **posiblemente** tenido muchos problemas.
("She may have **possibly** had many problems").

Finally, there are two sets of lexico-grammatical constraints. In French, the adverbs *absolument* ("definitely") and *apparemment* ("apparently") are not likely to appear between the subject and the verb (in M1 or M2 position). In Swedish and Norwegian, the adverbs equivalent to *possibly* and *probably* are less marked in the I position than they are in English, which has been shown to result in learners transferring this pattern into their production in English (Larsson, 2017).

Possible candidates for L1 transfer, based on the typological differences identified, are summarized in Table 3. The candidates mark contexts in which rules from the learners' L1 may be transferred into their English production.

Table 3. Overview of possible candidates for L1 transfer based on typological differences

Transfer type	Subtype	DU	FR	GE	NO	SP	SW
Grammatical	More frequent use of M3 before DO	?	?	?	?	?	?
	Less frequent use of M1	?		?	?		?
	Less frequent use of M2					?	
	Less frequent use of E			?			
Lexico-grammatical	Less frequent use of *definitely, apparently* in M1 and M2		?				
	More frequent use of *possibly, probably* in I				?		?

4. Results and discussion

In this section, we begin by providing an overview of the results of the first research question — namely, the impact of extralinguistic and linguistic factors on positional distribution (Section 4.1). Section 4.2 presents the findings related to our second research question, which examines L1 transfer.

4.1 The impact of extralinguistic and linguistic variables

In total, there were 4,002 valid tokens. As shown in Table 4, while the frequencies are relatively evenly distributed across the different clause positions overall, the M1 position shows slightly higher frequencies compared to the other positions. Percentages for each group are provided in Appendix A. The L1 Swedish group stands out for its comparatively more frequent use of the E position (as also observed in Castello, 2023). We also note that the L1 French and L1 Spanish groups contributed fewer tokens overall, which may indicate that these learners have somewhat lower proficiency, in line with the ratings in the LINDSEI manual (Gilquin et al., 2010: 11; see also Pérez-Paredes & Díez-Bedmar, 2012). In addition, L1 Spanish learners rely more on the I position than learners from other L1 backgrounds: the I position accounts for 41.6 percent of tokens in the L1 Spanish data, compared to 16–28 percent for the other groups. This preference appears to be driven primarily by a higher frequency of guesses beginning with *maybe* and, to a lesser degree, *perhaps*, in the L1 Spanish data, as exemplified in (16) and (17).

(16) so **maybe** that's the reason why sh= she's looking at something ugly (SP045)

(17) or **maybe** it's her house or something and her friend go to: look at the portrait (SP041)

Table 4. Overview of valid tokens across positions and L1 backgrounds; raw frequencies and normalized frequencies per 10,000 words

	Dutch Raw freq. (normed)	English Raw freq. (normed)	French Raw freq. (normed)	German Raw freq. (normed)	Norwegian Raw freq. (normed)	Spanish Raw freq. (normed)	Swedish Raw freq. (normed)	Total Raw freq. (normed)
I	118 (15.7)	138 (11.5)	98 (11.7)	147 (18.0)	131 (15.7)	102 (16.3)	131 (19.1)	865 (15.0)
M1	207 (27.6)	231 (26.7)	74 (8.9)	234 (28.6)	147 (17.6)	72 (11.5)	95 (13.9)	1060 (18.4)
M2	127 (16.9)	225 (18.7)	50 (6.0)	128 (15.7)	93 (11.1)	18 (2.9)	112 (16.4)	753 (13.1)
M3	159 (21.2)	114 (9.5)	69 (8.3)	110 (13.5)	60 (7.2)	27 (4.3)	66 (9.6)	605 (10.5)
E	136 (18.1)	172 (14.3)	58 (7.0)	72 (8.8)	104 (12.4)	26 (4.2)	151 (22.1)	719 (12.5)
Total	**747 (99.5)**	**880 (73.2)**	**349 (41.9)**	**691 (84.6)**	**535 (63.9)**	**245 (39.2)**	**555 (81.1)**	**4002 (69.6)**

With this overview in place, we now turn to the results of our first research question, namely — which factors help predict the positional distribution of the adverbs investigated in the spoken production of L1 and L2 students? To address this question, we used R (R Core Team, 2023) to run a Random Forest model using the *party* package (version 1.3–3; Strobl et al., 2008). The analysis was based on 4,000 trees (i.e. *ntree* was set to 4,000) and we allowed for three variables at each split (i.e. *mtry* was set to 3, corresponding to the square root of the number of predictors; see Levshina, 2015: 297). A Random Forest enables us to determine which factors best predict adverb placement by providing an overview of their relative importance (e.g. Gries, 2020). The technique aggregates predictions from multiple conditional inference trees (4,000, in our case) to identify the predictors most frequently selected across trees.

Following Larsson et al. (2020), the numeric variables (AUXILIARY, SUBJECT LENGTH, and OBJECT LENGTH) were converted to binary yes-no variables due to data sparsity. In addition, we excluded the following highly infrequent adverbs after a round of manual data exploration: *clearly* (2 tokens), *surely* (4 tokens), *simply* (8 tokens), and *possibly* (11 tokens), leaving a total of 3,977 tokens in the model. As only a small proportion of tokens featured a direct object, we created an interaction variable between OBJECT: YES/NO and OBJECT TYPE, instead of including them as two separate variables (see Gries, 2020).

A predictor matrix was computed to assess the classification accuracy of the Random Forest (Levshina, 2015: 299). The overall prediction accuracy was 67%,

with the M2 position achieving the highest accuracy (96%), followed by I (75%), M1 (70%), and M3 (67%). The E position had the lowest accuracy (24%), which, while low, still exceeds what could be expected by chance alone (20%) or baseline frequencies. While the predictor variables included yielded an acceptable overall classification accuracy for positional distributions, future studies may wish to investigate the factors influencing the choice of the end position in greater detail.[1] The dot chart in Figure 1 displays the variable importance for each predictor included.

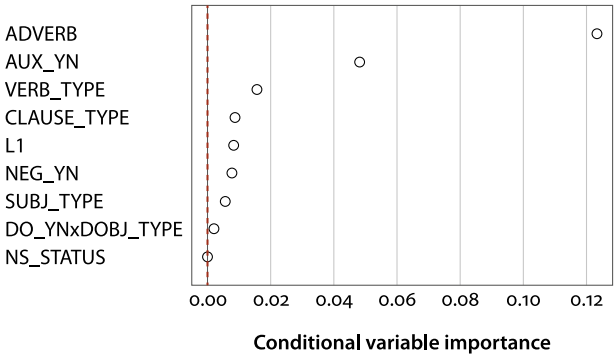


Figure 1. Predictor variables ranked in decreasing order of importance for the classification

The predictors are ranked in decreasing order of importance for the prediction of one of the five adverb positions. In more technical terms, 'conditional variable importance' is a measure of the expected decrease in classification accuracy if a predictor were removed. The results show that the three most influential predictors are ADVERB, PRESENCE/ABSENCE OF AUXILIARY,[2] and VERB TYPE. These are followed by CLAUSE TYPE, L1 (our first extralinguistic variable), NEGATION, SUBJECT TYPE, the interaction between DIRECT OBJECT and DIRECT OBJECT TYPE, and, finally, NS (native-speaker) STATUS (our second extralinguistic variable). Thus, as was also the case for the written data in Larsson et al.'s (2020) study,

1. As many of our predictor variables are tied to the subject and verb phrase, it is perhaps not too surprising that these seem less helpful in predicting the position that is furthest away from these positions: the E position.

2. It should be noted that presence of auxiliaries is a prerequisite for the M2 position. However, as we will see later in this section, our results show that adverbs are very unlikely to occur in the M3 position when an auxiliary is present; that is, presence of auxiliaries seems to "pull" the adverb to the M2 position when it is located inside the verb phrase.

the linguistic variables are much more influential predictors of adverb placement than the extralinguistic variables.

While a Random Forest can provide an overview of which variables are most influential in predicting adverb placement, it cannot provide any information about *how* these variables are associated with different adverb positions. We will therefore add a descriptive account to complement this overall picture. As NS status was not found to have any predictive power,[3] we will present the results from all L1 groups combined. We will focus specifically on the variables with the highest conditional variable importance: adverb, presence or absence of auxiliary, and verb type.

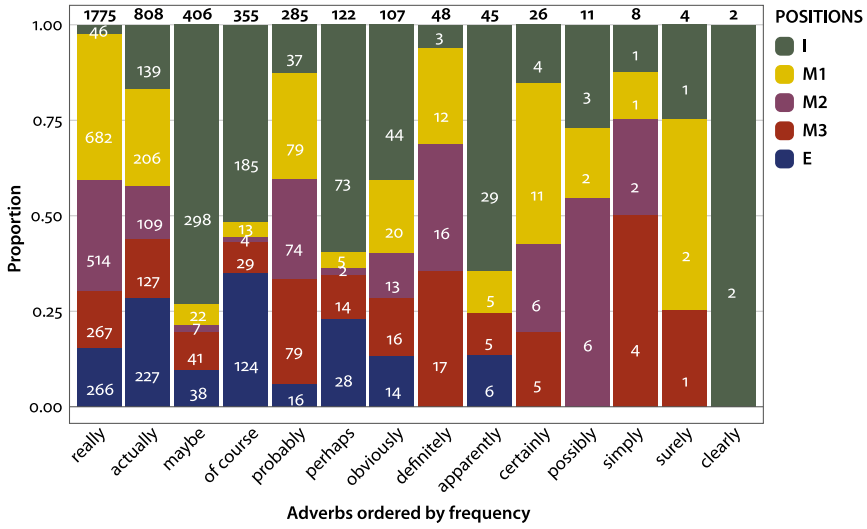


Figure 2. Distribution of adverbs across the clausal positions

Figure 2 is a stacked bar plot illustrating the distribution of adverbs across the clausal positions.[4] Raw frequencies are displayed inside the bars, with the total count shown above each bar. The most common adverbs are *really, actually*, and

3. To make sure that the lack of predictive power of the NS status variable (L1 English vs. all other L1s) was not due to the inclusion of the L1 variable (with all L1s as individual levels) in the model, we ran a Random Forest model excluding the L1 variable. However, NS status still showed no predictive power. We therefore retained both variables in the model.

4. The four least frequent adverbs (*possibly, simply, surely,* and *clearly*) were not included in the Random Forest model, as noted above. We nonetheless include them here to give readers an overview of their distribution.

maybe, with 1775, 808, and 406 occurrences, respectively. This is confirmed by the mean frequency per student, shown in Table 5.

Table 5. Overview of the distribution of adverbs across students ($n = 350$), normalized per 1,000 words

Adverb	Min; max	Median	Q1; Q3	Mean	SD
really	0.00; 13.88	2.37	0.94; 4.60	2.95	2.55
actually	0.00; 9.90	0.68	0.00; 2.10	1.31	1.77
maybe	0.00; 5.99	0.45	0.00; 1.07	0.73	1.02
of course	0.00; 7.41	0.00	0.00; 1.01	0.63	1.04
probably	0.00; 4.99	0.00	0.00; 0.72	0.48	0.84
perhaps	0.00; 3.90	0.00	0.00; 0.00	0.23	0.61
obviously	0.00; 4.98	0.00	0.00; 0.00	0.14	0.44
definitely	0.00; 2.35	0.00	0.00; 0.00	0.08	0.27
apparently	0.00; 1.27	0.00	0.00; 0.07	0.07	0.23
certainly	0.00; 1.40	0.00	0.00; 0.03	0.03	0.15
simply	0.00; 2.19	0.00	0.00; 0.00	0.01	0.15
possibly	0.00; 0.87	0.00	0.00; 0.00	0.01	0.08
surely	0.00; 1.28	0.00	0.00; 0.00	0.01	0.07
clearly	0.00; 0.06	0.00	0.00; 0.00	0.00	0.03

The adverbs with the highest mean frequencies were *really, actually, maybe, of course*, and *probably*. The least widely used adverbs were *clearly, surely, possibly, simply*, and *certainly*.

As discussed in Larsson et al. (2020), there are both differences and similarities between written and spoken production. In the written data from that study, *actually, simply, probably, clearly*, and *perhaps* were the most common adverbs, while the least frequent were *apparently, maybe, definitely, possibly,* and *certainly*. Based solely on frequencies in these corpora, *maybe* emerges as a strong candidate for an adverb strongly associated with spoken discourse, given its high frequency in the spoken data, but not in the written data — a pattern also noted by Biber et al. (2021: 862). By the same logic, *clearly* and *simply* are similarly associated with (student) academic writing rather than speech.

Regarding the positional distribution of adverbs, Figure 2 reveals considerable variation among the adverbs investigated in terms of their preferred position(s), despite belonging to a single functional category. For example, *maybe* and *apparently* show a clear preference for the I position, whereas *really* and *definitely*

show a clear *dis*preference for this position. Several adverbs also have zero occurrences in the E position.

Really, our most frequently occurring adverb, is an interesting case, as it is found with comparatively high frequencies in all five positions. However, a closer examination of clause-initial instances of *really* in the L2 data shows that many of them are somewhat dissonant, as in Examples (18)–(20).

(18) **really** she looks better than in the first: picture (SP032)

(19) but within three well three main religions and **really** the fanatics are th= there from all the religions (SW003)

(20) maybe if I try very hard I can […] meet people but **really** you just go to a party and meet people from everywhere (FR007)

The two most frequent positions for *really* are M1 and M2, which together account for 67% of all occurrences of *really*. These are illustrated in Examples (21) and (22).

(21) that **really** (erm) . got me thinking about you know who am I: who are they (SW037)

(22) they didn't **really** agree but they couldn't show that. (DU016)

While several of the adverbs examined, like *really*, appeared to exhibit a dispreference for one or more positions, others were more flexible, occurring frequently in all positions. For example, *actually*, the second most frequent adverb, showed a roughly even distribution across positions, as in Examples (23)–(27).

(23) I: yeah (em) **actually** it was kind of a fluke. (NO030)

(24) M1: the painting in the second picture is is relatively close to what she **actually** looks like in the first picture (BR0025)

(25) M2: I'm **actually** thinking about getting a master's . degree (NO016)

(26) M3: there was **actually** no need to worry about (GE010)

(27) E: he had an older sister and an older brother so much of it was pretty easy **actually** (GE014)

Another pattern that stands out in Figure 2 is the preference for the I position among *maybe, of course, perhaps*, and *apparently*, accounting for more than 50% of their occurrences. Examples of their use can be found in (28)–(31).

(28) well there's a: obviously an artist erm .. **maybe** he's amateur **maybe** he's professional (BR0006)

(29) **of course** there are. some people who are like that. but (erm) you can find them here as well. (GE012)

(30) **perhaps** . this woman is very rich and . she likes to show off with her friends .. (SP009)

(31) there are lots of sheep which is quite sweet and <starts laughing> (er) <stops laughing> **apparently** there are more sheep than .. (er) people in Wales (GE009)

There seem to be two main differences with regard to variation in adverb position across modes: unlike in the written data, several adverbs occur with relatively high frequency in the E position in our spoken data, whereas clause-medial positions are more common in written data than in our spoken data (see also Larsson et al., 2020).

When it comes to the variable with the second highest importance — presence or absence of an auxiliary — we observe the same pattern reported in Larsson et al. (2020: 175–176) for the written data: when an auxiliary is present, we would expect to find the adverb in the M2 position rather than in any other clause-medial slot. The M3 position is especially infrequent under these conditions (39 out of 605 instances), and most of these instances can be considered marked, as in (32) and (33). Compared to the written data, the spoken data contain a higher proportion of tokens with an auxiliary in the M3 position (6.4%, compared to 2.9%; 29/1004), indicating that the production constraints of the spoken medium may make it more conducive to learner errors and/or L1 transfer in adverb placement. We will return to this question in the next section.

(32) yeah ob= (em) I'll be **probably** too old for them to to worry about things like <overlap /> that (GE010)

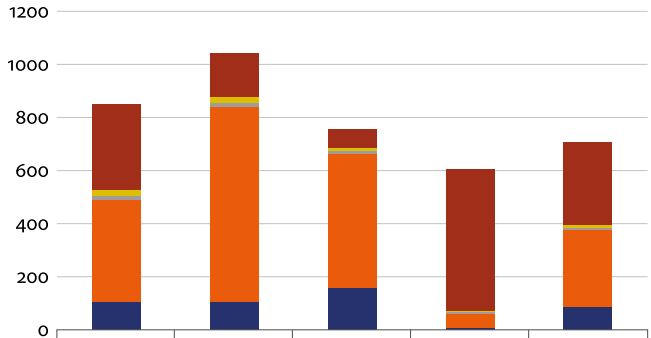
(33) it will be **really** an adventure (DU024)

By contrast, adverbs in the I and E positions are not affected by the presence or absence of an auxiliary in the verb phrase. Examples (34) and (35) show instances with an auxiliary that are unmarked despite the adverb appearing outside the M2 position.

(34) but. no I wouldn't compare it to normal war **really** no (NO033)

(35) and (er) . **perhaps** it will begin again (FR030)

Finally, with regard to the third most important variable — verb phrase — certain apparent trends are worth mentioning, as shown in Figure 3.



	I	M1	M2	M3	E
Linking	324	162	68	531	308
Compl transitive	19	27	11	3	10
Ditransitive	12	12	6	5	8
Transitive	383	719	506	56	291
Intransitive	110	120	161	9	89

Figure 3. Positional distribution of the verb valency patterns[5]

We can see that linking verbs (e.g. BE, SEEM), while not uncommon in other positions, are most strongly associated with the M3 position, as exemplified in (36). We also observe a relatively strong association between transitive verbs and the two other clause-medial positions, as shown in Examples (37) and (38).

(36) I think this woman thought we were **actually** American (BR0047)

(37) no I think it's f= more of a: a work attitude they **probably** work harder (BR0023)

(38) the[i:] only way I can ever actually eat again ever . is if I do **actually** sing (BR0037)

So far, the results from the spoken data largely align with the written data reported by Larsson et al. (2020). We will now turn to our investigation of possible L1 transfer to examine the extent to which any traces of negative transfer persist in these learners' spoken production.

5. The instances of M3 with intransitive verbs occur in cases where the verb phrase is followed by an obligatory adverbial (e.g. *it worked **actually** very good*; GE009).

4.2 L1 transfer

Our second research question investigates the extent to which L1 transfer is evident in learners' use of adverbs in their spoken production. As outlined in Section 3.2.2, if L1 transfer occurs, we would expect to find evidence in one or more of the contexts identified in our overview of typological differences. Specifically, we hypothesize that we will find:

i. instances of verb raising in L1 French and Spanish learners' English production,
ii. lower frequencies of adverbs in M1 produced by learners with a Germanic L1,
iii. lower frequencies of adverbs in M2 produced by L1 Spanish learners,
iv. lower frequencies of adverbs in E produced by L1 German learners,
v. lower frequencies of *definitely* and *apparently* in M1 and M2 in L1 French learners' production, and
vi. higher frequencies of *possibly* and *probably* in I by L1 Swedish and Norwegian learners.

We will address these hypotheses in turn.

Evidence of verb raising is expected in the M3 position when a direct object follows the adverb (SVAO). However, not all instances of this clause structure indicate L1 transfer. For example, clausal objects can be preceded by an adverb in M3 without being marked, as shown in (39). In fact, of the 64 potential candidates, only 12 instances could be considered marked, seven of which came from L1 French or Spanish learners, as exemplified in (40) and (41). This suggests that L1 transfer in this grammatical context is relatively rare.

(39) and . you don't know **actually** what to es= . expect (DU040)

(40) they have already started **of course** their: dissertations (FR042)

(41) and there you see **perhaps** the British life as it is . in real life (SP003)

Similarly, with respect to the hypothesis that learners with a Germanic L1 would be less likely to use the M1 position, we find no evidence of L1 transfer. In fact, learners with a Romance L1 used this position less frequently than their L1 Germanic peers overall. Figure 4 shows the mean frequency of M1 use per 1,000 words per student across L1 groups. The boxes represent the interquartile range (25th to 75th percentiles), with the solid horizontal lines indicating the median values. The whiskers extend to the minimum and maximum values, excluding statistical outliers which are shown as larger black dots above the whiskers. Smaller black dots indicate individual data points, while black diamonds mark the mean values with exact figures printed above them.

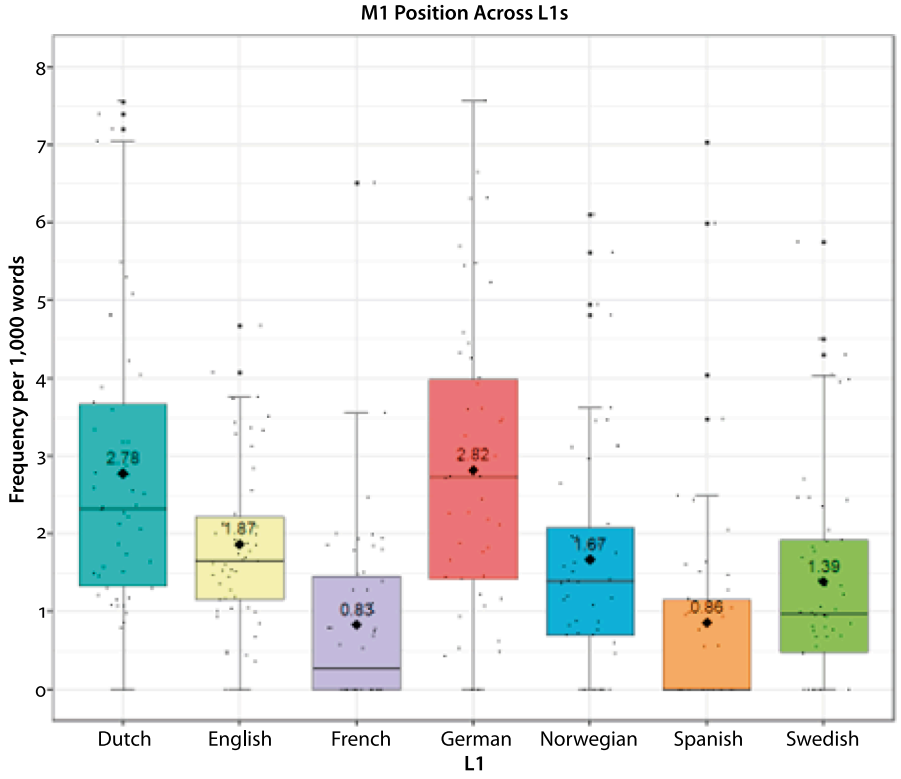


Figure 4. Distribution of frequencies of the M1 position per 1,000 words per student across L1 groups

By contrast, there may be some support for the hypothesis that L1 Spanish learners avoid the M2 position in English, as this position is not permitted in Spanish, for example: **(Ella) puede haber **posiblemente** tenido muchos problemas / "She may have **possibly** had a lot of problems"*. As shown in Figure 5, the M2 position was used least frequently by Spanish speakers (median = 0). However, we found no clear evidence supporting the hypothesis that L1 German learners disprefer the E position, as shown in Figure 6.

Our results for the lexico-grammatical hypotheses are somewhat inconclusive. Regarding the hypothesis that French L1 learners' production would include lower frequencies of *definitely* and *apparently* in M1 and M2, we found no instances of these adverbs in the M2 position in the L1 French data and only a single instance of *apparently* in the M1 position. However, these two adverbs were very infrequent overall (48 and 45 instances, respectively), so we do not have sufficient support for this hypothesis. Similarly, due to lack of data, we cannot draw conclusions about *possibly* (11 tokens total) which L1 Swedish and Norwegian learners were predicted

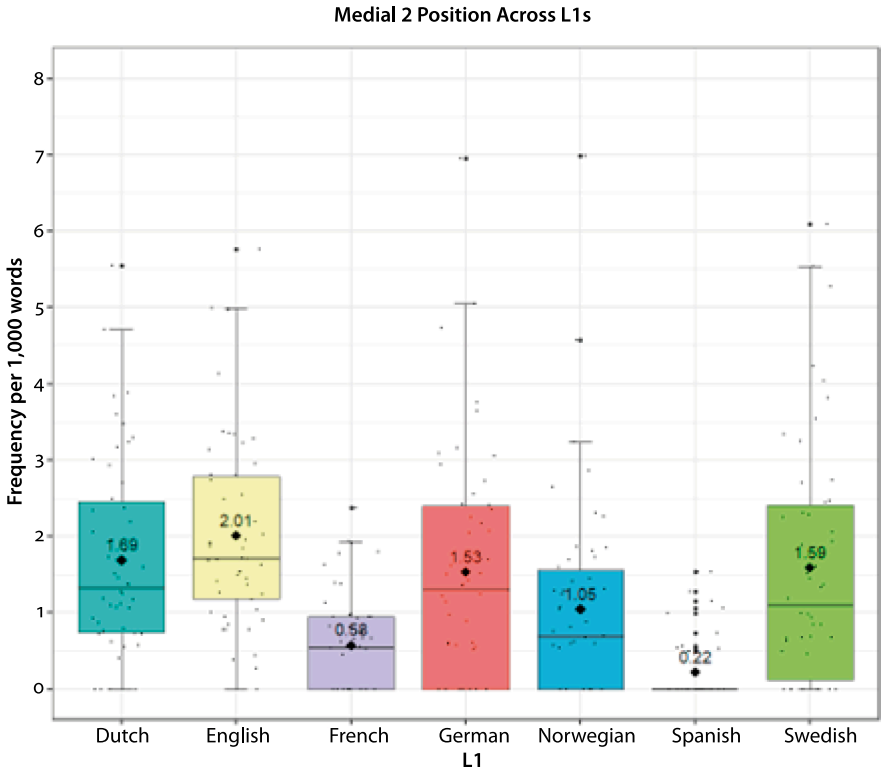


Figure 5. Distribution of frequencies of the M2 position per 1,000 words per student across L1 groups

to use more frequently in the I position. While we have more data for *probably* (285 tokens total), we found only six instances of the I position in the L1 Swedish and Norwegian data, compared to five instances in the L1 English data, suggesting there is not enough evidence to hypothesize that L1 transfer is at play here, either.

Thus, with the possible exception of the M2 position for L1 Spanish learners, we found no clear evidence of L1 transfer in our data; consistent with the written data reported by Larsson et al. (2020), despite the constrained production context of spoken data. Proficiency may play a role here, as the subsample of LINDSEI coded for proficiency indicated that the L1 Spanish learners had lower proficiency than the learners with Germanic L1 backgrounds, although not lower than the L1 French learners. The updated table from Section 3.2.2 is shown below (Table 6). Given that the vast majority of the upper-intermediate to advanced learners whose production is included in this study do not appear to have transferred

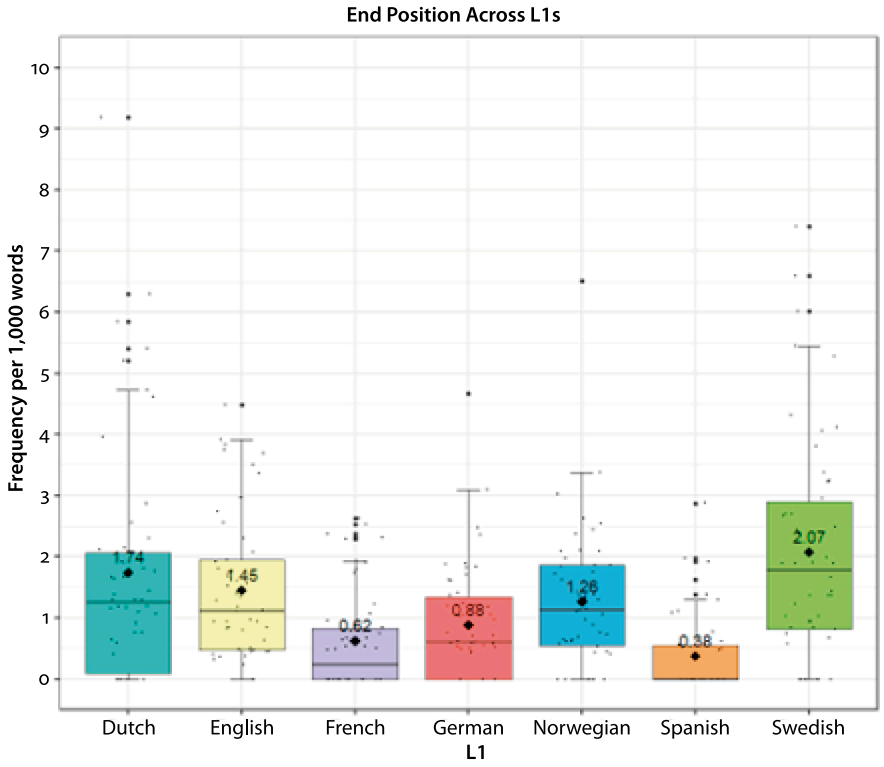


Figure 6. Distribution of frequencies of the E position per 1,000 words per student across L1 groups

Table 6. Possible L1 transfer attested in the data

Transfer type	Subtype	DU	FR	GE	NO	SP	SW
Grammatical	More frequent use of M3 before DO	X	X	X	X	X	X
	Less frequent use of M1	X		X	X		X
	Less frequent use of M2					✓	
	Less frequent use of E			X			
Lexico-grammatical	Less frequent use of *definitely, apparently* in M1 and M2		X				
	More frequent use of *possibly, probably* in I				X		X

grammatical or lexico-grammatical rules from their L1, and that their use closely resembles that of L1 English speakers, it seems reasonable to conclude that they have largely mastered adverb placement. According to usage-based theory (e.g.

Ellis et al., 2016; Tyler et al., 2018), language exposure plays a crucial role in language learning. We may therefore assume that the students in our study have received sufficient input inside and outside the classroom to internalize rules and positional preferences in English, despite potentially conflicting patterns in their own L1. Thus, unlike grammatical features such as the passive voice — which learners have been found to struggle with even at upper-intermediate to advanced levels of proficiency (Gilquin & Granger, 2021) — rules related to adverb placement appear to be a grammatical feature that learners can internalize and apply successfully in both spoken and written production.

5. Conclusion

The present study was motivated by two questions arising from previous research on adverb placement: (i) whether, as in written L2 production, adverb placement patterns in spoken L2 production are best explained by linguistic rather than non-linguistic features, and (ii) whether syntactic transfer is observable in the spoken production of upper-intermediate to advanced L2 learners. The results show that, consistent with Larsson et al.'s (2020) findings for writing, linguistic variables were the strongest predictors, with adverb type (e.g. *clearly, importantly*) and presence or absence of an auxiliary particularly influential. Somewhat surprisingly, NS status had no predictive power in the spoken data either, supporting the claim that the learners whose production is included in this study have largely mastered adverb placement, even in spontaneous production. Despite the more limited opportunities for pre-planning and post-editing in spoken data, we observed only minimal evidence of L1 transfer.

The present study sought to broaden our understanding of how register conventions and production constraints affect adverb placement, while emphasizing the importance of taking linguistic predictors into consideration, especially those related to verb phrase complexity. Fruitful avenues for future studies include investigating the possible impact of proficiency to better understand how lower-proficiency learners' use differs from that of higher-proficiency learners; unfortunately, the corpora used in the present study did not permit such comparisons. Future studies may also wish to explore a wider range of registers (including other kinds of spoken register) and L1 backgrounds from non-Indo-European language families to gain a more comprehensive understanding of the factors influencing adverb placement in L2 production. Moreover, incorporating prosodic information could help clarify the extent to which adverbs in the M positions can be considered parenthetical and thus more acceptable in otherwise marked positions, that is, if there is a prosodic break (equivalent to commas in writing; see

Hasselgård, 2010: 107ff). Finally, it would be interesting to investigate how phraseology (including idioms and chunks) may influence adverb placement.

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Appendix A. Adverb placement

Table A1. Raw frequencies and percentages for the L1 groups across position

	Dutch Raw freq. (percent)	English Raw freq. (percent)	French Raw freq. (percent)	German Raw freq. (percent)	Norwegian Raw freq. (percent)	Spanish Raw freq. (percent)	Swedish Raw freq. (percent)	Total Raw freq. (percent)
I	118 (16)	138 (16)	98 (28)	147 (21)	131 (24)	102 (42)	131 (24)	865 (22)
M1	207 (28)	231 (26)	74 (21)	234 (34)	147 (27)	72 (29)	95 (17)	1060 (26)
M2	127 (17)	225 (26)	50 (14)	128 (19)	93 (17)	18 (7)	112 (20)	753 (19)
M3	159 (21)	114 (13)	69 (20)	110 (16)	60 (11)	27 (11)	66 (12)	605 (15)
E	136 (18)	172 (20)	58 (17)	72 (10)	104 (19)	26 (11)	151 (27)	719 (18)
	747 (100)	**880 (100)**	**349 (100)**	**691 (100)**	**535 (100)**	**245 (100)**	**555 (100)**	**4002 (100)**

Address for correspondence

Tove Larsson
Department of English
Northern Arizona University
Box 6032
Flagstaff, AZ 86001
USA

tove.larsson@nau.edu
https://orcid.org/0000-0002-0489-2697

Co-author information

Marcus Callies
Faculty of Linguistics and Literary Studies
English-Speaking Cultures — English Linguistics
University of Bremen
callies@uni-bremen.de
https://orcid.org/0000-0002-7069-5819

Tülay Dixon
Quantitative Theory and Methods and Linguistics
Oxford College of Emory University
tulay.orucu.dixon@emory.edu
https://orcid.org/0000-0002-4502-2874

Hilde Hasselgård
Department of Literature, Area Studies and European Languages
University of Oslo
hilde.hasselgard@ilos.uio.no
https://orcid.org/0000-0001-7764-0469

Nicole Hober
Faculty of Linguistics and Literary Studies
English-Speaking Cultures — English Linguistics
University of Bremen
hober@uni-bremen.de

Natalia Judith Laso
Faculty of Philology and Communication
Department of Modern Languages and Literatures and of English Studies
University of Barcelona
njlaso@ub.edu

Sanne Van Vuuren
CLS/Dept. of Modern Languages and Cultures
Radboud University Nijmegen
sanne.vanvuuren@ru.nl
https://orcid.org/0000-0001-8491-3402

Isabel Verdaguer
Faculty of Philology and Communication
Department of Modern Languages and Literatures and of English Studies
University of Barcelona
i.verdaguer@ub.edu
https://orcid.org/0000-0002-7093-1527

Magali Paquot
FNRS — Centre for English Corpus Linguistics
Université catholique de Louvain
magali.paquot@uclouvain.be
https://orcid.org/0000-0001-5687-5074

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