Renia Lopez-Ozieblo*

Cut-offs and co-occurring gestures: Similarities between speakers' first and second languages

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Abstract: This paper explores cut-offs in the oral narrations of Spanish native speakers in their mother tongue (L1), and in their language-under-study, English (L2). Fluency in the L2 varies with proficiency, and so cut-offs offer a possible means of evaluating this. However, there are certain aspects of fluency which might be common to the L1 and the L2, suggesting that the L1 and L2 share cognitive factors that lead to similar disfluency patterns. To determine if cut-offs are reliable markers of L2 fluency, independent of those occurring in the L1, we assessed the cut-off patterns in the L1 and L2 narrations of this group of speakers, following a multimodal approach.

We observed similarities in both languages, potentially indicating that speakers use comparable cut-off-gesture patterns in the L1 and L2. We conclude that using speakers' cut-offs in an L2 to gauge proficiency is meaningful only if the L1 cut-off behaviour is known.

Keywords: cut-off, disfluency, gestures, second-language acquisition

1 Introduction

Fluency is a key element in evaluating second language proficiency (Tavakoli 2010) and yet aspects of L2 fluency can be predicted by L1 disfluency patterns (De Jong et al. 2015; Derwing et al. 2009; Fillmore 1979; Rose 2013; Schmidt 1992; Zuniga and Simard 2019). Fluency is defined in a broad sense as

> the ability to talk at length with few pauses; [...] to fill time with talk; [...] to talk in coherent and semantically dense sentences; [...] to have appropriate things to say in a wide range of contexts; and [...] to be creative and imaginative in the language use. (Fillmore 1979: 51)

***Corresponding author: Renia Lopez-Ozieblo,** English, Hong Kong Polytechnic University, Tower A, 4 F, Hung Hom, Kowloon, Hong Kong, E-mail: renia.lopez@polyu.edu.hk
https://orcid.org/0000-0003-1752-9392

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In second language acquisition a narrow sense definition is more common (Riazantseva 2001), and the one used throughout this paper. It specifically refers to the temporal aspect of proficiency, "the ability to talk at length with few pauses" (Fillmore 1979: 51), in particular the rate of speech, pauses and disfluencies (Lennon 1990).

Most studies confirm that fluency in L2 changes with proficiency (Riazantseva 2001; Riggenbach 1991; Tavakoli 2010). However, certain aspects of L2 fluency follow patterns also observed in the L1 (De Jong 2016; De Jong et al. 2015; Derwing et al. 2009; Kosmala and Morgenstern 2017; Rose 2013; Zuniga and Simard 2019). For example, it is the position of the pause, mid clause or at boundaries, rather than its frequency or length that can be best correlated with the development of fluency in L2 speakers (Tavakoli 2010). Observations like these question the validity of fluency as an indicator of proficiency and query whether aspects of fluency in L2 are related to the level of proficiency of the speaker or to L1 patterns (Derwing et al. 2009). We explore this question through a multimodal quantitative analysis of a specific type of disfluency – cut offs – and we focus on the hand gestures that co-occur with them.

A wide body of evidence supports a close link between gesture and speech (Kita 2000; Gullberg 2003; Kendon 2004; Seyfeddinipur 2006; Stam 2018), the two modalities forming one unit (Lopez-Ozieblo & McNeill 2017; McNeill 1992, McNeill 2012, McNeill 2005, McNeill 2015). Evidence of this link has been identified in L1 cut-offs, with co-occurring gestures reflecting speech difficulties. Once the speaker decides to interrupt the communication this is noticeable in both speech and gesture, with the interruption of the gesture slightly preceding that of the speech (Chui 2005; Seyfeddinipur 2006). If the cut-off patterns in L2 speakers are related to the proficiency level in that language then, it is expected that the gestures co-occurring with the cut-offs will also reflect that proficiency level – not matching the patterns of L1 speakers. However, this has not been confirmed, as there are no studies comparing L1-L2 speech by individual focusing on different types of cut-offs.

With this study on cut-offs and their gestures in speakers of Spanish (L1) learning English (L2) – a snapshot of these speakers at a B2 proficiency level (as defined by the Council of Europe 2002) – we seek to provide additional data on cut-offs that might confirm or reject them as valid markers of L2 fluency. Furthermore, we seek to answer the call for more "naturalistic and controlled research" in second language gestures (Stam and Buescher 2018: 805).

2 Disfluency in second-language acquisition

All speakers produce disfluencies – defined by Ferreira and Bailey as "any deviation in speech from ideal delivery" (2004: 231) – such as cut-offs, elongations, fillers, pauses or changes in vocalisation or a combination of these (Clark 1996). The speakers' 'original delivery' is disrupted at the 'suspension point', followed by a 'resumption point' when fluent speech, the 'resumed delivery', restarts. The speech unit in which the speaker detects an error/trouble is the 'reparandum'. The reparandum might be repeated or modified after resumption. In between these two points there could be a pause termed 'hiatus', a pause, which could be filled or not (Clark 1996: 258–259). The repair (or 'replacement') can affect the reparandum or elements before it.

Disfluencies in L2 speakers are commonly believed to be related to their level of proficiency, and so a potential tool to evaluate it (Fincher 2006; Kormos 1999). L2 disfluency studies report that lower proficiency speakers pay more attention to, first, lexical and, second, grammatical errors (Lennon 1984), but as proficiency increases, attention can be diverted onto discourse level issues, supporting the notion of an automatization of lower level processes (Kormos 2000; Van Hest 1996) which become faster. The simplicity of the correlation between disfluencies and proficiency has been criticised, as speakers of a second-language might choose not to correct themselves and avoid a disfluency (Simpson et al. 2013: 159). It is also possible that L2 disfluencies might mirror those in the L1 (Fillmore 1979), as they are the result of similar cognitive processes (Zuniga and Simard 2019), or be a language related characteristic (Riazantseva 2001).

Language related differences are known to affect speech rate in native speakers (Lopez-Ozieblo under review), pause duration (Riazentseva 2001) or frequency of elongations (Lecumberri, Cooke and Wester 2017). However, no differences have been found in the frequency of mid-word cut-offs between Spanish and English L1 speakers (Luisa Garcia et al. 2017). Certain L2 disfluencies, we believe cut-offs to be one of them, might follow L1 disfluency patterns as they are the result of cognitive factors (Segalowicz 2010), "conceptual encoding or extralinguistic factors [...] rather than difficulties with linguistic processing per se" (Williams and Korko 2019: 723). Indeed, a number of studies have confirmed that the strongest predictor of L2 disfluencies and repairs is the behaviour in the L1, such as: self-repair behaviour (Zuniga and Simard 2019); the overall frequency of pauses (Kosmala and Morgenstern 2017), specifically at utterance boundaries (De Jong 2016); frequency and duration of silent pauses (Rose 2013); and the frequency of pruned syllables (as defined by Lennon 1990) (Derwing Munro et al. 2009).

Derwing Munro et al. (2009) suggest that "fluency [in the L1 and L2 of a speaker] is governed by an underlying trait" (p. 533), which can be attributed to cognitive factors (a view supported by De Jong et al. 2015; Zuniga and Simard 2019). They advocate a "trait view" where the "L1 and L2 fluency are closely related" (Derwing et al. 2009: 535) in preference to a "state view" where the "L1 and L2 fluency are relatively independent" (idem). These findings caution against assuming the validity of all L2 disfluency measures as evaluators of proficiency and suggest certain similarities in L1 and L2 fluency that might be interpreted as the output of similar cognitive processes in the two languages.

2.1 Cut-offs

Self-interruptions, or cut-offs, have been studied in L1 and L2 in order to develop a better understanding of speech production (Bergmann et al. 2015; Declerck and Kormos 2012; Clark 1996; Kormos 2000; Levelt 1989). Cut-offs can occur mid-word or after the word has been completed and are usually followed by a short silent pause or by filled pauses that contain a number of editing expressions of various lengths including: 'uh' and 'um'. These two types of cut-off, mid-word and after completed-word, are thought to indicate the readiness of the speaker to produce the repair.

Speech is thought to be pre-planned and cut-offs can give an indication of the extent of this pre-planning and the importance given by L1 and L2 speakers to correction and fluency. In L1 speakers the Main Interruption Rule (MIR) proposed that speakers stop as soon as they need to, which would mean a focus on correction rather than fluency (Levelt 1989) as stopping could occur at any time (Nooteboom 1980). On the other hand, the Delayed Interruption for Planning Hypothesis (DIPH) (Seyfeddinipur 2006; Seyfeddinipur and Kita 2001; Seyfeddinipur et al. 2008) suggested that the cut-off is a controlled action, and so – on detecting the trouble – the stop might be postponed if necessary, to give time for the resumption process (based on the work by Blackmer and Mitton 1991). The DIPH was further confirmed by showing that cut-off to repair times were longer in completed-word cut-offs. There are only short or no pauses after mid-word cut-offs as speakers, on encountering an error and having the repair at hand, can proceed with the repair immediately after the interruption. If the repair is not ready, speakers will rather complete the word, even if wrong, which buys them extra time to produce the repair. Often, additional time is needed and pauses are also produced. Tydgat et al. (2011) added that speakers decide whether or not it is more effective to stop, and if so

where. It has not been confirmed whether these cut-off and pause patterns also occur in the L2.

Studies comparing cut-offs and repairs in L1 and L2 conclude that systems in both languages share repair mechanisms (de Bot 2000; Kormos 2006), although these are not fully automatized in less proficient L2 speakers who are reported to produce more cut-offs with longer pauses than more proficient speakers (Bergmann et al. 2015; Declerck and Kormos 2012; Kormos 2000). Simard et al. (2017) obtained similar results in a longitudinal study of self-repairs, suggesting that as speech production becomes more automatic, attentional resources can be spared to check correction during the pre-planning stage. Disfluency studies focusing on noticeable pauses (usually longer than 250 milliseconds – as shorter pauses are considered articulatory (Goldman-Eisler 1968)) also report changes with proficiency, such as a decrease of pause frequency and length (Lennon 1990; Riggenbach 1991); or just length (Riazantseva 2001); although others indicate that these are dependent on the position of the pause in the utterance (Tavakoli 2010; De Jong 2016). De Jong et al. (2015) conclude that pause duration is only a moderate indicator of fluency in the L2 and they recommend taking into account patterns in the L1 as a baseline.

Most studies (e. g. Graziano and Gullberg 2018; Kormos and Dénes 2004; Kosmala and Morgenstern 2017; Rose 2013; Williams and Korko 2019) usually only count noticeable pauses of 200 milliseconds and above (an exception is Riazantseva 2011) and do not differentiate between mid-word and completed-word cut-offs, which are expected to impact the pattern of the pause (Seyfeddinipur 2006). Studies do not always compare disfluencies from the same speaker in both L1 and L2 (e. g. Graziano and Gullberg 2018; Kosmala and Morgenstern 2017; Temple 2000). It would seem that there is a need for more detailed, same speaker L1-L2, disfluency studies. A better understanding of cut-offs would emerge from studies on different types of disfluencies, and their sub-types, the pauses following them (filled and unfilled), and a combination of these.

3 Gestures

Gestures, for the purposes of this study, are defined as hand and arm movements co-occurring and related to speech. Gestures are "part of the process of speaking" (McNeill 2012: 3), and can be classified according to their form and relationship with speech (Cienki 2015; McNeill 1992, McNeill 2005; Müller 2013). Gestures can refer iconically or metaphorically to the content of the speech, these are 'referential' gestures. If they point to existing or abstract objects or

notions, gestures are further subcategorized as 'deictic'. In addition to representational meanings, all gestures can also have pragmatic functions: meta-discursive (e. g. to indicate changes in the discursive mode); interactional (e. g. to manage the turn); and cognitive (e. g. to indicate an inference). If the form of these pragmatic gestures is somewhat conventionalized and they are observed in different speakers and contexts (Cienki 2017; Ladewig 2013) they are categorized as 'recurrent gestures'. 'Beats', baton like gestures, are mostly prosodic and help keep the rhythm, but could also have an interactional function when stressing salient information. Hand movements that do not require speech to be understood, such as the 'OK' symbol, are labelled 'emblems', and those used to answer a physical need (sneezing, scratching) are termed 'adaptors'.

Gestures phrases refer to the various phases the hand(s) go through to perform the stroke, usually from and to a resting position. This includes a preparation phase, to come into position, a pause before or/and after the stroke (hold), and finally the return to the resting position (Kendon 2004: 110–114; McNeill 2005: 31–33). The gesture can also be suspended, or interrupted, at any time, and restarted or replaced by a new one.

Generally, speakers gesture more in their L2 than their L1 (Gullberg 1998; Kita 1993; Nicoladis, Pika and Marentette 2007; Stam 2006). Gesture in L2 speakers has been shown to help recall speech learned (Cook et al. 2010); but it is used by L2 speakers for much more than just lexical retrieval (Krauss et al. 2000) or to solve difficulties in production (Feyereisen 1987). Gesture, in both L1 and L2, has also been linked to turn management (Duncan 1972; Mortensen and Hazel 2011); to repair (Gullberg 2008); to refer to elements previously mentioned (Gullberg 1999, Gullberg 2003); to specify the manner of the verb (in languages like Spanish where manner is not inherent in the verb, Stam 2006); to downplay unwanted information or stress other elements of the speech (Goldin-Meadow and McNeill 1999); to introduce new referents (So et al. 2010; Yoshioka and Kellerman 2006); to organize spatial information (Kita 2000); to free or aid cognitive resources (Goldin-Meadow 2001; Macedonia and von Kriegstein 2012); or to involve the addressee (De Fornel 1992; McCafferty 2002). Thus, as Akhavan et al. (2016) emphasize, the main function of gesture is not to resolve speech conflicts, as confirmed by their observations that gestures are more likely to occur with fluent rather than disfluent speech in the L1. This has also been observed in L2 speakers (Graziano and Gullberg 2018).

How speakers gesture in the L2 compared to the L1, seems to vary by language, culture and proficiency (Gullberg 2010; Laurent and Nicoladis 2015; So 2010). Studies comparing gestures in languages of different typologies report transfers between languages (Choi and Lantolf 2008; Negueruela et al. 2004; Stam 2006).

3.1 Gestures and disfluency

Most studies that look at disfluency in speech together with gesture centre on the relationship of the gesture to the speech and their synchronicity with it (Chui 2005; Seyfeddinipur 2006; Seyfeddinipur and Kita 2001; Seyfeddinipur Kita and Indefrey 2008). In both L1 and L2 speakers, gestures are more likely to occur with fluent, rather than disfluent, speech and are unlikely to commence during disfluencies (Chui 2005).

In German L1 speakers, Seyfeddinipur and Kita (2001) observed that gesture suspension or interruption, when it occurs, precedes speech suspension or cut-offs, hinting at the disfluency to come. This is considered as support to the Delayed Interruption for Planning Hypothesis, as the speaker knows that they will be disrupting speech and when, thus controlling it. Furthermore, Seyfeddinipur (2006) reported differences in the frequency of gestures and their temporal synchronicity with the cut-off (stopping, starting or continuing) depending on the type of cut-off, mid-word or completed-word, also in German L1 speakers. There were more gestures co-occurring with completed-word cut-offs than with mid-word cut-offs and with the former, gestures were more likely to stop before speech than during it, although in mid-word cut-offs this was not always the case. She concluded that "gesture suspension is closer in time to error detection than speech suspension" (2006: 143). Akhavan et al. (2016), in a gesture-disfluency study of L1 Farsi speakers corroborated Seyfeddinipur's results, reporting gesture interruption to be more likely to precede or coincide with the disfluency.

3.2 Disfluency and gesture in second-language acquisition

Not much research has been done in the combined topic of disfluency and gesture in second-language acquisition. Existing studies complement, rather than confirm each other's results. One of the few studies we are aware of that covers disfluency, gesture and second-language acquisition is by Graziano and Gullberg (2014, 2018). This study compared monolingual Italian and Dutch children and adults and Dutch learners of French. Their gestures were coded for completion versus suspension with the disfluency. Their findings indicate that less than 20% of gestures occur during the disfluency (over 80% take place with fluent speech) across all groups, except for the L2 speakers who perform about 30% of their total gestures during the disfluency. This seems to be mostly due to an increase in gestures used to retrieve lexicon from the addressee. Their work so far supports the close link between gesture and speech and also challenges the lexical retrieval hypothesis of

gestures being of a compensatory nature when speech fails, although in some cases gestures can compensate for speech conflicts. One immediate apparent drawback of the data, is that it compares L1-L2 speech in different individuals and it does not present gesture by type of disfluency, clustering all disfluencies together, and not accounting for different types of repair. If speech and gesture form a unit, interruptions in speech are expected to co-occur with interruptions in gesture (if a gesture had started before the interruption), while elongations might see the continuation of the gesture and fillers could co-occur with a new gesture, mirroring the differences in behaviour of gesture by type of cut-off as reported by Seyfeddinipur (2006).

Kosmala and Morgenstern (2017), in a study of four French speakers learning English, analysed disfluencies (filled and unfilled pauses and elongations) and their co-occurring gestures. Their findings confirmed those of Graziano and Gullberg (2018), indicating that most disfluencies were gesture-less, this includes holds, (in 92% of 114 disfluencies in the L1 and 66% out of 104 in the L2). Kosmala and Morgenstern (2015) further noted that in the L2, half of the gestures observed during the disfluency (19 out of 38) were whole-phrase gestures. This means that these gestures are occurring without speech, probably to illustrate the concept. These are referred to as 'lexical gestures' as it is thought that these referential gestures might prime the lexicon processor, 'lexical search', to produce the word sought (Krauss et al. 2000).

Another relevant study is that of Stam (2012) who described gesture-speech performance in ten adult Spanish (Mexican) speakers, learners of English as an L2 in the USA. Five subjects had an intermediate proficiency level and five advanced.[1] Subjects were asked to retell extracts from the *Canary Row* cartoon (Freleng 1950). Disfluencies and gestures in the L2 were classified by type, and the transcription included the number of lexical gestures, and their output (whether the correct word was found or not).

The results were divided by L2 proficiency level, intermediate and advanced speakers, and indicate that lexical gestures, whether successful or not, are synchronous with speech or a combination of speech and pause (seldom with pause alone). In addition, the study linked the type of gesture performed to the success of the lexical search, showing that the highest percentages of gestures used (during successful and unsuccessful retrieval) were referential (50% in intermediate learners and 82% in advanced learners in the successful case and 77.8% and 88.9% respectively in the unsuccessful case).

1 Although exact equivalencies are difficult to make, an ESOL intermediate level corresponds to a B1 CEFR (Council of Europe 2002) level and advanced to B2, C1 level.

None of these studies were specific to cut-offs, therefore the question remains whether the behaviour of gesture during cut-offs is the same in speakers of an L1 and an L2, and if not, how this could be changing with proficiency in the L2. Most scholars recognize the gesture-speech link (McNeill 2015), believing that interruptions and repairs are reflected in both modalities. If cut-off patterns vary by proficiency then, this should also be observable in gestures. From Kosmala and Morgenstern (2017) and Graziano and Gullberg (2018) it would seem that there are gesture differences between the disfluencies of L1 and L2 intermediate speakers. However, the question remains whether this is also observable in cut-offs. This study offers a snapshot of cut-offs and gestures in a group of L2 English speakers at a B2 (intermediate) proficiency level.

4 Objectives of the study

This study sought to contribute to the discussion on L1 and L2 disfluencies being "closely related" or "independent" (Derwing et al. 2009: 535) by providing additional data from a study on cut-offs, and the gestures co-occurring with them, in the narrations of Spanish native speakers in their L1 and English, their L2. The main objective was to identify whether, in this group of speakers, cut-off behaviour differed between the L1 and the L2.

Despite previous studies confirming changes in disfluency by proficiency (Bergmann et al. 2015; Declerck and Kormos 2012; Kormos 2000), there is enough evidence to suggest that specific L2 disfluency elements might be related to the L1 (De Jong 2016; De Jong et al. 2015; Derwing et al. 2009; Rose 2013; Tavakoli 2010; Zuniga and Simard 2019). The issue is relevant in second language acquisition as L2 disfluencies are often construed as a reflection of proficiency in the L2. From informal observations of L2 speakers, our view was that cut-offs in the L2, at least at intermediate proficiency levels, might follow L1 patterns, in which case they ought to be treated with caution as measures of proficiency. To test this possibility, we analysed the patterns of both the cut-offs and the gestures co-occurring with them, as gesture and speech are considered to form a unit (McNeill 2015) and so the gesture might provide additional information about the cut-off process. Thus, our hypotheses were:

H_1: Cut-off patterns in the L1 are similar to those in the L2 (at a B2 proficiency level).

H_2: Gesture patterns co-occurring with cut-off are similar in the L1 and the L2 (at a B2 proficiency level).

This study is unique in that it focuses on types of cut-offs in both the L1 and L2 of participants and includes gestures. Previous studies with L2 speakers do not make the distinction by type of cut-off and often have two separate sets of participants, one for each language. If the overall L1 and L2 cut-off patterns are similar, this would support the "trait view" (Derwing et al. 2009) suggesting the two are related, at least at an intermediate proficiency level. With our results we seek to provide L2 pedagogues and evaluators with a better understanding of cut-offs in the L2.

5 Methodology

The participants in this study were a group of 19 Spanish speakers (L1) learning English. These participants volunteered to be recorded narrating a story they had previously seen, heard or watched, both in Spanish (L1) and in English (L2). Data collection was based on convenience sampling, which was found to be the most feasible option despite its limitations (Farrokhi and Mahmoudi-Hamidabad 2012).

5.1 Participants

The nineteen volunteers were selected from twenty-two volunteers from English Philology departments of three universities in Spain. All 19 produced cut-offs in both their L1 and their L2, three volunteers were excluded as they did not gesture or produce cut-offs in the L1 or the L2. The participants were mostly female (68%) and between 20 to 25 years old, except for two females who were between 30–35 years old. They were all native Spanish speakers with a proficiency level in English of B2. Proficiency levels in the L2 were evaluated by independent tests, IELTS or Cambridge English (completed by the participants either before or after the recorded sessions) and confirmed by bespoke evaluations carried out by the institutions according to the guidelines of the Common European Framework of Reference for Languages (Council of Europe 2002).

The small size sample is a recognised limitation, preventing generalisations from the results. Gullberg (2010) points out that due to the detailed nature of gesture analysis, sample sizes in gesture studies tend to be small, such as in the studies by Chui (2005), Choi and Lantolf (2008), Graziano and Gullberg (2014, 2018); Seyfeddinipur (2006), and Stam (2006).

5.2 Procedure

Each session began with an explanation of the procedure, no specific mention was made of cut-offs or gestures. Participants warmed-up by recounting two narrations in their L1 (the L1 was used to minimise anxiety levels), one based on an audio and one on a text, these modalities have been found to be easier to participants than the video (Lopez-Ozieblo 2018). Finally, participants were asked to watch the first three minutes of a video, without sound, and to recount the story in one language, their L1 (in most cases, 85%) or L2, as indicated by the researcher based on the participants' preference. After this, they watched the last three minutes of the video and retold it in the other language (the L2 or L1). In order to relate this study to existing gesture studies a video from the *Tweety and Sylvester* stories, a television cartoon, was used. Based on the work pioneered by McNeill and Duncan (2000), we selected the *Canary Row* episode (Freleng 1950).

5.3 Analysis

The entire session with each participant was video-recorded and the speech and gestures transcribed. As there is some evidence that hesitations vary by task type (Riazantseva 2001), only the narrations based on the videos were extracted for analysis.

Interruptions, 'the sudden interruption of the flow of speech, which generally takes the form of a glottal stop' (van Hest 1996: 36) were noted, whether they occurred at the end of the word (completed-word cut-off) or before the end of the word (mid-word cut-off). As the focus of the study was specifically cut-offs and their relationship with gestures, we discounted all cases where a second disfluency was apparent, this included elongations that ended in cut-offs as well as a small number of interruptions immediately followed by a filler 'eh', 'ehm'. Our rationale was that the gesture could be equally affected by the elongation or the filler, their utterance leading to the production of the gesture. This was based on the findings by Seyfeddinipur (2006) of gesture patterns varying by type of cut-off as well as observations by Clark and Fox Tree (2002) on the different functions of fillers, 'ehm' possibly indicating a conceptual issue while 'eh' indicates a lexical search.

Praat (Boersma and Weenik 2019), a speech processing software that includes a spectrogram to analyse pitch and intensity, was used to identify cut-offs, pauses and their durations. Although Kormos and Dénes (2004) consider pauses under 250 milliseconds as articulatory, Riazantseva (2001) questions this boundary, noting that not all short pauses are articulatory, and

includes in her analysis pauses from 0.1 to 3 seconds long, a methodology we followed. Using *Excel*, the overall rate of cut-offs were calculated as a rate (cut-offs per 100 words, broken words and false starts were counted as individual words). Cut-offs were subdivided into completed-word or mid-word cut-offs, and a note was made of whether they were followed by pauses and their length. The repair was also transcribed and categorized as the utterance continuing, being rephrased or repeated. A rephrase could include a word being repeated or not and a subsequent change to one or more words. While under repetition, we included interrupted words that were then repeated, as in the examples below ('-' indicates the cut-off, ':' an elongation and '/' a pause with the duration marked in seconds (Du Bois 1991)):

(1) Rephrase:
he walked through the: hm:/tz/electricity-/(0.407) electrical wires
"He" refers to the cat who, in order to reach the bird's window, is walking along the overhead electricity cables that power the city's trams. The speaker has trouble describing the scene, utters the word "electricity", interrupts herself and replaces it with "electrical wires".

(2) Utterance continuing:
giving like/electric shock and sylvest-/(0.42) *al-*/(0.301) at the end of this fails
Another speaker explains how the cat is receiving shocks from the tram cables. After the first cut-off, "sylvest-" the speaker continues in Spanish with "al-" after which there is another cut-off, presumably the speaker has realised she has switched languages and another repair, a rephrase, provides the English translation: "at the".

(3) Repetition:
he enter to the: to the chamber of-/(0.07) of the grandmother
The cat, still chasing the bird, has entered the flat where Tweety lives. The speaker interrupts herself at "of" and after a short pause repeats the preposition.

For each speaker, the proportion of cut-offs by type, after completed-word and mid-word, and with or without a gesture, was compared in both the L1 and L2. This study also considered the temporal synchronicity of the gestures occurring with the cut-offs, noting whether the gesture continued through the interruption, stopped or started with it or if it was on hold during the interruption. *ELAN* (Sloetjes 2017), a multimodal data processing software that allows frame by frame analysis, was used to verify the transcriptions and add the gesture information.

The transcriptions were checked by two researchers. The exact duration of the pauses, where there were discrepancies of milliseconds, was taken as the average between the two measurements. The coding of all the cut-offs (whether

these were mid-word or after-word, whether there was a pause and the type of repair) and gestures (whether there was a gesture and their temporal synchronicity with the cut-off) was also carried out by two researchers, obtaining inter-coding agreement of 92% on the cut-off data and 88% on the gestures. The disagreement cases were mostly resolved after discussing the individual cases. For the 1% of cases where no consensus was reached, a third researcher was asked to review the data but was also unable to provide a conclusive answer. These cases were taken out of the data set.

The data was analysed statistically using *JASP* (JASP Team 2018), a statistical analysis programme, comparing L1 and L2 rates of cut-offs, the frequency of each type of cut-off, of pauses and their duration, the type of repair, the occurrence of gestures, and their temporal synchronicity with speech. All statistical calculations used a 5% level of significance. No assumptions were made about the normal distribution of the samples therefore a parametric paired-sample t-test (Wilcoxon Signed-Rank test) was used throughout to compare the difference in means between L1 and L2 variables, as recommended for small size samples (Larson-Hall 2015). Cohen's d was chosen to calculate effect size, interpreting the results to indicate a medium effect if $d \geq 0.5$ and a large effect if $d \geq 0.8$. When comparing proportions an N-1 Chi-squared (Richardson 2011) or a single-sample z test were performed.

6 Results

The data was analysed to compare cut-offs in the L1 and the L2. Overall, our results indicate that there are similarities between the L1 and L2 cut-off and gesture overall patterns, supporting the "trait view" (Derwing, Munro et al. 2009) in this set of speakers, with a L2 proficiency level of B2. However, there are also some differences that point to a language-proficiency explanation, such as a higher speech rate in the L1, a tendency in the L2 to make mid-word pauses longer than in the L1, and a propensity to repeat the reparandum after completed-word cut-offs, rather than rephrase it or continue the utterance as observed in the L1.

6.1 Cut-off rates

In total, we analysed 32 minutes of L1 (Spanish) speech, which comprised 5138 words containing 121 cut-offs, an average of 2.355 cut-offs per 100 words for the

combined narrations. During the narrations there were 93 gestures occurring during cut-offs (in 77% of all cut-offs). There were 46 minutes of L2 (English) speech, with 5031 words and 148 cut-offs, a total of 2.94 cut-offs per 100 words. In the L2 narrations there were a total of 114 gestures occurring during cut-offs (also in 77% of all cut-offs). L1 speech rates (words per second) ($N = 19$, $M = 2.68$, $SD = 0.44$) were significantly higher than L2 speech rates ($N = 19$, $M = 1.84$, $SD = 0.39$), $W = 190$, $p < 0.001$, confirmed by the confidence interval (*CI*) of the difference of the means [0.65, 1.00], with a high effect size, Cohen's $d = 2.17$. Although the average cut-off rate per 100 words was lower in the L1 ($N = 19$, $M = 2.42$, $SD = 1.33$) than in the L2 ($N = 19$, $M = 2.92$, $SD = 1.75$), this difference was not statistically significant, $W = 66$, $p = 0.258$ with a *CI* of [–1.32, 0.40]. Our results suggest there are similar patterns in cut-off rates in the L1 and L2, despite the different speech rates.

6.2 Types of cut-offs and pauses

Data on cut-offs was further analysed by type of cut-off (mid-word and completed-word cut-offs). In both L1 and L2, the majority of cut-offs occurred after the word had been completed (a collated 64%, out of all 121 cut-offs in L1 and 73%, out of 148 in L2). The difference between the frequency means of completed-word vs. mid-word cut-offs (see Table 1) was significant in both the L1 ($W = 113.5$, $p = 0.019$, *CI* [0.50, 4.00], $d = 0.621$, a medium effect), and in the L2 ($W = 131$, $p = 0.001$, *CI* [2.50, 6.00], $d = 0.963$, a large effect). Moreover, neither the difference between the mean frequencies of completed-word cut-offs in the L1 vs. the L2 ($W = 56$, $p = 0.204$, *CI* [–4.00, 1.00]) nor that of mid-word cut-offs between the two languages ($W = 56$, $p = 0.847$, *CI* [–1, 1.5] was statistically different. We also calculated the proportion of mid-word vs. completed-word cut-offs for each narration, confirming a preference for completed-word cut-

Table 1: Mid-word vs. completed-word cut-offs.

	L1 (Spanish) N = 19	L2 (English) N = 19
	Mean (SD)	Mean (SD)
Frequency of mid-word cut-offs	2.26 (2.16)	2.11 (2.51)
Frequency of completed-word cut-offs	4.11 (3.18)	5.69 (0.20)
% mid-word cut-offs (as a total of cut-offs per speaker)	0.37 (0.27)	0.32 (0.29)
% completed-word cut-offs (as a total of cut-offs per speaker)	0.63 (0.27)	0.68 (0.29)

offs (Table 1). Speakers show the same tendency to avoid within-word cut-offs in both the L1 and the L2.

Speakers produce a similar number of pauses in both languages (see Table 2 for the means and the standard deviations of the pause related data), the difference between the L1 and L2 pause frequency means is not statistically different ($W = 42$, $p = 0.059$, CI [−2.50, $3.75e^{-5}$]. Speakers are also more likely to pause after a completed-word cut-off rather than after a mid-word cut-off in both languages, a total of 41 out of 50 pauses in the L1, and 54 out of 74 pauses in the L2. The results of a Wilcoxon Signed-Rank test indicate that there is a significant difference between the means of the frequencies of pauses following mid-word vs. completed-word cut-offs, with more pauses following the latter in both the L1 ($W = 5$, $p = 0.005$, CI [−4.00, −1.00], $d = -0.71$) and in the L2, ($W = 14.5$, $p = 0.006$, CI [−3.5, −1], $d = -0.80$, a strong effect). The mean duration of pauses following a mid-word cut-off, was shorter than those following completed-words, in both the L1 (by 0.197 seconds) and in the L2 (by 0.114 seconds), see Table 2. This difference was significant in the L1 ($W = 17$, $p = 0.009$, CI [−0.31, −0.07], $d = -0.62$, a medium effect) but not in the L2 ($W = 53$, $p = 0.163$, CI [−0.26, 0.04]), where pauses after mid-word cut-offs were generally longer than in the L1. These results confirm that speakers differentiate between completed-word cut-offs and mid-word cut-offs, regardless of the language. In this group of speakers the pauses after completed-word cut-offs are similar in both the L1 and the L2 but there are differences in within-word cut-offs.

Table 2: Pauses following mid-word and completed-word cut-offs.

	L1 (Spanish) N = 19	L2 (English) N = 19
	Mean (SD)	Mean (SD)
Frequency of pauses	2.63 (1.45)	3.89 (3.07)
Frequency of pauses after mid-word cut-offs	0.47 (0.77)	1.05 (1.81)
Frequency of pauses after completed-word cut-offs	2.16 (2.29)	2.84 (1.98)
Mean duration of mid-word cut-offs (seconds)	0.084 (0.118)	0.145 (0.149)
Mean duration of completed-word cut-offs (seconds)	0.281 (0.339)	0.259 (0.266)

6.3 Repair after the cut-off

After the cut-off, speakers can either continue the utterance, repeat part of the interrupted speech or rephrase the reparandum. In both languages there is a preference to rephrase (53% out of 121 cut-offs in the L1 and 54% out of 148 cut-

offs in the L2). Speakers are more likely to just continue the utterance without a repair in the L1 than in the L2 (14% vs. 7% in the L2), while repeats are more frequent in the L2 (39% vs. 33% in the L1). However, the differences between the means of the L1 and the L2 repair frequencies are not statistically significant (see Table 3 for means and standard deviations of repair data): rephrases ($W = 41$, $p = 0.285$, CI [−3.00, 1.00]); continues ($W = 63.5$, $p = 0.492$, CI [−1.00, 1.50]); repeats ($W = 37$, $p = 0.113$, CI [−2.50, 0.50]).

Table 3: Repairs after cut-offs.

	L1 (Spanish) N = 19	L2 (English) N = 19
	Mean (SD)	Mean (SD)
Rephrases	3.37 (2.89)	4.21 (4.37)
Continues	0.90 (1.60)	0.58 (1.12)
Repeats	2.10 (2.21)	3.00 (2.11)

An analysis of the compiled data by type of repair following each type of cut-off, showed that rephrases are more likely to follow completed-word cut-offs (63% out of 64 rephrases in the L1 and 72.5% out of 80 in the L2) rather than mid-word cut-offs. The same can be observed with continuing utterances (94% of 17 cases in the L1 and 91% of 11 cases in the L2). Chi-squared tests comparing the proportions by language, type of cut-off and repair, indicated that these differences were not significant, see Table 4. However, while in the L1 the proportion of repeats following completed-word and mid-word cut-offs was similar (55% vs. 45%, out of 40 repetitions), in the L2, repeats were significantly more likely to follow completed-word cut-offs (77% out of 57 repetitions) rather than mid-word cut-offs, $\chi^2 = 5.168$, $p = 0.023$, CI [3.07%, 39.64%]. Although the confidence interval is quite wide, it indicates a difference in repair after mid-word cut-offs between L1 and L2 speakers.

6.4 Relationship cut-off and gesture

This group of speakers had a tendency to gesture during the reparandum leading to the interruption (our count included gestures that were interrupted at the cut-off). Overall, gestures were observed in over three fourths of cut-offs, 77% out of 121 cut-offs, including 3 cut-offs occurring with adaptors (not counted

Table 4: Repairs after type of cut-off.

	L1 (Spanish) *N* = 19	L2 (English) *N* = 19	X^2	*p*	*CI*
	Frequency (%)	Frequency (%)	*DF* = 1		
Rephrases±	64 (53% of 121 L1 repairs)	80 (54% of 148 L2 repairs)			
after mid-word cut-off	24 (38% of 64 L1 rephrases)	22 (27.5% of 80 L2 rephrases)	1.784	0.1817	[−4.73%, 25.45%]
after completed-word cut-off	40 (63% of 64 L1 rephrases)	58 (72.5% of 80 L2 rephrases)			
Continues±	17 (14% of 121 L1 repairs)	11 (7% of 148 L2 repairs)			
after mid-word cut-off	1 (6% of 17 L1 continues)	1 (9% of 11 L2 continues)	0.087	0.768	[−19.40%, 32.05%]
after completed-word cut-off	16 (94% of 17 L1 continues)	10 (91% of 11 L2 continues)			
Repeats±	40 (33% of 121 L1 repairs)	57 (39% of 148 L2 repairs)			
after mid-word cut-off	18 (45% of 40 L1 continues)	13 (23% of 57 L1 continues)	5.168	0.023*	[3.07%, 39.64%]
after completed-word cut-off	22 (55% of 40 L1 continues)	44 (77% of 57 L1 continues)			

± Note: Wilcoxon Signed-Rank tests were carried out for these variables, refer to the text.
* Significant at a 95% significance level.

as gestures), in the L1 and 77% out of 148, including 7 cut-offs occurring with adaptors in the L2. The mean gesture rate (gestures/cut-off) was the same in both the L1 ($M = 0.707$, $SD = 0.356$) and in the L2 ($M = 0.707$, $SD = 0.34$). These results were not found to be statistically significantly different ($W = 35$, $p = 0.894$, *CI* [−0.32, 0.315]), confirming the gesture rates with the cut-off were similar in both languages in this group of speakers.

The mean difference between the number of cut-offs occurring with a gesture and without one was significant in both the L1 ($W = 147$, $p = 0.008$, *CI* [1.00, 6.00], $d = 0.727$, a medium effect) and the L2 ($W = 138$, $p = 0.004$, *CI* [2.00, 7.00], $d = 0.701$, also a medium effect). See Table 5 for additional information on the proportions of cut-offs with and without gesture and the synchronicity gesture-speech. In both languages it is more likely that a cut-off will occur with a gesture than without one.

Compiling all the data, we found that the proportion of gestures co-occurring with completed-word cut-offs vs. mid-word cut-offs was higher in

Table 5: Gestures with cut-offs.

	L1 (Spanish) N = 19	L2 (English) N = 19	L1 (Spanish) Frequency[x] (%)	L2 (English) Frequency[x] (%)	X^2	*p*	*CI*
	Mean (SD)	Mean (SD)			*DF* = 1		
Cut-offs with gestures[±]	4.90 (4.37)	6.00 (6.17)	93 (77% out of 121 cut-offs)	114 (77% out of 148 cut-offs)			
Gesture continues	2.47 (2.65)	2.68 (4.23)	47 (50% out of 93 cut-offs with gesture)	51 (45% out of 114 cut-offs with gesture)	0.511	0.475	[−8.52%, 18.30%]
Gesture on hold	0.42 (0.77)	0.47 (0.91)	8 (9%)	9 (8%)	0.066	0.797	[−6.76%, 9.42%]
Gesture stops	1.47 (1.17)	2.58 (2.37)	28 (30%)	49 (43%)	3.689	0.055	[−0.23%, 25.41%]
Gesture starts	0.53 (0.77)	0.26 (0.56)	10 (11%)	4 (4%)	3.764	0.052	[−0.23%, 15.30%]
Cut-offs without gestures[±]	1.32 (1.45)	1.42 (1.58)	25 (21% out of 121 cut-offs)	27 (18% out of 148 cut-offs)			

[x] Including cut-offs co-occurring with adaptors (adaptors are not categorised as gestures): 3 in the L1 and 7 in the L2

[±] Wilcoxon Signed-Rank tests were carried out for these variables, please refer to the text.

Table 6: Gestures by type of cut-offs.

	L1 all gestures at cut-offs N = 93	L2 all gestures at cut-offs N = 114	χ^2	*p*	*CI*
			DF = 1		
Completed-word cut-off Frequency (%)	58 (62%)	79 (69%)	1.111	0.2919	[−5.87%, 19.78%]
Mid-word cut-off Frequency (%)	35 (38%)	35 (31%)			

both the L1 (62% out of 93 cut-offs with gestures) and the L2 (69%, out of 114 cut-offs with gestures). An N-1 Chi-squared test confirmed that the differences between L1 and L2 gesture proportions during mid-word cut-offs and those between L1 and L2 completed-word cut offs were not significantly different, see Table 6. However, the proportion of gestures during completed-word cut-offs is significantly different from 50%, in the L1 ($z = 2.314$, $p = 0.0206$, *CI* [51.34%, 71.87%]) and in the L2 ($z = 4.057$, $p < 0.0001$, *CI* [59.60%, 77.33%]).

Although neither interval is narrow, the results indicate that there is an effect based on the type of cut-off, gestures during cut-offs are more likely to occur during completed-word cut-offs in both languages than during mid-word cut-offs.

The temporal synchronicity of the gesture with the cut-off was also analysed, whether it stopped, continued or started with the cut-off (see Table 5). In the L1 half of all gestures co-occurring with cut-offs continued through the cut-off (50%, out of 93 gestures) and in the L2 45% out of 114 gestures. The gesture was more likely to start with the cut-off in the L1 (11%) than in the L2 (4%) and in both languages less than one tenth of gestures were on-hold during the cut-off (9% in the L1 and 8% in the L2). The gesture was interrupted (stopped) at the cut-off more often in the L2 than in the L1 (43% vs. 30%). There was not enough data to test the mean difference of gestures starting with cut-offs or on-hold but in the other two cases the differences between the L1 and L2 means were not significant: gestures continues ($W = 65.5$, $p = 0.77$, CI [−2.50, 2.50]), gesture stops ($W = 19.5$, $p = 0.072$, CI [−3.50, 4.63e-5]). Chi-squared tests were also carried out to compare the proportion of each variable between the L1 and the L2 not finding any significant differences, see Table 5. Again, these results indicate that, in this group of speakers, gesture patterns seem to be similar in both languages.

7 Discussion

The objective of this study was to identify whether cut-off patterns differed by language in a group of Spanish speakers (L1) learning English (L2, proficiency level B2). This study sought to contribute to the discussion on the relationship between L1 and L2 disfluencies (Derwing et al. 2009) by assessing the differences between L1 and L2 cut-offs through a multimodal analysis. We analysed 38 narrations from nineteen participants, comparing rates and types of cut-off, pauses following them and gestures co-occurring with cut-offs and the temporal synchronicity gesture-cut-off. Our results indicate that, in this group of speakers, there are similarities between the L1 and the L2 in the cut-off patterns by type, pause and gesture, suggesting comparable cut-off processing mechanism in both languages, probably due to similar cognitive factors in both languages (De Jong et al. 2015; Zuniga and Simard 2019). There are, however, some differences that could be related to the lower proficiency of the L2 vs. the L1, as explained in the following sections.

7.1 Cut-off rates

Speech rates were slower in L2 than L1 narrations, as expected. There were also more cut-offs in the L2 narrations, although, the difference in the rate of cut-offs was not statistically different between the two languages. A comparison of the various types of disfluencies falls outside the scope of this study but previous work (Lopez-Ozieblo 2017; Machuca, Llisterri and Ríos Carratalá 2015; Rodríguez and Torres 2006) has identified a tendency for filled pauses and elongations, in addition to cut-offs, in Spanish L1 speakers. On the other hand, Lecumberri, Cooke and Wester (2017) observed similar patterns in the cut-offs of English and Spanish native speakers. The same pattern was informally observed in the L1 and L2 narrations of the speakers under study. It is possible that an analysis of these other types of disfluencies will yield different results.

Within this group of speakers, cut-off frequency (per 100 words) was similar in the L1 and the L2, a language in which they were not fully proficient. Declerck and Kormos (2012) and Gilabert (2007) had also reported similar average disfluency frequencies in the L1 and L2 of their participants. These findings could be interpreted as support for the "trait view" (Derwing et al. 2009), suggesting similar lengths of speech planning chunks (after which a disfluency is more likely to occur) or a controlled processing of cut-offs (Tydgat et al. 2011) based on an intuitive understanding of the acceptable rate of cut-offs in discourse. We believe it might be the latter, as the length of fluent speech chunks has been found to vary by proficiency (Möhle 1984). In this group of speakers, as their L2 proficiency level was just a B2, we would expect their speech chunks to be longer in the L1 (although this was not tested).

7.2 Types of cut-off and pauses

Speakers showed a similar preference for completed-word cut-offs in both languages (a collated 64% out of 121 cut-offs in the L1 and 73% out of 148 in the L2), suggesting that fluency is important in both languages as reflected in the avoidance of mid-word interruptions, observed mostly when the repair is ready (Seyfeddinipur 2006; Seyfeddinipur et al. 2008). Our results for the proportion of completed-word cut-offs were slightly lower than those of Levelt (1989), who reported 78% of all cut-offs in his study were observed after completed words. It is likely that our lower rates are due to having excluded cut-offs followed by fillers such as 'eh' or 'ehm', which are more likely to follow completed-word cut-offs, rather than mid-word cut-offs, as they would indicate a need for more time to repair the utterance than mid-word cut-offs.

Similar patterns in the pauses after cut-offs were also observed in both languages, with more pauses after completed-word than after mid-word cut-offs. Over half of the speakers (9 out of 19) did not produce any pauses after mid-word cut-offs in the L2, although this proportion was higher in the L1 (14 out of 19 speakers). It would seem that even in the less proficient language, these speakers try to minimize disruptions to the speech flow by avoiding mid-word disfluencies, the same pattern observed in the L1. Declerck and Kormos (2012) observed a lower frequency of interruptions in some L2 speakers which they related to lower speech rates, hypothesizing that speakers slow down to pay attention to correction. If this were the case, then there should be fewer within-word cut-offs in the L2 than in the L1, as speakers will be avoiding errors. However, our results do not report significant differences in the means of L1 and L2 mid-word cut-offs, implying that lower speech rates in this group of speakers might not aid significantly to reduce interruptions.

The duration of the pause after cut-offs in the L1 and L2 narrations was also not significantly different. However, our observations indicate that pauses after mid-word cut-offs are usually shorter (or non-existent) than those after completed-word cut-offs, but only in the L1. This pattern is not so obvious in the L2, where pause duration after within-word cut-offs is not significantly shorter than after completed-word cut-offs. This observation confirms findings reporting more cut-offs followed by longer pauses in L2 speakers (Bergmann et al. 2015; Kormos 2000; Declerck and Kormos 2012). Although it is important to note that this only applied to within-word cut-off pauses for this group of speakers.

The DIPH (Seyfeddinipur et al. 2008) postulates that speakers can choose when to stop the speech. Both the L1 and L2 behaviours fit with the DIPH, as after-word cut-offs were more likely to occur with pauses than without them and these were longer than after mid-word cut-offs (at least in the L1). This indicates that speakers can continue the utterance, controlling when to stop to buy time (Seyfeddinipur et al. 2008). However, there was a difference between L1 and L2 speech, in that speakers in the L2 were slower to repair and compromised fluency by stopping at perceived errors. In the L2, speakers sometimes stopped mid-word without having the repair ready, thus producing longer pauses. This indicates a stronger focus on correction rather than on fluency. On the other hand, in the L1, it would seem that if correction was important to our speakers, it was not at the expense of fluidity, so when speakers noticed a conflict they interrupted themselves mid-word usually only if the repair was ready, therefore the pause was relatively short.

7.3 Repair after the cut-off

Over half of all cut-offs in both languages were repaired with rephrases, about a third with repeats and the least observed action was utterances continuing. If the frequency of cut-offs in the discourse is restricted by an intuitive acceptability pattern, it would stand to reason that cut-off production should be prioritized to utterances that fail the communicative intent of the speaker and thus need to be rephrased (an analysis of other types of disfluencies and their repairs could help confirm this notion). Most rephrases and continued utterances followed completed-word cut offs, in both the L1 and the L2. Post-study ad-hoc observations of the utterances revealed more semantic appropriateness rather than syntax or articulatory issues in both languages, as in example (1) (a full analysis of the causes of the reparandum and how the repair was resolved falls outside the scope of this study but we include our observations as these might be of interest in future research on cut-offs):

(1) and: / he: / ah: follows- he tracks movement of the train

Although in the L2 there were also syntax corrections, seldom needed in the L1, see example (2):

(2) and / after that / he wa- it was

In most cases where the utterance just continued there were no obvious reasons for the interruption and, as in example (3), there was also a pause, suggesting planning issues (in both languages):

(3) he doesn't get- / (0.339) to the window

Although patterns in rephrased and continued utterances were similar in the L1 and the L2, this was not so with repeats, which were more often observed after completed-word cut-offs in the L2 while in the L1 they were as likely to follow mid-word as completed-word cut-offs. Most repetitions in the L2 were of a single-syllable word of frequent use, such as prepositions: 'a', 'to', 'in', or the pronoun 'he', example (4), while in the L1 the range of repeated items was wider, and less likely to be monosyllables, although these were also observed, examples (5) and (6).

(4) this is a reason for / Sylvester to plan how to- / (0.118)to get him

(5) tiró me parece un peso encima y él fue- / (0.497) fue lanzado hacia arriba
threw I think a weight on-top and he was- /(0.497) was thrown towards up
[he] threw, I think, a weight on top and he was- (0.497) was propelled upwards

(6) vuelve a subi:r a:l piso de: de piolín por la cañería escalan- escalándola

goes-back to go-up to-the flat of of tweety through the pipe climbi- climbing-it
[he] goes back up to tweety's flat through the pipe climb- climbing it

Repetitions could be interpreted as failed correction attempts, another possibility is that they are mechanisms to buy time. As most of the repeated words in the L2 are frequent monosyllables, the latter possibility is quite likely, as also indicated by the longer pauses after the within-word cut-offs.

7.4 Relationship between cut-off and gesture

The analysis of the gestures co-occurring with cut-offs reveals no significant differences by language, with over three fourths of cut-offs co-occurring with a gesture in both languages, contradicting previous observations that disfluencies are less likely to occur with gestures than without them (Graziano and Gullberg 2014, Graziano and Gullberg 2018; Kosmala and Morgenstern 2017). Gesture rates during the cut-offs were similar in both languages, also contradicting the results from Graziano and Gullberg (2014, 2018) who reported that L2 speakers were more likely than L1 speakers to gesture during disfluencies. However, these previous gesture-disfluency studies had taken into account all types of disfluencies, which could explain the difference in results. It could be that gestures with elongations and filled pauses might follow different patterns than gestures with cut-offs. Another reason for the contradictory results could be related to differences in the proficiency levels of the participants and/or effects from their L1. Further studies are needed to exclude these variables.

More gestures occurred with completed-word cut-offs in both languages, as observed by Seyfeddinipur (2006). Seyfeddinipur (2006) also reported that gesture suspension preceded speech suspension. This could help explain why there were fewer gestures in the mid-word cut-offs, as the gesture could be stopping before the cut-off (and thus would not have been counted). Gestures were more likely to continue or stop with the cut-off while few gestures started at the cut-off, supporting the findings of Chui (2005) who noted that gestures are unlikely to start at the disfluency. The gesture stopping with the disfluency can be interpreted as proof of the gesture-speech link (McNeill 2015), however we did not expect such a high frequency of gestures just continuing through the disfluency. Perhaps these gestures referred to the repair, rather than to the reparandum, following Seyfeddinipur's (2006) conclusion that gesture precedes speech. Another possibility is that it is only the speech, not the gesture, that is perceived to be erroneous, therefore there would be no need to stop the

gesture. We also observed, in both the L1 and the L2, slightly less than 10% of gestures on-hold during the cut-off. These might also have been interrupted and frozen before the speech cut-off, anticipating it. An analysis of the errors behind the disfluencies, the repairs, and the referential meaning of the gestures (outside the scope of this study) would help test the likelihood of these possibilities.

Overall, we can report similar patterns in the temporal synchronization of gesture with speech in both languages, challenging Graziano and Gullberg's results (2014, 2018) who found different patterns in the L1 and the L2, although they had different participants in each group, as well as including all types of disfluencies. Overall, the L1 and L2 patterns described above question the validity of cut-offs in the L2 as a measure of proficiency, at least in this group of participants, at this stage of their L2 acquisition process. We concur with Segalowitz (2010) and De Jong et al. (2015) that L1 data is needed as a baseline when measuring the fluency in the L2, as it is likely that cognitive processes might be affecting the production of cut-offs in both the L1 and the L2 (De Jong et al. 2015; Zuniga and Simard 2019).

7.5 Summary

This study set out to compare L1 and L2 cut-offs, and the gestures co-occurring with them, in nineteen native Spanish speakers (L1) learning English (L2). Disfluencies in the L2, including cut-offs, filled and unfilled pauses and elongation, are thought to be related to the level of proficiency of the speaker (Kormos 2000; Van Hest 1996). However, elements of the disfluency, and subsequent repair, might be related to the same cognitive processes that cause them in the L1 (De Jong et al. 2015; Zuniga and Simard 2019). We suspected that cut-offs and their gestures might be similar in the L1 and the L2. This would question the validity of cut-offs as indicators of L2 proficiency.

We partially accepted the first hypothesis, as the cut-off rate and frequency by type of cut-offs was similar in both the L1 and the L2, suggesting comparable cut-off mechanisms that follow similar processes to identify errors and to decide whether to interrupt the speech and when. In both languages there is a preference for completed-word, rather than mid-word, cut-offs indicating a prioritization of fluency over correction. Nonetheless, the differences in L2 within-word cut-offs would suggest that speakers in the L2 are more concerned with correction than in the L1, as they are choosing to stop mid-word even if the repair is not ready. In the L1, pauses following within-word cut-off were short, as the planning mechanism was able to respond fast, usually with a rephrase. In the

L2, the pauses were longer and the repairs were mostly repetitions, suggesting that this group of speakers struggled more in the L2 with the overall planning of the speech, buying time whenever possible, a behaviour not observed in the L1 and probably linked to their proficiency in the L2.

We accepted the second hypothesis, as gesture patterns were comparable in both languages at the cut-off. The gesture-speech processes employed by these speakers produced equivalent gesture rates and gesture-cut-off temporal synchronicity patterns in the L1 and the L2. This suggests that the gesture at the cut-off might not be a good indicator of L2 proficiency (at least at an intermediate B2 level).

8 Conclusions

We concluded that, overall, cut-off and gesture behaviour in this group of speakers is similar in both the L1 and the L2. Although we cannot generalise, as this was a snapshot of speakers at a B2 proficiency level and a small sample, the implication for L2 pedagogues (especially those working with Spanish L1 and English L2) is that cut-offs might not be a very reliable indicator of proficiency. However, if the L1 patterns are known, there are some differences in L1-L2 pause length and repair with within-word cut-offs that might be related to the (lower) proficiency in the L2. The extent of those differences by level of proficiency would need to be tested with a longitudinal study.

This study does not contradict findings that relate disfluency with proficiency, but it supports the notion that some disfluency elements, in particular cut-offs, might be very similar in L1 and L2 as they could be triggered by comparable, if not shared, cognitive processes in both languages. The effects of proficiency might be more obvious in the repair, where a slower planning process leads to more unnecessarily delays in the L2.

An option we have not explored (as it fell outside the scope of this study) is the possibility of English and Spanish having different cut-off patterns. Grosjean and Dechamps (1975) identified that French has fewer but longer pauses than English, so perhaps there are structural difference between Spanish and English in the use of cut-offs, although Lecumberri, Cooke and Wester (2017) reported otherwise. If this were the case, speakers would be observed to alter their cut-off patterns with proficiency, with higher proficiency speakers producing cut-off patterns different to those of their L1. A longitudinal study of L2 speakers' patterns comparing cut-off production with their own in the L1 and with that of native speakers of the L2 would be needed to test this scenario.

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