Triggering Awareness in Second Language Acquisition

ABSTRACT
In second language acquisition research, a central question is how to improve learning of a foreign language. Many factors contribute to succesful learning. Awareness of what is being learnt is one of these factors. This study examines what could raise such awareness in a second language learning set-up. During a thinking-aloud experiment, participants learnt a new (artificial) language. Some of the participants received input which potentially triggers awareness, whereas others did not receive these potential triggers in the input. Participants' thoughts towards the input sentences as well as their scores on the posttest, and a comparison between both groups are used to determine the effects of the hypothetical triggers.

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1. Introduction

In the last couple of decades, a lot of research has been done on the role of awareness in second language acquisition. One of the common hypotheses is that in order for language learning to take place, a learner must be aware of the linguistic item he/she wants to learn. If, for example, a learner does not consciously notice that in English generally the plural is built by attaching the *-s* suffix to the stem, then he will not learn this regularity and will therefore never be able to create plurals of English substantives he has not heard before. The present study builds on the importance of awareness in second language acquisition and aims to find out what triggers awareness in second language learning. To achieve this, an experiment in which participants learn an artificial language has been set up. In this thinking-aloud study, participants are invited to verbalise their thoughts towards the language they are learning. Hypothetical triggers which should influence awareness are built in. The main goal is to find out which of these hypothetical triggers leads to a sped up or more successful process of becoming aware of an L2 phenomenon. The results should provide more insight in effective second language learning.

2. Theoretical background

2.1. The interface debate

In second language acquisition research, one of the most important questions is how adults effectively learn a second language. Although not all second language acquisition (henceforth: SLA) studies focus on the how-aspect of the learning, in the end they all serve the purpose of contributing to solving this puzzle. And if we take the effort to learn a second language, we obviously want to do this in the best and most efficient way, allowing us to get as proficient as possible in our L2 with minimum time investment.

Concerning how one learns a second language, one of the oldest distinctions that has been made with respect to the way of learning is made by Krashen in 1982. He divided SLA into two distinct and independent ways of language development. The first of them being an explicit way of development, or in his terms *learning*, whereas the second is a more natural way of acquiring competence which approaches, or is maybe even identical to, the way in which children learn their first language: implicit acquisition, or in his terms just *acquisition*. In dividing up these two ways of development, he states that (explicit) learning is a conscious process that enables learners to talk about the rules and grammar of the language, whereas in language acquisition no such awareness level is reached and therefore acquisition is a subconscious process (Krashen 1982: 14). Building on this, Krashen claims in his Monitor

Hypothesis that explicit knowledge (i.e. knowledge of which one knows one has it and that one is able to reproduce) has only one function, which is monitoring the output. It checks for correctness, which is the accuracy of the output and can change the form of the utterance to the correct one, either before the sentence is uttered or even afterwards, when it takes the form of a self-correction. For monitoring, however, as Krashen already states himself, one of the conditions that needs to be met is that there is sufficient time. This time may be present in language tests; however, it is absent in spontaneous speech. Therefore, Krashen claims that explicit knowledge is useful when responding to discrete items on tests and is therefore often concluded to be an efficient way of second language learning. However, this type of knowledge seems to play no role when language is being used for real communication (paraphrased after Robinson et al. 2012: 252). In his reasoning, speakers use implicit knowledge to establish this instead. It is Krashen's theory that gave rise to this still ongoing interface debate.

Since according to Robinson implicit knowledge is of great importance in SLA, one of the main points of discussion in the interface debate is whether it is possible for explicit knowledge to become implicit. There are three different views on this: the first one being the non-interface position, which is Krashen's position, and which entails that explicit knowledge cannot become implicit, because the two types of knowledge are stored differently in the brain. Robinson et al. 2012 elaborate on this statement by confirming that in the meanwhile it has indeed been demonstrated by neuroscience and neurolinguistics that the two types of knowledge are indeed stored differently in the brain. However, Robinson and colleagues point out that a different way of storing does not necessarily mean that explicit knowledge cannot become implicit. This leads to the second view, the weak-interface position. For example, R. Ellis defends the view that explicit knowledge can become implicit only if the learner is developmentally ready to advance (paraphrased after Robinson et.al. 2012: 252). The last position, which is for example argued for by DeKeyser (1997, 2003, 2009) and Ortega (2009), is known as the strong-interface position and holds that explicit knowledge will become automatised and therefore implicit after practice over many trials.

2.2. *Working memory and learning*

In rehearsing items (vocabulary items or grammatical rules), the working memory (WM) of the human brain plays a central role. According to Baddeley & Hitch' (1974) model, WM is the place in the brain where rehearsal happens. General theories about learning hypothesize that the longer/more often an item is present in working memory, the sooner/the greater the

chance it will be stored in long term memory. In the case of language learning this means that the more often an item is rehearsed in working memory, the more likely it is that it will become automatised, meaning it can be used in spontaneous speech and the comprehension of it. Because of the central role working memory plays in storage in long term memory, a lot of research has been done to the effect of the size of the working memory on SLA aptitude. DeKeyser & Koeth (2011) summarise the findings of these studies, and find that *"[I]t is clear that WM is important for a wide range of cognitive functions, including those underpinning SLA. The cognitive psychology and SLA researches clearly demonstrate a common trend: individuals with greater WM capacity outperform individuals with lesser capacity on a wide range of complex cognitive tasks."* (DeKeyser & Koeth 2011: 399) In addition to this, they further state that *"[w]orking memory is a critical component of aptitude for SLA"* (DeKeyser & Koeth 2011: 400). From these findings and studies it can therefore be concluded that the WM has a great effect on aptitude for SLA: the bigger the WM, the higher the aptitude for SLA is. Since according to Baddeley & Hitch one of the main functions of working memory is to rehearse items to eventually store them in LTM, it can be concluded that practicing helps to store items in LTM. For SLA, this means that repeating items often enough can lead to storage in LTM of these L2 items.

Parallel to the importance of the working memory for rehearsal, according to N. Ellis the working memory also has other important functions in (second) language acquisition. He states that working memory *"is the home of explicit induction, hypothesis formation, analogical reasoning, priorization, control and decision-making. It is where we develop, apply, and hone our metalinguistic insights into an L2."* (Ellis 2005: 337). From this, it can be concluded that with respect to explicit learning, the working memory has a central role in decoding language structures from an L2 to eventually encode them in long term memory. This insight emphasizes the crucial role of the working memory in SLA once again and it indicates why it is important to focus more on its role in explicit L2 acquisition.

It has been argued above that the total length of time the item is present in WM, or in other words how often it is practiced, plays a role in the success of acquisition. Another factor related to the WM influencing the success of acquisition is the activation level of the item to gain entry to the working memory in the first place. Ortega (2009) claims that the easier it is for an item to get activated in the working memory (i.e. before it will enter working memory), the higher the chance that it can remain there for rehearsal (Ortega 2009: 93) so the knowledge about the item can be stored in LTM and ideally becomes automatised. It is important to note here that without activation of an item in the working memory, this item

cannot be practiced and will therefore not be learnt at all; or at least not explicitly. It may be learnt implicitly, but what triggers the acquisition of implicit knowledge in a direct way, without the interposition of explicit knowledge, is a question that lies beyond the scope of this study and will therefore not be dealt with here.

Reaching the activation level

One factor that seems to have great influence on the activation level of items in the working memory is the concept of awareness. Schmidt (2001) defines awareness as metalinguistic knowledge about abstract rules or principles of an L2. He distinguishes awareness from noticing, in that in his terms noticing only concerns the detection of elements of a surface structure in the input, whereas awareness refers to conscious knowledge about these rules (Schmidt 2001: 5). An example illustrating this could be a learner who detects that in the L2 input the words *houses, cars* and *elephants* occur in the input. In other words, the learner has noticed that these words are part of the L2. However, only as soon as the learner consciously notices that there is a grammar rule that plurals are generally created by attaching the suffix *-s* to the stem of the noun, there is awareness (of this grammar rule). This means that before awareness can occur, the stimuli have already passed through working memory, in which they have been noticed, several times, because otherwise the speaker would not be able to see the regularity and generate a rule. Therefore, among others, Schmidt (paraphrased after Hulstijn, 2005) and Tomlin & Villa, 1994 (p. 192 ff.), who name the concept of noticing 'detection', state that noticing or detection is necessary for learning to take place. According to Tomlin & Villa detection makes key processes such as hypothesis formation and testing accessible for learning and therefore detection/noticing is a requirement for learning. The question which arises here is whether awareness is also required for grammar learning or whether it only helps and noticing is sufficient. DeKeyser (2003) states that there is very little hard evidence for learning without awareness. He illustrates this by summarizing the findings of various studies, among which Robinson (1996) and Scott (1989, 1990), in which participants of experimental groups that had rule awareness outperformed participants of groups that had no such awareness on posttests. From this, it can be concluded that people who are aware of a rule have a higher L2 performance than non-aware learners. Thus, since awareness stimulates learning, it does not seem very relevant to investigate whether it is a sufficient condition for learning or not, since knowing this does not change the follow-up question of how awareness can be triggered. Because of this relevance of awareness for

acquisition this study will aim to answer the question concerning what triggers awareness in SLA.

2.3. Noticing in SLA studies

In the previous paragraphs it has been claimed that noticing is necessary for awareness to occur. Finding out what factors influence noticing is therefore a first step in finding out what leads to awareness. With respect to factors influencing noticing, Tomlin & Villa state that attention plays an important role. According to them, the likelihood of an L2 item being noticed increases with the learner attending to the structure (Tomlin & Villa 1994: 190). They argue that (linguistic) input consists of many parts (i.e. semantic, syntactic, morphological information etc.), and the input is too complex for an L2 learner to pay attention to every single linguistic unit. Therefore, learners attend to some specific parts of the input and pay less or no attention to other parts. This means they select certain information for further processing in working memory to eventually encode it in LTM, whereas the information they do not attend to will not be processed in WM and will therefore also not enter LTM. The crucial question here therefore is what attracts attention, because without attention there is no noticing at all and therefore less chance that the learner will become aware of a particular linguistic phenomenon.

With respect to the question of what attracts attention, Robinson et.al. 2012 summarise the outcome of previous research into objects of attention in SLA. They state that research suggests that learners pay more attention to some aspects of language than to others. According to them, the joint results of several studies (among which for example Bordag & Pechmann 2007 and Holmes & de la Batie 1999) suggest that "*learners are less sensitive to syntactic cues to grammatical gender than they are to morphological cues (noun endings) during processing*" (Robinson et.al. 2012: 253). Another study they mention is the study by Gass et al. (2003), from which it can be concluded that in unfocused input (i.e. input which is not manipulated by the researcher so to increase the likelihood of noticing), the greatest amount of L2 learning takes place in the lexicon, followed by the area of morphosyntax, and in the last place by syntax (Robinson et.al. 2012: 254). From these results, it can be concluded that some aspects are more likely to be attended to and therefore have a higher chance of being noticed than other L2 parts. This knowledge might be useful in understanding how people learn an L2 in a naturalistic environment; however, when it comes to controlled SLA, as is the case in language courses etc., this knowledge is less useful. It does help in understanding why certain aspects of language are acquired faster or are "easier" than other

aspects, yet with respect to the question of how to manipulate L2 input in such a way that a specific phenomenon will be acquired better, or at least that it will be noticed, this knowledge is less useful. Previous research only dealt with the former question of which areas are acquired faster, but not with how to guide attention to the input in naturalistic learning environments so to raise noticing and eventually cause awareness. Because of the relevance of triggering awareness in SLA, this study aims to find out which factors do so.

2.4. Awareness in SLA studies

In the previous paragraph, the outcome of several studies into noticing has been discussed and the findings have been combined to the conclusion that noticing leads to awareness. In this paragraph, it will be argued that, based on the outcome of previous research, awareness is important when it comes to second language learning and that therefore more research should be carried out into what triggers noticing or awareness.

Several studies have dealt with the question of the role of awareness in SLA. However, most of them focus only on the effect awareness has on acquisition and not on how awareness is reached. A typical set up of these studies, as for example the previously mentioned studies by Robinson (1996) and Scott (1989, 1990), consist of several groups of L2 learners who vary in their awareness of the rule. Whereas in the experimental group(s) learners will be (explicitly) made aware of a grammatical rule, this is not the case for the learners in the control group(s). This enables measuring the influence of awareness on the performance of learners at language tests that follow the learning stage, as for instance truth value judgement tasks or written posttests. However, the only conclusions which can be drawn from such studies are whether awareness influences L2 acquisition, and what influence explicit instruction has on awareness. These studies do not deal with the question of how awareness arises and/or how it can be triggered other than by explicit instruction.

A study which focuses on the difference in effectiveness between deductive and inductive instruction in SLA has been carried out by Shaffer. She claims that after explicit instruction, students may think they understand the rule, but they fail in using it themselves. An inductive approach, however, might lead to rule generalisation (Shaffer 1989: 396) and therefore to more successful SLA. Therefore, it seems interesting to focus on inductive learning without explicit instruction rather than on deductive learning with explicit instruction. Combining this with the aim of triggering awareness gave rise to the current set up in which participants are learning the L2 in an inductive set up.

2.5. Triggers

The goal of the present study is thus to determine which factors trigger awareness of particular L2 structures. Therefore, a self-paced L2 learning experiment was set up in which participant received auditory input, combined with pictures. The language that was used as the L2 was an artificial grammar based on Swedish. In the experiment, several triggers that could lead to awareness were built in. They were aimed to give rise to awareness of linguistic form. In the experiment, participants were asked to think aloud while they were learning the language. This thinking-aloud offers more insight into the effect of the hypothetical triggers on the learning process. Four hypothetical triggers were built in. Each of these may naturally occur. Several potential triggers were considered, which are either based on intuition or on findings of previous research. More details about the exact design and distribution of the triggers are discussed in a later chapter. In this chapter ,only the character of the triggers will be discussed.

First of all, one of the major hypotheses was that awareness is triggered by repetition of a certain grammatical phenomenon. As the saying already states "repetition is the mother of all learning", which means that frequent repetition of items leads to storage of these items in memory. This is also what is predicted by the Baddeley & Hitch model in which after sufficient rehearsal in WM items will be stored in LTM. That rehearsal is effective in learning is demonstrated by many researchers, among which Hebb (1961), who even went beyond the question of whether it is effective, and showed that rehearsal also works when the participants are not aware of the fact that the items they are exposed to are being repeated. In his study, he exposed participants to a series of trials, which each consisted of nine digits the participants had to remember and reproduce immediately after exposure. In this series, every third trial was the same, the participants, however, were not informed about this regularity. Hebb found that the recall accuracy for the repeated list improved over time during the experiment, whereas the recall accuracy for the non-repeating trials did not. For the present study, this is an important finding, because this demonstrates that it is possible for learning to occur, even if the participants are not deliberately searching for regularities in the input, or in other words, repetition could lead to learning without awareness. However, as was argued before, language learning is more efficient when it includes awareness, because it is more complicated than solely remembering digit sequences. Based on intuition, if one accepts that repetition can lead to learning without awareness, repetition preceded by awareness will only improve the process. A goal of this study is therefore to verify whether or not repetition leads to awareness.

The second hypothesis was that contrast triggers awareness. Contrast here means that two items which each represent a different part of the same grammatical rule are following each other. For example, when the target structure is the a/an-distinction in English, then first a sentence with *a* is being presented and immediately afterwards a similar sentence containing *an* or vice versa, as for instance *He buys a green t-shirt* followed by *He buys an orange t-shirt.* The hypothesis was that when the contrast is being presented that the awareness arises sooner than if no such contrast is created and the sentences are offered with other stimuli in between. We are not aware of previous research dealing with the question of how much such contrast effects learning, but intuitively it seems to make sense that this type of contrast triggers awareness. This is because both items have to be present in a learner's working memory in order for them to generate a rule which explains the difference between two grammatical items. Since the capacity of the working memory is limited, this means that the maximum number of items that may be in between both occurrences of the target structure is the amount of items the working memory can keep minus two (both target items). In addition to that, the chance of whether or not general rule extraction takes place does not only depend on the capacity of the working memory, but also on the time elapsed between the two target stimuli. According to Robinson et al. 2012 (p. 251), the human working memory is sensitive to recency (see also Rescorla & Wagner, 1972), which means that the more time elapsed between two target items, i.e. the more input separates the two target sentences, the less chance the learner will find the grammatical rule that explains the difference between these two target items. Therefore, presenting the target sentences close to each other, as is the case when the contrast trigger is built in, the chance that rule awareness occurs increases.

A third hypothesis was that self-correction of the speaker may influence awareness. In natural speech speakers regularly make errors. When these errors do not lead to misunderstandings they need not be corrected and they will not be corrected by speakers most of the time. However, a type of mistake that does need to be corrected is when it could lead to misunderstandings. To prevent misunderstandings, speakers can correct themselves by using a self-correction. For example "*Ik koop de ehh het boek."* (Literally: *I'm buying the*$_{masc/fem}$ *ehh the*$_{neuter}$ *books*.). Inspired by this, Bosker et al. (2015) studied the influence of disfluencies on listeners' attention. They state that in native speech, disfluencies introduce information that is less accessible to the speaker and they hypothesise that after disfluency appears "*listeners may benefit from raising their attention as a precautionary measure to ensure timely comprehension of the unexpected information.*" In their study, they conducted an experiment in which they presented native speakers of Dutch to a small spoken story passage of three

sentences which either contained a disfluency (*uhm*) or which was completely fluent. Afterwards the participants got a transcript of the story and they had to tell whether the transcript matched the spoken passage. The researchers manipulated the transcript in that sometimes it matched the spoken passage, and sometimes the word after the disfluency (the target word) was being replaced by another word (sometimes semantically related, sometimes semantically unrelated). They found that participants who were listening to the disfluent story were better in recalling the target word than participants who got exposed to the fluent passage. From this they concluded that disfluency has a beneficial effect on recall accuracy. Because disfluencies may have a positive effect on recalling language, it is likely that they also trigger attention. Therefore, in this study we used disfluency as a trigger to test whether or not it triggers awareness.

The fourth and last hypothesis is inspired by the unexpected-event hypothesis. According to Frensch et.al. *"An event is unexpected when in the input something is not consistent with what the individual has experienced in this particular situation in the past and therefore does not expect."* (Frensch et.al. 2003: 347). Some of the examples they use to explain this are a sudden sound occurring during an experiment or a freezing of the computer screen. Frensch et. al. claim that if people notice an unexpected event, this event may trigger an intentional search for an explanation of why this event occurred (Frensch et.al. 2003: 347). This can be translated into the situation of the present experiment: When in the input an item is not consistent with what the participant is expecting based on previous input, the presence of the unexpected item might trigger the search for the grammatical rule explaining this. Concretely this means that the participants should have hypotheses about the regularity that underlies a specific grammatical phenomenon in the target L2, but that the unexpected event should make them aware of the incorrectness of their hypothetical rule, and let them search for the correct nature of the rule, and therefore triggers awareness in this way.

3. Method

3.1. Participants

For the present study, 40 native speakers of Dutch were selected. Participants who had multiple native languages were not excluded from participation. To keep the experience level of the participants as equal as possible, people who studied languages or linguistics in higher education were excluded. People who learnt (a lot of) foreign languages in high-school were not excluded, since in the Netherlands almost everyone learnt at least two foreign languages in high-school. The age of participants ranged between 18 and 30.

3.2. The artificial target language

An artificial language based on Swedish was as the target language of this experiment. One of the main reasons for choosing Swedish as the basis is because Swedish words are relatively easy to learn for native speakers of Dutch, since the words are alike in that they consist of the same/similar (amount of) sounds. For example, *cat* in Dutch is *kat* /kɑt/, whereas in Swedish it is *katt* /kɑt^{h}/; in Dutch the word for *house* is *huis* /hœys/, whereas in Swedish it is *hus* /hys/. Choosing a similar language keeps the vocabulary learning load as low as possible, as to allow participants to focus more on the grammar of the target structures. Appendix 1 offers an overview of the vocabulary of the artificial language.

3.3. The target structures

The artificial language contains four grammatical rules the participants ideally become aware of. Each grammatical strucuture was paired up with a hypothetical trigger. The choice for these specific grammar rules arose from several considerations. First of all, the target structures should operate independently from one another. This is important, because otherwise the success or failure of learning one structure can affect the capability of learning another target structure. Secondly, the structures should not be present as such or be too similar to a rule in Dutch, but at the same time they should be learnable for Dutch native speakers. Thirdly, the signified which is expressed by the sentence containing the grammatical structure should be easily depictable. Taking all these considerations into account finally resulted in a grammar containing four rules. We discuss these and their corresponding triggers in the next paragraphs.

3.3.1. Inflection of noun phrases in plural

The first target structure is based on the difference between dual and plural, as for instance can be found in Arabic or some Slavic languages. These languages mark differently for substantives in dual than for substantives plural. To prevent the structure from becoming too complex, the marking of dual and plural has in this study been restricted to only marking substantives differently and not also marking for example determiners and/or the verbs differently, which is done in for instance Arabic. This resulted in two different suffixes for marking noun phrases which are not singular: *-(e)r* for dual, and *-(e)t* for plural. This is illustrated in examples (1) and (2). The presence of the *e* in the suffix is optional, depending

on the final consonant of the stem: the suffixation should not lead to unpronounceable consonant clusters.

(1) *Två höna-r sitta.*
Two chicken-s sit
"Two chickens are sitting."

(2) *Tre höna-t sova.*
Three chicken-s sitta.
"Three chickens are sitting."

Both SV and SVO sentences have been included in the input as target sentences. The main reason for this was to prevent participants from linking a specific suffix to (in)transitivity. Note here, that in the target sentences each substantive that appears as a dual also appears as a plural elsewhere in the input and vice versa. This has mainly been done to prevent the participants from possibly assuming that the choice of the suffix depends on the substantive itself (as is the case in Dutch) instead of on the substantive's number feature.

The hypothetical trigger that should trigger awareness of this target structure is contrast: the input contains two successive sentences, one of which contains the dual and the other the plural on the same substantive. For example, when first sentence (1) has been presented and immediately after sentence (2). A non-contrasting case would be an order in which sentences (1) and (2) are separated by other sentences in the input.

3.3.2. Diminutives

The second target structure that is built in in the artificial language is inspired by the way in which diminutives are built in Swedish. Generally, in Swedish diminutives are built by using *liten/lilla/litet* as an adjective and *små* as a prefix which precede the substantive. In general, *små* is used for substantives in plural, and *liten/lilla/litet* for substantives in singular (Prisma Grammatica: 1990). There are some small exceptions to this rule, however the basics of this rule are used as a starting point for a rule in the artificial grammar. As is also the case in Swedish, in the artificial grammar *liten* is used to refer to diminutive substantives in singular, whereas *små* refers to plural diminutive substantives.

It should be noted here that this target structure interferes with the previous target structure. To learn this structure, knowledge about the plural is required. However, since all

input sentences are accompanied by a picture depicting the signified in the sentence, it is not necessary that the participants know the rule of plural building, because the picture already gives away that reference is being made to a substantive in non-singular (dual). Because of this, participants' knowledge about plural building does not influence their capability of learning the difference between *små* and *liten*. However, because of the interaction between these rules, *små* will only be used in sentences containing a dual, and not also in plural sentences. This is to prevent participants from linking *liten* or *små* to the dual-plural distinction instead. Plural sentences containing diminutives are not offered in the input at all.

The hypothetical trigger which should bring about the awareness of this target structure in the experimental group is the use of an unexpected event. Again, both SV and SVO sentences have been included. In the group that gets exposed to the unexpected event, one way of building diminutive, the use of *liten*, is set as the default case and is offered in eight different successive sentences that are only separated by other target structures and fillers, but not with sentences of the non-default case, *små*, as has been done in the control group. In the experimental group, the three sentences in which *små* is used to build the diminutive are presented only after the eight sentences with *liten* are offered. In this way, the occurrence of *små* instead of *liten* could be unexpected and may therefore serve as an unexpected event.

Based on the results of a pilot study where participants were not able to infer the rule, we decided to extend the setup of the trigger. Instead of only providing items with *liten* before those with *små*, we added them after as well. This allows subjects to check the explanation they might have in mind with more input that provides the relevant material for comparison. The setup of the pilot can be found in appendix 3A, the final setup in appendix 3B and an overview of the relevant items in appendix 2B.

3.3.3. Postpostions

The third target structure is connected to the position of adpositions. In the artificial grammar, adpositions will take the form of postpositions instead of prepositions which are common in Dutch. Although the place of adpositions in most European languages is generally not post-verbal, adpositions – being post-verbal in the artificial target language – probably will not be too hard to learn, since it is based on the same grammatical concept (the use of adpositions in general) as is present in Dutch. It is just the reverse case.

Three easily depictable postpositions are created in the artificial language: *on*, *in* and *behind*. *On* has been translated with the Swedish word for *on: på*. For the meaning of *in*, the

Swedish word *i* is slightly adapted by adding a consonant, resulting in *-li*, and for *behind* an entirely new adposition *-tu* was designed, because the Swedish original *efter* is too similar to the Dutch *achter* (Eng: behind). Sentence (3) offers a typical example.

(3) *Den katt sitta den hus-på.*
The cat sit the house-on
"The cat is sitting on the house."

3.3.4. Object marking

The last target structure that was built into the artificial language is direct object marking on the determiner. Since case generally is not marked overtly on noun phrases in Dutch (except from instances as *hem* (Eng: *him), zijn* (Eng: *his*) etc.), it may be hard for participants to notice there is case marking going on in the first place, let alone that they will be able to generalize a rule for it. However, since most Dutch native speakers who will participate in the experiment will have at least some experience with German (since they have learnt this in high school), a language that does mark case overtly, this structure should be learnable.

In the artificial grammar, *den* ([dɛn]) is used as the standard determiner that is not inflected for case. *Denen* ([denən]) is used as a determiner that indicates the direct object, as is exemplified in (4). To focus on the difference between *den* and *denen*, we opted for changing the realisation of the vowel in the stem: [ɛ] in *den* vs. [e] in *denen*. This gives participants an extra incentive to help them notice that two different determiners are being used.

(4) *Den man köpa denen$_{ACC}$ bil.*
The man buy the$_{ACC}$ car.
"The man is buying the car."

In the experimental group, this target structure is triggered by a repair, as is illustrated in example in (5).

(5) *Den man köpa den$_{NOM}$ ehh denen$_{ACC}$ bil.*
The man buy the self-repair the car.
"The man is buying the ehh the car."

3.3.5. Fillers

To separate target structures from one another, several filler items have been used. These filler items are intransitive SV sentences half the time, the other half of the time they introduce a new word into the language by using the *vara den* ('this is')-construction. Appendix 4 offers an overview of the fillers that are used.

On some of the filler items, a disfluency has been realised. The reason for this was avoiding that the self-correction on the target sentence containing direct object marking could function both as a 'repair trigger' and as an unexpected event. Offering disfluencies on filler items, before the self-correction on a target structure could serve as a trigger, avoids this ambiguity. The disfluencies on filler items may take different forms, i.e. the form of a hesitation (e.g. *Vara den ehh flaska.* (Eng: "this is the ehh bottle.")), or the form of a repair (e.g. *Den kvinna l- ehh koka.* (Eng: "The woman is l- ehh cooking.")).

3.4. Set-up of the experiment

3.4.1. Word learning stage

The first part of the experiment consisted of a word learning stage. Here the participants were confronted with the artificial language for the first time. In this stage all the substantives, verbs and numerals that are being used during the thinking aloud part of the study are presented. The word learning stage consists of two parts. In the first part, all the words are presented (first the substantives, then the verbs and finally the numerals). Participants receive a spoken word in the artificial language which is accompanied by a picture depicting the signified. For an overview of the pictures that were used in the experiment, see appendix 6. The database of clipart has been used to derive (parts of) pictures from.

In the second part, participants' knowledge about the vocabulary is tested. Participants get the same pictures and words as in the familiarising part, but now they receive a spoken word that is accompanied by four pictures, from which they have to pick the right one by clicking on it with the mouse. Once they make their choice, they receive feedback which is either a red or green square around the picture they have chosen. The entire vocabulary list is tested in a random order, and participants have to answer each question correctly. If their answer to a certain question is wrong, this item will return until the correct answer has been chosen. The test contains the entire vocabulary test twice, but only after all vocabulary items of the first list have been answered correctly the second list starts, for which again all items have to be answered correctly.

3.4.2. Thinking aloud part

After the word-learning stage, the level of the language gets more difficult and the participants are presented with spoken sentences of the target language, which are accompanied by a picture again. Participants are instructed to learn the language as well as they can. They are not explicitly asked to focus on grammar rules, nor are they asked to pay specific attention to vocabulary learning. They are informed that afterwards there will be a language test, but they are not told what kind of items will be in this test or what this test will look like.

During the learning stage, participants are asked to think aloud while running through the stimuli of the experiment. The experiment is self-paced and the participants are asked to verbalise what they have learnt from the stimuli. They are not specifically instructed to comment on every single stimulus, but as it turns out people do so, probably because interpreting the stimulus requires thinking (and subjects were asked to verbalise it). Each trial consisted of a spoken sentence accompanied by a picture depicting the signified. The picture was presented about a second before the auditory stimulus was being played. The auditory stimulus could only be heard once and could not be replayed. Once the participants said everything they wanted to say about a certain stimulus they could move on to the next pair of stimuli (auditory speech material + picture) by clicking a key on the keyboard.

3.4.3. The break

The input of the experiment contained 62 target items. Because of additional fillers which were built into the input, the total amount of the sentences during the thinking-aloud part of the experiment was even bigger. To prevent participants from losing their concentration, the input sentences are spread over two blocks which are separated by a break. During the break participants could breathe for a while or have something to drink. Apart from this, they also got some completely different tasks that pulled their attention away from language learning.

The tasks during the break aimed to measure the capacity of participants' working memory and their capability to distinguish between sounds. As for example Dörnyei & Skehan (2003) point out, "*phonemic coding ability can be related to input processing; language analytic ability*" (Dörnyei & Skehan 2003: 596) and is therefore likely to have an influence on participants' performances. Measuring the phonemic coding ability could therefore be relevant to explain eventual individual differences in performance. The LLama_D test is a test that measures the phonetic memory. Therefore, this is one of the tests that are carried out.

However, after piloting, we decided to move this test from the break to the initial stage of the experiment, so before the 'actual' experiment started. This is because the nature of the LLama_D is very different from the other two tests which are mentioned below. This test, being so different from the other two tests, annoyed the participants a little bit, but since the correlation between phonemic memory and performance on the 'actual' experiment might still be there, the LLama_D test was not cancelled, but was moved to the initial stage of the experiment instead.

The only tests the participants took during the break in the final setup were the auditory digit span tests. In these tests, the participants have to reproduce the digit span in the exact same and in the reverse order ('forwards' and 'backwards'). These digit span tests measure the capacity of the working memory of participants. Because this study contains a lot of unfamiliar items that are all processed in the working memory, the capacity of the working memory could also be a factor influencing the performance of participants and could therefore also serve to explain individual differences in performance.

3.4.4. The distribution of the target sentences

The experiment contained 62 target sentences: 8 sentences on object marking, 28 sentences containing duals or plurals (14 duals and 14 plurals), 11 structures with postpositions and 11 structures containing diminutives. See appendix 2A for a list of all the target structures.

An experiment like this, containing four different target structures and two different testing blocks lends itself perfectly for dividing the target structures over each block two by two, so that in each block the focus lays on the acquisition of two target structures instead of four. The advantage of this is that this requires less need to spread the attention, which keeps the chance of acquisition of a target structure higher. Tomlin & Villa (1994) claim that in such a way acquisition is more successful, since according to them, attending to a structure increases the likelihood of detection of the structure, which in its turn can facilitate awareness (Tomlin & Villa 1994: 190 ff.).

In the first block, the block before the break, only target structures containing duals and plurals, and target structures on object marking are offered. In the second block, some of these target structures are, but the focus is on target sentences containing diminutives and postpositions. The exact distribution of the target sentences can be found in appendix 3.

3.4.5. The order of the target sentences

The order of the target sentences is basically random, however manipulated to some extent on purpose. The basic order is determined by using the random function of excel. This ordering, however, resulted in an order in which sometimes multiple sequences of the same target structure followed each other. However, since repetition is one of the hypothetical triggers, it is not appropriate to use a repetition elsewhere in the input in which it is not meant to function as a trigger.

Another change in the order that is manually made is that after exposure to the target sentence with the repair on the determiner, another sentence with object marking (and without a repair) as the target structure follows. This has mainly been done to give participants the opportunity to check the correctness of the hypothesised rule they ideally have in mind after exposure to the hypothetical repair trigger. If they do not get this opportunity, they might have lost their attention to the structure and therefore awareness of it will not be reached (see Tomlin & Villa 1994 for a discussion about the role of memory, attention and awareness in SLA). This could lead to incorrect assumptions about the hypothetical trigger, while the non-awareness is actually due to attention loss and the ability to become aware of the structure decreases.

For other target structures, however, the role of attention is less important because the triggers appear more often (in the case of the repetition block and contrast trigger) than the self-repair which is only offered once. Therefore, the other target structures do not have to be offered successively, apart from places in which they should be successive because successiveness here is part of the trigger (as is the case in the repetition block).

This means that for the first block in about half of the time the target sentences are presented successively. If in group B the contrast trigger is built in, then in group A either a dual-dual pair or plural-plural pair is presented to the participants. The sentence pairs of duals and plurals alternate frequently, since among others Goldberg et al. 2004 and Boyd & Goldberg 2009 find that skewed input could influence participants' performance more than a balanced input. To avoid this factor from playing a role, both groups receive balanced input.

In the second block, there are almost no target structures containing the plural/dual anymore. However, being aware of the difference between singular and non-singular is crucial for the acquisition of the diminutive target structure. To remind participants of the dual marking suffix, the sentence functioning as unexpected event in group A is preceded by a sentence containing a dual. For the precise distribution of the target sentences see appendix 3.

3.4.6. Posttest

After the learning stage in which participants are asked to think aloud, a posttest follows. In this test, participants are asked to think aloud again. They, however, no longer receive visual stimuli next to the auditory stimuli. Instead of the picture depicting the meaning of the sentence, a small black cross is presented to keep participants' attention and prevent the posttest from being too different from the learning stage. They now only receive a spoken sentence and are asked to judge its correctness.

Participants have to judge the correctness of the items of the posttest on a scale of 4. The scale is not numerical, but is denoted in words on a Likert scale. The options which are used on the scale are '*Ik weet zeker dat deze zin goed is*' (I am sure this sentence is correct), '*Ik denk dat deze zin goed is*' (I believe this sentence is correct), '*Ik denk dat deze zin fout is*' (I believe this sentence is incorrect), '*Ik weet zeker dat deze zin fout is*' (I am sure this sentence is incorrect). Both the "I am sure" vs. the "I believe" options are included, because this forces participants to reflect about their certainty towards their answer. This certainty combined with the correctness of the answer allows for eventually comparing explicit and implicit knowledge.

In judging the sentences, the participants also have to motivate their choice by mentioning why they have made a certain choice. The advantage of this is that in this way, more insight is provided in how well the participants know the grammar rules of the artificial language: If in the thinking aloud part participants mention the rule, they should be able to use the rule here as well and judge ungrammatical sentences as such. Besides this, letting participants evaluate their answer also provides more insight in whether they made the choice based on explicit or implicit knowledge.

The test consists of 48 items, 12 to each structure, of which half are grammatical and half of them are not. The sentences are never exactly the same as they were in the input stage. It has been tried to keep the character of the sentences as new as possible, although because of the small vocabulary of the language the sentences will probably not be experienced as having a totally new character.

This posttest, however, is not the test we are the most interested in. It is mainly included to motivate the participants to pay attention and try to learn the language properly and also to be able to measure their implicit knowledge about the language. Another advantage of including a posttest was that it allows for checking whether participants who claim to be aware of a certain grammatical structure are also able to use this rule appropriately in grammaticality judgment tasks.

3.4.7. Debriefing

After the posttest had been completed, the last part of the experiment, which had the form of a debriefing, followed. The main goal of the debriefing was to check the level of awareness once more. In an ideal situation, participants would again formulate, i.e. verbalize the grammar rules they have become aware of during the exposure state of the experiment. When this was the case, we asked them whether they knew approximately when they became aware of this grammar rule and possibly even what triggered this awareness. However, most participants did not become aware of all the rules of the grammar and moreover some participants did not become aware of a single rule at all. For the rules the participants did not become aware of or which they did not mention in the debriefing, we first carefully asked them questions which guided them into the direction of mentioning the rules. We guided them carefully, for example by asking them something along the lines of "There was something on prepositions. Could you tell me something more about this?", as to invite them to tell something about the rules without giving away too much so that they were not biased. If they could not mention the rule, we explained the rule to them and asked them afterwards whether they see the regularity after it has been offered to them explicitly.

3. Methodology of the data analysis

In analysing the data of this study, the data concerning the thinking aloud part of the experiment were the starting point. For each participant, we summarized whether he/she became aware of the grammar rule and whether the trigger helped in getting aware or not. From this could be concluded whether the triggers caused awareness of the grammar rule.

Ideally, one would hope that the answer to the question of whether a certain trigger caused awareness in the experiment answers the research question to what triggers awareness, yet the situation seems to be slightly more complicated. As it turned out from the analysis, for some participants specific triggers did cause the search for an explanation of why certain grammatical phenomena are the way they are, but participants failed to find a rule covering these phenomena. An example of this is the unexpected event trigger that should have triggered the awareness of the liten-små distinction. Some of the participants did notice the unexpected event of *små* being used instead of *liten*, yet they were unable to find the rule covering this irregularity. They might have hypothesised other rules, as for example that *liten* refers to animate NPs and *små* to inanimate NPs or vice versa, but they did not find sufficient evidence for this rule and therefore rejected it. In other cases, they might have even kept their wrong hypothesis because they did not (or did not remember they did) receive any negative

evidence to this hypothesis. These incorrect assumptions led to situations in which participants became aware of a grammar rule of the artificial language which might not exist or which is incorrect, but which theoretically could have been a grammar rule in the artificial language (or even in an existing language). In the analysis of the thinking-aloud part in determining whether participants became aware of the grammar rule or not, situations like this have been analysed as the participant not being aware of the rule. This may be correct, but taking this as guidance in the analysis, the conclusion about the effect of the trigger will not be correct. As the example above shows, the hypothetical trigger might cause an intentional search for a grammar rule. This in itself is a great finding, since the awareness of irregularities in the input is required for finding out what caused these irregularities and therefore is a step towards rule awareness. However, these participants did not become aware of the appropriate rule within the scope of the language experiment. If this type of awareness (awareness of irregularities but not of the appropriate grammar rule) is not taken into account in the analysis, the conclusion that the hypothetical trigger does not have any effect on triggering awareness might be unjustified. To avoid this, two different levels of trigger effect were created: one in which the trigger caused the finding of the actual grammatical rule, and one in which the trigger led to an intentional rule search, but in which the participants did not succeed in finding the appropriate rule.

Besides the collected speech material in the thinking-aloud part, a second set of data that was taken into account in determining whether or not participants were aware of a certain grammar rule are the scores on the posttest. For participants who claimed to be aware of a certain grammar rule we expected that their grammaticality judgements on the posttest afterwards matched the expected outcome (that is a positive validation for grammatical items and a negative one for ungrammatical items). For the participants who were unable to verbalize the grammar rule, we used their answers on the posttest to check that they also did not have implicit knowledge about the rule. If they did, one would expect them to give the appropriate responses to the posttest items. If their answers follow a random pattern or if they are inappropriate most of the time, participants apparently also do not know the grammar rule implicitly.

A last factor that was taken into account in determining participants' knowledge about the grammar rules is the debriefing. If participants were able to verbalize the rule in the debriefing, but they were unable to give correct responses to the items on the posttest or did not verbalize the rule during the thinking-aloud part or the posttest, participants are still validated as being aware. If participants were unable to verbalize the grammar rules in the

thinking-aloud part, as well as in the posttest and in the debriefing, they were classified as being non-aware of those grammar rules.

In the end, these various results have been added up and combined to state a final conclusion about the effect of the hypothetical triggers on awareness.

4. Results

This chapter will give an overview of the results for each combination of structure and trigger. For each pair of structure and trigger the following questions will be answered: How many participants became aware of the structure?; Is there a significant between-group difference with respect to the being aware (with the dependent variable being the presence or absence of a hypothetical trigger)?; How did participants score on the GJT?; Is there a significant between-group difference in scores on the GJT with respect to the awareness level? Is there a connection between the awareness level and participants' scores on the GJT? And did the debriefing show unexpected results (i.e. participants who claimed to be aware of a structure when the thinking-aloud part and posttest revealed otherwise or vice versa)? For each pair, first of all the numerical data will be presented, secondly numerical data to the posttest and finally the outcome of the thinking-aloud data. Note that in the result section below only a selected part of the numerical data will be represented. A complete overview of all collected numerical data to the thinking-aloud part and posttest can be found in appendices 10 and 11.

With respect to the posttest, the following needs to be noted. In total, the posttest contained 840 grammatical and 840 ungrammatical structures, which means 24 grammatical and 24 ungrammatical structures for each participant. In turn, this means 3 grammatical and three ungrammatical sentences to each grammatical structure. The table in appendix 9 shows that from the 840 grammatical structures, participants labeled 648 of these as grammatical. This means, that participants give the correct answer approximately 77% of the time. For the ungrammatical structures, however, this percentage is totally different: Here in only 258 cases, so in about 31% of the time, participants gave the correct answer. This difference in correctness on grammatical and ungrammatical posttest items in favour of the grammatical items may be due to the yes-bias in GJTs. Since using biased data in an analysis is less meaningful than using unbiased data, it was decided to only take into account participants' answers to ungrammatical posttest items. In order to be as complete as possible, however, participants' answers to the grammatical items will be presented in the appendix as well, but will not be taken into account in the analysis.

4.1. Object and repair

Observations to thinking-aloud data

As becomes clear from the numerical data which will follow in the next section, only a minor part of the participants noticed the irregularity (only 16 out of 35 participants). From them, only 10 participants used this notion to think about the grammar of the language, and in the end only three of them became aware of the actual structure. The six remaining participants who did notice the irregularity but who were unable to connect this to grammatical aspects of the language either mentioned the irregularity once or a couple of times, but in any case, they did this without verbally connecting this to grammatical aspects of the language they were learning. One hypothesis a lot of the participants who did not become aware of the appropriate structure but who did notice the irregularity had was that *denen* is used as a kind of possessive marker and refers to *his* or *her*. In most cases this hypothesis was triggered by the sentence *Den pojke äta denen bröd* (Eng: The boy is eating bread). The interpretation that the boy is eating HIS bread would semantically make sense and this possessive interpretation is also a common expression in Dutch. Sentences as *Ik eet mijn brood* (Eng: I am eating my bread) are more commonly uttered than *Ik eet het brood* (Eng: I am eating the bread). Therefore, a possessive interpretation of *denen* seems to be obvious for Dutch speakers. Other hypotheses were that the difference between *den* and *denen* is caused by definiteness, the number or gender of the substantive; however participants failed to find evidence for this.

Another striking point with respect to the notion of the difference between both determiners is that there were a couple of participants who repeated (parts of) the input sentences correctly by repeating *denen* as determiner that marks objects and *den* in other cases. These participants, however, only repeated the sentences correctly and they did not mention there being two different determiners. Therefore, they are also not counted to the group of participants who were aware of an underlying irregularity. What is interesting about this finding, however, is that, at least for these participants, they are able to (acoustically) perceive the difference between both determiners.

With respect to the trigger, the stuttering/correction of the speaker in the input, some participants indicated that the speaker did so. During the thinking-aloud part, one of the participants indicated that this stuttering annoyed her, because she was looking for a meaning of the stuttering which she could not find. In the debriefing, another participant explained that the stuttering annoyed her, because it triggered her to say *uhh* herself as a kind of imitation. She said this made her think longer.

Thinking-aloud numerical data

From the 35 participants, five participants became aware of the correct grammatical structure. Two of them were in group A and received the hypothetical repair trigger; the other 3 were in group B and did not receive the trigger. A chi-square test reveals the between group difference here is not significant ($\chi^2(1)= 0.31$, p=0.58) and therefore the null hypothesis that there is no significant difference between group A and group B is not rejected. Note that in this study an alpha level of 0.05 has been used as the significance criterion for all statistical tests.

The number of participants who noticed irregularities in the input, or, in other words, who noticed there is something going on with the grammar but who did not figure out what exactly this is, is not very different in both groups. In group A, seven participants noticed the irregularities, whereas in group B, nine participants noticed these. A chi-square test reveals this difference is not significant ($\chi^2(1)= 0.27$, p=0.60).

Posttest data

In general, it can be concluded that for the posttest data with respect to the object marking structure, participants perform poorly. In only 58 out of 210 cases participants correctly judged an item ungrammatical, of which they were only certain 12 times (21%). In other words, each participant judged 1.7 out of 6 structures correctly. This means that in general, participants are not able to identify sentences which are ungrammatical on object marking, and if they are able to, they are not certain about their judgement most of the time. This in turn could mean that participants failed to learn the structure.

An independent samples T-test was conducted to compare the ranked values (participants' judgements with respect to expected outcomes) of both groups. This T-test shows there is a significant between group A (M=0.75, SD=0.99) and group B (M=0.95, SD=0.90); $t(208)$=-1.52, p=0.034. These results suggest that participants in the group that did not receive the trigger (group B) performed significantly better than participants in the group that did receive the trigger.

With respect to participants' certainty to their responses to the posttest items a chi-square test shows there is a significant difference between group A and B ($\chi^2(1)$=10.31, p=0.00). Participants in group A indicated that they were certain about their judgements in 66 out of 102 cases (65% of the time), whereas participants in group B indicated that they were certain about their judgments in only 46 out of 108 cases (43% of the time).

To determine whether there is a correlation between awareness and participants' performance on the posttest an independent samples T-test was conducted. This T-test shows that there is a significant difference in posttest performance between the unaware and aware participants (M=1.72, SD=0.90); t(208)=-4.19, p=0.000. Aware participants score significantly better than unaware participants.

At first sight, the score on the posttest of some participants seems to be unexpected, i.e. not in line with their level of awareness of this structure. When looking deeper into the data, however, these good performances seem to be accidental. Most of the time these participants reject these sentences due to vocabulary reasons (they think a word that occurred in the posttest sentence does not exist in the artificial language) or participants had a wrong hypothesised rule and they accidentally got the correct answer even though they used an inappropriate grammar rule. The correct rejections therefore seem not to be caused by knowledge about the grammar rule, but rather rely on chance.

The debriefing shows no unexpected results. There were no participants who claimed to be aware of the structure who did not indicate that before, either in the thinking-aloud part or in the posttest. However, there were some participants who indicated they noticed a difference between *den* and *denen*, but they said they did not find out the reason for this difference and they therefore did not mention this before.

4.2. Duals and plurals

Observations to thinking-aloud data

As will become clear from the numerical data in the next section, only a minor part of the participants noticed the irregularity (only 10 out of 35 participants). From them, only 7 participants used this notion to think about the grammar of the language and in the end only 4 of them became aware of the actual structure. The other three participants were searching for a difference, but could not find one. Two of them hypothesised that the form of the non-singular depends on the substantive. So, for example that for *häst* (Eng: horse) the non-singular always ends on *-t*, whereas for other substantives as for example *hund* (Eng: dog) the non-singular always ends on *-r*. They, however, failed to find sufficient evidence for this.

From the thinking-aloud data of participants who were not aware of the irregularities it becomes clear that a lot of participants did not hear the acoustic difference between the two suffixes. Obviously, when participants do not hear this difference, they cannot become aware of the irregularities and can therefore also not become aware of the underlying grammatical structure. This finding emphasises the importance of a good phonetic coding ability for

language learning. Surprisingly, however, an independent samples T-test reveals that there is no significant difference in scores on the LLama_D test between participants who are aware of the irregularity (*M*=22.88, *SD*=13.42) and participants who are not (*M*=29.43, *SD*=14.07); t(68)=1.91, *p*=0.06 (In this analysis only the structures for which it seems the most relevant to be able to make good phonetic distinctions are taken into account (that is the structures on object marking and the dual-plural distinction because of the minor differences between *den* and *denen* and the duals/plurals on *-r* and *-t* on the word ends) have been taken into account.

With respect to the trigger, the contrast in the input, some participants indicated, either in the thinking-aloud part, in the debriefing or in both, that the speaker stuttered so "there must be something going on with this". But only a couple of participants were able to find out the correct rule.

Thinking-aloud numerical data

From the 35 participants only four became aware of this structure (11%). These participants were all in group B and received the hypothetical trigger. This means that 18% of the participants in group B became aware of the structure, whereas in group A this is 0%. A Fisher exact test was conducted to determine whether participants in group B had a higher chance of getting aware than participants in group A. The test reveals that there is no significant between-group difference (df=1, p=1.104). This means that receiving the trigger seems to have no direct influence on getting aware of the grammatical rule.

However, with respect to the number of participants who became aware of irregularities, a chi-square test reveals there is a significant difference between group A and B ($\chi^2(1)=4.58$, p=0.03).

Posttest data

In general, participants seem to perform poorly on this structure. In only 40 of 210 (19% of the) cases in the posttest participants correctly judged an item as ungrammatical, of which they were only certain 15 times (38%). This means that, in general, participants are unable to classify ungrammatical sentences containing a dual or plural as such, and if they can, they are only certain about this judgment about 38% of the time. This in turn could mean that participants failed to learn the structure.

An independent samples T-test shows that there is a significant difference in performance on the posttest (ranked value) between group A (*M*=0.53, *SD*=0.780) and group B (*M*=0.93, *SD*=1.020); *t*(208)=-3.15, *p*=0.002 . From this, it can be concluded that the

participants who received the trigger (participants in group B) perform better on the posttest than participants in the group that did not receive the trigger (group A).

With respect to participants' certainty to their responses to the (ungrammatical) posttest items, however, there seems to be no significant difference between group A and group B ($\chi^2(1)=2.10$, $p=0.15$). A Fisher Exact test shows that there also is no significant difference in certainty between aware and non-aware participants ($df=1$, p=0.261). Here, with respect to these values, it needs to be mentioned, however, that one of the posttest items is not taken into account in the analysis. With two of the posttest items a lot of participants had extreme difficulties (one belonging to the grammatical sentences and one to the ungrammatical sentences). A lot of participants indicated they did not understand the sentences *Fyra kor äta* and *Fyra kot sova*. They claimed these words were new to them; They did not recognise these words. This failure in learning could be due to minor similarity between the words of the artificial language compared to Dutch: The word *sova* barely has similarities to the Dutch word *slapen* (Eng: to sleep); The pronunciation of the Swedish *fyra* [fʏra] (Eng: four) does not really lie close to its Dutch counterpart *vier* [vi:r], especially because the vowel is realised differently; And also the stem *ko* [ko] of the word *kor* is pronounced very differently from the Dutch counterpart *koe* [ku] (Eng: cow). Probably it is this lack of similarity to Dutch which caused most of the participants to not recognise these words and therefore to judge these sentences as ungrammatical. In these cases, however, participants' judgements are based on considerations with respect to vocabulary, and not on grammatical rules. Since judgements with respect to these specific sentences teach us more about participants' failure to learn vocabulary items than about their ability to recognise the grammatical concept of dual/plural marking underlying these sentences, these sentences are excluded from the statistical analysis.

The results of another independent samples T-test taking the ranked value as the dependent variable and awareness as the independent variable show that, in general, aware participants perform better on the posttest ($M=0.92$, $SD=1.00$) than participants who are not aware of the structure ($M=0.51$, $SD=0.80$); $t(208)=-3.26$, $p=0.00$, regardless of whether they belong to group A or B.

When comparing participants' score of correctness to their awareness of the structure, most participants behave in line with the expectations. Most unaware participants score poorly on the posttest and most aware participants score relatively well on the posttest. There are, however, some exceptions. Here again, vocabulary considerations seem to predominate

participants' decisions on what makes a sentence (un)grammatical rather than basing a decision on grammatical knowledge.

With respect to the debriefing there was only one participant who had some unexpected comment with respect to the dual-plural marking distinction. From the thinking-aloud data to the input learning stage and the posttest it did not become clear that this participant was aware of the structure. However, in the debriefing she indicated differently. She claimed that non-singulars are characterised by a t-suffix, but that there was also a different way of marking, and that the choice for the appropriate suffix depends on how many individuals were expressed (paraphrased). In the debriefing, she also indicated that her awareness for this notion was triggered by the similarity between the pictures.

4.3. Diminutives

Observations to thinking-aloud data

As will become clear from the next section, more than half of the participants noticed an irregularity in the input with respect to diminutive marking (20 out of 35 participants) (57%). No less than 16 participants used this notion to think about the grammar of the language (46%). However, in the end only 3 of them became aware of the actual structure (9%). Among the participants who thought about the grammatical form of the structure but who did not become aware of the appropriate, one common hypothesis was that the choice for a diminutive depends on the character of the substantive.

From the debriefing, it became apparent that a lot of participants did notice that both *liten* and *små* are being used as a diminutive, but a lot of these participants only confirmed this once the researcher asked about diminutives and they did not mention this themselves in the thinking-aloud part. Some of them searched for an explanation during the debriefing, while others had no clue and confirmed they were unsure. Some other participants guessed that it is about young vs. grown-up animals, animacy vs. inanimacy or that it depends on the substantive. Only a few participants mention the possibility of grammatical number.

With respect to the functionality of the trigger from the thinking-aloud data it can be concluded that the trigger seems to work. Participants in group A who received the trigger indicate that the trigger made them think about the grammatical form of the structure. On the other hand, participants in group B who did not receive the trigger also thought about the grammatical form of the structure, yet they more or less seemed to accept that both *liten* and *små* can be used to express the diminutive. Both forms seemed equal to them. They noticed

there were two different forms, but they accepted this as being normal and they were not as persistent in finding explanations for this as participants in group A.

Thinking-aloud numerical data

For this structure, only 3 out of 35 participants became aware of the appropriate rule (9%). Two of them were in group A and received the hypothetical trigger; the other one was in group B and did not receive the trigger. A chi-square test reveals the between group difference here is not significant ($\chi^2(1)= 0.43$, $p= 0.51$) and therefore the null hypothesis that there is no significant difference between group A and group B can be accepted.

Also, with respect to the number of participants who became aware of irregularities (9 in group A vs. 11 in group B), a chi-square test reveals there is no significant difference between group A and B ($\chi^2(1)= 0.24$, $p= 0.63$).

Based on counting with respect to the effect of the trigger solely, the trigger seems to be effective. From the 17 participants who received the trigger, 5 participants (29%) indicate (in the thinking-aloud data) that the trigger made them think about the grammatical form of the structure. Another 5 participants of this group were not focused on grammar, and therefore it was to be expected that for these participants the trigger would not have any effect, since these participants did not focus on grammar learning. This means that effectively for 5 out of 12 participants the trigger worked, which is about 42%.

Posttest data

In general, from the results from the posttest with respect to difference in diminutives, it can be concluded that participants performed poorly. In only 47 of 210 cases, participants correctly judged an item ungrammatical (22%) and they were only certain about this 14 times (7%). Generally, participants are thus unable to reject sentences in which *liten* is used as a diminutive with a substantive in dual number or sentences in which *små* is used with substantives in singular number. This means, that, generally, participants failed to learn the diminutive marking structure.

An independent samples T-test taking the ranked value of the posttest as the dependent variable and group as the grouping variable shows that there is no significant between-group difference in performance on the posttest. Participants in group A who received the trigger (M=0.76, SD=0.93) did not perform significantly better on the posttest than participants in group B who did not receive the trigger (M=0.84, SD=0.95); $t(208)$=-0.60, p=0.55.

Also, with respect to participants' certainty to their responses to the (ungrammatical) posttest items, there is no significant difference between group A and B ($\chi^2(1)=0.21$, $p=0.65$).

To determine whether being aware influences the performance on the posttest, an independent samples T-test taking the ranked value as the dependent variable and group as the independent variable has been conducted. This test shows there indeed seems to be a correlation. No matter whether the participants belonged to group A or B, aware participants perform significantly better on the posttest (M=1.39, SD=1.34) than unaware participants (M=0.75, SD=0.87); $t(208)$=-2.82, p=0.01. This means that participants behave in line with the expectations: most unaware participants score poorly on the posttest and most aware participants score relatively well on the posttest. There are, however, some exceptions. Some participants do not behave in line with the expectations. When, however, taking into account their explanations of why they judge certain sentences the way they do knowledge about the grammar rule does not seem to be the cause of the correct judgments most of the time. Again, some participants base their judgements on vocabulary considerations here. Other participants judge based on inappropriate hypotheses about the grammar of the artificial language. An example of this is that they believe the choice for *liten* or *små* depends on the nature of the substantive and not on the number of the substantive (for instance that for *hund* (Eng: dog) the appropriate diminutive is *liten*, whereas for *höna* (Eng: chicken) it is *små* or vice versa). Again, other participants do not recognise the diminutive *små* from the input and claim that for all diminutive substantives, *liten* should be used instead of *små*. Some indicate that *små* has similarities with the English word *small*, but that in this language it is not used. These judgments are also not based on the knowledge about the grammar rule. Since the number of participants who score out of the line of expectation is small and since for most of them their unexpected behaviour seems to be explainable by other factors than knowledge about the appropriate grammar rule, it can be concluded that for this structure again, awareness has a positive effect on posttest performance.

The debriefing showed no unexpected results. There were no participants who claimed to be aware of the structure who did not indicate that before, either in the thinking-aloud part or in the posttest. However, there were some participants who indicated they noticed there were two different diminutives, but they say they did not find out the reason for this difference and therefore they did not mention this before.

4.4. Postpositions

Observations to thinking-aloud data

As will become clear from the numerical data in the next section, 28 out of 35 participants (80%) noticed an irregularity in the input with respect to the postpositional character of adpositions. 24 participants (69%) used either this notion or were triggered by the presence of the hypothetical trigger to think about the grammar rule. In the end, 23 (96%) of them became aware of the actual structure.

With respect to the functionality of the trigger from the thinking-aloud data it can be concluded that the trigger works. Even though only 4 out of 18 participants (22%) became aware of the structure because of the trigger, potentional malfunctioning of the trigger does not seem to be the cause of this small number. In only 4 out of 18 possible times the trigger worked, however, in 10 other cases the participant already became aware before the trigger was presented. In this case, the trigger had no chance to cause awareness and therefore these cases should not be taken into account in calculating the effectiveness of the trigger. Subtracting the cases in which participants became aware of the structure before the trigger was presented the trigger was effective half of the time.

Thinking-aloud numerical data

From the 35 participants, 23 became aware of this structure (66%). Of these participants, 9 were in group A (39%) and did not receive the trigger, and 14 were in group B (61%) and did receive the trigger. A chi-square test reveals that this between-group difference is not significant ($\chi^2(1)=2.39$, $p= 0.12$). This means that participants who receive the trigger are not significantly more often aware of the structure than participants in group A or vice versa.

Also with respect to the number of participants who became aware of irregularities with respect to this structure, a chi-square test reveals there is no significant between-group difference ($\chi^2(1)= 0.008$, $p= 0.93$).

Posttest data

With respect to the postposition structure, participants perform relatively well on the posttest. In 113 out of 210 cases (54%), participants correctly judged an item ungrammatical. Participants were sure about this judgement 49 times, which is in 43% of the cases. Taking into account the yes-bias and the motivation to the thinking aloud-data, it can be concluded that this good performance is not caused by chance, but rather by knowledge about the grammar.

An independent samples T-test taking the expected outcome (ranked value) of the posttest as the dependent variable and group as the grouping variable shows that there is a

significant difference between groups in performance. Participants in group B who received the trigger (*M*=1.72, *SD*=0.97) performed significantly better than participants in group A who did not receive the trigger (*M*=1.41, *SD*=1.13); *t*(208)=-2.15, *p*=0.03.

With respect to participants' certainty to their responses to the posttest items, there is a significant difference between group A and group B ($\chi^2(1)= 10.31$, p=0.00). Participants in group A indicated that they were certain about their judgements in 66 out of 102 cases (65% of the time), whereas participants in group B indicated that they were certain about their judgments in only 46 out of 108 cases (43% of the time).

The performance of most participants of the posttest is in line with the expectation, i.e. participants who were aware performed better than participants who are not aware of the structure. An independent samples T-test supports this finding. Regardless to which group (A or B) participants belong, aware participants (*M*=1.75, *SD*=1.04) performed better on the posttest than non-aware participants (*M*=1.22, *SD*=1.01); *t*(208)=-3.55, *p*=0.00. However, sometimes participants who were not aware of the structure, did score relatively well on the posttest and vice versa. The explanation for this seems to lie in the lack of vocabulary knowledge of the participants. As is also the case for previously mentioned structures, a lot of participants judged an item as ungrammatical when they did not recognise words the item contained. This could lead to unjustified conclusions about the effect awareness has on posttest performance. For the other structures, this was a problem already, yet for this structure the effect of not mastering the vocabulary got even bigger. In the posttest items for the other structures the usage of "hard" words was restricted to substantives and verbs and numerals most of the time. These words occurred frequently in the input stage and thus had more chance to be remembered by the participants than words which were not frequently used in the input. The latter is the case for two out of three postpositions. *li* (Eng: in) and *tu* (Eng: behind) occured in the input only twice. Therefore, it should not come as a surprise that participants were unsure about the meaning of these words[1]. In the posttest, however, they together made up 66% of the adpositions of this target structure. Because participants sometimes did not recognise these adpositions, they classified more items as ungrammatical as they would have done when they would have remembered the meaning of these

[1] In designing the experiment the disadvantage of distorted posttest scores because participants did not have enough opportunity to learn the correct translations for *li* and *tu* was not taken into account. A more important consideration was that during the thinking-aloud input stage participants should be able to classify *li* and *tu* as adpositions, so that they would be able to generalise that in the artificial language adpositions have postpositional character.

adpositions. This explains the finding of some unaware participants who scored relatively well on the posttest.

The debriefing barely shows unexpected results. Most participants who became aware of the rule explained its working here. Other participants who did not mention the rule during the input thinking aloud stage or the posttest sometimes mentioned in the debriefing that some sentences ended with "some kind of word", but that they were unsure about its meaning and only a couple participants guessed its meaning correctly.

5. Discussion

Object structure and repair trigger

From the outcome of the statistical tests it can be concluded that there neither is a significant between-group difference in awareness level of the grammatical structure, nor a between-group difference in participants' awareness of grammatical irregularities in sentences containing the target structure. Besides that, participants in group B perform slightly better on the posttest structures on object marking than the participants in group A who did receive the trigger, whereas the statistical data also show that generally aware participants perform better on the posttest than unaware participants. Participants in group B, the participants who performed better, however, were not as certain about their judgments as participants in group A. The presence of the trigger thus seems to have a negative effect on participants' certainty. This, however, seems illogical and may be coincidental. Taking all these factors into account the hypothesis that self-repair triggers the awareness of the object structure needs to be rejected.

This rejection, however, does not necessarily mean that generally this trigger will have no effect at all in SLA. This reasoning could of course also work for other expected as well as unexpected findings, but seems exteremely relevant for this structure, since from 35 participants only three became aware of the structure. That only about 8,6% of the participants became aware of this structure might be an indication that the structure is too complex to acquire in this experiment. When in the debriefing the researcher explained the difference between *den* and *denen* a lot of participants complained that they had "no time" for noticing this. Some of them motivated this by explaining that for an unapparent reason they did not hear the acoustic difference between both words. Others claim they did hear it (even though they did not indicate this during the thinking-aloud stage or the posttest), but they state they did not have enough time to find out the grammatical rule covering this irregularity. Again others claim the rule is too hard to find out, without giving a specific reason.

Probably, the combination of the native language of the participants not having a case marking system, and the minor morphological difference between *den* and *denen*[2] made the rule too hard to acquire for native speakers of Dutch within this specific set up. Probaby, the object marking structure differs a lot from the other three structures that need to be acquired in the experiment. Even though some of these other grammatical concepts are not common in Dutch either, as for example marking differently for duals and plurals, the basic concepts underlying these structures are present in Dutch (in this example marking for non-singular). With respect to this, the other three structures differ a lot from the structure for object marking, and therefore these are probably easier to acquire than the structure for object marking.

Since the target structure appeared (too?) hard to acquire in this language experiment, it would be presumptive to conclude that the hypothetical trigger has no positive effect on learning at all. Especially, since some of the participants who noticed the trigger indicated that this trigger let them pay more attention and caused them to think longer about the input. In order to draw safer conclusions about the functionality of hesitating and self-repairs in SLA, or more specifically their effect on the awareness moment, more research needs to be carried out. This study shows that the choice for a specific target structure is very important in determining the effect of a trigger on the awareness moment and therefore, in a follow-up research, one should pick a structure that is easier to acquire for participants.

A conclusion about the effect of stuttering/hesitating on the awareness moment solely based on this study is that here this trigger neither had effect on the time at which the awareness moment took place, nor on the performance on a post GJT. However, as already has been pointed out, this result is likely to be due to the unlucky set-up of the experiment.

Dual-plural marking and contrast trigger

From the statistical tests, it can be concluded that participants in group B, the group that received the trigger, did not become aware of the grammatical concept underlying the target structure more often than participants in group A who did not receive the trigger. However, participants in group B became aware of irregularities in the input significantly more often. Next to this, they also performed better on the posttest. Since the structure is quite complex to learn, becoming aware or not becoming aware should not be taken as the major criterion for

[2] Even though some participants did notice the acoustic difference between *den* and *denen*, the difference still remains only minor. Since this difference is not that obvious, for some participants it might be too hard to distinguish within this set up.

whether or not the trigger had an effect. The fact that participants who got exposed to the trigger found irregularities more often seems to be more important. Especially, since next to this (some) participants also claim that the trigger caused them to search for the grammar rule. Therefore, it can be concluded that the trigger had a positive effect on L2 learning and performance.

Diminutive marking and the unexpected event trigger

The statistical tests show that between group A and B there neither is a significant difference in awareness of the grammar rule or in being aware of irregularities with respect to the grammatical structure at all, nor a significant difference in posttest performance. The only significant difference obtained is posttest performance of aware participants and unaware participants. The first score significantly better than the latter. A conclusion based on the outcome of these tests would therefore be that the hypothetical trigger does not lead to awareness.

However, the positive effect of the trigger which the thinking aloud data reveal in addition to the calculated effectiveness of 42% should not be neglected in stating a final conclusion. Some critical thinking about the set up of the experiment shows that it might be the set up of the experiment which caused the failure of finding a significant posttest performance difference between group A and B. One of the reasons for the participants not becoming aware of the structure could be the number of target items. Out of 7 participants in group A (the group that received the trigger) who noticed there is a difference between *liten* and *små* only 2 participants became aware of the structure. The rest of them were still looking for a rule covering the irregularity, but they could not find this rule. Since after exposure to the unexpected *små*, both *små* and *liten* occured only twice, it should not come as a surprise that participants were unable to find a rule covering this irregularity when they only had two chances of accepting or rejecting their hypothesis/hypotheses based on the input they received. However, to avoid the experiment from being too long and participants losing their concentration and motivation only 13 *liten-små* items have been included in the input. And in order to ensure that the unexpected event is really unexpected 8 *liten* items have been offered to the participants in group A before they received an unexpected *små* item, so that *liten* has passed so frequently that participants will accept it as the 'regular case'.

Another reason that might have prevented participants (in both group A and B) from noticing there is a difference between *liten* and *små* is the similarity between these diminutives to the English *little* and *small*. A lot of participants pointed out this similarity and

said this helped them in understanding the input. To keep the vocabulary learning load as low as possible instead of changing *liten* and *små* to words less close to English the Swedish originals are kept. Because of the similarity to English however, a language a lot of Dutch natives speak or at least are exposed to regularly, a lot of participants did not even notice that two different words were used (to express a diminutive). Being sensitive to the difference and not accepting both diminutives as equal is of course a requirement for awareness to take place or for the trigger to have an effect. Therefore, the statistical results with respect to this structure should be taken with caution.

Postpositions and repetition trigger

The statistical tests show there neither is a significant between-group difference in awareness of the grammar rule nor in being aware of irregularities with respect to the grammatical structure at all. A conclusion based on the outcome of these tests would therefore be that the hypothetical trigger does not lead to awareness. This, however seems not to be entirely true. Participants' posttest performance shows that participants who received the trigger score better than participants who did not receive the trigger. Besides that, the thinking-aloud data reveal that the trigger has a positive effect on learning. A lot of participants who did not become aware before the trigger indicate that the repetition in the input made them aware of the postpositional character of the adposition. It may therefore be concluded that the hypothetical trigger of repetition has a positive effect on learning. Probably, due to the set up of the experiment in which the repetition came "too late" for participants to be effective, the statistical data does not support this finding.

6. Conclusion

The main research question this thesis was concerned with is which factors influence the awareness moment in spontaneous learning of a second language. The effect of four triggers that may influence awareness has been tested in a thinking-aloud language learning experiment. Each trigger was combined with a unique target structure participants had to learn. If the hypothetical trigger had a positive influence on the awareness moment, then the participants who received the trigger should either become aware of the target structure quicker or more often than participants who did not receive the trigger. It turned out that in this experimental set up, the former is hard to determine, because the number of chances of becoming aware of a structure is limited, combined with only few participants becoming aware of a structure at all, which makes a comparison of the awareness moment insignificant.

Based on the results of this experiment the latter is easier determined, however there are some exceptions to this.

Sometimes, there is no effect present in statistical terms, yet the thinking-aloud data suggest the trigger works. An example of this is the self-repair trigger which was meant to trigger the awareness of the object marking structure. The object marking structure, however, appeared to be too complex to learn for the participants in this type of set up. Therefore, the effect of the trigger is hard to determine. Statistical analyses of the research data suggest there is neither a significant difference in awareness moment between participants who received the trigger and participants who did not, nor in posttest performance. When looking into the thinking-aloud data, however, the situation seems slightly different. The thinking-aloud data reveal that participants' attention was attracted by the presence of the trigger; learning just did not take place within the scope of the experiment (probably because of the complexity of the structure). Further research should look into the role of self-repair to study how it influences the awareness moment in SLA.

The effect of the contrast trigger, on the other hand, is more clearly visible than the effect of the self-repair trigger. The effect of contrast between two extremes in the input seems to trigger awareness and influence L2 performance. The statistical tests show that the number of participants who became aware is significantly higher in the group that received the trigger. This group also contained significantly more participants who became aware of irregularities with respect to the target structure. Besides the increased awareness for participants who received the trigger, they also scored significantly better on the posttest and their certainty on the posttest was higher than of participants who did not receive the trigger. Next to this, the answers to the posttest were in line with the expectations: generally, participants who became aware scored better on the posttest than participants who did not become aware of the structure. Therefore, it can be concluded that the contrast trigger has a positive effect on awareness and leads to a higher L2 performance.

The hypothesis that an unexpected event leads to higher awareness may also be confirmed. Even though the outcomes of most statistical tests reveal there is no significant difference between participants who received the trigger and participants who did not receive the trigger, the thinking-aloud data indicate otherwise. Participants indicate that the trigger does lead to thinking about the grammatical form of the structure. The only significant statistical difference which is found is that participants who are aware of the structure perform better on the posttest. This is in line with the expectation that awareness leads to higher performance. The lack of other significant statistical differences is probably due to the small

number of participants who became aware of the structure at all, which in turn may be due to distribution of and amount of target sentences.

For measuring the effect of the hypothesis that repetition leads to awareness, the distribution and amount of target sentences turned out to be of even more influence than for the previous combination of target structures and hypothetical triggers. Statistical tests reveal there is no significant difference between participants who received the trigger and participants who did not. The only statistical difference found, which is in favour of participants who received the trigger, is again their posttest performance. Participants who received the trigger score better on the posttest than participants who did not receive the trigger. Even though the statistical data may indicate otherwise, from the thinking-aloud data it becomes clear that the trigger does have an influence on awareness. Participants indicate that the repetition block made them think longer about the target structure. This, however, only counts for participants who were not aware of the grammatical structure at the time the repetition block was presented in the input, which unfortunately was only for a limited number of participants. A lot of participants were aware of the structure already before the repetition block was presented. This leads to a distorted statistical analysis, since this analysis supposes that the trigger is crucial in awareness. The trigger either causes awareness, or awareness stays out (because the trigger is not presented or does not work), but it does not take into account the possibility that participants may already be aware of the structure before the trigger is presented. Taking into account the calculation made by hand that for participants who were not aware of the structure yet when the repetition block was presented in the input the trigger is effective half of the time, plus the results to the thinking-aloud data, it can be concluded that a repetition block has a positive effect on awareness.

Coming back to the main research question, which factors trigger awareness, based on this research it can be concluded that at least three out of four factors tested have a positive influence on reaching the awareness moment. The contrast trigger, repetition trigger and unexpected event trigger seem to have a positive influence on reaching the awareness moment. As has been pointed out, stating the same for self-repair trigger, however, would be presumptive when solely the results of this study are taken into account. Yet, since participants state this trigger helped them in attracting their attention to the target structure further research into the effect of this trigger would be desirable. Picking a structure that is easier to acquire for the participants than the object marking structure was is crucial here.

The findings of this study contribute to the field of second language acquisition, in that they provide triggers which can be used in creating a method for learning a second language

in an inductive way. Since, according to Shaffer (1989), inductive learning leads to rule generalisation, and this generalisation in turn facilitates awareness, the knowledge about the positive effect of these factors triggering awareness is useful knowledge in understanding and improving successful second language education.

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Overview appendices

Appendix 1: The vocabulary of the artificial language

Substantives

Artificial language/Swedish	**Dutch**[3]	**English**
bil	auto	car
bröd	brood	bread
dosa	doos	box
flicka	meisje	girl
häst	paard	horse
höna	kip[4]	chicken
hund	hond	dog
hus	huis	house
katt	kat	cat
ko	koe	cow
korg	mand	basket
kvinna	vrouw	woman
man	man	man
pojke	jongen	boy

Verbs

Artificial language/Swedish	**Dutch**	**English**
äta	eten	to eat
bära	dragen	to carry
fodra	voederen	to feed
gräva	graven	to dig
köpa	kopen	to buy
pussa	kussen	to kiss
sitta	zitten	to sit
störta	rennen	to run
teckna	tekenen	to draw
vara[5]	zijn	to be

Numerals

Artifical language/Swedish	**Dutch**	**English**
två	twee	two
tre	drie	three
fyra	vier	four
fem	vijf	five

[3] To enable non-Dutch readers to compare the artificial language to the native-language of the participants Dutch translations and glosses have also been included in the appendices.

[4] Literally translated Swedish *höna* in Dutch is *kip* (Eng: *chicken*), or in a more specific context it could also be translated with *hen* (Eng: *hen*). Note, however, that *höna* is very similar to the Dutch word *haan* (Eng: *cock*). *Höna* therefore is more similar to Dutch than it appears at first sight.

[5] *Vara* is also used in context of *this is…*, similar to how in French *il y a* is used. For example *Vara den man* means *This is the/a man.*

Appendix 2A: Target sentences pilot

In order to make it possible to refer to sentences in a short way, and therewith keep schemata conveniently arranged a name is attributed to every sentence of the input. Here, "mv" functions as abbreviation of the Dutch word for *plural*, namely *meervoud*. The English abbreviation for plural, *pl*, will not be used as a name, in order to avoid ambiguity between plural as opposed to singular and plural as opposed to dual. Therefore the Dutch abbreviation *mv* is "kept" as referring to sentences that contain non-singular substantives as target structure. Furthermore A stands for sentences in dual, and B for sentences in plural. The remaining abbreviations are *obj* for sentences containing direct object marking as their target structure; *PP* for sentences containing postpositions as their target structure, in which *P* stands for the postposition *på*, *L* for the postposition *li* and *T* for the postposition *tu*; Finally *dim* stands for sentences containing diminutives as their target structure, in which *liten* stands for sentences with *liten* as adjective/prefix and *små* for sentences with *små* as adjective/prefix[6].

<u>Duals and plurals:</u>

mv1A: *Två hunder äta.*
"Two dogs are eating."
"Twee honden eten."

mv1B: *Tre hundet sitta.*
"Three dogs are sitting."
"Drie honden zitten."

mv2A: *Den kvinna bära två hunder.*
"The woman is carrying two dogs."
"De vrouw draagt twee honden."

mv2B: *Den man teckna fem hundet.*
"The man is drawing five dogs."
"De man tekent vijf honden."

mv3A: *Två hunder gräva.*
"Two dogs are digging."
"Twee honden graven."

mv3B: *Tre hundet sova.*
"Three dogs are sleeping."
"Drie honden slapen."

mv4A: *Den flicka fodra två hunder.*
"The girl is feeding two dogs."
"Het meisje voert twee honden."

mv4B: *Den kvinna köpa fyra hundet.*
"The woman is buying four dogs."
"De vrouw koopt vier honden."

mv5A: *Två hunder sitta.*

mv5B: *Fyra hundet störta.*

[6] It has not been determined whether *liten* and *små* function as adjective or as prefix in the artificial language, but this is not of importance since the only linguistic input the participants receive is auditory. Eventually, since the speaker who recorded the sentences of the artificial language is a native speaker of Swedish, phonetically *liten* will probably have more of the status of a phonological word (and therewith syntactically function as adjective), whereas *små* will more likely have the status of a phonological foot (and therewith syntactically function as prefix), since in Swedish *liten* is an adjective, whereas *små* most of the time is used as prefix (but not always). However, since the exact syntactical status of *liten* and *små* in the artificial language, nor in Swedish, is important for the study here, this is not determined.

"Two dogs are sitting."
"Twee honden zitten."

mv6A: *Den pojke teckna två hunder.*
"The boy is drawing two dogs."
"De jongen tekent twee honden."

mv7A: *Två hönar störta.*
"Two chickens are running."
"Twee kippen rennen."

mv8A: *Den kvinna köpa två hönar.*
"The woman is buying two chickens."

"De vrouw koopt twee kippen."

mv9A: *Två hönar sitta.*
"Two chickens are sitting."
"Twee kippen zitten."

mv10A: *Den kvinna teckna två hönar.*
"The woman is drawing two chickens."

"De vrouw tekent twee kippen."

mv11A: *Två kor äta.*
"Two cows are eating."
"Twee koeien eten."

mv12A: *Den man köpa två kor.*
"The man is buying two cows."
"De man koopt twee koeien."

mv13A: *Två pojker teckna.*
"Two boys are drawing."
"Twee jongens tekenen."

mv14A: *Den man köpa två häster.*
"The man is buying two horses."

"De man koopt twee paarden."

"Four dogs are running."
"Vier honden rennen."

mv6B: *Den man fodra tre hundet.*
"The man is feeding three dogs."
"De man voert drie honden."

mv7B: *Fem hönat äta.*
"Five chickens are eating."
"Vijf kippen eten."

mv8B: *Den flicka bära tre hönat.*
"The girl is carrying three chickens."
"Het meisje draagt drie kippen."

mv9B: *Tre hönat sova.*
"Three chickens are sleeping."
"Drie kippen slapen."

mv10B: *Den kvinna fodra tre hönat.*
"The woman is feeding three chickens."
"De vrouw voert drie kippen."

mv11B: *Tre kot störta.*
"Three cows are running."
"Drie koeien rennen."

mv12B: *Den pojke teckna tre kot.*
"The boy is drawing three cows."
"De jongen tekent drie koeien."

mv13B:*Tre pojket gräva.*
"Three boys are digging."
"Drie jongens graven."

mv14B: *Den kvinna teckna fyra hästet.*
"The woman is drawing four horses."
"De vrouw tekent vier paarden."

Object marking:

obj1:	*Den pojke fodra denen häst.*	*Den pojke fodra denen häst.*
	the boy feed the-ACC horse	de jongen voeren het-ACC paard
	"The boy is feeding the horse."	"De jongen voert het paard."
obj2:	*Den man bära denen kvinna.*	*Den man bära denen kvinna.*
	the man carry the-ACC woman	de man dragen de-ACC vrouw
	"The man is carrying the woman."	"De man draagt de vrouw."
obj3:	*Den man bära denen dosa.*	*Den man bära denen dosa.*
	the man carry the-ACC box.	de man dragen de-ACC doos
	"The man is carrying the box."	"De man draagt de doos."
obj4:	*Den pojke äta denen bröd.`*	*Den pojke äta denen bröd.*
	the boy eat the-ACC bread	de jongen eten het-ACC brood
	"The boy is eating the bread."	"De jongen eet het brood."
obj5:	*Den flicka pussa denen pojke.*	*Den flicka pussa denen pojke.*
	the girl kiss the-ACC boy	het meisje kussen de-ACC jongen
	"The girl is kissing the boy."	"Het meisje kust de jongen."
obj6:	*Den man köpa denen bil.*	*Den man köpa denen bil.*
	the man buy the-ACC car	de man kopen de-ACC auto
	"The man is buying the car."	"De man koopt de auto."
obj7:	*Den kvinna fodra denen ko.*	*Den kvinna fodra denen ko.*
	the woman feed the-ACC cow	de vrouw voeren de-ACC koe
	"The woman is feeding the cow."	"De vrouw voert de koe."
obj8:	*Den kvinna teckna denen flicka.*	*Den kvinna teckna denen flicka.*
	the woman draw the-ACC girl	de vrouw tekenen het-ACC meisje
	"The woman is drawing the girl."	"De vrouw tekent het meisje."

Postpositions:

PP L1:	*Den katt sova den korg-li.*	*Den katt sova den korg-li.*
	the cat sleep the basket-in	de kat slapen de mand-in
	"The cat is sleeping in the basket."	"De kat slaapt in de mand."
PP L2:	*Den bröd vara den dosa-li.*	*Den bröd vara den dosa-li.*
	the bread be the box -in	het brood zijn de doos-in
	"The bread is in the box."	"Het brood is in de doos."
PP L3:	*Den man vara den hus-li.*	*Den man vara den hus-li.*

the man be de house-in	de man zijn het huis-in
"The man is in the house."	"De man is in huis."
PP P1: *Den flicka sitta den ko-på.*	*Den flicka sitta den ko-på.*
the girl sit the cow-on	het meisje zitten de koe-op
"The girl is sitting on the cow."	"Het meisje zit op de koe."
PP P2: *Den höna vara den bil-på.*	*Den höna vara den bil-på.*
the chicken be the car-on	de kip zijn de auto-op
"The chicken is on the car."	"De kip is op de auto."
PP P3: *Den bröd vara den korg-på.*	*Den bröd vara den korg-på.*
the bread be the basket-on	het brood zijn de mand-op
"The bread is on the basket."	"Het brood is/ligt op de mand."
PP P4: *Den pojke sitta den häst-på.*	*Den pojke sitta den häst-på.*
the boy sit the horse-on	De jongen zitten het paard-op
"The boy is sitting on the horse."	"De jongen zit op het paard."
PP P5: *Den katt sitta den hus-på.*	*Den katt sitta den hus-på.*
the cat sit the house-on	de kat zitten het huis-op
"The cat is sitting on the house."	"De kat zit op het huis."
PP P6: *Den höna vara den ko-på.*	*Den höna vara den ko-på.*
the chicken be the cow-on	de kip zijn de koe-op
"De kip is op de koe."	"De kip is op de koe."
PP T1: *Den häst vara den bil-tü.*	*Den häst vara den bil-tü.*
the horse be the car-behind	het paard zijn de auto-achter
"The horse is behind the car."	"Het paard is achter de auto."
PP T2: *Den hund sitta den korg-tü.*	*Den hund sitta den korg-tü.*
the dog sit the basket-behind	De hond zitten de mand-achter
"The dog is sitting behind the basket"	"De hond zit achter de mand."

<u>Diminutives:</u>

dim/liten1: *Den liten häst störta.*
"The foal is running"
"Het veulen(tje) rent."

dim/liten2: *Den pojke köpa denen liten bil.*
"The boy is buying the little car (model car)."
"De jongen koopt het autootje (speelgoedautootje)."

dim/liten3: *Den liten ko sova.*
"The calf is sleeping."
"Het kalf(je) slaapt."

dim/liten4: *Den man fodra denen liten ko.*
"The man is feeding the calf."
"De man voert het kalf(je)."

dim/liten5: *Den liten hund störta.*
"The puppy is running."
"De puppy rent."

dim/liten6: *Den kvinna köpa denen liten dosa.*
"The woman is buying the little box."
"De vrouw koopt het doosje."

dim/liten7: *Den liten katt sitta.*
"The kitten is sitting."
"De kitten zit."

dim/liten8: *Den pojke pussa denen liten häst.*
"The boy is kissing the foal."
"De jongen kust het veulen(tje)."

dim/små1: *Den småhönar äta.*
"The chicks are eating."
"De kuikens eten."

dim/små2: *Den flicka bära denen småkatter.*
"The girl is carrying the kittens."
"Het meisje draagt de kittens."

dim/små3: *Den småhunder störta.*
"The puppies are running."
"De puppies rennen."

Appendix 2B: Target sentences final version

Duals and plurals:

mv1A: *Två hunder äta.*
"Two dogs are eating."
"Twee honden eten."

mv1B: *Tre hundet sitta.*
"Three dogs are sitting."
"Drie honden zitten."

mv2A: *Den man teckna två hunder.*
"The man is painting two dogs."
"De man tekent twee honden."

mv2B: *Den man teckna fem hundet.*
"The man is drawing five dogs."
"De man tekent vijf honden."

mv3A: *Två hunder sova.*
"Two dogs are sleeping."
"Twee honden slapen."

mv3B: *Tre hundet sova.*
"Three dogs are sleeping."
"Drie honden slapen."

mv4A: *Den kvinna köpa två hunder.*
"The woman is buying two dogs."
"De vrouw koopt twee honden."

mv4B: *Den kvinna köpa fyra hundet.*
"The woman is buying four dogs."
"De vrouw koopt vier honden."

mv5A: *Två hunder sitta.*
"Two dogs are sitting."
"Twee honden zitten."

mv5B: *Fyra hundet störta.*
"Four dogs are running."
"Vier honden rennen."

mv6A: *Den pojke teckna två hunder.*
"The boy is drawing two dogs."
"De jongen tekent twee honden."

mv6B: *Den man fodra tre hundet.*
"The man is feeding three dogs."
"De man voert drie honden."

mv7A: *Två hönar störta.*
"Two chickens are running."
"Twee kippen rennen."

mv7B: *Fem hönat äta.*
"Five chickens are eating."
"Vijf kippen eten."

mv8A: *Den flicka bära två hönar.*
"The girl is carrying two chickens."

"Het meisje draagt twee kippen."

mv8B: *Den flicka bära tre hönat.*
"The girl is carrying three chickens."
"Het meisje draagt drie kippen."

mv9A: *Två hönar sitta.*
"Two chickens are sitting."
"Twee kippen zitten."

mv9B: *Tre hönat sitta.*
"Three chickens are sitting."
"Drie kippen zitten."

mv10A: *Den kvinna teckna två hönar.*
"The woman is drawing two chickens."

"De vrouw tekent twee kippen."

mv10B: *Den kvinna fodra tre hönat.*
"The woman is feeding three chickens."
"De vrouw voert drie kippen."

mv11A: *Två kor störta.*
"Two cows are running."
"Twee koeien rennen."

mv11B: *Tre kot störta.*
"Three cows are running."
"Drie koeien rennen."

mv12A: *Den man köpa två kor.*
"The man is buying two cows."
"De man koopt twee koeien."

mv12B: *Den pojke teckna tre kot.*
"The boy is drawing three cows."
"De jongen tekent drie koeien."

mv13A: *Två pojker teckna.*
"Two boys are drawing."
"Twee jongens tekenen."

mv13B:*Tre pojket gräva.*
"Three boys are digging."
"Drie jongens graven."

mv14A: *Den kvinna teckna två häster.*
"The woman is drawing two horses."

"De vrouw tekent twee paarden."

mv14B: *Den kvinna teckna fyra hästet.*
"The woman is drawing four horses."
"De vrouw tekent vier paarden."

<u>Object marking:</u>

obj1: *Den pojke fodra denen häst.*
the boy feed the-ACC horse
"The boy is feeding the horse."

Den pojke fodra denen häst.
de jongen voeren het-ACC paard
"De jongen voert het paard."

obj2: *Den man bära denen kvinna.*
the man carry the-ACC woman
"The man is carrying the woman."

Den man bära denen kvinna.
de man dragen de-ACC vrouw
"De man draagt de vrouw."

obj3: *Den man bära denen dosa.*
the man carry the-ACC box.
"The man is carrying the box."

Den man bära denen dosa.
de man dragen de-ACC doos
"De man draagt de doos."

obj4: *Den pojke äta denen bröd.`*
the boy eat the-ACC bread
"The boy is eating the bread."

Den pojke äta denen bröd.
de jongen eten het-ACC brood
"De jongen eet het brood."

obj5: *Den flicka pussa denen pojke.*
the girl kiss the-ACC boy
"The girl is kissing the boy."

Den flicka pussa denen pojke.
het meisje kussen de-ACC jongen
"Het meisje kust de jongen."

obj6: *Den man köpa denen bil.*
the man buy the-ACC car
"The man is buying the car."

Den man köpa denen bil.
de man kopen de-ACC auto
"De man koopt de auto."

obj7: *Den kvinna fodra denen ko.* *Den kvinna fodra denen ko.*
the woman feed the-ACC cow de vrouw voeren de-ACC koe
"The woman is feeding the cow." "De vrouw voert de koe."

obj8: *Den kvinna teckna denen flicka.* *Den kvinna teckna denen flicka.*
the woman draw the-ACC girl de vrouw tekenen het-ACC meisje
"The woman is drawing the girl." "De vrouw tekent het meisje."

Postpositions:

PP L1: *Den katt sova den korg-li.* *Den katt sova den korg-li.*
the cat sleep the basket-in de kat slapen de mand-in
"The cat is sleeping in the basket." "De kat slaapt in de mand."

PP L2: *Den bröd vara den dosa-li.* *Den bröd vara den dosa-li.*
the bread be the box -in het brood zijn de doos-in
"The bread is in the box." "Het brood is in de doos."

PP L3: *Den man vara den hus-li.* *Den man vara den hus-li.*
the man be de house-in de man zijn het huis-in
"The man is in the house." "De man is in huis."

PP P1: *Den flicka sitta den ko-på.* *Den flicka sitta den ko-på.*
the girl sit the cow-on het meisje zitten de koe-op
"The girl is sitting on the cow." "Het meisje zit op de koe."

PP P2: *Den höna vara den bil-på.* *Den höna vara den bil-på.*
the chicken be the car-on de kip zijn de auto-op
"The chicken is on the car." "De kip is op de auto."

PP P3: *Den bröd vara den korg-på.* *Den bröd vara den korg-på.*
the bread be the basket-on het brood zijn de mand-op
"The bread is on the basket." "Het brood is/ligt op de mand."

PP P4: *Den pojke sitta den häst-på.* *Den pojke sitta den häst-på.*
the boy sit the horse-on De jongen zitten het paard-op
"The boy is sitting on the horse." "De jongen zit op het paard."

PP P5: *Den katt sitta den hus-på.* *Den katt sitta den hus-på.*
the cat sit the house-on de kat zitten het huis-op
"The cat is sitting on the house." "De kat zit op het huis."

PP P6: *Den höna vara den ko-på.* *Den höna vara den ko-på.*
the chicken be the cow-on de kip zijn de koe-op

"De kip is op de koe."	"De kip is op de koe."
PP T1: *Den häst vara den bil-tü.*	*Den häst vara den bil-tü.*
the horse be the car-behind	het paard zijn de auto-achter
"The horse is behind the car."	"Het paard is achter de auto."
PP T2: *Den hund sitta den korg-tü.*	*Den hund sitta den korg-tü.*
the dog sit the basket-behind	De hond zitten de mand-achter
"The dog is sitting behind the basket"	"De hond zit achter de mand."

<u>Diminutives:</u>

dim/liten1: *Den liten häst störta.*
"The foal is running"
"Het veulen(tje) rent."

dim/liten2: *Den pojke köpa denen liten bil.*
"The boy is buying the little car (model car)."
"De jongen koopt het autootje (speelgoedautootje)."

dim/liten3: *Den liten ko sova.*
"The calf is sleeping."
"Het kalf(je) slaapt."

dim/liten4: *Den man fodra denen liten ko.*
"The man is feeding the calf."
"De man voert het kalf(je)."

dim/liten5: *Den liten hund störta.*
"The puppy is running."
"De puppy rent."

dim/liten6: *Den kvinna köpa denen liten dosa.*
"The woman is buying the little box."
"De vrouw koopt het doosje."

dim/liten7: *Den liten katt sitta.*
"The kitten is sitting."
"De kitten zit."

dim/liten8: *Den pojke pussa denen liten häst.*
"The boy is kissing the foal."
"De jongen kust het veulen(tje)."

dim/liten9: *Den liten höna äta.*
"The little chicken/The chick is eating."
"Het kleine kipje/De kleine kip/Het kuiken(tje) eet."

dim/liten10: *Den liten häst äta.*
"The little horse/The foal is eating."
"Het kleine paard(je)/Het veulen(tje) eet."

dim/små1: *Den småhönar äta.*
"The chicks are eating."
"De kuikens eten."

dim/små2: *Den flicka bära denen småkatter.*
"The girl is carrying the kittens."
"Het meisje draagt de kittens."

dim/små3: *Den småhunder störta.*
"The puppies are running."
"De puppies rennen."

Appendix 3A: The distribution of the target sentences in the pilot

The sentences that are (part of) a hypothetical trigger are represented in italics.

The triple line between 32 and 33 represents that here is the break between block 1 and block 2, in which the auditory digit span tests are taken.

	Group A	**Group B**
1.	mv1A	mv1A
2.	obj1	obj1
3.	mv8B	mv13A
	filler26	filler26
	filler1	filler1
4.	mv11B	mv5A
	filler18	filler18
	filler10	filler10
5.	mv4A	*mv4A*
6.	mv9A	*mv4B*
	filler5	filler5
	filler23_repair	filler23_repair
7.	mv6B	mv6B
8.	obj2	obj2
9.	mv7B	mv7B
10.	obj3	obj3
	filler4_repair	filler4_repair
	filler2	filler2
	filler24_repair	filler24_repair
11.	mv10A	*mv9B*
12.	mv13A	*mv9A*
	filler6_repair	filler6_repair
	filler25	filler25
13.	mv2B	*mv2B*
14.	mv3B	*mv2A*
15.	obj4	obj4
16.	mv14B	mv10B
	filler22_repair	filler22_repair
	filler12	filler12
17.	mv5A	*mv8B*
18.	mv8A	*mv8A*
19.	obj5	obj5
	filler17	filler17
	filler3	filler3
	filler13_repair	filler13_repair
20.	mv5B	*mv3A*
21.	mv10B	*mv3B*

22.	obj7	obj7
23.	mv3A	mv10A
	filler20	filler20
	filler19	filler19
24.	mv14A	*mv14A*
25.	mv9B	*mv14B*
26.	*obj6_repair*	obj6
27.	obj8	obj8
28.	mv4B	mv5B
	filler27	filler27
29.	mv11A	mv13B
	filler11_repair	filler11_repair
	filler28	filler28
30.	mv2A	*mv11B*
31.	mv13B	*mv11A*
	filler16	filler16
32.	mv12A	mv12A
33.	dim/liten1	dim/liten1
34.	PP P1	PP P1
35.	mv7A	mv7A
	filler7	filler7
36.	PP P2	PP P2
37.	dim/liten2	dim/liten2
38.	PP L1	PP L1
39.	dim/liten3	dim/små1
40.	mv1B	mv1B
41.	dim/liten4	dim/liten3
42.	PP T1	PP T1
43.	dim/liten5	dim/liten4
44.	PP P3	*PP P3*
45.	dim/liten6	*PP P4*
46.	PP P4	*PP L2*
47.	mv12B	*PP T2*
48.	PP L2	*PP P5*
49.	dim/liten7	*PP L3*
50.	PP T2	dim/små2
51.	obj7	obj7
52.	PP P5	mv12B
53.	dim/liten8	dim/liten5
54.	mv6A	mv6A
55.	*dim/små1*	dim/liten6
56.	obj4	obj4
57.	dim/små2	dim/liten7

58.	PP P6	PP P6
59.	dim/små3	dim/liten8
	filler14_repair	filler14_repair
	filler9	filler9
60.	PP L3	dim/små3

Appendix 3B: The distribution of the target sentences in the actual experiment

	Group A	**Group B**
1.	mv1A	mv1A
2.	obj1	obj1
3.	mv8B	mv13A
	filler26	filler26
	WL6	WL6
4.	mv11B	mv5A
	WL8	WL8
	filler10	filler10
5.	mv4A	*mv4A*
6.	mv9A	*mv4B*
	WL14	WL14
	filler23_repair	filler15_repair
7.	mv6B	mv6B
8.	obj2	obj2
9.	mv7B	mv7B
10.	obj3	obj3
	WL13	WL13
	filler2	filler2
	filler24_repair	filler24_repair
11.	mv10A	*mv9A*
12.	mv13A	*mv9B*
	filler6_repair	filler6_repair
	WL2	WL2
13.	mv2B	*mv2B*
14.	mv3B	*mv2A*
15.	obj4	obj4
16.	mv14B	mv10B
	WL5	WL5
	filler12	filler12
17.	mv5A	*mv8B*
18.	mv8A	*mv8A*
19.	obj5	obj5
	WL4	WL4
	filler1	filler1
	filler13_repair	filler13_repair
20.	mv5B	*mv3A*
21.	mv10B	*mv3B*
22.	obj7	obj7
23.	mv3A	mv10A
	filler20	filler20
	WL11	WL11

24.	mv14A	*mv14A*
25.	mv9B	*mv14B*
26.	*obj6_repair*	obj6
27.	obj8	obj8
28.	mv4B	mv5B
	WL9	WL9
29.	mv11A	mv13B
	filler11_repair	filler11_repair
	WL1	WL1
30.	mv2A	*mv11B*
31.	mv13B	*mv11A*
	WL12	WL12
32.	mv12A	mv12A
33.	dim/liten1	dim/liten1
34.	PP P1	PP P1
35.	mv7A	mv7A
	filler7	filler7
	filler15_repair	filler15_repair
36.	PP P2	PP P2
37.	dim/liten2	dim/liten2
38.	PP L1	PP L1
39.	dim/liten3	dim/små1
40.	mv1B	mv1B
41.	dim/liten4	dim/liten3
42.	PP T1	PP T1
43.	dim/liten5	dim/liten4
44.	PP P3	*PP P3*
45.	dim/liten6	*PP P4*
46.	PP P4	*PP L2*
47.	mv12B	*PP T2*
48.	PP L2	*PP P5*
49.	dim/liten7	*PP L3*
50.	PP T2	dim/små2
51.	obj7	obj7
52.	PP P5	mv12B
53.	dim/liten8	dim/liten5
54.	mv6A	mv6A
55.	*dim/små1*	dim/liten6
56.	obj4	obj4
57.	dim/liten9	dim/liten7
	WL7	WL7
58.	dim/små2	dim/små3
59.	PP P6	PP P6
	WL3	WL3

60.	dim/liten10	dim/liten8
	WL10	WL10
61.	dim/små3	dim/liten9
	filler14_repair	filler14_repair
	filler9	filler9
62.	PPL3	dim/liten10

Appendix 4: Fillers

Intransitives

1. *Den flicka sjunga.*
   "The girl is singing."
   "Het meisje zingt."

2. *Den bil driva.*
   "The car is driving."
   "De auto rijdt."

3. *Den häst hoppa.*
   "The horse is jumping."
   "Het paard springt."

4. *Den kvinna koka.*
   "The woman is cooking."
   "De vrouw kookt."

5. *Den pojke läsa.*
   "The boy is reading."
   "De jongen leest."

6. *Den katt tvätta.*
   "The cat is washing."
   "De kat wast."

7. *Den man simma.*
   "De man is swimming."
   "De man zwemt."

8. *Den flicka grina.*
   "The girl is crying."
   "Het meisje huilt."

9. *Den man sopa.*
   "The man is wiping."
   "De man veegt."

10. *Den pojke ringa.*
    "The boy is calling."
    "De jongen telefoneert."

11. *Den kvinna cyckla.*

"The woman is cycling."
"De vrouw fietst."

12. *Den pojke gunga.*
"The boy is playing on the swings."
"De jongen schommelt."

13. *Den man fiska.*
"The man is fishing."
"De man vist."

14. *Den kvinna dansa.*
"The woman is dancing."
"De vrouw danst."

Vara den (this is)-sentences

15. *Vara den lejon*
"This is the/a lion."
"Dit is de/een leeuw."

16. *Vara den blomma.*
"This is the/a flower."
"Dit is de/een bloem."

17. *Vara den tiger.*
"This is the/a tiger."
"Dit is de/een tijger."

18. *Vara den äpple.*
"This is the/an apple."
"Dit is de/een appel."

19. *Vara den hink.*
"This is the/a bucket."
"Dit is de/een emmer."

20. *Vara den duva.*
"This is the/a pigeon."
"Dit is de/een duif."

21. *Vara den bord.*
"This is the/a table."
"Dit is de/een tafel."

22. *Vara den uggla.*
    “This is the/an owl.”
    “Dit is de/een uil.”

23. *Vara den flaska.*
    “This is the/a bottle.”
    “Dit is de/een fles.”

24. *Vara den banan.*
    “This a the/a banana.”
    “Dit is de/een banaan.”

25. *Vara den ljus.*
    “This a the/a candle.”
    “Dit is de/een kaars.”

26. *Vara den får.*
    “This is the/a sheep.”
    “Dit is het/een schaap.”

27. *Vara den morot.*
    “This is the/a carrot.”
    “Dit is de/een wortel.”

28. *Vara den tårta.*
    “This is the/a pie.”
    “Dit is de/een taart.”

Appendix 5A: The posttest

Object marking

	Grammatical	Ungrammatical
1.	*Den man fodra denen flicka.*	*Den flicka fodra den katt.*
2.	*Den pojke köpa denen häst.*	*Den kvinna köpa den hund .*
3.	*Den kvinna bära denen korg.*	*Den man bära den flicka.*
4.	*Den flicka pussa denen hund.*	*Den kvinna pussa den man.*
5.	*Den pojke teckna denen man.*	*Den pojke teckna den korg.*
6.	*Den flicka köpa denen katt.*	*Den man köpa den häst.*

Duals/plurals

	Grammatical	Ungrammatical
1.	*Två hönar sova.*	*Två hönat äta.*
2.	*Två manner teckna.*	*Två mannet gräva.*
3.	*Två flickar störta.*	*Två flickat sitta.*
4.	*Tre kattet äta.*	*Tre katter störta.*
5.	*Fyra kot sova.*	*Fyra kor äta.*
6.	*Fem pojket sitta.*	*Fem pojker sova.*

Postpositions

	Grammatical	Ungrammatical
1.	*Den man sitta den bil-li.*	*Den flicka vara li den hus.*
2.	*Den pojke vara den korg-li.*	*Den man vara li den bil.*
3.	*Den kvinna sitta den ko-på.*	*Den korg vara på den dosa.*
4.	*Den höna sitta den dosa-på.*	*Den hund sitta på den bil.*
5.	*Den katt vara den dosa-tu.*	*Den höna sitta den tu den korg.*
6.	*Den flicka vara den hus-tu.*	*Den katt sitta tu den dosa.*

Diminutives

	Grammatical	Ungrammatical
1.	*Den liten häst äta.*	*Den småhäst sova.*
2.	*Den liten katt störta.*	*Den småkatt äta.*
3.	*Den liten hund gräva.*	*Den småhund sitta.*
4.	*Den småkor sova.*	*Den liten kor störta.*
5.	*Den småhönar sitta.*	*Den liten hönar sova.*
6.	*Den småhunder sova.*	*Den liten hunder äta.*

Appendix 5B: Distribution of posttest sentences

TrialNumber	Type	Sentence	Expected outcome
501	obj	Den man fodra denen flicka.	1
502	mv	Två hönat äta.	4
503	obj	Den kvinna köpa den hund .	4
504	PP	Den kvinna sitta den ko-på.	1
505	obj	Den pojke teckna denen man.	1
506	dim	Den liten kor störta.	4
507	mv	Tre katter störta.	4
508	PP	Den man sitta den bil-li.	1
509	obj	Den flicka pussa denen hund.	1
510	mv	Två manner teckna.	1
511	PP	Den höna sitta den tu den korg.	4
512	mv	Fyra kot sova.	1
513	obj	Den man bära den flicka.	4
514	mv	Två hönar sova.	1
515	dim	Den liten katt störta.	1
516	PP	Den pojke vara den korg-li.	1
517	dim	Den småhäst sova.	4
518	mv	Fem pojket sitta.	1
519	obj	Den man köpa den häst.	4
520	mv	Två flickat sitta.	4
521	dim	Den liten hunder äta.	4
522	obj	Den flicka fodra den katt.	4
523	dim	Den småhund sitta.	1
524	mv	Fyra kor äta.	4
525	PP	Den hund sitta på den bil.	4
526	dim	Den liten häst äta.	1
527	PP	Den flicka vara den hus-tu.	1
528	obj	Den kvinna bära denen korg.	1
529	dim	Den småkatt äta.	4
530	PP	Den höna sitta den dosa-på.	1

531	obj	Den kvinna pussa den man.	4
532	mv	Två flickar störta.	1
533	dim	Den liten hund gräva.	1
534	PP	Den man vara li den bil.	4
535	obj	Den pojke teckna den korg.	4
536	dim	Den småkor sova.	4
537	PP	Den katt vara den dosa-tu.	1
538	mv	Fem pojker sova.	4
539	dim	Den småhönar sitta.	1
540	PP	Den flicka vara li den hus.	4
541	mv	Två mannet gräva.	4
542	dim	Den liten hönar sova.	4
543	obj	Den flicka köpa denen katt.	1
544	PP	Den katt sitta tu den dosa.	4
545	obj	Den pojke köpa denen häst.	1
546	dim	Den småhunder sova.	1
547	PP	Den korg vara på den dosa.	4
548	mv	Tre kattet äta.	1

Appendix 6: Pictures

Word learning stage

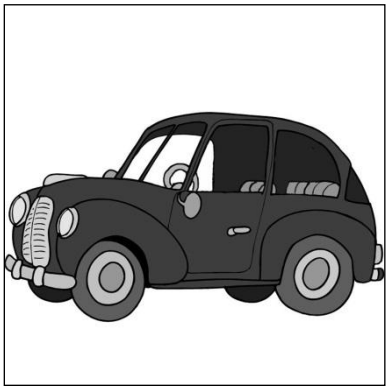


Figure 1: WL1

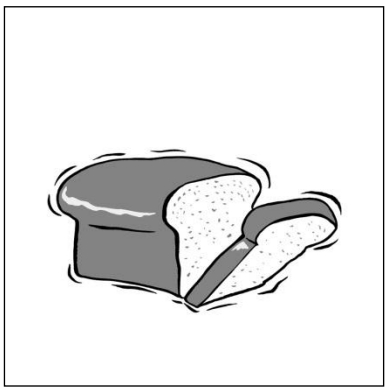


Figure 2: WL2

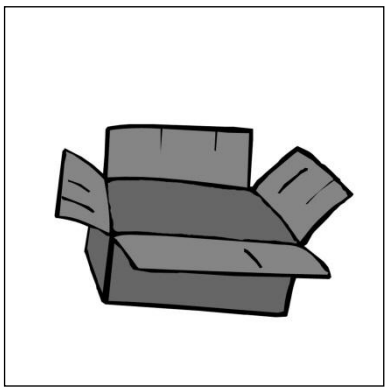


Figure 3: WL3

Figure 4: WL4

Figure 5: WL5

Figure 6: WL6

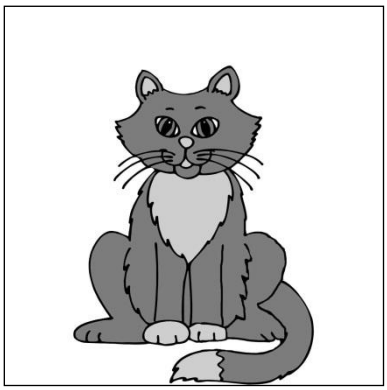


Figure 7: WL7

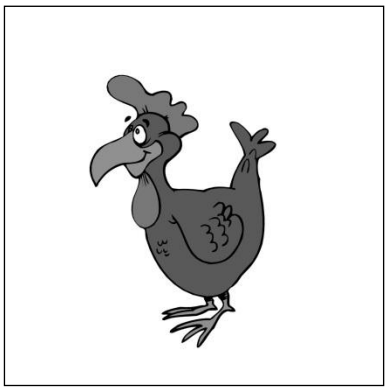


Figure 8: WL8

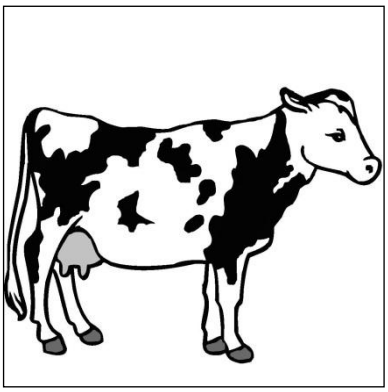


Figure 9: WL9

Figure 10: WL10

Figure 11: WL11

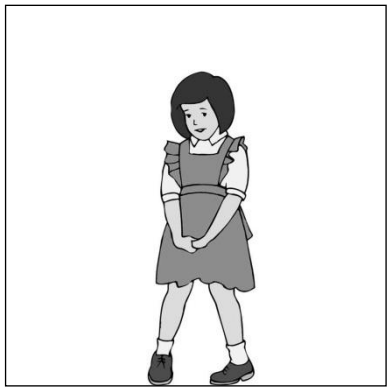


Figure 12: WL12

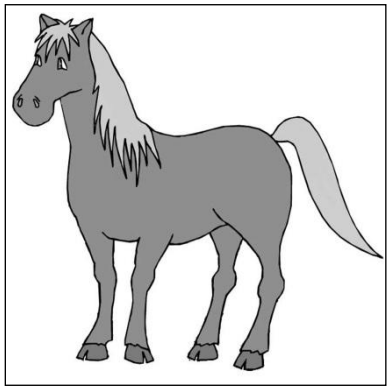


Figure 13: WL13

Figure 14: WL14

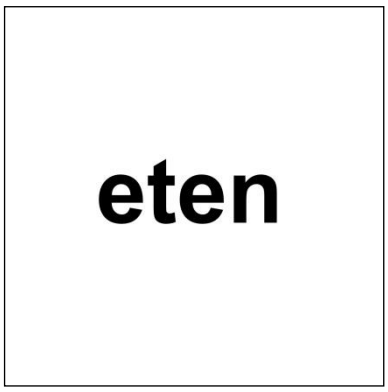


Figure 15: WL15

Figure 16: WL16

Figure 17: WL17

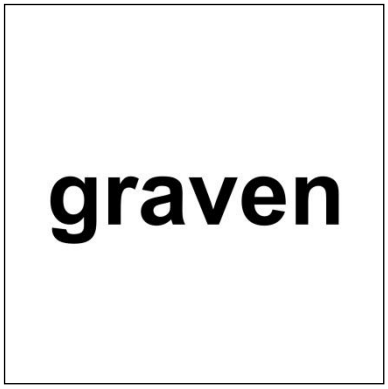


Figure 18: WL18

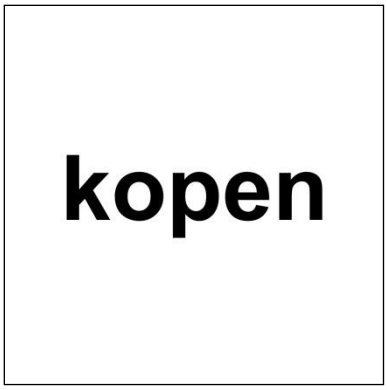


Figure 19: WL19

Figure 20: WL20

Figure 21: WL21

Figure 22: WL22

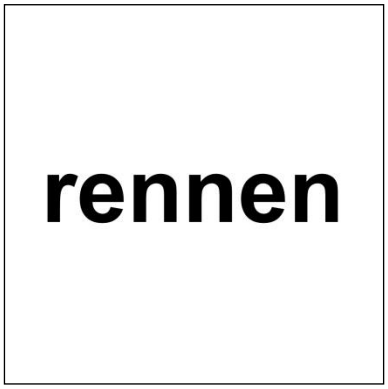


Figure 23: WL23

Figure 24: WL24

Figure 25: WL25

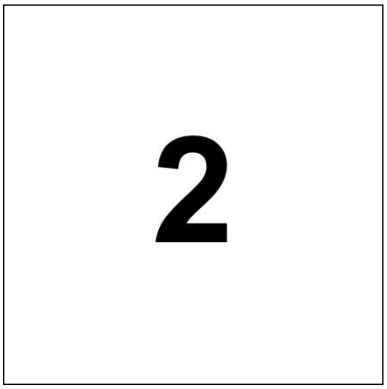


Figure 26: WL26

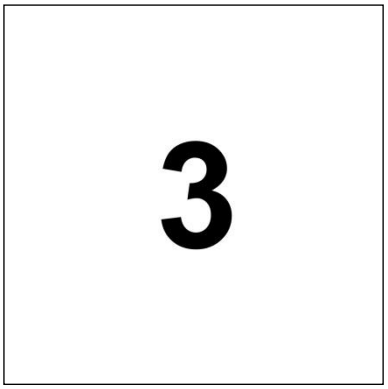


Figure 27: WL27

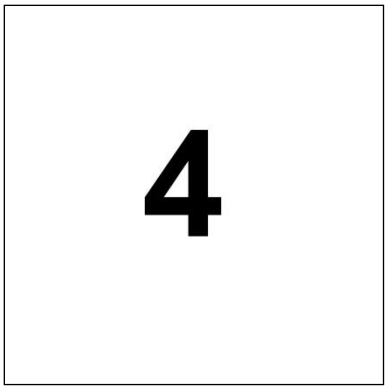


Figure 28: WL28

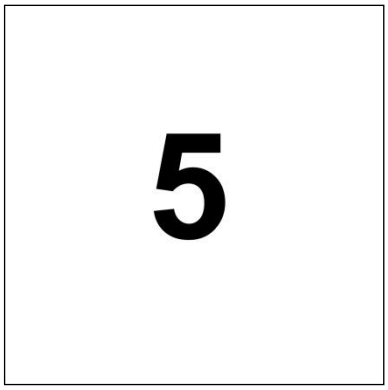


Figure 29: WL29

Thinking-aloud part

Figure 30: dim/liten1

Figure 31: dim/liten2

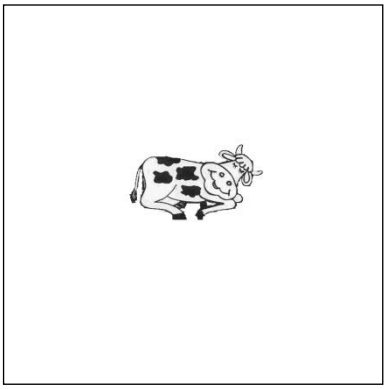


Figure 32: dim/liten3

Figure 33: dim/liten4

Figure 34: dim/liten5

Figure 35: dim/liten6

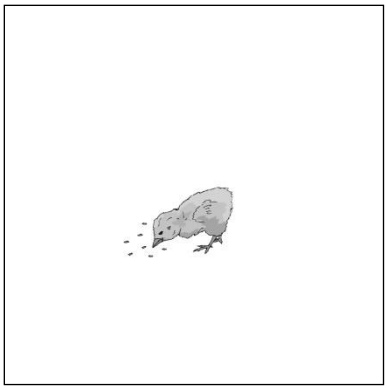


Figure 36: dim/liten7

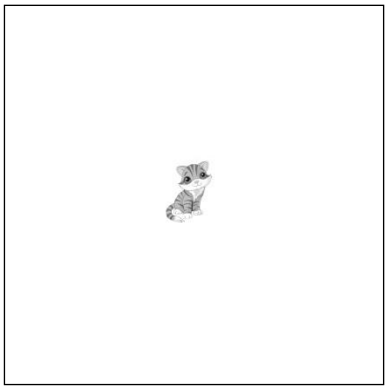


Figure 37: dim/liten8

Figure 38: dim/liten9

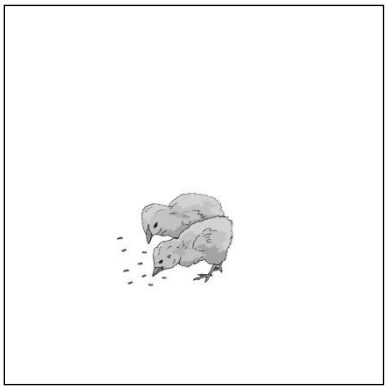


Figure 39: dim/små1

Figure 40: dim/små2

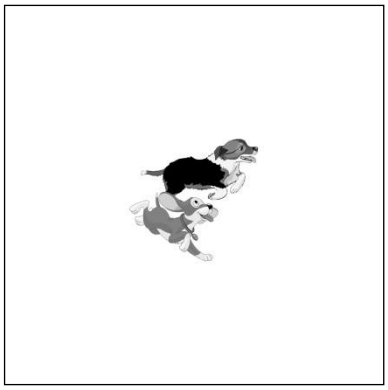


Figure 41: dim/små3

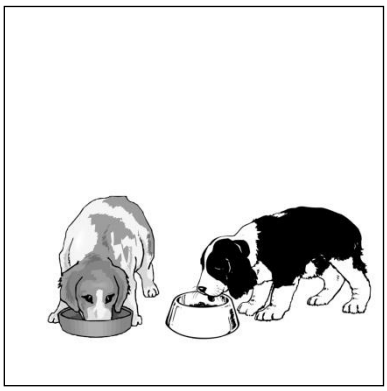


Figure 42: mv1A

Figure 43: mv1B

Figure 44: mv2A

Figure 45: mv2B

Figure 46: mv3A

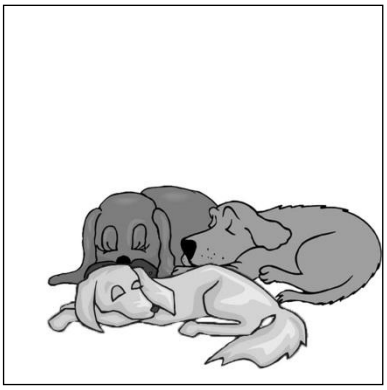


Figure 47: mv3B

Figure 48: mv4A

Figure 49: mv4B

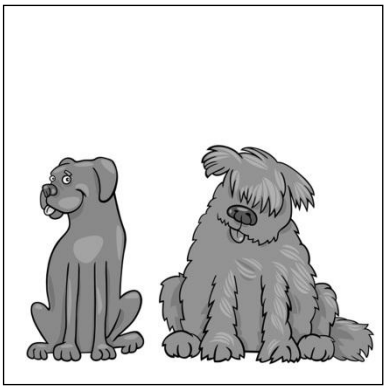


Figure 50: mv5A

Figure 51: mv5B

Figure 52: mv6A

Figure 53: mv6B

Figure 54: mv7A

Figure 55: mv7B

Figure 56: mv8A

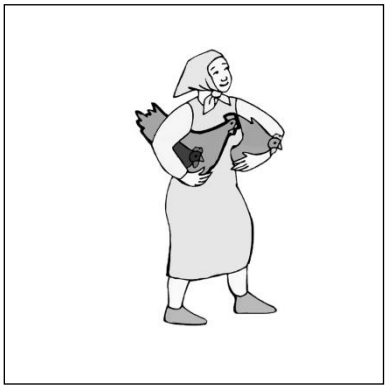


Figure 57: mv8B

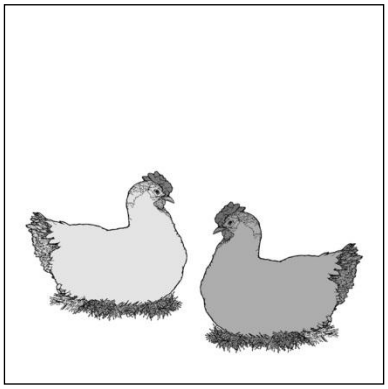


Figure 58: mv9A

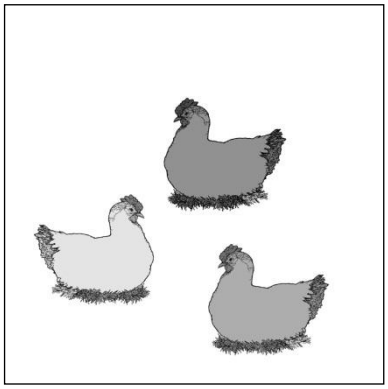


Figure 59: mv9B

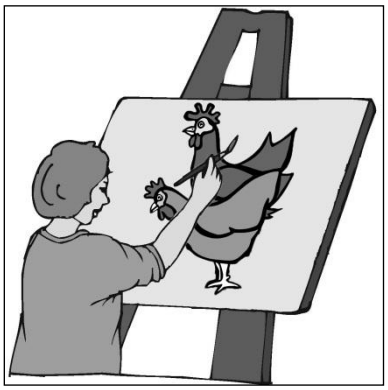


Figure 60: mv10A

Figure 61: mv10B

Figure 62: mv11A

Figure 63: mv11B

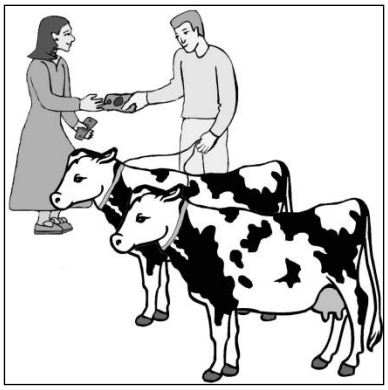


Figure 64: mv12A

Figure 65: mv12B

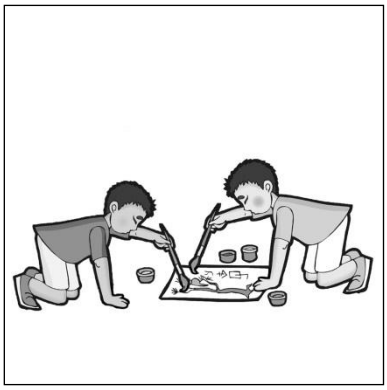


Figure 66: mv13A

Figure 67: mv13B

Figure 68: mv14A

Figure 69: mv14B

Figure 70: obj1

Figure 71: obj2

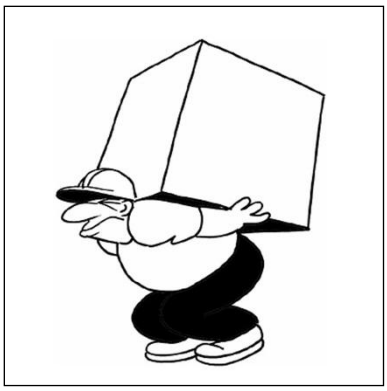


Figure 72: obj3

Figure 73: obj4

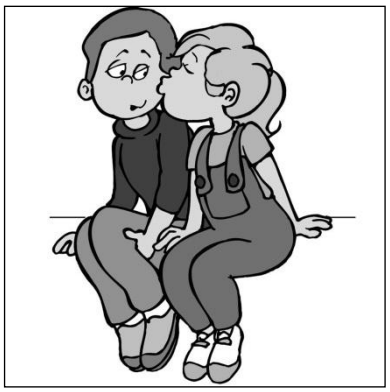


Figure 74: obj5

Figure 75: obj6

Figure 76: obj7

Figure 77: obj8

Figure 78: PPL1

Figure 79: PPL2

Figure 80: PPL3

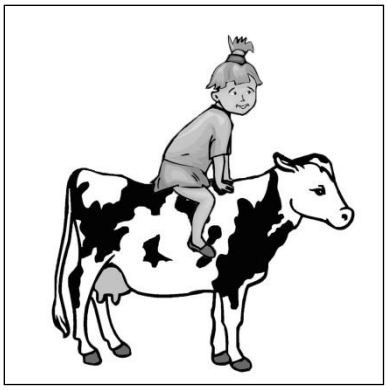


Figure 81: PPP1

Figure 82: PPP2

Figure 83: PPP3

Figure 84: PPP4

Figure 85: PPP5

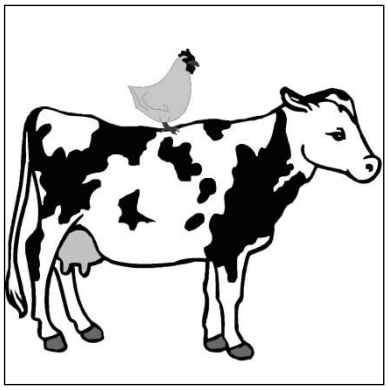


Figure 86: PPP6

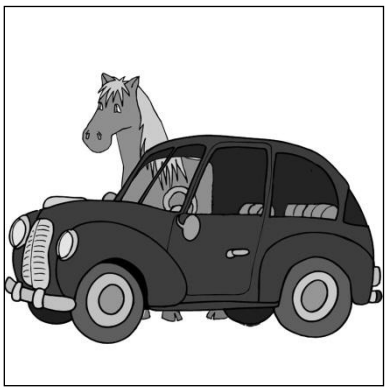


Figure 87: PPT1

Figure 88: PPT2

Fillers

Figure 89: filler1

Figure 90: filler2

Figure 91: filler4_repair

Figure 92: filler6_repair

Figure93: filler7

Figure94: filler9

Figure 95: filler10

Figure 96: filler11_repair

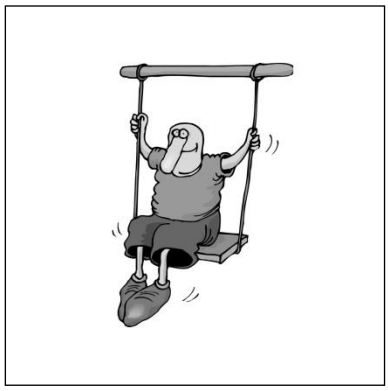


Figure 97: filler12

Figure 98: filler13_repair

Figure 99: filler14_repair

Figure 100: filler15_repair

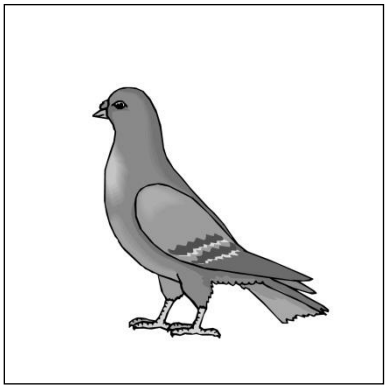
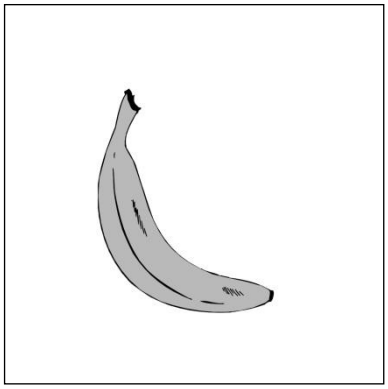
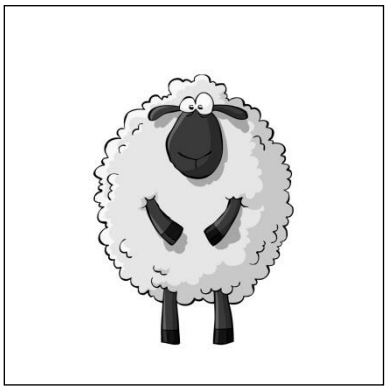


Figure 101: filler20

Figure 102: filler23_repair



Filler 103: filler24_repair



Filler 104: filler26

Appendix 7A: Questionnaire original (Dutch) version

Algemene vragen

1. Geboortedatum: ……
2. Voorkeurshand: □ Links □ □ Rechts □ Soms links, soms rechts
3. Geslacht: □ Man □ Vrouw
4. Opleiding: ….....

(Als u nog bezig bent met een opleiding, vul dan in wat uw studierichting is en in welk jaar u zit.)

Uw gezondheid kan de resultaten van het onderzoek beïnvloeden. Met deze vragen willen we vaststellen of er sprake kan zijn van verminderd gehoor, gezichts- of leervermogen. Deze informatie wordt uiteraard anoniem verwerkt en vertrouwelijk behandeld.

5. Heeft u problemen met uw gehoor?
   □□ Nee
   □□ Ik heb geen gehoorapparaat, maar ik kan mensen vaak niet verstaan
   □□ Ja, ik heb een gehoorapparaat
6. Bent u doof aan een van uw oren of aan beide oren?
   □□ Nee □ □ Ja, links □ □ Ja, rechts □ Ja, aan beide oren
7. Beschikt u momenteel, al dan niet met bril of contactlenzen, over een goed gezichtsvermogen?
   □□ Ja □ □ Nee
8. Kunt u goed van een computerscherm lezen (kunt u de tekst goed zien)?
   □□ Ja □ □ Nee
9. Bent u dyslectisch?
   □ Ja □ Nee
10. Lijdt u een andere taalstoornis?
    □ Ja □ Nee
11. Heeft u concentratie problemen?
    □ Ja □ Nee

Vragen over uw taalkundige kennis:

1. Bent u student taalwetenschap of talenstudent van een taal anders dan Nederlands (geweest)? Middelbare school ervaring telt hierbij niet mee.

□ □ Ja □ □ Nee

2. Heeft u in de laatste 12 maanden een taalcursus gevolgd?

□ Ja □ Nee

Zo ja, welke taal heeft u geleerd? ……

3. Welke talen spreekt u? (Vul ze in met het bijbehorende niveau*: A1, A2, B1, B2, C1, C2 of moedertaal.)

…….	…….
…….	…….
…….	…….
…….	…….
…….	…….
…….	…….

* Zie onderstaande tabel voor een beschrijving van de verschillende niveaus van taalvaardigheid:

Niveaugroep:	A		B		C	
Naam niveaugroep:	Basaal gebruiker		Zelfstandig gebruiker		Vergevorderd gebruiker	
Niveau:	**A1**	**A2**	**B1**	**B2**	**C1**	**C2**
Naam niveau:	**Beginner**	**Basis**	**Gemiddeld**	**Bovengemiddeld**	**Gevorderd**	**Vergevorderd**
Beschrijving:	- U kunt bekende alledaagse uitingen begrijpen en gebruiken en heel basale zinnen produceren die te maken hebben met specifieke behoeften. - U kunt zichzelf en anderen voorstellen en vragen over persoonlijke details stellen en beantwoorden (woonplaats, kennissen, bezittingen e.d.). - U kunt een eenvoudig gesprek voeren gegeven dat de gesprekspartner langzaam en duidelijk praat en bereid is te helpen.	- U kunt zinnen en veelvoorkomende uitdrukkingen over zaken van direct belang begrijpen (zoals persoonlijke en familie-informatie, winkelen, lokale omgeving, werk etc.). - U kunt communiceren in simpele en routine-taken die slechts eenvoudige en directe uitwisseling van informatie over bekende en veelvoorkomende zaken vereist. - U kunt in eenvoudige bewoordingen aspecten beschrijven van uw achtergrond, directe omgeving en zaken van directe behoefte.	- U kunt de hoofdpunten van duidelijk en standaard taalgebruik begrijpen als dit gaat over bekende zaken die regelmatig langskomen op bijv. werk, school of hobby's. - U kunt omgaan met de meeste situaties die zich met zekere regelmaat voordoen tijdens het reizen in het land waar de betreffende taal wordt gesproken. - U kunt een eenvoudige, lopende tekst schrijven over onderwerpen die bekend of van persoonlijke belang zijn. - U kunt ervaringen, gebeurtenissen, dromen, hoop en ambities beschrijven en kort redenen en verklaringen geven voor uw meningen en plannen.	- U kunt de hoofdpunten van complexe teksten begrijpen, zowel over concrete als abstracte onderwerpen, inclusief technische verhandelingen uit uw eigen vakgebied. - U kunt op vloeiende en spontane wijze deelnemen aan gesprekken, zodat normale interactie met moedertaalsprekers zonder moeite van een van beide kanten tot stand komt. - U kunt duidelijke en gedetailleerde teksten schrijven over een breed scala aan onderwerpen. U kunt uw mening geven over een onderwerp en daarbij de voor- en nadelen van verschillende opties uiteenzetten.	- U kunt een breed scala aan ingewikkelde, lange teksten begrijpen en daarin impliciete boodschappen herkennen. - U kunt uw ideeën vloeiend en spontaan uiten zonder al te veel naar woorden te hoeven zoeken. - U kunt de taal flexibel en effectief gebruiken voor sociale, academische en professionele doeleinden. - U kunt heldere, gestructureerde en gedetailleerde teksten schrijven over complexe onderwerpen, met duidelijke controle over middelen van structuur en samenhang en verbindingswoorden.	- U kunt met gemak vrijwel alles wat u hoort en leest in de betreffende taal begrijpen. - U kunt informatie uit verschillende gesproken en geschreven bronnen samenvatten en daarbij de argumenten en uitspraken reconstrueren tot een coherente presentatie. - U kunt uzelf spontaan, precies en zeer vloeiend uiten, daarbij onderscheid makend tussen verschillende subtiele nuances van betekenis, zelfs in de meest complexe situaties.

Appendix 7B: Questionnaire English version

General questions

1. Date of birth: ……
2. Preferred hand: □ Left □ □ Right □ Left sometimes, right sometimes
3. Gender: □ Male □ Female
4. Education: ….....

(If you are still in education, please fill in your subject and which year of the education you are in.)

Your health could influence the results of this research. Using these questions we want to determine whether there is a decrease in hearing, seeing or learning ability. This information will of course be processed anonymously and treated confidentially.

5. Do you have troubles in hearing?
   □□ No
   □□ I do not have a hearing aid, but I often cannot hear people.
   □□ Yes, I have a hearing aid.
6. Are you deaf on one or both of your ears?
   □□ No □ □ Yes, left □ □ Yes, right □ Yes, on both ears
7. Do you have good seeing, whether or not through glasses or contact linses?
   □□ Yes □ □ No
8. Are you able of reading well from a computer screen (are you able of seeing the text properly)?
   □□ Yes □ □ No
9. Are you dyslectic?
   □ Yes □ No
10. Are you suffering from another language disease?
    □ Yes □ No
11. Do you have trouble concentrating?
    □ Yes □ No

Questions to your linguistic knowledge:

1. Are you/Have you been a student of linguistics, or of languages other than Dutch? High-school experience should not be considered in this.

□ □ Yes □ □ No

2. Have you been following a language course in the past 12 months?

□ Yes □ No

If so, which language have you been learning? ……

3. Which languages do you speak? (Fill in and add the corresponding level *: A1, A2, B1, B2, C1, C2 or mother tongue.)

…….	…….
…….	…….
…….	…….
…….	…….
…….	…….
…….	…….

* For a description of the different levels of language competence see the table below:

Level group:	A		B		C	
Level group name:	Basic user		Independent user		Proficient user	
Level:	**A1**	**A2**	**B1**	**B2**	**C1**	**C2**
Level name:	**Breakthrough or beginner**	**Way stage or elementary**	**Threshold or intermediate**	**Vantage or upper intermediate**	**Effective operational proficiency or advanced**	**Mastery of proficiency**
Description:	- Can understand and use familiar everyday expressions and very basic phrases aimed at the satisfaction of needs of a concrete type. - Can introduce themselves and others and can ask and answer questions about personal details such as where he/she lives, people they know and things they have. - Can interact in a simple way provided the other person talks slowly and clearly and is prepared to help.	- Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment). - Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters. - Can describe in simple terms aspects of their background, immediate environment and matters in areas of immediate need.	- Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. - Can deal with most situations likely to arise while travelling in an area where the language is spoken. - Can produce simple connected text on topics that are familiar or of personal interest. - Can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans.	- Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in their field of specialization. - Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. - Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.	- Can understand a wide range of demanding, longer clauses, and recognize implicit meaning. - Can express ideas fluently and spontaneously without much obvious searching for expressions. - Can use language flexibly and effectively for social, academic and professional purposes. - Can produce clear, well-structured, detailed text on complex subjects, showing controlled use of organizational patterns, connectors and cohesive devices.	- Can understand with ease virtually everything heard or read. - Can summarize information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. - Can express themselves spontaneously, very fluently and precisely, differentiating finer shades of meaning even in the most complex situations.

Appendix 8: Results thinking-aloud part

For each structure first of all a table that gives an overview of the thinking aloud data for each participant will be presented. The table contains a set of columns, which represent the following:

- Participant: the unique number that has been assigned to each participant. Participants in group A received numbers between 301 and 317, and participants in group B got numbers between 401 and 418.
- Group: the group the participant was in. The number 1 represents group A, in which participants got triggers to object marking and the liten-små distinction. The number 2 represents group B, in which participants got triggers to the dual-plural distinction and the postpositional character of adpositions.
- GrammarFocus: in the thinking-aloud stage some of the participants were only focused on correctly understanding the meaning of the input. They did not pay attention to the grammatical aspect of the language. Since comparing participants who focused (at least a bit) on grammar might be more meaningful than comparing participants of whom only a part focused on grammar and the other part did not this grouping variable has been introduced. In the table the number 1 represents participants who during the thinking-aloud stage focused on grammar, whereas the number 0 represents participants who did not.
- Awareness: whether or not the participant became aware of the appropriate grammatical target structure. In the table awareness is indicated as 1 when the participant did become aware of the structure, if not then awareness is indicated as 0.
- TriggerCausedThinking: as has already been described, in some cases the trigger lead to thinking about the (grammatical) form of the input, but this thinking did not necessarily lead to awareness of the target structure. In the table 0 represents participants who did not think about the form of the structure at all, whereas 1 represents participants who did think about the grammatical aspect of the structure. Note here, that a value of 0 automatically means that the value of 'Awareness' is also 0, whereas the opposite must not be true: If the trigger lead to thinking about form, awareness of the grammar rule is not implied.
- IrregularityCausedThinking: in some cases it was not the trigger which lead to thinking about the grammatical form of the structure, but it was the nature or the irregularity in the input itself. This is for example the case for participants who did not

receive a trigger to the grammatical structure, but who still made thoughts about the form. Another case in which this happened frequently is the notion of the place of the adposition before participants got exposed to the trigger. If it was the irregularity or nature of the input which caused thinking, then in the table this is indicated as 1, if not 0 has been indicated.

Note that for some participants both the trigger and the irregularity caused them to think about the structure. In other cases it sometimes remains unclear whether it is only the trigger which caused the thinking or whether the irregularity in the input itself caused this as well. In both previous cases 'TriggerCausedThinking' as well as 'IrregularityCausedThinking' are indicated as 1.

- AwareIrreg: some participants noticed there was some kind of irregularity in the input or some input that was inconsistent with their hypotheses about the language, but for them this awareness of this inconsistency did not lead to rule search. Since noticing inconsistencies in the input is the first step in becoming aware it might be interesting to not only taking into account the success of participants who became aware of the grammar rule or of participants who were actively searching for a rule, but also the success of participants who noticed the irregularities but did not come to do something with this information. In the table participants who noticed the irregularity received the value 1, whereas participants who did not notice any irregularity receive the value 0. Note here, that a score of 0 here means that both the values for 'IrregularityCausedThinking' and 'Awareness' are also 0, whereas a value of 1 does not imply a value of 1 for them. Note also, that there is no implied correlation between 'AwareIrreg' and 'TriggerCausedThinking': If a participant scores 1 on 'AwareIrreg' he/she might score either 0 or 1 for 'TriggerCausedThinking' and if he/she scores 0 'AwareIrreg' still both values for 'TriggerCausedThinking' are open.
- TriggerCausedRuleAw: whether or not it is the trigger that caused participants to become aware of the grammatical rule. If in the table indicated with 1, then upon hearing the trigger the participant formulated the grammatical rule correctly, if indicated with 0, then the participant did not formulate the grammatical rule upon hearing the trigger. Note that a positive value for 'TriggerCausedRuleAw' implies a positive value for 'TriggerCausedThinking' as well, whereas the reverse might but must not be the case. Also a positive value on 'TriggerCausedRuleAw' implies a positive value for 'Awareness', whereas again the reverse might, but must not be the case.

- AwareBeforeTrigger: as has already been indicated some participants became aware of the appropriate rule before they got exposed to the trigger. In this cases 1 is indicated, in other cases 0.
- LLama_D: the participants' score on the LLama_D test
- forwards: the participants' score on the forwards digit span test
- backwards: the participants' score on the backwards digit span test

In appendix 9 a second table reflects the outcome of the post GJT. Here, some additional columns are added which represent:

- TrialNumber: the unique item number of a posttest item, varying between 501 and 548. For an overview of the correspondence between item number and test sentence see appendix 5B.
- ExpectedOutcome: for each posttest item, based on the grammaticality of that item, a certain outcome is to be expected. If the posttest item is grammatical, then the expected outcome is indicated with 1, if the item is ungrammatical it is indicated with 4.
- Result: the participants' actual judgment of a posttest item. If indicated with 1, the participant was absolutely certain about the item being grammatical. If 2, then the participant though that the item was grammatical, but he/she was not completely sure. If 4, the participant was absolutely sure the item was ungrammatical and if 3, the participant though the item was ungrammatical, but he/she was not completely sure.
- Correctness: whether or not the actual judgment was correct. If it was correct, then 1 has been indicated, if the judgment was incorrect, then 0 has been indicated.
- Certainty: the degree of certainty participants had to their judgement. If 1, then they answered they were absolutely certain about their judgement (either 1 or 4 for 'Result'), if 0, participants were not completely sure about their judgement (either 2 or 3 to 'Result').
- Value: participants' rated score of a posttest item. In this rating both the expected outcome and the actual result have been taken into account. The scores vary between 0 and 3. If a participant scores 0, then he/she scored extremely poor. For example when the expected outcome is 4 and the participants answers 1 or vice versa. A score of 3 is the best, which can be obtained when the participant answers 1 when the expected outcome is 1 or 4 when the expected outcome is 4. The in between scores are 1 and 2.

A score of 1 is indicated when the participants grammaticality judgment is correct, but the participant was not certain about his/her judgment. And finally, a score of 2 is indicated when the participants grammaticality judgment is incorrect, but when the participant was again not certain about his/her judgment. In this way the score on 'Value' could tell something about participants' success in learning the structure, i.e. in their ability of applying the grammatical rule correctly.

Thinking-aloud data

Object and repair

Thinking aloud data:

Participant	Group	GrammarFocus	Awareness	TriggerCausedThinking	IrregularityCausedThinking	AwareIrreg	TriggerCausedRuleAw	AwareBeforeTrigger	LLama_D	forwards	backwards
301	1	1	0	1	1	1	0	0	30	7	7
302	1	1	0	0	1	1	0	0	40	6	6
303	1	0	0	0	0	0	0	0	30	6	7
304	1	1	0	0	1	1	0	0	25	8	5
305	1	1	0	0	1	1	0	0	25	8	5
306	1	0	0	0	0	0	0	0	0	6	3
307	1	1	0	0	0	0	0	0	50	6	5
308	1	1	0	0	0	1	0	0	20	6	4
309	1	0	0	0	0	0	0	0	45	6	5
310	1	1	0	0	0	1	0	0	25	5	5
311	1	1	0	0	0	0	0	0	45	8	7
312	1	0	0	0	0	0	0	0	30	5	5
313	1	1	0	0	0	0	0	0	20	8	7
314	1	1	0	0	0	0	0	0	50	7	5
315	1	1	1	0	1	1	0	1	20	8	6
316	1	1	0	0	0	0	0	0	20	7	8
317	1	0	0	1	0	0	0	0	10	6	5
401	2	1	0		0	0			30	6	8
402	2	1	0		0	1			35	8	7
403	2	1	0		0	0			45	6	5
404	2	0	0		0	0			25	6	6
405	2	1	0		0	1			40	7	7
406	2	1	0		0	0			30	7	6
407	2	1	1		1	1			15	6	4
408	2	1	0		1	1			0	6	4
409	2	1	0		0	0			5	5	4
410	2	1	0		0	0			35	7	7
411	2	0	0		0	0			40	7	5
412	2	1	0		1	1			15	8	5
413	2	1	1		1	1			0	8	5
414	2	1	0		0	0			40	6	5
415	2	1	0		0	1			35	7	5
416	2	1	0		0	1			15	6	4
417	2	1	0		1	1			40	8	6
418	2	0	0		0	0			15	6	6

Table 1: Thinking-aloud data on object marking

Duals and plurals

Participant	Group	GrammarFocus	Awareness	TriggerCausedThinking	IrregularityCausedThinking	AwareIrreg	TriggerCausedRuleAw	AwareneBeforeTrigger	Llama_D	forwards	backwards
301	1	1	0		0	0			30	7	7

302	1	1	0		0	0			40	6	6
303	1	0	0		0	0			30	6	7
304	1	1	0		0	0			25	8	5
305	1	1	0		0	0			25	8	5
306	1	0	0		0	0			0	6	3
307	1	1	0		0	0			50	6	5
308	1	1	0		0	1			20	6	4
309	1	0	0		0	0			45	6	5
310	1	1	0		0	0			25	5	5
311	1	1	0		0	0			45	8	7
312	1	0	0		0	0			30	5	5
313	1	1	0		0	0			20	8	7
314	1	1	0		0	0			50	7	5
315	1	1	0		1	1			20	8	6
316	1	1	0		0	0			20	7	8
317	1	0	0		0	0			10	6	5
401	2	1	0	0	0	1	0	0	30	6	8
402	2	1	0	0	0	1	0	0	35	8	7
403	2	1	1	1	1	1	1	0	45	6	5
404	2	0	0	0	0	0	0	0	25	6	6
405	2	1	0	0	0	0	0	0	40	7	7
406	2	1	0	0	0	0	0	0	30	7	6
407	2	1	1	1	1	1	0	0	15	6	4
408	2	1	1	0	1	1	0	0	0	6	4
409	2	1	0	0	0	0	0	0	5	5	4
410	2	1	0	0	0	1	0	0	35	7	7
411	2	0	0	0	0	0	0	0	40	7	5
412	2	1	0	1	1	0	0	0	15	8	5
413	2	1	0	1	1	1	1	0	0	8	5
414	2	1	0	0	0	0	0	0	40	6	5
415	2	1	0	0	0	0	0	0	35	7	5
416	2	1	1	1	1	1	1	0	15	6	4
417	2	1	0	0	0	0	0	0	40	8	6
418	2	0	0	0	0	0	0	0	15	6	6

Table 2: Thinking-aloud data on dual-plural distinction

Diminutives

Participant	**Group**	**GrammarFocus**	**Awareness**	**TriggerCausedThinking**	**IrregularityCausedThinking**	**AwareIrreg**	**TriggerCausedRuleAw**	**AwareneBeforeTrigger**	**Llama_D**	**forwards**	**backwards**
301	1	1	1	1	1	1	1	0	30	7	7
302	1	1	0	0	0	1	0	0	40	6	6
303	1	0	0	0	0	0	0	0	30	6	7
304	1	1	0	0	0	0	0	0	25	8	5
305	1	1	0	0	1	1	0	0	25	8	5
306	1	0	0	0	0	0	0	0	0	6	3
307	1	1	0	0	0	0	0	0	50	6	5
308	1	1	0	1	1	1	0	0	20	6	4

309	1	0	0	0	0	0	0	0	45	6	5
310	1	1	0	1	1	1	0	0	25	5	5
311	1	1	0	0	0	0	0	0	45	8	7
312	1	0	0	0	0	1	0	0	30	5	5
313	1	1	0	0	1	1	0	0	20	8	7
314	1	1	0	0	0	0	0	0	50	7	5
315	1	1	1	1	1	1	1	0	20	8	6
316	1	1	0	1	1	1	0	0	20	7	8
317	1	0	0	0	0	0	0	0	10	6	5
401	2	1	0		1	1			30	6	8
402	2	1	0		1	1			35	8	7
403	2	1	0		0	1			45	6	5
404	2	0	0		0	0			25	6	6
405	2	1	0		0	1			40	7	7
406	2	1	0		0	0			30	7	6
407	2	1	0		1	1			15	6	4
408	2	1	0		1	1			0	6	4
409	2	1	0		1	1			5	5	4
410	2	1	1		1	1			35	7	7
411	2	0	0		0	0			40	7	5
412	2	1	0		1	1			15	8	5
413	2	1	0		1	1			0	8	5
414	2	1	0		0	0			40	6	5
415	2	1	0		1	1			35	7	5
416	2	1	0		0	0			15	6	4
417	2	1	0		0	0			40	8	6
418	2	0	0		0	0			15	6	6

Table 3: Thinking-aloud data on diminutive marking

Postpositions

Participant	**Group**	**GrammarFocus**	**Awareness**	**TriggerCausedThinking**	**IrregularityCausedThinking**	**AwareIrreg**	**TriggerCausedRuleAw**	**AwareneBeforeTrigger**	**Llama_D**	**forwards**	**backwards**
301	1	1	1		1	1			30	7	7
302	1	1	0		0	0			40	6	6
303	1	0	0		0	0			30	6	7
304	1	1	1		1	1			25	8	5
305	1	1	0		1	1			25	8	5
306	1	0	0		0	0			0	6	3
307	1	1	1		1	1			50	6	5
308	1	1	0		0	1			20	6	4
309	1	0	0		0	1			45	6	5
310	1	1	1		1	1			25	5	5
311	1	1	1		1	1			45	8	7
312	1	0	0		0	1			30	5	5
313	1	1	1		1	1			20	8	7
314	1	1	1		1	1			50	7	5
315	1	1	1		1	1			20	8	6

316	1	1	1		1	1			20	7	8
317	1	0	0		0	1			10	6	5
401	2	1	1	1	1	1	1	0	30	6	8
402	2	1	1	1	1	1	1	0	35	8	7
403	2	1	1	1	1	1	1	0	45	6	5
404	2	0	0	0	0	0	0	0	25	6	6
405	2	1	1	0	1	1	0	1	40	7	7
406	2	1	1	0	1	1	0	1	30	7	6
407	2	1	1	0	1	1	0	1	15	6	4
408	2	1	1	0	1	1	0	1	0	6	4
409	2	1	1	0	1	1	0	1	5	5	4
410	2	1	1	0	1	1	0	1	35	7	7
411	2	0	0	0	0	0	0	0	40	7	5
412	2	1	1	0	1	1	0	1	15	8	5
413	2	1	1	1	1	1	1	0	0	8	5
414	2	1	1	0	1	1	0	1	40	6	5
415	2	1	1	0	1	1	0	1	35	7	5
416	2	1	0	0	0	0	0	0	15	6	4
417	2	1	1	0	1	1	0	1	40	8	6
418	2	0	0	0	0	0	0	0	15	6	6

Table 4: Thinking-aloud data on postpositional adposition marking

Appendix 9: Results posttest

Overview of scores per structure

	Grammatical				**Total grammatical**	**ungrammatical**				**Totaal ungrammatical**	**Endtotal**
Participant	**dim**	**mv**	**obj**	**pp**		**dim**	**mv**	**obj**	**pp**		
301	4	5	5	5	19	2	0	1	5	8	27
302	6	5	6	5	22	1	1	0	2	4	26
303	6	6	3	2	17	0	1	1	3	5	22
304	4	4	6	6	20	1	0	1	6	8	28
305	5	5	5	2	17	0	1	0	1	2	19
306	5	4	4	3	16	3	2	3	3	11	27
307	6	5	5	4	20	0	1	1	2	4	24
308	5	5	6	4	20	2	1	1	3	7	27
309	6	6	4	3	19	2	0	6	2	10	29
310	6	6	6	6	24	0	0	0	0	0	24
311	6	4	6	6	22	0	0	0	0	0	22
312	6	5	3	3	17	2	1	0	3	6	23
313	6	5	2	3	16	1	1	4	1	7	23
314	5	4	5	2	16	3	0	1	3	7	23
315	5	4	6	6	21	3	1	6	6	16	37
316	3	6	6	3	18	1	0	1	4	6	24
317	3	6	6	3	18	1	0	1	4	6	24
401	4	6	5	6	21	3	0	0	6	9	30
402	6	6	5	6	23	1	1	0	5	7	30
403	6	4	5	5	20	1	3	1	6	11	31
404	1	5	4	2	12	4	0	3	5	12	24
405	3	2	5	3	13	2	0	2	4	8	21
406	6	5	6	3	20	3	3	1	2	9	29
407	5	3	6	5	19	2	5	4	5	16	35
408	5	3	6	5	19	2	5	4	5	16	35
409	5	4	4	2	15	0	3	1	4	8	23
410	3	5	5	6	19	3	1	0	6	10	29
411	6	5	4	3	18	2	1	3	2	8	26
412	6	6	5	2	19	0	0	1	1	2	21
413	6	5	5	5	21	0	2	2	0	4	25
414	6	5	4	3	18	0	1	2	6	9	27
415	5	4	5	2	16	0	1	2	5	8	24
416	6	5	5	2	18	0	1	2	0	3	21
417	6	5	3	4	18	0	2	1	3	6	24
418	5	5	3	4	17	2	1	2	0	5	22
Endtotal	**177**	**168**	**169**	**134**	**648**	**47**	**40**	**58**	**113**	**258**	**906**

Table 5: Posttest scores per structure

Object marking

Participant	Group	TrialNumber	ExpectedOutcome	Result	Correctness	Certainty	Value
301	1	501	1	1	1	1	3
302	1	501	1	1	1	1	3
303	1	501	1	2	1	0	2
304	1	501	1	1	1	1	3
305	1	501	1	1	1	1	3
306	1	501	1	1	1	1	3
307	1	501	1	1	1	1	3
308	1	501	1	1	1	1	3
309	1	501	1	1	1	1	3
310	1	501	1	1	1	1	3
311	1	501	1	1	1	1	3
312	1	501	1	1	1	1	3
313	1	501	1	3	0	0	1
314	1	501	1	1	1	1	3
315	1	501	1	1	1	1	3
316	1	501	1	1	1	1	3
317	1	501	1	1	1	1	3
301	1	505	1	1	1	1	3
302	1	505	1	1	1	1	3
303	1	505	1	4	0	1	0
304	1	505	1	1	1	1	3
305	1	505	1	1	1	1	3
306	1	505	1	2	1	0	2
307	1	505	1	1	1	1	3
308	1	505	1	1	1	1	3
309	1	505	1	1	1	1	3
310	1	505	1	1	1	1	3
311	1	505	1	1	1	1	3
312	1	505	1	1	1	1	3
313	1	505	1	1	1	1	3
314	1	505	1	4	0	1	0
315	1	505	1	1	1	1	3
316	1	505	1	1	1	1	3
317	1	505	1	1	1	1	3
301	1	509	1	1	1	1	3
302	1	509	1	1	1	1	3
303	1	509	1	1	1	1	3
304	1	509	1	1	1	1	3
305	1	509	1	3	0	0	1
306	1	509	1	2	1	0	2
307	1	509	1	1	1	1	3
308	1	509	1	1	1	1	3
309	1	509	1	3	0	0	1
310	1	509	1	1	1	1	3

311	1	509	1	1	1	1	3
312	1	509	1	3	0	0	1
313	1	509	1	3	0	0	1
314	1	509	1	1	1	1	3
315	1	509	1	1	1	1	3
316	1	509	1	2	1	0	2
317	1	509	1	2	1	0	2
301	1	528	1	3	0	0	1
302	1	528	1	1	1	1	3
303	1	528	1	2	1	0	2
304	1	528	1	2	1	0	2
305	1	528	1	1	1	1	3
306	1	528	1	3	0	0	1
307	1	528	1	4	0	1	0
308	1	528	1	1	1	1	3
309	1	528	1	2	1	0	2
310	1	528	1	1	1	1	3
311	1	528	1	1	1	1	3
312	1	528	1	2	1	0	2
313	1	528	1	1	1	1	3
314	1	528	1	1	1	1	3
315	1	528	1	1	1	1	3
316	1	528	1	2	1	0	2
317	1	528	1	2	1	0	2
301	1	543	1	1	1	1	3
302	1	543	1	2	1	0	2
303	1	543	1	3	0	0	1
304	1	543	1	1	1	1	3
305	1	543	1	1	1	1	3
306	1	543	1	4	0	1	0
307	1	543	1	2	1	0	2
308	1	543	1	1	1	1	3
309	1	543	1	2	1	0	2
310	1	543	1	1	1	1	3
311	1	543	1	1	1	1	3
312	1	543	1	3	0	0	1
313	1	543	1	3	0	0	1
314	1	543	1	2	1	0	2
315	1	543	1	2	1	0	2
316	1	543	1	2	1	0	2
317	1	543	1	2	1	0	2
301	1	545	1	1	1	1	3
302	1	545	1	1	1	1	3
303	1	545	1	3	0	0	1
304	1	545	1	1	1	1	3
305	1	545	1	1	1	1	3

306	1	545	1	1	1	1	3
307	1	545	1	2	1	0	2
308	1	545	1	2	1	0	2
309	1	545	1	3	0	0	1
310	1	545	1	1	1	1	3
311	1	545	1	1	1	1	3
312	1	545	1	3	0	0	1
313	1	545	1	3	0	0	1
314	1	545	1	1	1	1	3
315	1	545	1	1	1	1	3
316	1	545	1	2	1	0	2
317	1	545	1	2	1	0	2
301	1	503	4	1	0	1	0
302	1	503	4	1	0	1	0
303	1	503	4	2	0	0	1
304	1	503	4	1	0	1	0
305	1	503	4	1	0	1	0
306	1	503	4	4	1	1	3
307	1	503	4	1	0	1	0
308	1	503	4	3	1	0	2
309	1	503	4	3	1	0	2
310	1	503	4	1	0	1	0
311	1	503	4	1	0	1	0
312	1	503	4	2	0	0	1
313	1	503	4	3	1	0	2
314	1	503	4	4	1	1	3
315	1	503	4	4	1	1	3
316	1	503	4	1	0	1	0
317	1	503	4	1	0	1	0
301	1	513	4	1	0	1	0
302	1	513	4	1	0	1	0
303	1	513	4	1	0	1	0
304	1	513	4	1	0	1	0
305	1	513	4	1	0	1	0
306	1	513	4	3	1	0	2
307	1	513	4	1	0	1	0
308	1	513	4	1	0	1	0
309	1	513	4	3	1	0	2
310	1	513	4	1	0	1	0
311	1	513	4	1	0	1	0
312	1	513	4	1	0	1	0
313	1	513	4	1	0	1	0
314	1	513	4	1	0	1	0
315	1	513	4	3	1	0	2
316	1	513	4	3	1	0	2
317	1	513	4	3	1	0	2

301	1	519	4	1	0	1	0
302	1	519	4	2	0	0	1
303	1	519	4	3	1	0	2
304	1	519	4	3	1	0	2
305	1	519	4	1	0	1	0
306	1	519	4	1	0	1	0
307	1	519	4	1	0	1	0
308	1	519	4	1	0	1	0
309	1	519	4	3	1	0	2
310	1	519	4	1	0	1	0
311	1	519	4	1	0	1	0
312	1	519	4	1	0	1	0
313	1	519	4	3	1	0	2
314	1	519	4	2	0	0	1
315	1	519	4	3	1	0	2
316	1	519	4	2	0	0	1
317	1	519	4	2	0	0	1
301	1	522	4	1	0	1	0
302	1	522	4	1	0	1	0
303	1	522	4	2	0	0	1
304	1	522	4	1	0	1	0
305	1	522	4	1	0	1	0
306	1	522	4	1	0	1	0
307	1	522	4	1	0	1	0
308	1	522	4	1	0	1	0
309	1	522	4	3	1	0	2
310	1	522	4	1	0	1	0
311	1	522	4	1	0	1	0
312	1	522	4	1	0	1	0
313	1	522	4	4	1	1	3
314	1	522	4	1	0	1	0
315	1	522	4	3	1	0	2
316	1	522	4	2	0	0	1
317	1	522	4	2	0	0	1
301	1	531	4	1	0	1	0
302	1	531	4	1	0	1	0
303	1	531	4	2	0	0	1
304	1	531	4	1	0	1	0
305	1	531	4	1	0	1	0
306	1	531	4	2	0	0	1
307	1	531	4	1	0	1	0
308	1	531	4	1	0	1	0
309	1	531	4	4	1	1	3
310	1	531	4	1	0	1	0
311	1	531	4	1	0	1	0
312	1	531	4	1	0	1	0

313	1	531	4	4	1	1	3
314	1	531	4	1	0	1	0
315	1	531	4	3	1	0	2
316	1	531	4	1	0	1	0
317	1	531	4	1	0	1	0
301	1	535	4	3	1	0	2
302	1	535	4	1	0	1	0
303	1	535	4	2	0	0	1
304	1	535	4	1	0	1	0
305	1	535	4	1	0	1	0
306	1	535	4	4	1	1	3
307	1	535	4	3	1	0	2
308	1	535	4	1	0	1	0
309	1	535	4	3	1	0	2
310	1	535	4	1	0	1	0
311	1	535	4	1	0	1	0
312	1	535	4	2	0	0	1
313	1	535	4	2	0	0	1
314	1	535	4	1	0	1	0
315	1	535	4	3	1	0	2
316	1	535	4	2	0	0	1
317	1	535	4	2	0	0	1
401	2	501	1	2	1	0	2
402	2	501	1	1	1	1	3
403	2	501	1	1	1	1	3
404	2	501	1	4	0	1	0
405	2	501	1	1	1	1	3
406	2	501	1	1	1	1	3
407	2	501	1	1	1	1	3
408	2	501	1	1	1	1	3
409	2	501	1	1	1	1	3
410	2	501	1	1	1	1	3
411	2	501	1	1	1	1	3
412	2	501	1	4	0	1	0
413	2	501	1	4	0	1	0
414	2	501	1	2	1	0	2
415	2	501	1	2	1	0	2
416	2	501	1	1	1	1	3
417	2	501	1	1	1	1	3
418	2	501	1	1	1	1	3
401	2	505	1	4	0	1	0
402	2	505	1	1	1	1	3
403	2	505	1	3	0	0	1
404	2	505	1	1	1	1	3
405	2	505	1	3	0	0	1
406	2	505	1	1	1	1	3

407	2	505	1	1	1	1	3
408	2	505	1	1	1	1	3
409	2	505	1	2	1	0	2
410	2	505	1	1	1	1	3
411	2	505	1	2	1	0	2
412	2	505	1	1	1	1	3
413	2	505	1	2	1	0	2
414	2	505	1	2	1	0	2
415	2	505	1	1	1	1	3
416	2	505	1	1	1	1	3
417	2	505	1	2	1	0	2
418	2	505	1	1	1	1	3
401	2	509	1	1	1	1	3
402	2	509	1	1	1	1	3
403	2	509	1	1	1	1	3
404	2	509	1	2	1	0	2
405	2	509	1	2	1	0	2
406	2	509	1	1	1	1	3
407	2	509	1	2	1	0	2
408	2	509	1	2	1	0	2
409	2	509	1	4	0	1	0
410	2	509	1	3	0	0	1
411	2	509	1	1	1	1	3
412	2	509	1	1	1	1	3
413	2	509	1	1	1	1	3
414	2	509	1	2	1	0	2
415	2	509	1	1	1	1	3
416	2	509	1	1	1	1	3
417	2	509	1	1	1	1	3
418	2	509	1	3	0	0	1
401	2	528	1	2	1	0	2
402	2	528	1	4	0	1	0
403	2	528	1	1	1	1	3
404	2	528	1	4	0	1	0
405	2	528	1	2	1	0	2
406	2	528	1	1	1	1	3
407	2	528	1	1	1	1	3
408	2	528	1	1	1	1	3
409	2	528	1	3	0	0	1
410	2	528	1	1	1	1	3
411	2	528	1	3	0	0	1
412	2	528	1	1	1	1	3
413	2	528	1	1	1	1	3
414	2	528	1	3	0	0	1
415	2	528	1	3	0	0	1
416	2	528	1	2	1	0	2

417	2	528	1	3	0	0	1
418	2	528	1	3	0	0	1
401	2	543	1	2	1	0	2
402	2	543	1	1	1	1	3
403	2	543	1	1	1	1	3
404	2	543	1	1	1	1	3
405	2	543	1	2	1	0	2
406	2	543	1	2	1	0	2
407	2	543	1	1	1	1	3
408	2	543	1	1	1	1	3
409	2	543	1	1	1	1	3
410	2	543	1	1	1	1	3
411	2	543	1	2	1	0	2
412	2	543	1	1	1	1	3
413	2	543	1	1	1	1	3
414	2	543	1	3	0	0	1
415	2	543	1	2	1	0	2
416	2	543	1	3	0	0	1
417	2	543	1	3	0	0	1
418	2	543	1	3	0	0	1
401	2	545	1	2	1	0	2
402	2	545	1	1	1	1	3
403	2	545	1	2	1	0	2
404	2	545	1	1	1	1	3
405	2	545	1	2	1	0	2
406	2	545	1	2	1	0	2
407	2	545	1	1	1	1	3
408	2	545	1	1	1	1	3
409	2	545	1	1	1	1	3
410	2	545	1	1	1	1	3
411	2	545	1	3	0	0	1
412	2	545	1	1	1	1	3
413	2	545	1	1	1	1	3
414	2	545	1	2	1	0	2
415	2	545	1	2	1	0	2
416	2	545	1	2	1	0	2
417	2	545	1	3	0	0	1
418	2	545	1	1	1	1	3
401	2	503	4	2	0	0	1
402	2	503	4	1	0	1	0
403	2	503	4	2	0	0	1
404	2	503	4	2	0	0	1
405	2	503	4	1	0	1	0
406	2	503	4	1	0	1	0
407	2	503	4	2	0	0	1
408	2	503	4	2	0	0	1

409	2	503	4	1	0	1	0
410	2	503	4	1	0	1	0
411	2	503	4	3	1	0	2
412	2	503	4	1	0	1	0
413	2	503	4	2	0	0	1
414	2	503	4	3	1	0	2
415	2	503	4	2	0	0	1
416	2	503	4	3	1	0	2
417	2	503	4	2	0	0	1
418	2	503	4	3	1	0	2
401	2	513	4	1	0	1	0
402	2	513	4	1	0	1	0
403	2	513	4	1	0	1	0
404	2	513	4	3	1	0	2
405	2	513	4	3	1	0	2
406	2	513	4	1	0	1	0
407	2	513	4	3	1	0	2
408	2	513	4	3	1	0	2
409	2	513	4	1	0	1	0
410	2	513	4	1	0	1	0
411	2	513	4	3	1	0	2
412	2	513	4	1	0	1	0
413	2	513	4	3	1	0	2
414	2	513	4	2	0	0	1
415	2	513	4	3	1	0	2
416	2	513	4	1	0	1	0
417	2	513	4	4	1	1	3
418	2	513	4	2	0	0	1
401	2	519	4	2	0	0	1
402	2	519	4	1	0	1	0
403	2	519	4	4	1	1	3
404	2	519	4	2	0	0	1
405	2	519	4	2	0	0	1
406	2	519	4	3	1	0	2
407	2	519	4	1	0	1	0
408	2	519	4	1	0	1	0
409	2	519	4	1	0	1	0
410	2	519	4	1	0	1	0
411	2	519	4	2	0	0	1
412	2	519	4	1	0	1	0
413	2	519	4	2	0	0	1
414	2	519	4	3	1	0	2
415	2	519	4	3	1	0	2
416	2	519	4	3	1	0	2
417	2	519	4	2	0	0	1
418	2	519	4	2	0	0	1

401	2	522	4	2	0	0	1
402	2	522	4	1	0	1	0
403	2	522	4	2	0	0	1
404	2	522	4	3	1	0	2
405	2	522	4	1	0	1	0
406	2	522	4	1	0	1	0
407	2	522	4	3	1	0	2
408	2	522	4	3	1	0	2
409	2	522	4	2	0	0	1
410	2	522	4	1	0	1	0
411	2	522	4	1	0	1	0
412	2	522	4	3	1	0	2
413	2	522	4	2	0	0	1
414	2	522	4	2	0	0	1
415	2	522	4	1	0	1	0
416	2	522	4	1	0	1	0
417	2	522	4	2	0	0	1
418	2	522	4	3	1	0	2
401	2	531	4	2	0	0	1
402	2	531	4	1	0	1	0
403	2	531	4	2	0	0	1
404	2	531	4	3	1	0	2
405	2	531	4	3	1	0	2
406	2	531	4	1	0	1	0
407	2	531	4	4	1	1	3
408	2	531	4	4	1	1	3
409	2	531	4	2	0	0	1
410	2	531	4	2	0	0	1
411	2	531	4	2	0	0	1
412	2	531	4	1	0	1	0
413	2	531	4	1	0	1	0
414	2	531	4	2	0	0	1
415	2	531	4	1	0	1	0
416	2	531	4	1	0	1	0
417	2	531	4	1	0	1	0
418	2	531	4	2	0	0	1
401	2	535	4	2	0	0	1
402	2	535	4	1	0	1	0
403	2	535	4	2	0	0	1
404	2	535	4	1	0	1	0
405	2	535	4	2	0	0	1
406	2	535	4	1	0	1	0
407	2	535	4	3	1	0	2
408	2	535	4	3	1	0	2
409	2	535	4	3	1	0	2
410	2	535	4	1	0	1	0

411	2	535	4	3	1	0	2
412	2	535	4	1	0	1	0
413	2	535	4	4	1	1	3
414	2	535	4	2	0	0	1
415	2	535	4	1	0	1	0
416	2	535	4	2	0	0	1
417	2	535	4	2	0	0	1
418	2	535	4	1	0	1	0

Table 1: Posttest data on object marking

Duals and plurals

Participant	**Group**	**TrialNumber**	**ExpectedOutcome**	**Result**	**Correctness**	**Certainty**	**Value**
301	1	501	1	1	1	1	3
302	1	501	1	1	1	1	3
303	1	501	1	2	1	0	2
304	1	501	1	1	1	1	3
305	1	501	1	1	1	1	3
306	1	501	1	1	1	1	3
307	1	501	1	1	1	1	3
308	1	501	1	1	1	1	3
309	1	501	1	1	1	1	3
310	1	501	1	1	1	1	3
311	1	501	1	1	1	1	3
312	1	501	1	1	1	1	3
313	1	501	1	3	0	0	1
314	1	501	1	1	1	1	3
315	1	501	1	1	1	1	3
316	1	501	1	1	1	1	3
317	1	501	1	1	1	1	3
301	1	505	1	1	1	1	3
302	1	505	1	1	1	1	3
303	1	505	1	4	0	1	0
304	1	505	1	1	1	1	3
305	1	505	1	1	1	1	3
306	1	505	1	2	1	0	2
307	1	505	1	1	1	1	3
308	1	505	1	1	1	1	3
309	1	505	1	1	1	1	3
310	1	505	1	1	1	1	3
311	1	505	1	1	1	1	3
312	1	505	1	1	1	1	3
313	1	505	1	1	1	1	3
314	1	505	1	4	0	1	0
315	1	505	1	1	1	1	3
316	1	505	1	1	1	1	3

317	1	505	1	1	1	1	3
301	1	509	1	1	1	1	3
302	1	509	1	1	1	1	3
303	1	509	1	1	1	1	3
304	1	509	1	1	1	1	3
305	1	509	1	3	0	0	1
306	1	509	1	2	1	0	2
307	1	509	1	1	1	1	3
308	1	509	1	1	1	1	3
309	1	509	1	3	0	0	1
310	1	509	1	1	1	1	3
311	1	509	1	1	1	1	3
312	1	509	1	3	0	0	1
313	1	509	1	3	0	0	1
314	1	509	1	1	1	1	3
315	1	509	1	1	1	1	3
316	1	509	1	2	1	0	2
317	1	509	1	2	1	0	2
301	1	528	1	3	0	0	1
302	1	528	1	1	1	1	3
303	1	528	1	2	1	0	2
304	1	528	1	2	1	0	2
305	1	528	1	1	1	1	3
306	1	528	1	3	0	0	1
307	1	528	1	4	0	1	0
308	1	528	1	1	1	1	3
309	1	528	1	2	1	0	2
310	1	528	1	1	1	1	3
311	1	528	1	1	1	1	3
312	1	528	1	2	1	0	2
313	1	528	1	1	1	1	3
314	1	528	1	1	1	1	3
315	1	528	1	1	1	1	3
316	1	528	1	2	1	0	2
317	1	528	1	2	1	0	2
301	1	543	1	1	1	1	3
302	1	543	1	2	1	0	2
303	1	543	1	3	0	0	1
304	1	543	1	1	1	1	3
305	1	543	1	1	1	1	3
306	1	543	1	4	0	1	0
307	1	543	1	2	1	0	2
308	1	543	1	1	1	1	3
309	1	543	1	2	1	0	2
310	1	543	1	1	1	1	3
311	1	543	1	1	1	1	3

312	1	543	1	3	0	0	1
313	1	543	1	3	0	0	1
314	1	543	1	2	1	0	2
315	1	543	1	2	1	0	2
316	1	543	1	2	1	0	2
317	1	543	1	2	1	0	2
301	1	545	1	1	1	1	3
302	1	545	1	1	1	1	3
303	1	545	1	3	0	0	1
304	1	545	1	1	1	1	3
305	1	545	1	1	1	1	3
306	1	545	1	1	1	1	3
307	1	545	1	2	1	0	2
308	1	545	1	2	1	0	2
309	1	545	1	3	0	0	1
310	1	545	1	1	1	1	3
311	1	545	1	1	1	1	3
312	1	545	1	3	0	0	1
313	1	545	1	3	0	0	1
314	1	545	1	1	1	1	3
315	1	545	1	1	1	1	3
316	1	545	1	2	1	0	2
317	1	545	1	2	1	0	2
301	1	503	4	1	0	1	0
302	1	503	4	1	0	1	0
303	1	503	4	2	0	0	1
304	1	503	4	1	0	1	0
305	1	503	4	1	0	1	0
306	1	503	4	4	1	1	3
307	1	503	4	1	0	1	0
308	1	503	4	3	1	0	2
309	1	503	4	3	1	0	2
310	1	503	4	1	0	1	0
311	1	503	4	1	0	1	0
312	1	503	4	2	0	0	1
313	1	503	4	3	1	0	2
314	1	503	4	4	1	1	3
315	1	503	4	4	1	1	3
316	1	503	4	1	0	1	0
317	1	503	4	1	0	1	0
301	1	513	4	1	0	1	0
302	1	513	4	1	0	1	0
303	1	513	4	1	0	1	0
304	1	513	4	1	0	1	0
305	1	513	4	1	0	1	0
306	1	513	4	3	1	0	2

307	1	513	4	1	0	1	0
308	1	513	4	1	0	1	0
309	1	513	4	3	1	0	2
310	1	513	4	1	0	1	0
311	1	513	4	1	0	1	0
312	1	513	4	1	0	1	0
313	1	513	4	1	0	1	0
314	1	513	4	1	0	1	0
315	1	513	4	3	1	0	2
316	1	513	4	3	1	0	2
317	1	513	4	3	1	0	2
301	1	519	4	1	0	1	0
302	1	519	4	2	0	0	1
303	1	519	4	3	1	0	2
304	1	519	4	3	1	0	2
305	1	519	4	1	0	1	0
306	1	519	4	1	0	1	0
307	1	519	4	1	0	1	0
308	1	519	4	1	0	1	0
309	1	519	4	3	1	0	2
310	1	519	4	1	0	1	0
311	1	519	4	1	0	1	0
312	1	519	4	1	0	1	0
313	1	519	4	3	1	0	2
314	1	519	4	2	0	0	1
315	1	519	4	3	1	0	2
316	1	519	4	2	0	0	1
317	1	519	4	2	0	0	1
301	1	522	4	1	0	1	0
302	1	522	4	1	0	1	0
303	1	522	4	2	0	0	1
304	1	522	4	1	0	1	0
305	1	522	4	1	0	1	0
306	1	522	4	1	0	1	0
307	1	522	4	1	0	1	0
308	1	522	4	1	0	1	0
309	1	522	4	3	1	0	2
310	1	522	4	1	0	1	0
311	1	522	4	1	0	1	0
312	1	522	4	1	0	1	0
313	1	522	4	4	1	1	3
314	1	522	4	1	0	1	0
315	1	522	4	3	1	0	2
316	1	522	4	2	0	0	1
317	1	522	4	2	0	0	1
301	1	531	4	1	0	1	0

302	1	531	4	1	0	1	0
303	1	531	4	2	0	0	1
304	1	531	4	1	0	1	0
305	1	531	4	1	0	1	0
306	1	531	4	2	0	0	1
307	1	531	4	1	0	1	0
308	1	531	4	1	0	1	0
309	1	531	4	4	1	1	3
310	1	531	4	1	0	1	0
311	1	531	4	1	0	1	0
312	1	531	4	1	0	1	0
313	1	531	4	4	1	1	3
314	1	531	4	1	0	1	0
315	1	531	4	3	1	0	2
316	1	531	4	1	0	1	0
317	1	531	4	1	0	1	0
301	1	535	4	3	1	0	2
302	1	535	4	1	0	1	0
303	1	535	4	2	0	0	1
304	1	535	4	1	0	1	0
305	1	535	4	1	0	1	0
306	1	535	4	4	1	1	3
307	1	535	4	3	1	0	2
308	1	535	4	1	0	1	0
309	1	535	4	3	1	0	2
310	1	535	4	1	0	1	0
311	1	535	4	1	0	1	0
312	1	535	4	2	0	0	1
313	1	535	4	2	0	0	1
314	1	535	4	1	0	1	0
315	1	535	4	3	1	0	2
316	1	535	4	2	0	0	1
317	1	535	4	2	0	0	1
401	2	501	1	2	1	0	2
402	2	501	1	1	1	1	3
403	2	501	1	1	1	1	3
404	2	501	1	4	0	1	0
405	2	501	1	1	1	1	3
406	2	501	1	1	1	1	3
407	2	501	1	1	1	1	3
408	2	501	1	1	1	1	3
409	2	501	1	1	1	1	3
410	2	501	1	1	1	1	3
411	2	501	1	1	1	1	3
412	2	501	1	4	0	1	0
413	2	501	1	4	0	1	0

414	2	501	1	2	1	0	2
415	2	501	1	2	1	0	2
416	2	501	1	1	1	1	3
417	2	501	1	1	1	1	3
418	2	501	1	1	1	1	3
401	2	505	1	4	0	1	0
402	2	505	1	1	1	1	3
403	2	505	1	3	0	0	1
404	2	505	1	1	1	1	3
405	2	505	1	3	0	0	1
406	2	505	1	1	1	1	3
407	2	505	1	1	1	1	3
408	2	505	1	1	1	1	3
409	2	505	1	2	1	0	2
410	2	505	1	1	1	1	3
411	2	505	1	2	1	0	2
412	2	505	1	1	1	1	3
413	2	505	1	2	1	0	2
414	2	505	1	2	1	0	2
415	2	505	1	1	1	1	3
416	2	505	1	1	1	1	3
417	2	505	1	2	1	0	2
418	2	505	1	1	1	1	3
401	2	509	1	1	1	1	3
402	2	509	1	1	1	1	3
403	2	509	1	1	1	1	3
404	2	509	1	2	1	0	2
405	2	509	1	2	1	0	2
406	2	509	1	1	1	1	3
407	2	509	1	2	1	0	2
408	2	509	1	2	1	0	2
409	2	509	1	4	0	1	0
410	2	509	1	3	0	0	1
411	2	509	1	1	1	1	3
412	2	509	1	1	1	1	3
413	2	509	1	1	1	1	3
414	2	509	1	2	1	0	2
415	2	509	1	1	1	1	3
416	2	509	1	1	1	1	3
417	2	509	1	1	1	1	3
418	2	509	1	3	0	0	1
401	2	528	1	2	1	0	2
402	2	528	1	4	0	1	0
403	2	528	1	1	1	1	3
404	2	528	1	4	0	1	0
405	2	528	1	2	1	0	2

406	2	528	1	1	1	1	3
407	2	528	1	1	1	1	3
408	2	528	1	1	1	1	3
409	2	528	1	3	0	0	1
410	2	528	1	1	1	1	3
411	2	528	1	3	0	0	1
412	2	528	1	1	1	1	3
413	2	528	1	1	1	1	3
414	2	528	1	3	0	0	1
415	2	528	1	3	0	0	1
416	2	528	1	2	1	0	2
417	2	528	1	3	0	0	1
418	2	528	1	3	0	0	1
401	2	543	1	2	1	0	2
402	2	543	1	1	1	1	3
403	2	543	1	1	1	1	3
404	2	543	1	1	1	1	3
405	2	543	1	2	1	0	2
406	2	543	1	2	1	0	2
407	2	543	1	1	1	1	3
408	2	543	1	1	1	1	3
409	2	543	1	1	1	1	3
410	2	543	1	1	1	1	3
411	2	543	1	2	1	0	2
412	2	543	1	1	1	1	3
413	2	543	1	1	1	1	3
414	2	543	1	3	0	0	1
415	2	543	1	2	1	0	2
416	2	543	1	3	0	0	1
417	2	543	1	3	0	0	1
418	2	543	1	3	0	0	1
401	2	545	1	2	1	0	2
402	2	545	1	1	1	1	3
403	2	545	1	2	1	0	2
404	2	545	1	1	1	1	3
405	2	545	1	2	1	0	2
406	2	545	1	2	1	0	2
407	2	545	1	1	1	1	3
408	2	545	1	1	1	1	3
409	2	545	1	1	1	1	3
410	2	545	1	1	1	1	3
411	2	545	1	3	0	0	1
412	2	545	1	1	1	1	3
413	2	545	1	1	1	1	3
414	2	545	1	2	1	0	2
415	2	545	1	2	1	0	2

416	2	545	1	2	1	0	2
417	2	545	1	3	0	0	1
418	2	545	1	1	1	1	3
401	2	503	4	2	0	0	1
402	2	503	4	1	0	1	0
403	2	503	4	2	0	0	1
404	2	503	4	2	0	0	1
405	2	503	4	1	0	1	0
406	2	503	4	1	0	1	0
407	2	503	4	2	0	0	1
408	2	503	4	2	0	0	1
409	2	503	4	1	0	1	0
410	2	503	4	1	0	1	0
411	2	503	4	3	1	0	2
412	2	503	4	1	0	1	0
413	2	503	4	2	0	0	1
414	2	503	4	3	1	0	2
415	2	503	4	2	0	0	1
416	2	503	4	3	1	0	2
417	2	503	4	2	0	0	1
418	2	503	4	3	1	0	2
401	2	513	4	1	0	1	0
402	2	513	4	1	0	1	0
403	2	513	4	1	0	1	0
404	2	513	4	3	1	0	2
405	2	513	4	3	1	0	2
406	2	513	4	1	0	1	0
407	2	513	4	3	1	0	2
408	2	513	4	3	1	0	2
409	2	513	4	1	0	1	0
410	2	513	4	1	0	1	0
411	2	513	4	3	1	0	2
412	2	513	4	1	0	1	0
413	2	513	4	3	1	0	2
414	2	513	4	2	0	0	1
415	2	513	4	3	1	0	2
416	2	513	4	1	0	1	0
417	2	513	4	4	1	1	3
418	2	513	4	2	0	0	1
401	2	519	4	2	0	0	1
402	2	519	4	1	0	1	0
403	2	519	4	4	1	1	3
404	2	519	4	2	0	0	1
405	2	519	4	2	0	0	1
406	2	519	4	3	1	0	2
407	2	519	4	1	0	1	0

408	2	519	4	1	0	1	0
409	2	519	4	1	0	1	0
410	2	519	4	1	0	1	0
411	2	519	4	2	0	0	1
412	2	519	4	1	0	1	0
413	2	519	4	2	0	0	1
414	2	519	4	3	1	0	2
415	2	519	4	3	1	0	2
416	2	519	4	3	1	0	2
417	2	519	4	2	0	0	1
418	2	519	4	2	0	0	1
401	2	522	4	2	0	0	1
402	2	522	4	1	0	1	0
403	2	522	4	2	0	0	1
404	2	522	4	3	1	0	2
405	2	522	4	1	0	1	0
406	2	522	4	1	0	1	0
407	2	522	4	3	1	0	2
408	2	522	4	3	1	0	2
409	2	522	4	2	0	0	1
410	2	522	4	1	0	1	0
411	2	522	4	1	0	1	0
412	2	522	4	3	1	0	2
413	2	522	4	2	0	0	1
414	2	522	4	2	0	0	1
415	2	522	4	1	0	1	0
416	2	522	4	1	0	1	0
417	2	522	4	2	0	0	1
418	2	522	4	3	1	0	2
401	2	531	4	2	0	0	1
402	2	531	4	1	0	1	0
403	2	531	4	2	0	0	1
404	2	531	4	3	1	0	2
405	2	531	4	3	1	0	2
406	2	531	4	1	0	1	0
407	2	531	4	4	1	1	3
408	2	531	4	4	1	1	3
409	2	531	4	2	0	0	1
410	2	531	4	2	0	0	1
411	2	531	4	2	0	0	1
412	2	531	4	1	0	1	0
413	2	531	4	1	0	1	0
414	2	531	4	2	0	0	1
415	2	531	4	1	0	1	0
416	2	531	4	1	0	1	0
417	2	531	4	1	0	1	0

418	2	531	4	2	0	0	1
401	2	535	4	2	0	0	1
402	2	535	4	1	0	1	0
403	2	535	4	2	0	0	1
404	2	535	4	1	0	1	0
405	2	535	4	2	0	0	1
406	2	535	4	1	0	1	0
407	2	535	4	3	1	0	2
408	2	535	4	3	1	0	2
409	2	535	4	3	1	0	2
410	2	535	4	1	0	1	0
411	2	535	4	3	1	0	2
412	2	535	4	1	0	1	0
413	2	535	4	4	1	1	3
414	2	535	4	2	0	0	1
415	2	535	4	1	0	1	0
416	2	535	4	2	0	0	1
417	2	535	4	2	0	0	1
418	2	535	4	1	0	1	0

Table 2: Posttest data on dual-plural marking

Diminutives

Participant	**Group**	**TrialNumber**	**ExpectedOutcome**	**Result**	**Correctness**	**Certainty**	**Value**
301	1	515	1	1	1	1	3
302	1	515	1	1	1	1	3
303	1	515	1	1	1	1	3
304	1	515	1	1	1	1	3
305	1	515	1	1	1	1	3
306	1	515	1	2	1	0	2
307	1	515	1	1	1	1	3
308	1	515	1	1	1	1	3
309	1	515	1	1	1	1	3
310	1	515	1	1	1	1	3
311	1	515	1	1	1	1	3
312	1	515	1	1	1	1	3
313	1	515	1	1	1	1	3
314	1	515	1	2	1	0	2
315	1	515	1	1	1	1	3
316	1	515	1	3	0	0	1
317	1	515	1	3	0	0	1
301	1	523	1	4	0	1	0
302	1	523	1	1	1	1	3
303	1	523	1	2	1	0	2
304	1	523	1	4	0	1	0
305	1	523	1	4	0	1	0
306	1	523	1	2	1	0	2

307	1	523	1	1	1	1	3
308	1	523	1	1	1	1	3
309	1	523	1	1	1	1	3
310	1	523	1	1	1	1	3
311	1	523	1	1	1	1	3
312	1	523	1	1	1	1	3
313	1	523	1	1	1	1	3
314	1	523	1	1	1	1	3
315	1	523	1	4	0	1	0
316	1	523	1	3	0	0	1
317	1	523	1	3	0	0	1
301	1	526	1	1	1	1	3
302	1	526	1	1	1	1	3
303	1	526	1	2	1	0	2
304	1	526	1	1	1	1	3
305	1	526	1	1	1	1	3
306	1	526	1	1	1	1	3
307	1	526	1	1	1	1	3
308	1	526	1	1	1	1	3
309	1	526	1	2	1	0	2
310	1	526	1	1	1	1	3
311	1	526	1	1	1	1	3
312	1	526	1	1	1	1	3
313	1	526	1	1	1	1	3
314	1	526	1	1	1	1	3
315	1	526	1	1	1	1	3
316	1	526	1	2	1	0	2
317	1	526	1	2	1	0	2
301	1	533	1	1	1	1	3
302	1	533	1	1	1	1	3
303	1	533	1	1	1	1	3
304	1	533	1	1	1	1	3
305	1	533	1	1	1	1	3
306	1	533	1	2	1	0	2
307	1	533	1	1	1	1	3
308	1	533	1	1	1	1	3
309	1	533	1	1	1	1	3
310	1	533	1	1	1	1	3
311	1	533	1	1	1	1	3
312	1	533	1	1	1	1	3
313	1	533	1	1	1	1	3
314	1	533	1	2	1	0	2
315	1	533	1	1	1	1	3
316	1	533	1	3	0	0	1
317	1	533	1	3	0	0	1
301	1	539	1	3	0	0	1

302	1	539	1	1	1	1	3
303	1	539	1	2	1	0	2
304	1	539	1	3	0	0	1
305	1	539	1	1	1	1	3
306	1	539	1	1	1	1	3
307	1	539	1	1	1	1	3
308	1	539	1	3	0	0	1
309	1	539	1	1	1	1	3
310	1	539	1	1	1	1	3
311	1	539	1	1	1	1	3
312	1	539	1	2	1	0	2
313	1	539	1	1	1	1	3
314	1	539	1	1	1	1	3
315	1	539	1	2	1	0	2
316	1	539	1	2	1	0	2
317	1	539	1	2	1	0	2
301	1	546	1	2	1	0	2
302	1	546	1	1	1	1	3
303	1	546	1	2	1	0	2
304	1	546	1	2	1	0	2
305	1	546	1	1	1	1	3
306	1	546	1	3	0	0	1
307	1	546	1	2	1	0	2
308	1	546	1	2	1	0	2
309	1	546	1	1	1	1	3
310	1	546	1	1	1	1	3
311	1	546	1	1	1	1	3
312	1	546	1	2	1	0	2
313	1	546	1	1	1	1	3
314	1	546	1	3	0	0	1
315	1	546	1	2	1	0	2
316	1	546	1	2	1	0	2
317	1	546	1	2	1	0	2
301	1	506	4	1	0	1	0
302	1	506	4	1	0	1	0
303	1	506	4	1	0	1	0
304	1	506	4	1	0	1	0
305	1	506	4	1	0	1	0
306	1	506	4	2	0	0	1
307	1	506	4	1	0	1	0
308	1	506	4	1	0	1	0
309	1	506	4	1	0	1	0
310	1	506	4	1	0	1	0
311	1	506	4	1	0	1	0
312	1	506	4	1	0	1	0
313	1	506	4	1	0	1	0

314	1	506	4	2	0	0	1
315	1	506	4	1	0	1	0
316	1	506	4	3	1	0	2
317	1	506	4	3	1	0	2
301	1	517	4	1	0	1	0
302	1	517	4	1	0	1	0
303	1	517	4	1	0	1	0
304	1	517	4	1	0	1	0
305	1	517	4	1	0	1	0
306	1	517	4	3	1	0	2
307	1	517	4	1	0	1	0
308	1	517	4	3	1	0	2
309	1	517	4	3	1	0	2
310	1	517	4	1	0	1	0
311	1	517	4	1	0	1	0
312	1	517	4	1	0	1	0
313	1	517	4	2	0	0	1
314	1	517	4	3	1	0	2
315	1	517	4	4	1	1	3
316	1	517	4	2	0	0	1
317	1	517	4	2	0	0	1
301	1	521	4	3	1	0	2
302	1	521	4	1	0	1	0
303	1	521	4	1	0	1	0
304	1	521	4	2	0	0	1
305	1	521	4	1	0	1	0
306	1	521	4	2	0	0	1
307	1	521	4	1	0	1	0
308	1	521	4	1	0	1	0
309	1	521	4	1	0	1	0
310	1	521	4	1	0	1	0
311	1	521	4	1	0	1	0
312	1	521	4	1	0	1	0
313	1	521	4	1	0	1	0
314	1	521	4	1	0	1	0
315	1	521	4	4	1	1	3
316	1	521	4	2	0	0	1
317	1	521	4	2	0	0	1
301	1	529	4	1	0	1	0
302	1	529	4	3	1	0	2
303	1	529	4	2	0	0	1
304	1	529	4	4	1	1	3
305	1	529	4	1	0	1	0
306	1	529	4	2	0	0	1
307	1	529	4	1	0	1	0
308	1	529	4	1	0	1	0

309	1	529	4	1	0	1	0
310	1	529	4	1	0	1	0
311	1	529	4	1	0	1	0
312	1	529	4	1	0	1	0
313	1	529	4	1	0	1	0
314	1	529	4	1	0	1	0
315	1	529	4	4	1	1	3
316	1	529	4	2	0	0	1
317	1	529	4	2	0	0	1
301	1	536	4	3	1	0	2
302	1	536	4	1	0	1	0
303	1	536	4	2	0	0	1
304	1	536	4	1	0	1	0
305	1	536	4	1	0	1	0
306	1	536	4	3	1	0	2
307	1	536	4	2	0	0	1
308	1	536	4	2	0	0	1
309	1	536	4	3	1	0	2
310	1	536	4	2	0	0	1
311	1	536	4	2	0	0	1
312	1	536	4	3	1	0	2
313	1	536	4	4	1	1	3
314	1	536	4	3	1	0	2
315	1	536	4	2	0	0	1
316	1	536	4	2	0	0	1
317	1	536	4	2	0	0	1
301	1	542	4	2	0	0	1
302	1	542	4	1	0	1	0
303	1	542	4	2	0	0	1
304	1	542	4	2	0	0	1
305	1	542	4	1	0	1	0
306	1	542	4	4	1	1	3
307	1	542	4	2	0	0	1
308	1	542	4	3	1	0	2
309	1	542	4	1	0	1	0
310	1	542	4	1	0	1	0
311	1	542	4	1	0	1	0
312	1	542	4	3	1	0	2
313	1	542	4	1	0	1	0
314	1	542	4	3	1	0	2
315	1	542	4	2	0	0	1
316	1	542	4	2	0	0	1
317	1	542	4	2	0	0	1
401	2	515	1	3	0	0	1
402	2	515	1	1	1	1	3
403	2	515	1	1	1	1	3

404	2	515	1	2	1	0	2
405	2	515	1	2	1	0	2
406	2	515	1	1	1	1	3
407	2	515	1	2	1	0	2
408	2	515	1	2	1	0	2
409	2	515	1	1	1	1	3
410	2	515	1	1	1	1	3
411	2	515	1	1	1	1	3
412	2	515	1	1	1	1	3
413	2	515	1	1	1	1	3
414	2	515	1	2	1	0	2
415	2	515	1	1	1	1	3
416	2	515	1	1	1	1	3
417	2	515	1	2	1	0	2
418	2	515	1	1	1	1	3
401	2	523	1	3	0	0	1
402	2	523	1	1	1	1	3
403	2	523	1	2	1	0	2
404	2	523	1	4	0	1	0
405	2	523	1	4	0	1	0
406	2	523	1	1	1	1	3
407	2	523	1	2	1	0	2
408	2	523	1	2	1	0	2
409	2	523	1	1	1	1	3
410	2	523	1	4	0	1	0
411	2	523	1	2	1	0	2
412	2	523	1	1	1	1	3
413	2	523	1	1	1	1	3
414	2	523	1	2	1	0	2
415	2	523	1	2	1	0	2
416	2	523	1	1	1	1	3
417	2	523	1	2	1	0	2
418	2	523	1	1	1	1	3
401	2	526	1	2	1	0	2
402	2	526	1	1	1	1	3
403	2	526	1	1	1	1	3
404	2	526	1	4	0	1	0
405	2	526	1	2	1	0	2
406	2	526	1	1	1	1	3
407	2	526	1	3	0	0	1
408	2	526	1	3	0	0	1
409	2	526	1	1	1	1	3
410	2	526	1	1	1	1	3
411	2	526	1	1	1	1	3
412	2	526	1	1	1	1	3
413	2	526	1	1	1	1	3

414	2	526	1	2	1	0	2
415	2	526	1	2	1	0	2
416	2	526	1	1	1	1	3
417	2	526	1	2	1	0	2
418	2	526	1	1	1	1	3
401	2	533	1	2	1	0	2
402	2	533	1	1	1	1	3
403	2	533	1	2	1	0	2
404	2	533	1	4	0	1	0
405	2	533	1	2	1	0	2
406	2	533	1	1	1	1	3
407	2	533	1	2	1	0	2
408	2	533	1	2	1	0	2
409	2	533	1	1	1	1	3
410	2	533	1	1	1	1	3
411	2	533	1	1	1	1	3
412	2	533	1	1	1	1	3
413	2	533	1	2	1	0	2
414	2	533	1	2	1	0	2
415	2	533	1	1	1	1	3
416	2	533	1	1	1	1	3
417	2	533	1	2	1	0	2
418	2	533	1	1	1	1	3
401	2	539	1	1	1	1	3
402	2	539	1	1	1	1	3
403	2	539	1	2	1	0	2
404	2	539	1	3	0	0	1
405	2	539	1	3	0	0	1
406	2	539	1	1	1	1	3
407	2	539	1	1	1	1	3
408	2	539	1	1	1	1	3
409	2	539	1	1	1	1	3
410	2	539	1	4	0	1	0
411	2	539	1	2	1	0	2
412	2	539	1	1	1	1	3
413	2	539	1	1	1	1	3
414	2	539	1	2	1	0	2
415	2	539	1	1	1	1	3
416	2	539	1	1	1	1	3
417	2	539	1	2	1	0	2
418	2	539	1	1	1	1	3
401	2	546	1	1	1	1	3
402	2	546	1	1	1	1	3
403	2	546	1	1	1	1	3
404	2	546	1	3	0	0	1
405	2	546	1	3	0	0	1

406	2	546	1	2	1	0	2
407	2	546	1	2	1	0	2
408	2	546	1	2	1	0	2
409	2	546	1	3	0	0	1
410	2	546	1	4	0	1	0
411	2	546	1	2	1	0	2
412	2	546	1	1	1	1	3
413	2	546	1	1	1	1	3
414	2	546	1	2	1	0	2
415	2	546	1	3	0	0	1
416	2	546	1	1	1	1	3
417	2	546	1	2	1	0	2
418	2	546	1	3	0	0	1
401	2	506	4	4	1	1	3
402	2	506	4	1	0	1	0
403	2	506	4	2	0	0	1
404	2	506	4	2	0	0	1
405	2	506	4	2	0	0	1
406	2	506	4	1	0	1	0
407	2	506	4	2	0	0	1
408	2	506	4	2	0	0	1
409	2	506	4	1	0	1	0
410	2	506	4	1	0	1	0
411	2	506	4	2	0	0	1
412	2	506	4	1	0	1	0
413	2	506	4	1	0	1	0
414	2	506	4	1	0	1	0
415	2	506	4	2	0	0	1
416	2	506	4	1	0	1	0
417	2	506	4	1	0	1	0
418	2	506	4	1	0	1	0
401	2	517	4	4	1	1	3
402	2	517	4	1	0	1	0
403	2	517	4	2	0	0	1
404	2	517	4	2	0	0	1
405	2	517	4	2	0	0	1
406	2	517	4	3	1	0	2
407	2	517	4	3	1	0	2
408	2	517	4	3	1	0	2
409	2	517	4	1	0	1	0
410	2	517	4	4	1	1	3
411	2	517	4	2	0	0	1
412	2	517	4	1	0	1	0
413	2	517	4	1	0	1	0
414	2	517	4	1	0	1	0
415	2	517	4	2	0	0	1

416	2	517	4	2	0	0	1
417	2	517	4	1	0	1	0
418	2	517	4	2	0	0	1
401	2	521	4	1	0	1	0
402	2	521	4	1	0	1	0
403	2	521	4	1	0	1	0
404	2	521	4	3	1	0	2
405	2	521	4	2	0	0	1
406	2	521	4	1	0	1	0
407	2	521	4	2	0	0	1
408	2	521	4	2	0	0	1
409	2	521	4	1	0	1	0
410	2	521	4	1	0	1	0
411	2	521	4	2	0	0	1
412	2	521	4	1	0	1	0
413	2	521	4	1	0	1	0
414	2	521	4	1	0	1	0
415	2	521	4	1	0	1	0
416	2	521	4	1	0	1	0
417	2	521	4	2	0	0	1
418	2	521	4	1	0	1	0
401	2	529	4	2	0	0	1
402	2	529	4	1	0	1	0
403	2	529	4	1	0	1	0
404	2	529	4	3	1	0	2
405	2	529	4	3	1	0	2
406	2	529	4	1	0	1	0
407	2	529	4	2	0	0	1
408	2	529	4	2	0	0	1
409	2	529	4	1	0	1	0
410	2	529	4	4	1	1	3
411	2	529	4	1	0	1	0
412	2	529	4	1	0	1	0
413	2	529	4	1	0	1	0
414	2	529	4	2	0	0	1
415	2	529	4	1	0	1	0
416	2	529	4	1	0	1	0
417	2	529	4	1	0	1	0
418	2	529	4	1	0	1	0
401	2	536	4	4	1	1	3
402	2	536	4	3	1	0	2
403	2	536	4	3	1	0	2
404	2	536	4	3	1	0	2
405	2	536	4	3	1	0	2
406	2	536	4	3	1	0	2
407	2	536	4	2	0	0	1

408	2	536	4	2	0	0	1
409	2	536	4	1	0	1	0
410	2	536	4	4	1	1	3
411	2	536	4	3	1	0	2
412	2	536	4	1	0	1	0
413	2	536	4	1	0	1	0
414	2	536	4	2	0	0	1
415	2	536	4	2	0	0	1
416	2	536	4	2	0	0	1
417	2	536	4	2	0	0	1
418	2	536	4	3	1	0	2
401	2	542	4	2	0	0	1
402	2	542	4	1	0	1	0
403	2	542	4	1	0	1	0
404	2	542	4	4	1	1	3
405	2	542	4	2	0	0	1
406	2	542	4	3	1	0	2
407	2	542	4	3	1	0	2
408	2	542	4	3	1	0	2
409	2	542	4	1	0	1	0
410	2	542	4	1	0	1	0
411	2	542	4	4	1	1	3
412	2	542	4	1	0	1	0
413	2	542	4	1	0	1	0
414	2	542	4	2	0	0	1
415	2	542	4	1	0	1	0
416	2	542	4	1	0	1	0
417	2	542	4	2	0	0	1
418	2	542	4	3	1	0	2

Table 3: posttest data on diminutives

Postpositions

Participant	**Group**	**TrialNumber**	**ExpectedOutcome**	**Result**	**Correctness**	**Certainty**	**Value**
301	1	504	1	2	1	0	2
302	1	504	1	1	1	1	3
303	1	504	1	2	1	0	2
304	1	504	1	1	1	1	3
305	1	504	1	1	1	1	3
306	1	504	1	1	1	1	3
307	1	504	1	1	1	1	3
308	1	504	1	1	1	1	3
309	1	504	1	3	0	0	1
310	1	504	1	1	1	1	3
311	1	504	1	1	1	1	3
312	1	504	1	1	1	1	3
313	1	504	1	1	1	1	3

314	1	504	1	2	1	0	2
315	1	504	1	1	1	1	3
316	1	504	1	2	1	0	2
317	1	504	1	2	1	0	2
301	1	508	1	3	0	0	1
302	1	508	1	2	1	0	2
303	1	508	1	1	1	1	3
304	1	508	1	1	1	1	3
305	1	508	1	3	0	0	1
306	1	508	1	2	1	0	2
307	1	508	1	2	1	0	2
308	1	508	1	3	0	0	1
309	1	508	1	1	1	1	3
310	1	508	1	1	1	1	3
311	1	508	1	2	1	0	2
312	1	508	1	2	1	0	2
313	1	508	1	1	1	1	3
314	1	508	1	4	0	1	0
315	1	508	1	1	1	1	3
316	1	508	1	3	0	0	1
317	1	508	1	3	0	0	1
301	1	516	1	2	1	0	2
302	1	516	1	4	0	1	0
303	1	516	1	3	0	0	1
304	1	516	1	1	1	1	3
305	1	516	1	3	0	0	1
306	1	516	1	3	0	0	1
307	1	516	1	3	0	0	1
308	1	516	1	4	0	1	0
309	1	516	1	1	1	1	3
310	1	516	1	2	1	0	2
311	1	516	1	1	1	1	3
312	1	516	1	4	0	1	0
313	1	516	1	4	0	1	0
314	1	516	1	4	0	1	0
315	1	516	1	1	1	1	3
316	1	516	1	3	0	0	1
317	1	516	1	3	0	0	1
301	1	527	1	1	1	1	3
302	1	527	1	2	1	0	2
303	1	527	1	3	0	0	1
304	1	527	1	1	1	1	3
305	1	527	1	3	0	0	1
306	1	527	1	1	1	1	3
307	1	527	1	4	0	1	0
308	1	527	1	1	1	1	3

309	1	527	1	4	0	1	0
310	1	527	1	1	1	1	3
311	1	527	1	1	1	1	3
312	1	527	1	3	0	0	1
313	1	527	1	2	1	0	2
314	1	527	1	3	0	0	1
315	1	527	1	1	1	1	3
316	1	527	1	3	0	0	1
317	1	527	1	3	0	0	1
301	1	530	1	1	1	1	3
302	1	530	1	1	1	1	3
303	1	530	1	3	0	0	1
304	1	530	1	1	1	1	3
305	1	530	1	2	1	0	2
306	1	530	1	4	0	1	0
307	1	530	1	1	1	1	3
308	1	530	1	2	1	0	2
309	1	530	1	1	1	1	3
310	1	530	1	1	1	1	3
311	1	530	1	2	1	0	2
312	1	530	1	2	1	0	2
313	1	530	1	4	0	1	0
314	1	530	1	2	1	0	2
315	1	530	1	2	1	0	2
316	1	530	1	2	1	0	2
317	1	530	1	2	1	0	2
301	1	537	1	1	1	1	3
302	1	537	1	1	1	1	3
303	1	537	1	3	0	0	1
304	1	537	1	1	1	1	3
305	1	537	1	4	0	1	0
306	1	537	1	3	0	0	1
307	1	537	1	2	1	0	2
308	1	537	1	1	1	1	3
309	1	537	1	4	0	1	0
310	1	537	1	1	1	1	3
311	1	537	1	2	1	0	2
312	1	537	1	4	0	1	0
313	1	537	1	4	0	1	0
314	1	537	1	4	0	1	0
315	1	537	1	1	1	1	3
316	1	537	1	2	1	0	2
317	1	537	1	2	1	0	2
301	1	511	4	4	1	1	3
302	1	511	4	1	0	1	0
303	1	511	4	1	0	1	0

304	1	511	4	3	1	0	2
305	1	511	4	1	0	1	0
306	1	511	4	4	1	1	3
307	1	511	4	2	0	0	1
308	1	511	4	2	0	0	1
309	1	511	4	1	0	1	0
310	1	511	4	1	0	1	0
311	1	511	4	1	0	1	0
312	1	511	4	3	1	0	2
313	1	511	4	1	0	1	0
314	1	511	4	2	0	0	1
315	1	511	4	4	1	1	3
316	1	511	4	3	1	0	2
317	1	511	4	3	1	0	2
301	1	525	4	4	1	1	3
302	1	525	4	1	0	1	0
303	1	525	4	2	0	0	1
304	1	525	4	4	1	1	3
305	1	525	4	2	0	0	1
306	1	525	4	4	1	1	3
307	1	525	4	1	0	1	0
308	1	525	4	1	0	1	0
309	1	525	4	1	0	1	0
310	1	525	4	1	0	1	0
311	1	525	4	1	0	1	0
312	1	525	4	2	0	0	1
313	1	525	4	1	0	1	0
314	1	525	4	2	0	0	1
315	1	525	4	4	1	1	3
316	1	525	4	3	1	0	2
317	1	525	4	3	1	0	2
301	1	534	4	3	1	0	2
302	1	534	4	3	1	0	2
303	1	534	4	3	1	0	2
304	1	534	4	4	1	1	3
305	1	534	4	4	1	1	3
306	1	534	4	1	0	1	0
307	1	534	4	4	1	1	3
308	1	534	4	1	0	1	0
309	1	534	4	4	1	1	3
310	1	534	4	1	0	1	0
311	1	534	4	1	0	1	0
312	1	534	4	3	1	0	2
313	1	534	4	1	0	1	0
314	1	534	4	3	1	0	2
315	1	534	4	4	1	1	3

316	1	534	4	2	0	0	1
317	1	534	4	2	0	0	1
301	1	540	4	3	1	0	2
302	1	540	4	2	0	0	1
303	1	540	4	3	1	0	2
304	1	540	4	4	1	1	3
305	1	540	4	2	0	0	1
306	1	540	4	1	0	1	0
307	1	540	4	2	0	0	1
308	1	540	4	3	1	0	2
309	1	540	4	1	0	1	0
310	1	540	4	1	0	1	0
311	1	540	4	1	0	1	0
312	1	540	4	2	0	0	1
313	1	540	4	2	0	0	1
314	1	540	4	4	1	1	3
315	1	540	4	4	1	1	3
316	1	540	4	2	0	0	1
317	1	540	4	2	0	0	1
301	1	544	4	3	1	0	2
302	1	544	4	1	0	1	0
303	1	544	4	2	0	0	1
304	1	544	4	3	1	0	2
305	1	544	4	1	0	1	0
306	1	544	4	1	0	1	0
307	1	544	4	1	0	1	0
308	1	544	4	3	1	0	2
309	1	544	4	1	0	1	0
310	1	544	4	1	0	1	0
311	1	544	4	2	0	0	1
312	1	544	4	2	0	0	1
313	1	544	4	2	0	0	1
314	1	544	4	2	0	0	1
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316	1	544	4	3	1	0	2
317	1	544	4	3	1	0	2
301	1	547	4	2	0	0	1
302	1	547	4	4	1	1	3
303	1	547	4	3	1	0	2
304	1	547	4	4	1	1	3
305	1	547	4	2	0	0	1
306	1	547	4	3	1	0	2
307	1	547	4	3	1	0	2
308	1	547	4	4	1	1	3
309	1	547	4	3	1	0	2
310	1	547	4	2	0	0	1

311	1	547	4	2	0	0	1
312	1	547	4	4	1	1	3
313	1	547	4	4	1	1	3
314	1	547	4	4	1	1	3
315	1	547	4	4	1	1	3
316	1	547	4	3	1	0	2
317	1	547	4	3	1	0	2
401	2	504	1	2	1	0	2
402	2	504	1	1	1	1	3
403	2	504	1	1	1	1	3
404	2	504	1	1	1	1	3
405	2	504	1	2	1	0	2
406	2	504	1	1	1	1	3
407	2	504	1	1	1	1	3
408	2	504	1	1	1	1	3
409	2	504	1	1	1	1	3
410	2	504	1	1	1	1	3
411	2	504	1	2	1	0	2
412	2	504	1	1	1	1	3
413	2	504	1	1	1	1	3
414	2	504	1	1	1	1	3
415	2	504	1	1	1	1	3
416	2	504	1	1	1	1	3
417	2	504	1	1	1	1	3
418	2	504	1	2	1	0	2
401	2	508	1	2	1	0	2
402	2	508	1	1	1	1	3
403	2	508	1	1	1	1	3
404	2	508	1	3	0	0	1
405	2	508	1	3	0	0	1
406	2	508	1	3	0	0	1
407	2	508	1	1	1	1	3
408	2	508	1	1	1	1	3
409	2	508	1	4	0	1	0
410	2	508	1	1	1	1	3
411	2	508	1	1	1	1	3
412	2	508	1	3	0	0	1
413	2	508	1	1	1	1	3
414	2	508	1	4	0	1	0
415	2	508	1	3	0	0	1
416	2	508	1	2	1	0	2
417	2	508	1	2	1	0	2
418	2	508	1	3	0	0	1
401	2	516	1	1	1	1	3
402	2	516	1	1	1	1	3
403	2	516	1	2	1	0	2

404	2	516	1	3	0	0	1
405	2	516	1	4	0	1	0
406	2	516	1	4	0	1	0
407	2	516	1	2	1	0	2
408	2	516	1	2	1	0	2
409	2	516	1	4	0	1	0
410	2	516	1	2	1	0	2
411	2	516	1	4	0	1	0
412	2	516	1	3	0	0	1
413	2	516	1	3	0	0	1
414	2	516	1	3	0	0	1
415	2	516	1	3	0	0	1
416	2	516	1	3	0	0	1
417	2	516	1	3	0	0	1
418	2	516	1	3	0	0	1
401	2	527	1	2	1	0	2
402	2	527	1	1	1	1	3
403	2	527	1	3	0	0	1
404	2	527	1	4	0	1	0
405	2	527	1	2	1	0	2
406	2	527	1	3	0	0	1
407	2	527	1	3	0	0	1
408	2	527	1	3	0	0	1
409	2	527	1	2	1	0	2
410	2	527	1	1	1	1	3
411	2	527	1	3	0	0	1
412	2	527	1	3	0	0	1
413	2	527	1	1	1	1	3
414	2	527	1	2	1	0	2
415	2	527	1	3	0	0	1
416	2	527	1	3	0	0	1
417	2	527	1	3	0	0	1
418	2	527	1	1	1	1	3
401	2	530	1	1	1	1	3
402	2	530	1	1	1	1	3
403	2	530	1	1	1	1	3
404	2	530	1	2	1	0	2
405	2	530	1	2	1	0	2
406	2	530	1	2	1	0	2
407	2	530	1	1	1	1	3
408	2	530	1	1	1	1	3
409	2	530	1	3	0	0	1
410	2	530	1	1	1	1	3
411	2	530	1	2	1	0	2
412	2	530	1	2	1	0	2
413	2	530	1	1	1	1	3

414	2	530	1	1	1	1	3
415	2	530	1	1	1	1	3
416	2	530	1	3	0	0	1
417	2	530	1	2	1	0	2
418	2	530	1	1	1	1	3
401	2	537	1	1	1	1	3
402	2	537	1	1	1	1	3
403	2	537	1	2	1	0	2
404	2	537	1	3	0	0	1
405	2	537	1	3	0	0	1
406	2	537	1	2	1	0	2
407	2	537	1	2	1	0	2
408	2	537	1	2	1	0	2
409	2	537	1	3	0	0	1
410	2	537	1	1	1	1	3
411	2	537	1	3	0	0	1
412	2	537	1	3	0	0	1
413	2	537	1	1	1	1	3
414	2	537	1	3	0	0	1
415	2	537	1	3	0	0	1
416	2	537	1	3	0	0	1
417	2	537	1	2	1	0	2
418	2	537	1	2	1	0	2
401	2	511	4	3	1	0	2
402	2	511	4	1	0	1	0
403	2	511	4	4	1	1	3
404	2	511	4	4	1	1	3
405	2	511	4	2	0	0	1
406	2	511	4	2	0	0	1
407	2	511	4	4	1	1	3
408	2	511	4	4	1	1	3
409	2	511	4	3	1	0	2
410	2	511	4	4	1	1	3
411	2	511	4	2	0	0	1
412	2	511	4	3	1	0	2
413	2	511	4	2	0	0	1
414	2	511	4	4	1	1	3
415	2	511	4	3	1	0	2
416	2	511	4	2	0	0	1
417	2	511	4	2	0	0	1
418	2	511	4	1	0	1	0
401	2	525	4	3	1	0	2
402	2	525	4	4	1	1	3
403	2	525	4	4	1	1	3
404	2	525	4	3	1	0	2
405	2	525	4	2	0	0	1

406	2	525	4	3	1	0	2
407	2	525	4	3	1	0	2
408	2	525	4	3	1	0	2
409	2	525	4	4	1	1	3
410	2	525	4	3	1	0	2
411	2	525	4	2	0	0	1
412	2	525	4	1	0	1	0
413	2	525	4	2	0	0	1
414	2	525	4	3	1	0	2
415	2	525	4	1	0	1	0
416	2	525	4	1	0	1	0
417	2	525	4	3	1	0	2
418	2	525	4	1	0	1	0
401	2	534	4	3	1	0	2
402	2	534	4	4	1	1	3
403	2	534	4	3	1	0	2
404	2	534	4	3	1	0	2
405	2	534	4	4	1	1	3
406	2	534	4	2	0	0	1
407	2	534	4	4	1	1	3
408	2	534	4	4	1	1	3
409	2	534	4	3	1	0	2
410	2	534	4	3	1	0	2
411	2	534	4	3	1	0	2
412	2	534	4	2	0	0	1
413	2	534	4	2	0	0	1
414	2	534	4	4	1	1	3
415	2	534	4	3	1	0	2
416	2	534	4	2	0	0	1
417	2	534	4	2	0	0	1
418	2	534	4	1	0	1	0
401	2	540	4	3	1	0	2
402	2	540	4	4	1	1	3
403	2	540	4	3	1	0	2
404	2	540	4	3	1	0	2
405	2	540	4	4	1	1	3
406	2	540	4	2	0	0	1
407	2	540	4	4	1	1	3
408	2	540	4	4	1	1	3
409	2	540	4	1	0	1	0
410	2	540	4	4	1	1	3
411	2	540	4	2	0	0	1
412	2	540	4	2	0	0	1
413	2	540	4	1	0	1	0
414	2	540	4	3	1	0	2
415	2	540	4	3	1	0	2

416	2	540	4	2	0	0	1
417	2	540	4	2	0	0	1
418	2	540	4	2	0	0	1
401	2	544	4	3	1	0	2
402	2	544	4	4	1	1	3
403	2	544	4	3	1	0	2
404	2	544	4	1	0	1	0
405	2	544	4	3	1	0	2
406	2	544	4	1	0	1	0
407	2	544	4	4	1	1	3
408	2	544	4	4	1	1	3
409	2	544	4	2	0	0	1
410	2	544	4	4	1	1	3
411	2	544	4	2	0	0	1
412	2	544	4	2	0	0	1
413	2	544	4	2	0	0	1
414	2	544	4	3	1	0	2
415	2	544	4	3	1	0	2
416	2	544	4	2	0	0	1
417	2	544	4	3	1	0	2
418	2	544	4	1	0	1	0
401	2	547	4	3	1	0	2
402	2	547	4	4	1	1	3
403	2	547	4	3	1	0	2
404	2	547	4	3	1	0	2
405	2	547	4	3	1	0	2
406	2	547	4	3	1	0	2
407	2	547	4	2	0	0	1
408	2	547	4	2	0	0	1
409	2	547	4	3	1	0	2
410	2	547	4	4	1	1	3
411	2	547	4	4	1	1	3
412	2	547	4	2	0	0	1
413	2	547	4	1	0	1	0
414	2	547	4	3	1	0	2
415	2	547	4	3	1	0	2
416	2	547	4	2	0	0	1
417	2	547	4	3	1	0	2
418	2	547	4	2	0	0	1

Table 4: Posttest data on postpositions