

The Priming of L2 Information Structure in a Narrative Retelling Task

Wies J. Voerman

S1065765

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Dr. M.B.P Starren

Faculteit der Letteren

Radboud Universiteit Nijmegen



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Abstract

Information structure is a domain of linguistic interest at the intersection of grammar, content and context. It is a complex network that shapes discourse cohesion and guides the interlocuter's attention to the important beats in the discourse. Because it is grammar dependent, each language has a different information structure. Previous research has shown that foreign language learners preserve elements of their native language's information structure when speaking their second language, even at high proficiency levels or after living for several years in the target country (Benazzo & Andorno, 2010, Verheijen et al., 2013). This study explored the role of exposure and implicit learning mechanisms in the acquisition of L2 information structure by embedding a priming element into a narrative retelling task. 22 native Dutch speakers described clips from a stop motion film while being primed by a confederate who described the missing clips with a narrative containing many typical English discourse features such as inanimate subjects, SVO instead of V2 word order, and the progressive aspect (Carroll & Lambert, 2003; Starren, 2017; Van Ierland, 2010). The results gave little indication that priming led to an increased use of the English information structure. A lack of priming effects could be an indication that implicit learning mechanisms are not very effective in the acquisition of IS. This would account for the challenges of acquiring IS in a second language that have been previously observed. More research is needed to understand how the mental representations of information structure are formed and the role of implicit and explicit learning therein.

Keywords: Implicit Learning, Information Structure, Priming, SLA

The Priming of L2 Information Structure in a Narrative Retelling Task

The more abstract and complex language features get, the harder they are to acquire. Information structure (IS), which lies at the intersection of syntax and grammar, is one of the more complex features of language use. That makes it a challenging aspect to learn in a foreign language. IS entails making the grammatical choices that align with the content, the rest of the discourse and the communicative goal. Sentences that are grammatically correct as a stand-alone, may be structurally incorrect in a particular discourse context. Yet others may be simply dispreferred. This leads to challenges for second language speakers, who may have trouble mastering these constructions that are discourse driven, yet rooted in syntax.

Subtle variations in grammars can have profound impact on how native speakers of different languages prefer to structure their discourse. This is nicely illustrated by a study done by Carroll and Lambert (2003). When asked to describe a painting, speakers of German chose a very different discourse structure in their descriptions than English speakers. German speakers linked their sentences by means of spatial relation to a previous mentioned element (“Darunter ist ein bar...” underneath.that is a bar). While “underneath that is a bar” is a sentence that could exist in English, it is not the preferred structure at all. The reason for these differences, Carroll and Lambert argue, is the difference in word order between English and German. English has a strict subject-verb-object (SVO) word order, while German follows the verb-second (V2) principle. That means that in German the first position in a sentence can be flexible, as long as the second position contains a (finite) verb. The first position is thus not by default a subject, but can be used to provide a link to the previous sentence (e.g. a spatial link) to improve discourse cohesion. The English language favours a subject in the first position before the verb, and thus utilises different means to achieve discourse cohesion. Grammatical variations like these can have far reaching consequences for the information structure of a text. Learners who come from a V2 language (Dutch and Scandinavian languages are also examples of V2 languages) and learn an SVO language such as English (or the other way around) have to go beyond simply learning the right word order. They have to learn how to utilise that word order to achieve discourse cohesion, linking strategies, focus, introducing new entities or places, and a whole lot more. Previous research into the acquisition of information structure have indeed identified this as a hurdle for language learners (see for example Benazzo & Andorno, 2010; Jackson, 2018; Verheijen et al., 2013). It may also be the case that learners lack awareness of such IS principles (Callies & Keller, 2008).

A persistent influence of the native language in information structure has been widely observed. The question that comes to mind, then, is, what makes this aspect of language learning so challenging? To take a step in the direction of answering that question, this research aims to investigate if and how people attend to IS elements in their second language, and if implicit learning is sufficient to incorporate those elements into their own language production. This is done by introducing a priming paradigm into a narrative retelling experiment. The following sections will first summarise previous literature on IS and IS in second language acquisition (SLA). The next section will explain what priming is, what conclusions can be drawn from priming experiments, and why it is relevant to introduce a

priming element into the study of information structure. The next sections will explain the methodology and the results of the experiment.

Literature Review

Information Structure

Information Structure is a broad term encompassing a wide range of interlinking features, such as topic and focus, information status, word order, linking, and reference introduction and maintenance. Some of these, such as information status and reference introduction, are more context dependent, whereas others, such as word order, are more grammar dependent. Although grammar varies from language to language, and contexts even vary from conversation to conversation, there are general principles regarding the organization of information in a sentence that are shared between many languages. The following paragraphs will focus on the aspects of information structure relevant to this research.

Word order

Many features of information structure eventually come down to word order. Which information takes first place? What is saved for last? What is the standard word order, and when or why do people deviate from that? Grammar dictates in broad strokes which information should be placed where in a sentence. In English, for example, a so called *SVO-language*, the subject should come before the verb, and an object should be placed after. Other elements are more free to be placed in any sentence position. But variations on the basic word order are also possible, and can indeed be utilised to change the meaning or focus of a sentence, for instance in cleft constructions (e.g. “*It is a man I want.*”) or dislocation (e.g. “*That picture of a frog, where is it?*”) (Biber et al., 1999).

Information status

Besides grammatical categories as subject, verb and object, there are other ways to categorise the information in a sentence and analyse its placement. One such distinction that is relevant to the information structure is the difference between old, or given, information compared to new information. Old information in this dichotomy is information that has been mentioned before in the discourse, or is assumed to be familiar to the hearer. New information are elements that have not yet been introduced in the current discourse or are unfamiliar to the hearer. Across languages there is a preference to place old information before new information. That is because new information often has more *weight*. That is to say, new information is often encoded in longer phrases or are more information heavy compared to older information. Old information has already been established in the hearer’s mind, and can for instance be referred to by a shorter pronoun (Ward & Birner, 2006). Therefore, placing old information first and new information later makes less of a demand on your working memory during sentence processing (Biber et al., 1999).

Topic & focus

Sentence constituents can also be categorised based on their prominence within the sentence or discourse. In other words, their *topic status* or how much *focus* they receive. The topic is

what the sentence is about, the focus is what receives the most emphasis. It is often the case that topic aligns with the grammatical subject, but this does not always need to be the case. The focus of a sentence often goes to the new information. This could be considered the standard topic and focus assignment in English, but not always the desired allocation. Changing the word order, such as when using clefts or dislocation, is a strategy to shift the focus to another element than usual. Adding intensifiers or contrast are other options to achieve this effect.

Linking

Information structure goes beyond word order within sentence level. Another topic of interest is the cohesion between sentences at discourse level. There are many ways to show how one sentence relates to the other sentences in the discourse. From anaphoric references (this, he), to contrast (on the other hand...), or temporal or causal links, to name a few. Also the old-to-new information flow provides structure for cohesion, by placing the old information at the start of the sentence to form a bridge with the previous one. The options to link information are numerous, and languages vary in their preferred strategies to achieve discourse cohesion.

Information structure in L2

Based on this short list alone, it is clear that IS is not a uniform or singular rule that needs to be learned and applied. As such, proficiency of IS principles in a foreign language is also not uniformly acquired. The grammatical word order (e.g. SVO or SOV) is usually acquired early on without much difficulty. The nuances of IS are acquired only at an advanced stage, and even then pose significant challenges for foreign language speakers. The participants in Verheijen et al.'s (2013) longitudinal corpus study, for example, still showed clear signs of L1 transfer in their L2 writing, even after three years of writing instructions. Corpus research is one of the various research methods that have been used to study the acquisition of IS of foreign language speakers. These methods and their findings will be briefly discussed in the following section.

Corpus methods

One way to study L2 proficiency is with corpus research. A corpus is a large collection of naturally occurring language data, of either spoken (transcribed) or written texts. Especially learner corpora, which consist of language samples from language learners, are of interest in this area. The corpus Verheijen and her colleagues (2013) used, for example, was a longitudinal learner's corpus of first to third year Dutch bachelor's students of the program English Language and Culture. It consisted of their written English assignments throughout those years. The researchers then looked at the usage of certain sentence constructions that are typical interferences of Dutch, and English sentence construction typical of a formal written academic register. They compared these results to a corpus of native English students. Although the Dutch students improved their English writing skills, their language use was still not on par with that of the native English speakers by their third year, despite coaching on their English writing skills. Although the corpus was relatively small, similar patterns have been found in other types of studies as well.

Experimental data

Besides corpus studies, which use naturally occurring language, there are also experimental methods that can be used to glimpse the information structural skills of language learners. One such method is for example to use acceptability judgement tasks (Lozano & Callies, 2018). This task asks participants to judge how acceptable a certain sentence construction is. Such ratings can be compared to the ratings of native speakers to measure if these groups have different preferences.

Picture descriptions

Other methods focus on ways to elicit speaker data in which IS features of interest are naturally salient. Picture descriptions are an example of this. Take for example the study described above, where participants were asked to describe an image, such as a painting (Carroll & Lambert, 2003). How they structured their descriptions differed between English/Romance (SVO) and Germanic (V2) speakers. German speakers rely on local anchoring points and link their sentences by moving up, down or sideways from previously mentioned elements in the picture (remember for instance the “Darunter ist ein bar...” underneath.that is a bar, example from before). The position (“where”) comes before the object (“what”) in this sentence structure. This structuring is facilitated by the free first position in the V2 structure. English speakers leaned more towards a global anchoring point, using the picture or the viewer as vantage point, singling out the elements (“what”) on the picture with less of a focus of where they are compared to each other. This is similarly supported by the SVO structure, where the subject (the “what”) is mentioned first (before the verb).

Film descriptions

Another type of method to study aspects of IS in a narrative context is to ask participants to describe a film. Spatial linking is the feature of IS that most prominently features in picture descriptions, which are static images. Films, on the other hand, have a dimension of time, a protagonist, and actions. Such description tasks require the participant to link all these elements and information within a narrative and thus forms an ideal context for studying information selection (which elements of the story are worthy of mention), word order (what gets described first), focus, reference management and temporal linking. The same “where” vs “what” distinction between Romance and English languages compared to Germanic V2 language can be found in film descriptions, extending the “where” category to include “when”.

Dimroth et al. (2010) used a film retelling task and furthermore identified a “Romance” and a “Germanic” way of contrasting information in a narrative. Participants were asked to retell narratives in which entities, time or predicate were either maintained or changed between scenes. The participants were speakers of French, Italian (Romance languages), German and Dutch (Germanic languages). Each of these languages has different linguistic means to express change or continuity within a language. German and Dutch speakers have the possibility to assert a statement using particles (doch/toch, wel). The Romance languages rely on other means to mark contrast or continuity, for example by focussing on a different

parameter. For example, Dutch speakers highlight a change in polarity more often (is it the case, or is it not the case that X) using the particle *wel*, Italian speakers highlight a change in entity more often, using adverbs or cleft constructions. The four languages are comparable in the number of scenes in which they mark a change or continuity, but in which scenes and what manner they express that these languages are shown to differ. These findings provide a clear demonstration of how linguistic parameters influence narrative structure.

Benazzo et al. (2010) studied the extent of L1 transfer on such narrative structures in L2 production using the same stimulus and highly proficient L2 speakers of the same languages as Dimroth et al. (2010) studied. The language pairs consisted of L2 French, with either German or Italian as L1, and L2 Italian, with either French or German as L1. Thus, for each target language they had learners from a Germanic and from a Romance language background. This design allows for an in-depth analysis of how specific L1 features influence L2 production. Comparisons of both types of learner data with the native speaker data from Dimroth et al. (2010) showed patterns of L1 transfer. Where there were multiple options to achieve discourse continuity, the patterns of L2 speakers deviated from both their L1 and their L2 natives. They either use a mix of strategies that are preferred in source or in target language, or under- or overuse certain structures compared to natives. Remarkable about these findings is that, despite the high L2 proficiency and time spent in the target language's country, traces of their L1 still laced their L2 narrative. So while it seems like linguistic parameters are the basis for narrative structure, the habits formed because of the L1 transcend that language itself and persist even when speaking a different language with parameters that would lend themselves better to a different strategy.

Quest

Another set of film retelling experiments have been done with the film *Quest* (Stellmach & Montgomery, 1996). *Quest* is a stop motion film about a sand creature on a quest for water. There is no written or spoken text in this film. The film is an interesting stimulus because there are active environmental forces that pose a threat or challenge to the main character during his search for water (such as stones that move up beneath him or machines that cut his toes off). *Quest* has been described by native speakers of English, Dutch, German, French, Italian, Spanish, and second language speakers of English with either German or French as their first language (for L1 English, French, German, Italian, Spanish, and L2 French-English and L2-German English, see Carroll & Lambert (2003) and Carroll & Lambert (2006) for further details on those L2 pairings; for L1 Dutch and comparisons with L1 English and L1 German, see Starren (2017) and Van Ierland (2010)). The large variety of language backgrounds describing the same stimulus provide excellent opportunities cross-linguistic comparisons about information structural preferences. For example, Von Stutterheim and Carroll (2006) included Arabic participants in their sample (using not *Quest* but other short clips as stimuli) to investigate the role of culture in information structure. The clusters that formed within the languages that were investigated were driven by shared linguistic features rather than shared cultures. English and Arabic speakers used a similar global temporal frame, facilitated by the morphological marker of the progressive aspect that both language share. German, Norwegian and Dutch, who share the V2 constraint and no morphological

progressive aspect, all used similar intrinsic time shifts instead. This led the researchers to conclude that linguistic, and not cultural, parameters are the driving force behind the differences in narrative structures.

The methodology was similar in all cases. Participants were shown the film, and after each scene they were asked to describe “what happened?”. The biggest differences between languages could be found in (a) the temporal perspective taken and the linguistic means of progressing the story forward, and (b) which entities and events are eligible for mentioning and the status they are assigned. The difference in temporal perspective is driven by the presence (or lack thereof) of the progressive aspect, and the mention of boundedness of events and of end points. The differences in the mention of entities are manifested in references to environmental forces, and whether they are referred to as syntactic subject, or a complement or otherwise, and if they are mentioned in a main clause, subordinate clause, or passive construction (or not at all). This study will use the same film in order to facilitate comparisons with prior research. The L1 English, L1 Dutch, and L1 German-L2 English data (because of the demonstrable similarities between Dutch and German) are the most relevant to the present study and will take the spotlight in the following summary.

The Role of the Progressive Aspect in Temporal Sequencing

The progressive aspect plays a key role in the information structure of English narratives. The English language has a morphological way of encoding ongoingness onto a verb, by using the structure *to be verb-ing*. English differs in this way from German and Dutch. German has no grammaticalized way of expressing a verb is ongoing. Dutch does have ways to mark a progressive aspect (e.g. *aan het (V-inf) zijn*, literally “at the (verb) be”, ‘; *zitten te (V-inf)*, (‘to sit to (V-inf)’), but in contrast to English, “[t]he Dutch periphrastic progressive constructions cannot be used in the same contexts as the English progressive, and are *never* obligatory” (Starren, 2017). For English speakers the contrast between a simple form (e.g. *hears*) and a progressive form (e.g. *is looking*) is meaningful in a way that cannot be achieved in Dutch. An event coded in the simple form is explicitly not ongoing, and can thus be interpreted as having been completed by the time the next simple tense form is used. For instance in Example 1, “events (03) (*hears*) and (04) (*gets excited*) can be regarded as happening while the protagonist is looking around, his hearing the thunder and getting excited take place in succession.” (Carroll & Lambert, 2006). Because the use of the progressive in Dutch is optional, such inferences cannot be made. Dutch speakers must resort to different means to emphasise which events take place simultaneously and which take place in succession. It is therefore similar to German, which has no way of marking a verb as ongoing (see Table 1 for occurrences of the progressive aspect in Quest narrations).

- 01 he’s looking around (it is now the case)
- 02 and there is nothing but sand dunes everywhere
- 03 and he hears the sound of thunder
- 04 and he gets excited
- 05 a rain storm is going to start

Example 1, (Carroll & Lambert, 2006)

The progressive aspect thus enables a global perspective in English narratives where events are presented as ongoing and unbounded. English speakers commonly frame a narrative event with “*now you see*” or similar phrases. The *temporal anchor* is set *extrinsic* of the narrative itself (i.e. the viewer or hearer). The succession of events in this frame is dependent on the viewer (and by extension, the pacing of the film), and not the events happening within the narrative. It is not necessary for the events to have reached a state of completion. Dutch and German speakers use a different temporal perspective. They do not (cannot) use the distinction between simple aspect and progressive aspect to signal which events happen in succession. They use adverbials instead. Using the free first position provided by the V2 structure, they link the narrative events with an *and then...*, *and then...* sentence structure. The temporal anchor is *intrinsic*, as events are organised based on what happened prior in the narrative. Events are bounded and lead to an endpoint, before the next event is described (see Table 2).

Language	Progressive
L1 Eng ^a	17.50%
L1 Eng (scenes 1-3) ^b	21%
L1 Dutch ^a	0.58%
L1 German ^a	0%
L2 German-English ^a	26%

Table 1. Percentage of utterances with a progressive aspect. A) from (Starren, 2017), B) from (Carroll & Lambert, 2006).

Language	End points/bounded	Unbounded
L1 Eng ^b	27.4%	44.7%
L1 Dutch ^a	41.6%	
L1 German ^b	51.4%	20.2%
L2 German-English ^b	34.4%	33.9%

Table 2. Percentage of utterances with end points or bounded events, and unbounded events. A) from (Starren, 2017), B) from (Carroll & Lambert, 2006).

The role of the subject in deciding what to say

Another difference was found in the domain of entities. *Quest* has a single protagonist and a number of antagonistic environmental forces, such as the wind, moving rocks, and machines. The manner in which these entities are referred to is interesting because it differs between languages. In German and Dutch it are the actions of the protagonist that drive the story forward. It is therefore the protagonist who is preferred to be mapped onto the subject. In English it is not just the protagonist who is mentioned as subject. The environmental forces also take on the role of subject. Furthermore, they are more likely to be mentioned at all, compared to German and Dutch narratives (see Table 3). The number of utterances that mentioned an inanimate entity in a dynamic role (states were left out of the analyses) even varied with a significant difference, when comparing Dutch and German with the languages

English, French and Spanish (L1 German 24.5% and L1 Dutch 23.6%, English 34.5%, t-test English-German $p=0.006$ (Carroll et al., 2004; Carroll & Lambert, 2003).

Environmental force as subject	Main clause	Sub clause
L1 Eng^a	29.9%	24.1% (and ACI)
L1 Eng (scenes 1-3)^c	26.0%	2.5%
L1 Dutch^a	20.8%	26.4%
L1 German^a	12.7%	12.3%
L2 German-English^c	24.3%	29.0%

Table 3. Percentage of utterances with an environmental force as syntactic subject. A) from (Starren, 2017), C) from (Carroll & Lambert, 2003).

Priming

Structural priming is a phenomenon where a person is more likely to use a certain structure after having been exposed (i.e. “primed”) to that stimulus in prior discourse. For example, a person who hears the phrase *Lisa passes the ball to Mick*, will be more likely to produce a follow up sentence with a similar prepositional phrase (PO structure) such as *Mick gives a compliment to Lisa*, instead of its structural alternative using a direct object (DO structure) construction such as *Mick gives Lisa a compliment* (Kootstra & Doedens, 2016). In experimental settings such repetitions are studied in terms of prime and target pairs, where the exposure stimulus is called the prime, and the participant response is called the target. Priming experiments are popular within the field of psycholinguistics because they shed light on the connections between the different parts of the brain that deal with language processing and production.

Earlier priming experiments established the robustness of priming effects in areas such as word recognition and language comprehension (see, for example, Kidd et al., 2015; Van Gompel & Arai, 2018). Within the field of bilingualism priming effects are held as evidence to argue for a shared lexicon for both of the bilingual’s languages. For example, if a Dutch-English bilingual reads the word “table” faster after having seen the Dutch equivalent “tafel”, it hints at a strong mental connection between “table” and “tafel”, where hearing one word also activates the other, despite each belonging to a different language. There are multiple factors that contribute to or modulate such a priming effect. There are cognitive mechanisms that trigger such repetitions, but also social factors play a role in why speakers mimic each other’s language (e.g. Chun & Kaan, 2022), as well as individual differences (e.g. Kidd, 2012). Lastly, linguistic properties such as complexity of a structure or the frequency of its use could also influence to what extent it is susceptible to priming (Kootstra & Doedens, 2016).

Residual activation

The neuroscience behind priming is generally explained in terms of neural activation (Dijkstra & van Heuven, 2002). Linguistic input (auditory or visual) activates a whole network of associations within the brain. For example, the visual input *table* will likely activate the

conceptual meaning of table (perhaps even both as a surface to dine at, and as a grid to organise data in), but also the pronunciation of table, semantically related words such as *chair*, orthographically related words such as *cable*, and in the case of a Dutch-English bilingual for instance, it would also activate the Dutch translation equivalent *tafel*. Because this whole network of neurons has now been activated, they are more easily reactivated in subsequent discourse because of residual activation of the chemicals in the brain. In case of structural priming, the input activates combinatorial nodes: abstract representations of how elements can be linked (Hartsuiker & Berolet, 2017). In the example above, *Lisa passes the ball to Mick*, the structure might be represented as [verb] + [noun phrase] + to + [noun phrase]. The explanation of residual activation works well for short-term priming – priming effects that occur within a few seconds or sentences of the target – but cannot (fully) account for long-term priming, which is when priming effects are still measured in a post-test at the end of the experiment, or in a delayed post-test a day, or even a week after the initial experiment. Long-term priming is perhaps better understood as a form of implicit learning. This interpretation is supported by the inverse frequency effect that is observed in various priming studies (Jackson, 2018). An inverse frequency effect occurs when a lesser used feature (e.g. grammatical structure) shows greater priming effects than a more frequently occurring alternative feature. This makes sense as a form of input based learning. The less common feature is more salient in the input because it is more rare, which results in stronger priming effects.

Priming effects have been found in a wide variety of contexts, ranging from word recognition, semantic relatedness, to syntactic choices, and even non-linguistic domains such as story formats (Gerstenberg, 2019) or spatial awareness (Smith et al., 2011). Priming effects have also been demonstrated with features that are central to IS.

Priming IS

Jackson and Ruf (2017) measured priming effects of V2 word order variations with learners of German with an SVO language (English) as their L1. Participants were primed with adverb-verb-subject compared to subject-verb-adverb phrases, where the adverb was either a temporal adverb or a locative adverb. The results showed that participants were sensitive to these different structures and showed short term priming effects for both. However, participants only produced constructions with a temporal adverb in first position in the baseline, pre-priming condition. They did not produce utterances with locative adverbials in first position. The priming effects of the locative phrases did not prevail in the post-test, indicating that long term priming is modulated by how solidified structures are in the language learner's repertoire.

A similar conclusion was reached by Gerwien & Flecken (2015). They studied priming effects of the progressive aspect in native Dutch and proficient L2 German-Dutch speakers. As explained above, the Dutch progressive is formed with the prepositional phrase *aan het (at the) + an infinitive*. German has no aspectual marker of the progressive. The Dutch participants showed a priming effect for the progressive form, compared to a neutral form. The German participants produced a similar amount of progressive phrases over the course of

the experiment overall, but unlike the Dutch participants, they did not show an increase in progressive phrases after a progressive prime sentence. In other words, while the German speakers of Dutch do know and can use this structure, they show no priming effects even though native Dutch speaker do. Instead, the German participants were more sensitive to prime sentences containing other uses of the *aan het* construction (e.g. in locative or dative constructions) while the Dutch participants were not. The authors argue that in native Dutch speakers the concept, or meaning, of the progressive is activated and therefore primed, whereas the German learners rely more on form than on meaning. In fact, Hartsuiker and Bernolet (2017) have proposed a model for the development of L2 syntactic structure in line with these observations. They describe in their model that syntactic constructions are first lexically based (i.e. *this* word appears in *this* particular structure), and gradually become more abstract and shared between lexical items, and eventually between languages. Thus, abstract combinatorial nodes that can be primed within or between languages might not yet have been developed in less proficient learners, in which case they have to rely more on the form of a prime than on the abstract structure behind it.

Research Question and Predictions

Considering the robustness of priming effects in a wide range of contexts and studies, it stands to reason that (at least) certain aspects pertaining to IS would similarly be susceptible to priming effects. Yet the stubbornness with which L2 speakers cling to their native IS suggests that perhaps mere exposure to a certain information structure in discourse is not sufficient to adapt that structure into one's own language production. Take for example the participants of Benazzo et al. (2010) who were highly proficient L2 speakers of whom at least 70% had been living in their target country for a minimum of 4 years. Despite their exposure to native speakers, they still showed an influence from their native language. The influence of exposure on IS acquisition, however, has not yet been systematically studied. Can information structure be learned through implicit means alone? What is the role of priming in implicit learning of IS? Are there even combinatorial nodes for how sentences will be linked at a discourse level that can be primed? Are those language specific, or shared between languages? This experiment aims to explore some of those questions by investigating what the effect is of priming L2 IS features during a film retelling task. The main question this paper seeks to answer is the following: can participants be primed to use the grammatical and structural features that are characteristic of the information structure of their L2?

The focus will be on native Dutch participants with English as their L2. The characteristics of English information structure compared to Dutch information structure are, as explained above, the use of the progressive aspect to describe unbounded events, the use of inanimate forces in subject position, and less adverbials in clause initial position. These three features, while not the only features that are characteristic of English information structure, were selected to get a diverse spread of structures that capture the Dutch-English IS challenges specifically, while keeping the scope limited. The sentence initial position concerns the word order dimension of IS, and is specifically distinct between Dutch (as a V2 language) and English (as a SVO language), creating a hurdle for language learners. The progressive form concerns a more grammatical dimension of IS, because it requires language learners to

correctly differentiate between the uses of the present simple and the present continuous, and the role they play in framing narrative events. The encoding of the subject, on the other hand, is a more semantically and pragmatically related aspect of IS as it concerns topic and focus assignment within the narrative. Together, these three features represent both the variety of information structural principles and the challenges that Dutch speakers face as second language learners of English.

Considering the precedent for priming effects by Dutch participants for the concept of the progressive (Gerwien & Flecken, 2015), and for variations in sentence initial word order in an L2 that varies in the SVO compared to V2 word order (Jackson & Ruf, 2017), it can be expected that also in a narrative context, these structures would show (short-term) priming effects. That is to say, if Dutch participants are exposed to an “English style” narrative containing ample examples of these features, shortly before having to construct a narrative in English themselves, they would be expected to:

- Use more inanimate subjects in favour of the protagonist as subject
- Start less utterances with “then” or other adverbials in the first position
- Use more progressive verb forms

The occurrence of these structures will be compared to a baseline condition: the narration of the first scene before they are exposed to the confederate’s narrative. Furthermore, the repeated exposure to these structures throughout the experiment should lead to cumulative priming effects, so the effects can be expected to be stronger in the later scenes compared to the earlier scenes.

Method

The experiment combines a film retelling task with a confederate scripting paradigm. Similar to the other film retelling studies, participants watched scenes from a film and were afterwards asked to describe “what happened”. New to this experiment is that the retelling task was framed as a dialogue, where participants were asked to describe what happened to another “participant” in another room. The other “participant” was in reality a recording of a confederate reading a script when it was the confederate’s turn to describe a scene to the participant.

Participants

The participants are 22 native speakers of Dutch (18 women, 4 male). The participants were rewarded with either course credit or a gift card. Their ages ranged from 18 to 69, but 86% was between 18 and 28 years old (mean 21, SD 2,7). The other participants were aged above 50. Their English (L2) proficiency ranged from (high) intermediate to high. The average of the self-ratings of their reading, listening, writing and speaking proficiencies is 7,45 on a scale from 1-10 (ranging 6,25-10), with the average speaking proficiency only slightly lower (see Table 4). Four participants rated their German proficiency or usage on par with their English proficiency, but for no participant was there reason to believe English was not their L2.

Participants	Mean (SD)	Range
Age	27 (16,0)	18-69
Proficiency average (1-10)	7,45 (0,9)	6,25-10
Proficiency speaking (1-10)	6,9 (1,1)	5-10
Proportion of Use (in %, compared to other languages spoken)	23,3% (13)	1-45
Frequency of Use (on scale from 0-5, never to always)	2,11 (0,99)	0,62-4,75

Table 4. Participant characteristics: age, English proficiency and English language use

Materials

The silent stop motion film *Quest* served as the stimulus. The film is about a sand creature who passes through different worlds on a search for water. Each world constitutes a separate scene, starting with a world filled with sand (scene 1), followed by a plane of paper (scene 2), a world of stone (scene 3), and one filled with machines where the creature is first above a surface of metal plates (scene 4) and later beneath the plates amidst the machinery (scene 5). The entire film is 11 minutes long, with each scene taking between 1,5 to 2,5 minutes. Scenes 2 to 5 were split in the middle, the first half of each scene was described by the confederate, the second half was shown to the participant. The first scene was used as a baseline condition which the participant described without having heard any prior discourse. The confederate was a 26 year old native Dutch man with high fluency in English. He watched the film and had time to familiarise himself with the script before the audio of him recounting the script was recorded in a sound proof booth. The same sound proof booths were used during the experiment. The confederate was not present during the experiment itself.

The script that the confederate used was based on the English information structure as identified by Carroll & Lambert (2003) and a transcription of one of their native English participants. The focus was on the use of the progressive and inanimate subjects, these features were exaggerated in the script. The script contained a total of 71 utterances, divided across 4 scenes (paper 11, rock 18, metal 25 and machines 17). Utterances were defined according to the same definition as Van Ierland (2010) used, “[a]n utterance as a rule contained only one finite verb”. Utterances with a verb in the progressive aspect appeared in 27 (38%) of the confederate’s utterances. Utterances with a verb in simple present that moved the plot forward, as opposed to describing a state of being, made up 42% of the utterances. The protagonist was the syntactic subject in 28 (39%) of the utterances, and inanimate objects also starred as the syntactic subject in 28 (39%) of the utterances. None of the utterances contained the word *then*, although the linking words *and*, *so* and *but* did appear. The full script can be found in appendix A. This experimental set up has more freedom in word choice than most (syntactic) priming paradigms, but since prime and target pertained to the same scenes within the same story, it can be considered a priming condition with lexical overlap. A meta-analysis of syntactic priming studies (Mahowald et al., 2016) recommends for studies with lexical overlap at least 24 items for 16 participants to reach a minimum of 80% statistical power. With 22 participants and at least 24 items (utterances) for each variable of interest

(progressive and inanimate subject), this experiment should have nearly 97% chance of measuring reliable priming effects.

The experiment was run using the free software Open Sesame (Mathôt et al., 2012). A plug-in automatically turned the microphone on when it was time for the participants to describe a scene. The microphone was turned off again when the participants pressed space to continue to the next step. During the time that the confederate (supposedly) watched their half of the scene, a question appeared on the participant's screen to keep their attention on the experiment. The questions were open ended and inquired about their opinions of the movie, such as if they like the movie, if they understand it, or what they think the focus of this experiment is. The answers were written on a separate piece of paper. They were scanned through for any glaring misunderstandings that could impact the results, but were otherwise not used for the analyses. After the experiment participants were handed a short questionnaire to measure their language proficiencies and use, based on questions from the LEAP-Q (Marian et al., 2007) and LH-Q3 (Li et al., 2020) language background questionnaires.

Procedure

Participants were led into a soundproof computer booth and given an information document and consent form. The information document described the general research area (differences in storytelling between languages), but no details about which linguistic features or the alignment/priming aspect of the experiment. While the participants read these documents the researcher pretended to check in with the "other participant" who was supposedly already in the second booth further into the room. After collecting the documents from both booths the researcher gave the start sign. Participants first saw the whole film once, without having to describe anything yet. The "interactive" part of the experiment started after. The participants saw the first scene. The screen changed the moment the scene ended to a black screen with in white the text "Please describe what happened" and a red circle to indicate the microphone was now turned on. When they were done narrating they had to press space to continue. This also switched off the microphone again. The other participant supposedly watched the next part of the movie. During this time a question appeared on the participant's screen, which they could answer on a sheet of paper. A countdown appeared five seconds before the clip would end, followed by a noise to alert the participant that the other person would start their description (i.e., the recording of the confederate was being played). Once the other person stopped narrating, the participant had to press space again to start the next clip of the film. This repeated for all five scenes. The researcher then handed out the language proficiency questionnaire on a sheet of paper for the participant to fill out. Finally the researcher debriefed the participants about the true focus of the experiment and that the other participant was in fact a recording of a confederate.

Transcription and Coding

All participant recordings were transcribed using an online transcription software (Kisler et al., 2017) and were corrected manually. The narratives were split up into utterances using the above mentioned definition of an utterance. Each phrase or clause with its own finite verb was counted as a separate utterance. Each utterance was coded for (a) what or who was the

syntactic subject, (b) what was in the first position of the utterance, and (c) were there any progressives used in this utterance. The syntactic subject was coded as the protagonist (“the sandman is...”), an inanimate object or force (“the wet paper rips...”), or other. The latter category included existential expressions (“there is...”), deictic references to people outside the narrative (“I think...”, “you see”), mentions to the film or “frame” of the film (“the clip started...”). Utterances in which the subject was omitted were coded as if there had been a subject. The first position was categorised as either a syntactic subject, the adverb “then”, other adverbials indicating time or place, or other (e.g. “apparently”, “surprise surprise...”). Linking words such as “and”, “but”, “because”, and “so”, were skipped in determining what came in the first position of the utterance. All verb+ing forms were counted and categorised as either a finite progressive form (“he is walking...”), an inchoative form (“he starts digging..”) or an ACI construction (“sees some water dripping...”).

Results

General properties

The participants narrated the film with an average of 80 (SD 24,4) utterances total and 16 (SD 6,4) per scene, using on average 555 (SD 184,9) words total and 113 (SD 48,0) words per scene. The mean length of utterance (MLU) is 6,5 (SD 1,36). There was great variation between participants, with the shortest narrative spanning only 40 utterances, and the longest a total of 135. Due to technical difficulties there is one recording of the first scene and one recording of the fourth scene missing, from two different participants. The missing scene caused one participant to have an even shorter narrative, consisting of only 29 utterances describing four scenes.

A direct comparison to the L1 English and L1 Dutch speakers (reported on in Van Ierland (2010) is not possible because of the differences in methodology. The dialogue-like set up in the current study, compared to the monologue set up of the previous studies, means that the length of film that the narratives describe is different. Van Ierland (2010) reported that the participants watched about 7 minutes of the film. In the present experiment, the participants watched in total approximately 6 minutes of film. The general outcomes of both this study and those of previous studies can be found in Table 5.

Language	N	mean Utt (SD)	mean words (SD)	MLU (SD)
L2 English	22	80 (24)	555 (185)	6,53 (1,36)
L1 Dutch	19	70 (25)	362 (121)	5,27 (0,61)
L1 English	20	189 (74)	1145 (424)	6,12 (0,54)
Confederate	1	71	506	7,13

Table 5. The means and standard deviations of the number of utterances, number of words, and the mean length of utterance.

Despite the difference in length of the narratives, the results of this study come a lot closer to the L1 Dutch speakers than the L1 English speakers. It seems to be the case that the participants used a level of depth and detail more comparable to their native language than to

the target language. The length of the participants' narratives did match the length of the confederate's narratives ($p > .05$ for both the number of utterances and the number of words). The participants' narratives varied in length, so the number of occurrences of each feature within a scene was counted and divided by the total number of utterances in that scene to obtain a percentage that could be compared between participants. The features of interest that were counted were the subject (the protagonist or inanimate), the first position (subject or "then"), and the use of the progressive. Across the whole sample the protagonist was the subject in 66% of the utterances, and inanimate forces 19% of the utterances. 76% of the utterances started with a subject, 14% with the temporal adverbial "then". Progressives were used in 22% of the utterances, with 15% (of the total utterances, that is 66% of all progressive forms) finite progressive forms, and 5% inchoatives. The distribution of these features across all scenes is listed in Table 6. These percentage values were subsequently divided into two categories: the baseline condition (scene 1), and the primed condition (mean of the percentages of scenes 2 to 5). A paired samples T-test was used to compare the two conditions. The results of this test, presented in Table 7, suggest there is insufficient evidence to presume any priming of these information structural features took place. There is no significant difference with regards to what is placed in the first position of the utterance (subject in first position: $p = .459$, "then" in first position: $p = .185$), nor was there a significant change in the use of progressive forms (finite progressive forms: $p = .284$, inchoative forms: $p = .153$). There was a significant difference regarding who or what is encoded as the subject. However, contrary to the hypotheses, both inanimate forces ($p = .007$) as well as the protagonist ($p < .001$) occurred more frequently in subject position in later scenes compared to the first, so these results warrant a closer look. The following sections will go more in depth into each of the three features.

Mean % (SD)	N	Subject		First position		Progressive	
		Protagonist	Inanimate	Subject	Then	Finite	Inchoative
Scene 1	21	58 (11,8)	13 (10,8)	76 (11,2)	17 (11,3)	15 (15,6)	6 (6,3)
Scene 2	22	66 (12,8)	23 (11,0)	77 (12,3)	16 (12,2)	18 (16,7)	6 (6,3)
Scene 3	22	78 (13,6)	15 (9,7)	72 (12,7)	16 (10,3)	13 (17,7)	5 (7,3)
Scene 4	21	68 (14,3)	20 (11,8)	76 (10,7)	15 (16,7)	14 (10,5)	2 (3,8)
Scene 5	22	67 (8,6)	21 (7,2)	78 (10,6)	10 (6,2)	19 (14,8)	5 (7,5)
Scenes 2-5	21	70 (8,2)	20 (5,0)	76 (8,4)	15 (7,5)	16 (11,4)	5 (5,0)

Table 6. The mean percentages of utterances that have the protagonist or inanimate force as subject, a subject or "then" in first position, or contain a finite or inchoative progressive, for each individual scene and the average of the primed scenes 2-5.

Significance of Comparisons of Baseline and Primed Conditions					
Protagonist as subject	Inanimate force as subject	Subject in first position	Then in first position	Finite progressive	Inchoative progressive
$p < .001$	$p = .007$	$p = .459$	$p = .185$	$p = .284$	$p = .153$

Table 7. Paired Samples Test comparing baseline (scene 1) to primed (scenes 2-5) narratives.

Subject

The expectation for the encoding of the subject was that after the prime, participants would use more inanimate forces as subject (e.g. “paper starts flying into his face”), leading to a decrease in utterances starring the protagonist in subject position (e.g. “the sandman walks over the paper”). A comparison of means showed, however, that both inanimate forces and the protagonist appear more often in subject position after the first scene. In other words, it is the third rest category that is used more often in the first scene and less in the later scenes. It is likely that the type of subjects from the rest category, which includes subjects such as “there is”, personal pronouns, or references to the movie itself rather than the entities within, were used to set the scene and introduce the entities at the start of the narrative (scene 1), and were subsequently used less in the continuation of the narrative once the entities were already known (scenes 2-5). Compare for example the first utterances of participant 3 in scene 1 (1a-b) with the start of scene 2 (2a). The sandman is introduced with an existential there in the first scene, and in subsequent utterances referred to as “he”, but participant 3 deems it no longer necessary to (re)introduce or explain this reference at the start of the next scene, and continues referring to the sandman exclusively with *he* or *his*. This makes the use of the existential “there is” to refer to the sandman unique to scene 1 for reasons other than the priming aspect. If this is the case for more participants, the observed increases are due to the difference in the positions of the scenes within the narrative, and not because of the priming that took place after the first scene.

- 1a there’s a sand man in a desert
 1b he’s lying down on his belly
 2a he walks around
 (Participant 3, scene 1 and 2)

To bypass this stimulus effect, the comparisons were done again while counting only the utterances that had either the protagonist or an inanimate force as subject (see Table 8). Although the number of times that an inanimate force takes subject position compared to the protagonist does increase after being primed (from 17% of the subsection of utterances featuring an inanimate subject compared to 83% featuring the protagonist, to 22% featuring an inanimate force versus 78% featuring the protagonist), this difference is likely still not meaningful ($p=.091$).

Inanimate Subject	N	mean	St dev
Scene 1	21	17,15	14,30
Scenes 2-5	21	21,92	5,94

Table 8. The proportion of utterances with an inanimate subject out of the subsection of utterances that feature either an inanimate force or the protagonist as subject.

Proficiency

To see if English proficiency plays a roll in the strength of the priming effect, the participants were divided into a lower proficiency and a higher proficiency group. The lower proficiency

group included everyone who rated their speak proficiency with a 6 or lower (n=6 for scene 1, n=7 for scenes 2-5), with high proficiency being defined as 7 or higher (n=15). Levene's test for equality of variances showed that equal variances between the two groups can be assumed. The two groups did not differ in the encoding of the subject ($p > .290$).

First Position

It is common in Dutch narratives to start a phrase with a linking word, such as “then”. The English word order, on the contrary, prefers a subject in the first position. One of the research questions therefore was whether the participants would continue to link their utterances with “then”, as is expected in Dutch, even if the word was not used at all in the prime narrative. Analyses of the utterance initial constituents in the first scene compared to the primed scenes revealed virtually no difference between the two. The percentage of utterances that started with the subject stayed stable at 75% on average and a within participants comparison also revealed no change ($p = .459$). The use of “then” in first position diminished only slightly from 16,5% in the first to 14,5% on average in the primed scenes, but this change is also not significant ($p = .185$).

Proficiency

The two proficiency groups do seem to differ in their sentence initial word order. Their use of “then” was comparable to each other (16% of the utterances for the higher proficiency group, 18% for the lower proficiency group, $p = .331$), but the lower proficiency group tended to use more other non-subject constituents in the baseline condition (see for examples 3 a and c), whereas the higher proficiency group started more often with the subject in first position (e.g. 3 b and e). This meant that the higher proficiency group started with the subject in 79% of the utterances, and the lower proficiency group in only 68% ($p = .029$). This difference between the two groups disappears in the later scenes ($p = .406$), mostly due to an increase in the use of subject in the lower proficiency group (from 68% to 74%). However, a paired samples T-test of the lower proficiency group's baseline versus primed scenes yielded no significant results, so this is more likely due to natural variation rather than a priming effect. The use of “then” in first position diverges more in the primed scenes, leading to a near significant results between the two proficiency groups ($p = .069$), this time mostly due to a decrease in the use of “then” in first position in the high proficiency group. But this change in the baseline compared to the primed scenes is also not significant (see Table 9). So, while there are some differences between the groups, there are no changes within the groups that could have been indicative of a priming effect.

- 3a at first, you saw some text and then a desert with a blue sky
 3b and the image's moving to the right
 3c and eventually you see some sort of rock and a bottle sticking out of the sand,
 3d and then the image zooms in on the rock and the bottle,
 3e and the rock starts moving.
 (Participant 8, scene 1)

First position	Scene 1	Scenes 2-5	Paired Samples Test
Lower proficiency			
Subject	68%	74%	p=.122
Then	18%	18%	p=.494
Higher proficiency			
Subject	79%	76%	p=.162
Then	16%	13%	p=.127
Independent Samples Test			
Subject	p=.029	p=.406	
Then	p=.331	p=.069	

Table 9. Comparisons of what comes in first position for both pre and post priming and between the lower and higher proficiency groups.

Progressive

There is much variation between participants in how they used -ing forms in their narratives. The majority of -ing forms were finite verbs, but some of them appeared in ACI constructions (12% of all -ing forms). These *Accusativus cum Infinitivo* (ACI) constructions are subordinate clauses where the “subject” appears in the accusative case and the verb as an infinitive, or in English, as an -ing form (e.g. “he sees some water dripping”). A first glance at the data also suggested that progressive forms were often used as inchoatives, so to describe the instigation of an action with a conjugation of “to start” + progressive aspect (e.g. “he starts looking around”). These forms made up 22% of all -ing forms. Because these inchoatives describe the beginning of an action, rather than describing the middle of an *unbounded* action, inchoative progressive forms were coded separately from other finite progressive forms. The ACI constructions were so infrequent (46 occurrences in total, which is 2,5% of all utterances) that they were left out of further analysis.

A finite progressive form (i.e. excluding those paired with “to start”) was used on average in 15,0% of the utterances in the first scene, and 16,4% in the primed scenes. A paired samples T-test reveals that this increase is not significant. For the inchoative forms the average was 5,9% for the first scene, and 4,6% for the primed scenes. This difference was also not significant. The lower and higher proficiency groups also did not differ in their use of the progressive forms.

Baseline progressive preferences

The progressive aspect is not obligatory in Dutch, but in English there are contexts where not using a progressive form is grammatically incorrect. Mastering this form and being able to autonomously use it in narratives could thus be seen as a marker of English proficiency. Previous priming studies predicted that the degree to which participants have mastered a certain structure can modulate priming effects. Only people who already used the target structure in a baseline condition showed significant short term priming effects (McDonough,

2006). For this reason, the participants were also divided into two groups based on whether they already used a finite progressive form in the first scene (baseline) or not ($n=6$ for those who did not use a finite progressive, henceforth referred to as the non-group, and $n=15$ for the group who did, the prog-group). Although the group sizes are identical to the high-low proficiency groups, the composition of the groups was not identical.

The selection criterium for the non-group was that they used no finite progressive forms in the first scene. The prog-group used in the first scene a finite progressive form on average in 21,0% of the utterances (SD14,6). In the primed scenes this increased to 9,4% (SD 4,4) for the non-group and stayed almost the same for the prog group at 19,2% (SD 12,3). A between-groups comparison using an independent samples T-test showed that these groups still differed significantly in their use of the finite progressive in the primed scenes ($p=.039$). What stands out when dividing the participants this way is the use of inchoatives. Although the prog-group used more instances of the finite progressive, they used the inchoative progressives less often than the non-group. The prog-group used inchoative progressives in only 4,6% (SD 5,6) of the utterances of scene 1, whereas the non-group used them 9,2% (SD 7,4), (independent samples T-test: sig. $p=.068$). In the primed scenes this difference persists (3,0%, SD 4,1 for the prog-group, 8,3% with SD 5,5 for the non-group, sig. $p=.013$). A breakdown of inchoative use per scene shows an interesting pattern (see Figure 1). The use of inchoatives is consistently low for the group who used finite progressives from the start, but the average of the non-group increases for both finite and inchoative progressives after the first prime (in scene 2). After that the use of inchoatives decreases while the use of finite progressives continues to increase with further priming. These patterns suggest that the inchoative progressive is an easier form to use for less proficient speakers of English, where it functions as a bridge between the Dutch bounded information structure and the English continuous information structure.

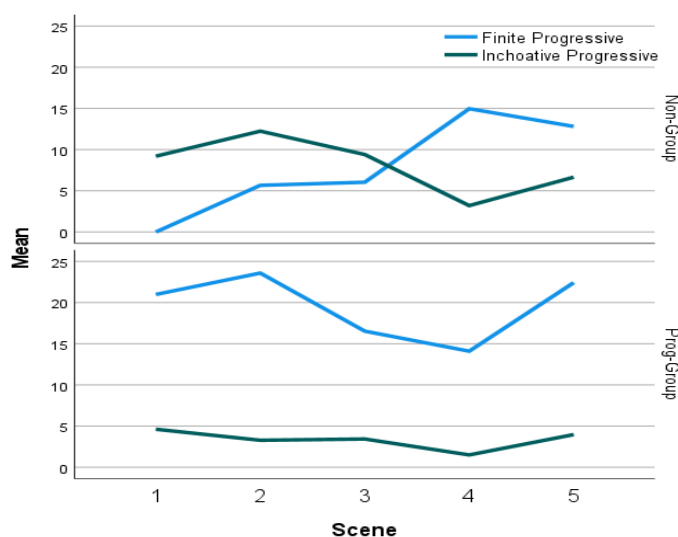


Figure 1. The means of the percentage of utterances that contain finite and inchoative progressives, for both the non-group (top) and the prog-group (bottom).

Discussion

The expectations for the results of this study were that the participants would use more inanimate subjects, less clause initial adverbials, and more progressive forms after being primed with a narrative containing many examples of these features. These characteristics were also expected to show up more in the later scenes of the narrative as a result of cumulative priming. And although the raw data does indeed show that the trend for each of these seemed to be going in the predicted direction, the difference between the baseline and the primed condition was minimal and only in rare instances significant. There is too little evidence to attribute these variations to a robust priming effect. The use of these characteristics did also not show a steady increase (for inanimate subjects and progressives) or decrease (for the use of clause initial “then”) from the beginning to the end of the narrative. Instead, the occurrence of these features fluctuated within scenes and also varied between participants.

Priming of Form

Inanimate forces were indeed used more often as the subject of an utterance in the primed scenes compared to the baseline scene, but because the difference was not statistically significant, it is hard to conclude whether this would be best explained as a result of hearing the prime narrative, the differences in the contents of the scene, or something else entirely. There are hints that there is some extent priming of the progressive verb form. However, an analysis of the use of the inchoative progressive (e.g. “starts doing”) suggests that it is likely a priming of form (i.e. verb + ing), instead of a priming of the concept of an unbounded, ongoing action (the conceptualisation of the progressive). This seemed to be especially the case for the group of participants who had themselves not used the finite progressive form in the baseline. The use of the inchoative progressive forms increased first after priming for this group, followed by an increase in finite progressive forms. The inchoative progressive forms (e.g. “starts digging”) use the same structure as finite progressive forms (verb + -ing form), but don’t share the same conceptualisation as the (normal) progressive aspect does in English narratives (e.g. “is walking”). In English narratives, the progressive is used to describe the middle of ongoing unbounded events and can be used to sequence a series of successive events without defining their start and end point. The inchoative form, on the other hand, per definition defines the beginning of an event, and in doing so assigns a boundary to the event. The rise in inchoatives thus suggests that if priming took place, it was only the -ing form that was primed, and not the temporal frame of successive unbounded events. The number of utterances which started with “then”, which remained nearly identical pre and post priming, further supports the conclusion that the participants held onto their native Dutch temporal framing style of moving from one bounded event to the next.

Implicit Learning

If Jackson and Ruf (2017) were able to measure priming effects of sentence initial word order with intermediate L2 speakers, and Gerwien and Flecken (2015) measured priming effects of the concept of the progressive in native Dutch participants, then what is the reason that no priming effects were measured in this experiment? To return to Hartsuiker and Bernolet’s (2017) model of the formation of L2 syntactic structure, syntactic priming is actualised, at

least in part, by the activation of abstract combinatorial nodes. Syntactic structures start as lexical representations, but as the language proficiency increases, the representations become increasingly generalised between and across lexical items, and eventually between and across languages. The lack of priming of the English information structures could be an indication that there are no generalised mental representations for these English structures present (yet). If priming does indeed have little effect on the structures of information selection and discourse cohesion, like these findings suggest, these results are in line with the earlier observed persistence of L1 transfer in the domain of IS. Priming plays an important factor in implicit learning mechanisms. It helps to solidify those structures in the brain, especially when the speaker uses the primed structure in their own production, which leads to long lasting learning effects. If these information structures are not primed and reproduced, it will indeed hinder the acquisition of these language principles. These results seem to run counter to the idea that more complex structures are best learned via implicit methods, as summarised by Ellis (2011): “When the material to be learned is more randomly structured with a large number of variables and when the important relationships are not obvious, then explicit instructions only interfere and an implicit mode of learning is more effective.” (p. 38). Information structure fits that description to the T. And yet one of the important mechanisms underlying implicit learning seem to be only marginally effective in bringing these IS patterns from language input into language production. To know the reason(s) why IS show only marginal priming effects more research needs to be done. This study alone is not enough to investigate the full scope of the complex network of processes involved in L2 language structuring. Follow up studies that focus on different aspects of IS, as well as different languages and proficiency levels of the participants would paint a much clearer picture on how information structure is attended to, acquired and stored in the brain.

Notes on the Methodology

This experiment employed a novel experimental set up in order to study priming effects within a narrative context. The methodology this study used diverged from the set up that many priming studies have used before. There are merits to this method, but there is also room for improvement. A common set up for past priming studies is a task with stimuli that are likely to elicit a single sentence containing the study’s target structure. This set up allows for a strong focus on the structure of interest (modulated by filler sentences) and a precise level of control over the time between the prime and target sentences. A downside to this procedure is that it is far removed from natural language production and often utilises decontextualised sentences. Because information structure concerns not just structures within a sentence, but also the link between sentences and the narrative as a whole, it is simply impossible to study it sufficiently with individual, decontextualised sentences. That is why the priming element was embedded in a narrative retelling task. While the chosen set-up allows for information structure to be studied within the context of a full narrative, it does come with a few limitations of its own. First of all, the length of the stimulus (i.e., half a minute to one-and-a-half-minute long video clips) meant that the time between prime and target narrative was longer than it would be if short phrases were used, with a couple of filler sentences in between at most. Furthermore, in a classic priming paradigm the target structure might be more salient to the hearer as there is less other information to focus on. In this narrative

retelling task, the prime consists of not just one, but many sentences, each with their own syntactic structures. That is in addition to the cognitive effort of trying to construe the previous instalment of the story based on the description that the confederate gave and memorising the contents of the clip that the participants had to describe. Perhaps the use of more compact narrative stimuli that allow for shorter segmentation would lead to clearer results. Perhaps the single event descriptions as used in e.g. in Van Ierland (2010) or Von Stutterheim & Carroll (2006) would be useful for this purpose.

There is also a chance that the differences between the baseline and the primed condition might be due to the differences in stimuli (i.e., the various scenes had parallel but not identical content), rather than the exposure to the prime. However, each scene did provide ample opportunity to have used the language features of interest. For example, each scene featured instances of objects/forces that impacted or hindered the protagonist, prompting the opportunity to give those forces a prominent subject role. So, while the different scenarios in each of the scenes may indeed lead to differences in language use, this is unlikely to be a main reason behind why participants did not describe those scenarios with an inanimate subject. Nonetheless, such stimulus biases could be reduced in future research by counterbalancing the order in which the scenes (or another chosen narrative segment) appear to the participants. Such a design may benefit from a larger participant sample to balance out individual differences in narrative styles, considering it adds a level of variation between the participants that was not present in the current methodology.

If indeed a method were used where the scenes are presented in a random order, the shuffling of scenes could be introduced as a puzzle element that further distracts from the confederate's role. In the current experiment, multiple participants, when asked after completing the experiment if they had noticed anything odd about the other participant, guessed that the other person was indeed not a real participant. The reasoning behind these suspicions varied. One participant had reasoned that the set up would be too difficult, despite the effort that was taken to make it seem as realistic as possible. Another noticed that the confederate's narratives did not align with the participant's earlier descriptions. Interestingly, multiple people reasoned that the confederate was too fluent in his English or his descriptions to be just another (Dutch) participant. Many even suspected that the confederate was a native speaker of English, even though this was not the case. The reason for this could be that the confederate's descriptions were more fluent because he already knew what he was going to say, since he had a script in front of him. This could give the impression that he was more proficient and comfortable with constructing an English narrative on the spot. Another explanation is that the use of English information structure principles in his narrative made his descriptions sound distinctly non-Dutch, even if the participants were not able to pinpoint why exactly. This observation, however, requires more systematic research to define the cause behind it.

Future Directions

Narrative retelling tasks, including the Quest narratives, have been used to investigate a variety of language features, and it is beyond the scope of this paper to take them all under a loop. Future research could expand on the study of subject encoding and information selection

by looking beyond just who or what the subject is, but also, for instance, take into account the level of agency or importance that (inanimate) subjects are assigned. How often do inanimate forces take on an active role (cf. “all around him are a lot of machines” compared to “some kind of machine is pushing the metal”)? And which entities are more likely to get introduced in a main clause, subordinate clause, or passive sentence construction? Scene 2, for example, features a moment where the protagonist is hit and knocked over by a sheet of paper. Roughly a third of the participants did not describe this event at all, another third gave the paper a prominent and active subject position in this event (“and paper starts flying into his face”), while in other narratives the paper is much more passive or demoted to a subordinate clause. A more systematic investigation into the encodings of moments like these could provide a more nuanced outlook on the effect that the priming of inanimate subjects has on both information selection and the information status of inanimate entities, such as the paper in this scene.

The results of this study contribute to the existing database of *Quest* retellings in various native and learner languages. Future research could expand on the findings presented here by comparing these descriptions to the other *Quest* retellings in a more in depth qualitative – or, if done with care for the difference in the stimulus length, quantitative – analyses. A closer look at how these participants differ from Dutch participants narrating in English without a priming condition would be of particular interest and might bring to light where the primed narratives differ most from unprimed narratives.

Another interesting avenue for research comes from the statement that immediately followed Ellis’ (2011) observation that complex structures are best learned implicitly. He adds to that by saying that any form of explicit scaffolding “is always better than learning without any cues at all” (p. 38). Could the addition of explicit instruction improve the priming effects and the acquisition of L2 information structure?

Conclusion

This study set out to investigate the influence that priming has on information structural aspects of language production. Information structure is where grammar, content and context intersect in a complex network that shapes discourse cohesion. Because it is grammar dependent, each language has a different information structure. Previous research has shown that foreign language learners preserve elements of their native language’s information structure when speaking their second language, even at high proficiency levels or after living for several years in the target country (Benazzo & Andorno, 2010). This leads to questions about the role of exposure and implicit learning mechanisms in the acquisition of L2 information structure. This study tackled those questions by priming native Dutch speakers during a narrative retelling task on typical English discourse features such as inanimate subjects, SVO instead of V2 word order, and the progressive aspect (Carroll & Lambert, 2003; Starren, 2017; Van Ierland, 2010). The results gave little indication that priming led to an increased use of these English information structural benchmarks. A lack of priming effects could be an indication that implicit learning mechanisms are not very effective in the

acquisition of IS. This would account for the challenges of acquiring IS in a second language that have been previously observed. More research is needed to understand how the mental representations of information structure are formed and the role of implicit and explicit learning therein.

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Appendix A

Confederate Script

Scene 2a: Paper

okay now you see a landscape of paper
there are sheets lying on the floor
and the wind is blowing
and paper is rustling
and the creature falls down onto this paper ground from the sky
and a piece of paper moves straight towards his face
he moves up to dodge it
and the pieces of paper keep flying past him
uhm, he hears water, water is dropping somewhere in the background
and he walks into the direction of the sound

Scene 3a: Stone

he fell through the paper world, right?
now he's fallen into a world of rocks
uhm, there are stones in stacks all around
and the stones are moving
they are shifting or they are tumbling down
uh one rock nearly falls on the man's face
he dodges this one again
he plucks a shard out of his arm
uhm, the sound of water catches his attention again
so he's wandering around this rocky landscape
and the rocks around him are constantly shifting
and some piles of stone are rising up from the ground and falling down again
and one rock pushes up right below him
he gets caught up on top of it
so now he's on top of this tower
and he's looking around for water

Scene 4a: Metal

Uhh, the world this time is completely flat
the sky is ominously red and the ground is this yellow colour
it is made out of some kind of metal material
you hear a thud, and you can see
the creature lying on top of his head
he stands up, touches his head
the top of it has been flattened from the landing
so the man shakes his head
and sand comes falling out of his ears
he hears a machine now that his ears are open, a saw of sorts?
and the sound of it is getting closer
and he notices it too late and he can no longer dodge out of the way
and the saw cuts off the tops of his toes
so he's sitting on the floor, watching his feet
trying to put his toes back together but the sand keeps falling off
so he continues the quest for water again

and the rest of the world is just as dangerous
there are machines everywhere
they are moving all kinds of metal plates or drilling things into place

Scene 5a: Underground

so he jumps between the plates
and he finds himself in this dark underground area
uh, it's dark, you can't really see what's going on
there are more machines here
all around are turning... all around gears are turning and machinery is buzzing and making all
kinds of noises and movements
it looks like some kind of factory production line
he nearly falls because some part of a machine moves towards him
uh he gets caught up on a big bicycle chain instead
and he's sort of sliding along and going towards some cogs
and he's getting scared of hitting his head again
but he manages to jump off in time and he lands flat on the floor